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Proceeding

The 1st Almuslim International Conference on Science, Technology, and Society

The Institute of Research and Community Services
ALMUSLIM UNIVERSITY BIREUEN - ACEH

COORDINATION OF PRIVATE HIGHER EDUCATION REGIONAL XIII ACEH

CHAPTER I

LIFE SCIENCE

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Message from the Rector

Assalamu'alaikum Wr. Wb.
Greetings.

Ladies and gentlemen,

It is an honor indeed to open this conference, the 1stAlmuslim International Conference on Science, Technology, and Society (AICSTS). On behalf of Almuslim University (Umuslim), I would like to extend a warm welcome to all participants and our speakers who are with us to make this a notable and exciting event a success.

At Almuslim University, we emphasize the best possible achievements in education and research and are also committed to innovation and technology. Today, we are faced with more challenges in these spheres, and therefore, as members of the academic community, we have a duty to find innovative research solutions for them. Hence, this conference is an excellent forum for experts, professionals, researchers, and students as well, to present, share, and discuss their knowledge and experiences with all of us. In line with such idealism, it is really a privilege for us to host you, not just this year, but for years to come, to give and provide opportunities to contribute lasting and practical solutions to the challenges that confront us from time to time. This conference includes keynote speeches, oral and poster parallel sessions on topics in the field of sciences, life sciences, engineering, social sciences and humanities.

Finally, we know that in the origination of this conference there may be some shortcomings, for which we would like deeply apologize in advance to all of you. This is the University's first experience in organizing an international conference like this. With deepest sincerity hereby we would also like to thank all the keynote speakers for your contribution, time and support for this conference. Our heartfelt appreciation goes to all the authors of the selected papers for their effort and hard work. I also would like thank the organizing committee of the conference for their hard work in making this event a success. I wish to encourage them to continue organizing more events and to take other initiatives as well in future. To support and sustain important research linkages for dialogue and facilitate exchanges of ideas such as this will certainly generate more new discoveries and innovations in years to come. It is everyone's optimism that all we will learn from this first international conference in 2015 will be used as a reference for the development of research, as well as guidance for the readers in education and in academic profession.

I am sure the committee of this conference has served you in the best way they can to make your brief stay with us a lasting memory.

Thank you.

Dr. Amiruddin Idris, SE, M.Si

Message from the Committee Chairman

Assalamu'alaikum Wr. Wb.
Greetings,

Ladies and Gentlemen,

I would like to take this occasion to cordially welcome all participants of the 1st Almuslim International Conference on Science, Technology, and Society (AICSTS). This conference is held at our beloved campus of Almuslim University (Umuslim), Bireuen, from November 7th to November 8th, 2015. Almuslim University, the home of 7 faculties, is one of the major private universities in Aceh. We are assured that the 416 scientific participants will contribute to productive discussions and exchanges of scientific experiences that will bring about success to this conference. Participants from 9 countries, Indonesia, Malaysia, Thailand, Philippines, United States, India, Taiwan, England, and Qatar, have optimally marked an international scope to the conference.

I would like to express my gratitude to the Coordination of Private Higher Education Regional XIII Aceh, the Institute of Research and Community Services of Almuslim University and the committee members for helping us in organizing the conference. The conference and proceedings are a credit to a large group of people and everyone should be proud of the outcome.

We are delighted with the vast responses of 152 submissions from researchers and practitioners. The knowledge bases that we are aiming to generate in the conferences topics are overwhelming due to the involvement of these experts from various fields of studies. Their papers will be published in the proceedings to provide permanent records of what has been presented. The proceedings are divided into four, Life Sciences, Engineering, Social Sciences and Humanities (Science Educations), and Social Sciences and Humanities (Economics, Social and Arts), and the papers published here will exhibit the current state of development in all aspects of important topics that are instrumental to all researchers in the various fields. They have succeeded in bringing together various aspects of developments and innovations in knowledge and technology that will benefit not only the academic community, but the society itself as well.

We realize that there are still many shortcomings in the implementation of the arrangements of this conference. Therefore at this opportunity we also expect criticism and constructive suggestions from all stakeholders so that the conference arrangements in future will be more successful. Finally we would like to thank you all for all the support and assistance you have contributed to making this conference and its proceedings successful.

Thank you,

Drs. Marwan Hamid, M.Pd

KEYNOTE SPEAKERS

ASEAN ICT Manpower: (Case Study of Thailand, Indonesia, and Vietnam)

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Abstract

This study investigates the situations of ICT manpower in Thailand, Indonesia, and Vietnam in 2012 and performs a projection of ICT manpower for 2018. This study involved both qualitative and quantitative research approaches. It describes the ICT development policies in the three countries to provide some context of the study. In-depth interviews and questionnaires were conducted to collect data from ICT manpower in core ICT industries, non-ICT industries and education sectors. The majority of ICT manpower in Thailand, Indonesia and Vietnam obtained a bachelor's degree, and are currently officer/technician/ engineer. In addition, the average salary rate is 690 USD in Thailand, 630 USD in Indonesia, and 350 USD in Vietnam. In 2018, the number of ICT manpower in Thailand will have about 634,981 persons, 3,122,800 persons in Indonesia, and 868,136 persons in Vietnam. It is found in the study that the ICT manpower in these countries has the same weakness, which is English communication. Regarding AEC, most ICT companies in three countries will gain advantages from AEC by seeking business opportunities and expanding businesses. This is an empirical study which investigates cross-country the profile of the ICT Manpower in Thailand, Indonesia, and Vietnam in 2012. It identifies the strengths and weaknesses of ICT manpower in the three countries based on the survey data obtained. Based on the results, it offers some recommendations on how to develop ICT manpower for a global labour-market competition and ASEAN.

Keywords*:* ASEAN, ICT Manpower, Thailand, Indonesia, Vietnam, ICT Professional Standards

Introduction

Nowadays, information technology has been rapidly changed with respect to an algorithm, structure and platform. In order to cope with the challenges of the waves of innovation and technological changes, ASEAN submitted ICT development in the next five years under the name "ASEAN ICT Masterplan 2015

(AIM 2015)". This Masterplan is driven by six strategies of economic transformation, people empowerment and engagement, innovation, infrastructure development, human capital development, and bridging the digital divide to deliver 4 key outcomes: 1) ICT as an engine of growth for ASEAN countries, 2) recognition for ASEAN as a global ICT hub, 3) enhanced quality of life for peoples of ASEAN, and 4) contribution towards ASEAN integration (ASEAN, 2011). As a result, ASEAN Membership: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnamwill planto develop their ICT infrastructures and ICT manpower. Nevertheless, factors that affect the development and capacity of ICT manpower in ASEAN countries are: 1) the mechanisms of education and innovation, 2) the support for ICT infrastructure in the country, 3) facilities of education/training, 4) the wages of labour, 5) the desire for a country to move forward, 6) the level of the community's economy, and 7) Government policies related to ICT.

The paper first describes briefly the ICT development policies of Thailand, Indonesia and Vietnam. Then, it discusses ICT professional standards, and describes the research methodology and data collection. After that, it provides the results of the quantitative and qualitative analyses on the current situations of ICT manpower, number of the ICT manpower, need for ICT manpower in market, strengths and weaknesses of ICT manpower, professional standards of ICT employees. Finally, it provides the impacts of ASEAN Economic Community (AEC) and ICT business trends in Thailand, Indonesia, and Vietnam.

ICT Development Policies in Thailand, Indonesia and Vietnam

In 2011, Thailand had been upgraded income categorization from a lower-middle income economy to an upper-middle income economy by The World Bank, and rank sixty-seven in the Networked Readiness Index in 2015 by The World Economic Forum. In order to enhance the competitiveness of the Thai industrial sector and prepare Thailand for the ASEAN Economic Community, the Government has revealed the Masterplan under name "Digital Economy". This Masterplan covers in four areas: Digital Commerce, Digital Entrepreneur, Digital Innovation, and Digital Content, and consists of five strategies, namely, Hard Infrastructure, Soft Infrastructure, Service Infrastructure, Digital Economy Promotion, and Digital Society (GSMA, 2015).

According to Thailand ICT Development Policy, the Ministry of Information and Communication Technology (MICT) has formulated the ICT 2020 Policy Framework. According to vision and goals of the ICT 2020 policy, "ICT is a key driving force in leading Thai people towards knowledge and wisdom and leading society towards equality and sustainable economy" (NECTEC, 2011). Furthermore, the ICT 2020 policy framework set five strategies: Strategy 1: Universal and secure ICT and broadband infrastructure, Strategy 2: ICT Human Resource and ICT Competent Workforce to emphasise the development of ICT employees' knowledge and skills and the expansion of a number and quality highly-skilled ICT manpower based on international standard. Strategy 3: ICT industry competitiveness and ASEAN integration, Strategy 4: Smart government: ICT for government service innovation and good governance, and Strategy 5: ICT for Thailand competitiveness and vibrant economy.

Indonesia has the largest of population in ASEAN and ranks seventy-nine in the Networked Readiness Index in 2015. In order to develop Indonesia as one of the world's main food suppliers, the Government has revealed the Masterplan for the Acceleration and Expansion of Economic Development of Indonesia (MP3EI). This plan is implemented for the period of 2005-2025 by focusing on eight main programs, namely the development of agriculture, mining, energy, industry, maritime, tourism, telecommunication, and development of strategic zones. The implementation strategy of MP3EI will integrate three main elements: 1) developing the regional economic potential in six Indonesia Economic Corridors: Sumatra Economic Corridor, Java Economic Corridor, Kalimantan Economic Corridor, Sulawesi Economic Corridor, Bali – Nusa Tenggara Economic Corridor, and Papua – Kepulauan Maluku Economic Corridor; 2) strengthening national connectivity locally and internationally; and 3) strengthening human resource capacity and national science & technology to support the development of main programs in every economic corridor (Ministry for Economic Affairs, 2011).

According to ICT development, this Masterplan emphasises ICT industry development in Java Economic Corridor only. Furthermore, in order to link the producers and users of science and technology, the government of Indonesia established intermediary institutions to achieve this objective such as Business Innovation Center (BIC), Business Technology Center (BTC), Center for Innovation - LIPI, Center for Nuclear Partnership - BATAN, BPPT engineering, and Technology Incubator Center – BPPT.

Meanwhile, Vietnam has quickly and continuously developed all ICT sectors, and ranks eighty-five in the Networked Readiness Index in 2015. In order to develop Vietnam into an industrialised and modernised country in 2020, the government has revealed Vietnam's Socio-Economic Development Strategy for the period of 2011-2020 (Ministry of Planning and Investment, 2012). This strategy is aimed to stimulate investments in major industries through tax incentives, for example, goods export, agriculture and forestry, advanced technology industries (such as manufacturing computer software and components), environment, research and development, labour intensive industries, and natural resources and infrastructure.

Regarding ICT development in Vietnam, Ministry of Information and Communication set the National strategies and plannings on ICT development to drive ICT sector during 2011-2020. . In 2013, the Government of Vietnam established the National Commission on Application Information Technology (NCAIT) to promote the use and development of IT in state agencies. Moreover, Vietnam expanded ICT sector to upcountry by establishing Department of Information Communication in 63 provinces (MIC, 2014). As for ICT manpower development, by the end of the year 2013, Vietnam had 290 universities and colleges and 228 vocational schools which offered training courses on telecommunications and IT majors with the total enrollment quota exceeding 80.000 students (MIC, 2014).

ICT Professional Standards

The ICT professional standards have been used to measure or evaluate each individual ICT employee in terms of potential, skills, attitudes, competency, and knowledge. In addition, the ICT professional standard can enable public and private organisationsto more effectively recruit and develop ICT

employees. Based on the existing relevant data and information, it is found that various ICT professional standards to implement in several countries.InEurope, the European Commission developed and implemented European Qualification Framework (EQF) and European e-Competence Framework (e-CF).The EQF uses to compare the education standard levels between the European Union member countries. The e-CFaims to develop ICT manpower, and support all industries in Europe. In the United Kingdom (UK), government developed The ICT professional standards under name Skills Framework for the Information Age (SFIA). In Asia, Japan proposed standard under name Skill Standards for IT Professional (ITSS).

Meanwhile, ASEANhave developed ICT professional standard, in order to measure ICT manpower knowledge and skills, and use to compare the ICT professional standard between the ASEAN member states. ASEAN ICT professional standard set ICT competency at three levels as follows: Level 1 Basic Level - Has basic knowledge and skills which is adequate to perform a given task(s) under supervision of management. Level 2 Intermediate Level - Has professional knowledge and skills to perform a given task(s) independently, and, if required, can supervise others; understand the number of comparative approaches to problems in their fields; and be able to apply them efficiently, and Level 3 Advanced Level - Has professional knowledge and skills in both technical and management to lead a team in inexperienced environment.

Methodology

This study used qualitative research, and quantitative research approaches. We conducted in-depth interviews with executives responsible for ICT management in public and private organisations, and then questionnaire surveys to collect relevant data during 2012 –2014 in Thailand, Indonesia and Vietnam.

The sampling respondents were selected from ICT manpower in core and non-core ICT industries sectors in the three countries. The total number of returned and usable questionnaires are 589 questionnaires and 87 interviews from Thailand, 214 questionnaires and 15 interviews from Indonesia, and 200 questionnaires and 15 interviews from Vietnam.

Findings

The results of the study on ICT manpower in Thailand, Indonesia, and Vietnam are presented as follows:

ICT Manpower in Thailand

The study of demographic characteristics reveals that there were 589 respondents, 70.6% of which were male and 29.4% were female and the average age of the respondent was not over 33 years old. Most respondents are employed as technician/ engineer. Regarding education, most of them had a bachelor's degree, followed by master's degree, and their average work experiences are between 1-10 years. For salary rate, the average salary rate was 690 USD.

1. *The Number of ICT Manpower in Thailand.* Base on the report of Thailand ICT manpower - National Statistical Office of Thailand and Office of the National Economic and Social Development Board during 2001-2012, in order to forecast the number of ICT manpower in

Thailand during 2013 – 2018, this study uses the Inverse Cobb – Douglas Production Functions, which uses Regression Analysis for the calculation to find the relationship between the number of manpower and gross capital stock, and time. Thus, if the Thai economy keeps expanding with consistent growth of GDP and CAP, the overall number of ICT manpower also tends to increase from 519,703 persons in 2013 to 540,947 persons in 2014, 563,065 persons in 2015, and 634,981 persons in 2018.

2. Need for ICT Manpower in Thailand Market. The result of interviews suggest that hardware sector needed for employees to fill in the position of product managers (who possess understanding and knowledge about ICT businesses and technology), network engineer, system engineer, developer, data communication specialist, security specialist, system manager, project manager, and system architecture specialist. The software and service sectors required employees in the level of software development specialist and project manager with the software specialist abilities. While telecommunication sector required employees in telecommunication engineering, radio network, database administration, IT security, network security and data analytic (Employee with IT knowledge and abilities to analyse data to find out customers' needs which will enable the company to better respond to their needs).

3. Strengths and Weaknesses of ICT Manpower in Thailand. As for strengths of Thai ICT manpower when compared with those of other ASEAN countries, the executives of the sample organisations viewed that Thai employees are careful and can work effectively in programming. They have problem solving skills and can effectively develop systems. Also, they are flexible and helpful, which are good for consultation services. Meanwhile, the weaknesses mentioned by the interviewed executives include the following: lack of presentation skills, lack of management skills, lack of business knowledge, lack of overall business pictures, lack of discipline, lack of responsibilities, impatience, lack of determination, lack of motivation to seek more knowledge by themselves, and lack of English skill.

All the executives advised that English texts are necessary. Thus, Thai ICT manpower must be increased English skills because English is important for development of knowledge and abilities since ICT technology originated from the West while Eastern countries adopted such technology from them.

4. Professional Standards of ICT Employees in Thailand. According to the professional standards of ICT Employees in Thailand, several government offices,such as Thailand Professional Qualification Institute (TPQI), Council of Engineers, Department of Skill Development, Office of the Education Council, etc.are attempted to develop professional standards to evaluate the potential of ICT manpower. This might affect the ICT manpower or entrepreneurs. Meanwhile, private sectoremphasised universal standards, such as ISO, ITIL and COBIT, as well as vendor certificates, such as MCITP (Microsoft Certificate IT Professional), CCNA (CISCO Certified Network Associate), VCP (VMware Certified Professional), SAP and ORACLE.

However, the results of surveys and interviews suggested a advantages of ICT professional standards to support the ICT manpower and companies as follows: 1) increase potential: ICT professional standards enable employees to learn about their own knowledge and abilities, it is a way to encourage

themselves to learn and meet the set standards; 2) clear self-development strategies: ICT professional standard framework set requirements for ICT employees to pass criteria in each level so employees see how they can grow in their professions, set the goals for themselves, and learn which areas they need to develop to meet the goals; 3) reliability and acceptance: ICT professional standards are criteria for setting the minimum knowledge and expertise in professions, employee passing professional standards will receive certificates certifying the knowledge and abilities in accordance with what is specified in the professional standards; 4) employee planning: ICT certificates that an employee receives from passing the professional standards certifies skills, knowledge and the minimum abilities of that person, it is an additional information useful for recruiting employee for work to suit each position; 5) build mutual understanding: ICT professional standards enable all the sectors related with ICT systems in Thailand to understand correctly about ICT ability levels in different fields. This professional standard framework can also be used as a reference for developing ICT manpower; 6) upgrade industries: ICT professional standards help develop the ICT manpower in terms of knowledge and abilities, they can perform tasks better. Once employees possess knowledge and abilities in accordance with the set standards, the overall productivity of the industry will be better, meet the standards, and is more widely accepted.

In addition, the results of the surveys and in-depth interviews showed disadvantages of ICT Professional Standards to impact ICT manpower and companies as follows: 1) lack of knowledge in the field of work: as professional standards encourage employees to have expertise; this may lead to the fact that ICT employees view the tasks only in the dimension of their own expertise. As a result, the overall Thai ICT employees may lack the comprehensive ICT knowledge; 2) higher expenses: Various businesses will have more expenses on employee as they are needed for supporting ICT employees to pass the professional standard tests.

5. The Impacts of AEC and ICT Business Trends in Thailand. AEC will bring advantages to Thailand in term of businesses, technologies and manpower. At the business level, most companies are expected to be able to rapidly expand business and outsource their business activities in the ICT service sector. Furthermore, they can recruit foreignmanpower with lower wage. On the other hand,In order to compete in AEC market, Thai companies should be developed and adjusted products quality to high standards, including technology change. At the same time, ICT manpower should be developed individual skills such as English language skill and working skills.

Regarding the new ICT business in the future, the results of technology and customer behaviour continued to change in Thailand market. As a result, most of ICT companiesand non-ICT companies will adjust business plans and develop new products/services by focusing on Cloud Computing, Big Data, and Mobile Application and Business.

ICT Manpower in Indonesia

The study of demographic characteristics found that there were 216 respondents, 74.10% of which were male and 25.90% were female and the average age of the respondent was 30 years old or below. Most respondents were employed as a technician/ engineer. Regarding education, most of them had a

bachelor's degree, followed by diploma, and the experience was 1- 5 years. For salary rate, the average salary rate was 630 USD.

1. The Number of ICT Manpower in Indonesia. Based on the information of ICT manpower in Indonesia during 2005-2010 by The Economic and Social Commission for Asia and the Pacific (UNESCAP or ESCAP), this study used the method of Linear Regression to predict ICT manpower in Indonesia during 2011-2018. The result suggested that, the ICT manpower in Indonesia will increase from 2,042,000 persons in 2013 to 2,258,000 persons in 2014, and 2,474,000 persons in 2015. Moreover, Indonesia will have about 3,122,800 persons of ICT manpower in 2018.

2. Need for ICT Manpower in Indonesia Market. According to a study by the Economist Intelligence Unit conducted for British Council in June 2012, it was found that the Indonesian economy is experiencing changes, from the focus on agriculture to manufacturing industry. According to Indonesia's economic plan for 2011 – 2023 (MP3EI), most of the budget is allocated for coal, mine, petroleum and natural gas. Meanwhile, the ICT industry is one of the ten industries the government aims to develop. The ICT industry development developed the broadband business to reach the growth of 8% in 2014 (from 0.5% in 2010) and aimed to stimulate four main businesses, including device manufacturing, professional and consulting services, content and applications development, and ecosystems innovation. In order to develop these businesses, Indonesia needs to have employees with a degree in computer science, which is still rare at present.

For Indonesian market need, important knowledge and expertise for the ICT manpower were in network, databases, integrated systems, software engineering and the ability to analyse needs, system planning, quality assurance, filing system, and integration with Cloud Computing.

However, there are some factors about how significant changes can affect demand for Indonesia ICT manpower: 1) when companies use computerized devices and modern tools, 2) the entry of foreign companies in the pioneering technology to Indonesia, 3) the flow of information and communication needs that are quite high in every work unit/institution/company, 4) started to use the system information in doing a job that is considered to be more practical and easier than the job manually.

3. Strengths and Weaknesses of ICT Manpower in Indonesia. According to a review of strength in ICT manpower in Indonesia when compared with other ASEAN countries, the executives of sample organisations who were interviewed gave the opinion that IT manpower in Indonesia is of high potential, particularly in software operation and adoption. Some Indonesian employees possess qualifications suitable for job positions in ICT large companies. The ICT manpower in Indonesia has some weaknesses, for instance, initiatives, innovation, diligence, access of information, lack of interest from the government sector to develop ICT knowledge and English skills, and breadth of knowledge.

In order to increase ICT manpower performance, some organisationsrecognised the importance of aiding technology of developers, such as programming, education, knowledge and experience development, logics in problem solving, importance of computer systems, and organisation leadership. Moreover, mutual guidance for operation should be established, for example, arranging regular training to

develop new knowledge, undergoing training, workshops and seminars to gain modern knowledge and expertise by including the Employee training budget in the annual budget, and organizing internal and external training.

4. Professional Standards of ICT Manpower in Indonesia. For professional standards of ICT manpower in Indonesia, the standards mentioned by Indonesian respondents are for certificates issued by some companies like Cisco, Mikrotik, Microsoft and others. Furthermore, there are some standards in Indonesia which have received the international certification, for instance, standards for ICT graduates or SKKNI. It was mentioned that the standards should link with the international standards. The organisation with the role to set Indonesia's professional standards is the Ministry of Communications and Informatics). In general, professional standards are one of the factors for determining the manpower's salary rates. The sample respondents viewed that the current professional standards are good and sufficient, for example, certificates of various companies, such as CISCO, MSEE, ORACLE, JAVA, etc. which are accepted in Indonesia and internationally.

In their view, The advantage of ICT professional standards are: 1) develop universal language system to facilitate ICT jobs without having to undergo long training 2) have manpower with widely accepted certification 3) potential of ICT manpower is determined by the same standard, and they have a chance to prove their potential both at national and international levels 4) professional standards help increase skills of ICT manpower. Despite a lot of advantages, ICT professional standards also had some loopholes, including 1) financial problems related with the certificate issuing organisations as they are not located in Indonesia. 2) ICT professional standards will not be taken into consideration or neglect to process the application portfolio. When ICT employees have the knowledge and accept their performance by their agencies. 3) It will be more difficult to search for employees which meet ICT professional standards. As a result, all the related organisations should involve ICT curriculum, including private and foreign organisations, in the same way as Indonesia's governmental organisations.

5. The Impacts of AEC and ICT Business Trends in Indonesia. Regarding the impacts of AEC, most of the ICT executives thought that they can gain benefits from AEC by seeking business opportunity into AEC market, exchanging knowledge and technology, sharing technological development, and expanding cooperation. On the other hand, some ICT executives thought that they will not gain advantages from AEC.

For the ICT business trends in the future, enterprise state and private sector firms have important roles to drive ICT industry in Indonesia. Most of companies expect changes in the ICT industry such as: 1) a more "user friendly" technology, 2) the establishment of strong technology-based companies, like Google, Microsoft or Macintosh, in Indonesia, 3) the ability to compete internationally, 4) the shift towards the use of mobile devices (mobile device), 5) the development of software industry as well as hardware industry. Based on telecommunication structure and ICT manpower skills, ICT companies in Indonesia will use joint venture strategy to develop new products/services by focusing on Cloud Computing, Mobile Business, ICT Outsourcing, and Call Center.

ICT Manpower in Vietnam

The study of demographic characteristics found that there were 200 respondents, 69.5% of which were male and 30.5% were female and the average age of the respondent was not over 30 years. Most of the respondents were employed as a technician/ engineer. Regarding education, most of them have a bachelor's degree, followed by diploma, and their work experiencesare in the range of 1- 5 years. For salary rate, the average salary rate was 350 USD.

1. The Number of ICT Manpower in Vietnam. Based on Vietnam ICT White Book in 2009 - 2014, this study used the method of Linear Regression to predict ICT manpower in Vietnam during 2013 - 2018, and found that, Vietnam ICT manpower will have about 441,008 persons in 2013, 505,086 persons in 2014, 578,324 persons in 2015, and 868,136 persons in 2018. However, the ICT personnel development plan of the Ministry of Information and Communication (MIC) aims to increase the number of Vietnam ICT manpower to 1 million persons in 2020 in order to support ICT Industry and export ICT manpower to global market (Minister of Information and Communications, 2012).

2. Need for ICT Manpower in Vietnam Market. The result of in-depth interviews suggested that the ICT manpower should possess knowledge and expertise in hardware and software. Employees must be able to control themselves emotionally and be flexible in stressful working environment, develop specialisation and accomplish tasks assigned by the company. In addition, Vietnam market need manpower with good communication skills and could communicate with foreigners. Thus, the most important elements are foreign language skills, abilities to do research, management, team work and presentation skills. In other words, Vietnam has a lot of knowledgeable ICT manpower, but without expertise.

3. Strengths and Weaknesses of ICT Manpower in Vietnam. According to a review of strength in the ICT manpower in Vietnam when compared with other ASEAN countries, the executives of sample organisationsviewed that Vietnam has large number of ICT manpower who are youths with creativity, and love for learning and new experiences. They are active and dedicate themselves to work, and can learn fast. Its ICT manpower has high skills and the wages are lower than in other countries. Strength of Vietnam's ICT is knowledge. Vietnam possesses knowledge and the ICT manpower with the right degree and potential in research and development in specialised ICT. In general, Vietnam manpower is hard-working and determined. Each employee has various abilities. For example, programmers can learn about network or system integration. For weaknesses, the ICT manpower in Vietnam has limitations in language and professional training. These include the lack of creativity, independence, teamwork skills, knowledge and experience. As a result, they are required for more technical training. Their working environment is not professional and there is no training in educational institutions. But the training in Vietnam is not systematically organised. Many training institutions have been established without trainers' quality control. The ICT manpower can increase their skills only through work experiences. As a result, new graduates have low-level skills.

4. Professional Standards of ICT Manpower in Vietnam. Based on the result of interviews, this study found that ICT professional standards do not affect the worker's salary rate. The salary rate is dependent on the employee's ability, knowledge and work experiences. However, the Vietnam government has a plan to develop professional standards of ICT manpower in the future.

5. The Impacts of AEC and ICT Business Trends in Vietnam. Most of the ICT executives believed that AEC will bring advantages in that Vietnamese ICT manpower will get to learn new technology more. Manpower with required skills will be easier to find, their wages will be cheaper than those in ASEAN, and more cooperation will be enhanced. The chance to export software and expand markets will also increase, with the focus on Indonesia or Malaysia market. The cooperation with other ASEAN countries can help promote the company among their overseas counterparts. In addition, there will be transfers of manpower, knowledge, new working methods, and exchanges of expertise or problem solving strategies.

Regarding the new ICT business trends in the future, most of the ICT executives viewed that ICT companies in Vietnam will use joint venture strategy to develop and launchnew products/services. There are 1) Software Outsourcing Cluster 2) Data Center Service, and 3) Cloud Computing.

Conclusion

Regarding ICT demographic data of Thailand, Indonesia, and Vietnam, most of the ICT manpower in the three countries were male. Vietnam ICT manpower had a higher ratio of female manpower than Thailand and Indonesia, and most respondents in the three countries are employed as a technician/ engineer. Regarding education, most of the respondents have a bachelor's degree, followed by master's degree for Thailand, and diploma for Indonesia and Vietnam. Their ICT work experiences range from 1-10 years for Thailand and 1-5 years for Indonesia and Vietnam. For the average salary rate, Thailand has higher salary rates than Indonesia and Vietnam (690 USD in Thailand, 630 USD in Indonesia, and 350 USD in Vietnam). According the forecast of the number of ICT manpower in 2018, Thailand will have about 634,981 persons, 3.2 million persons in Indonesia, and 887,025 persons in Vietnam. Thus, Indonesia has the largest number of ICT manpower in ASEAN. As a result, Indonesia can quickly develop and launch ICT products/services to domestic markets and global markets. As for strengths and weaknesses of ICT employees in Thailand, Indonesia, and Vietnam, the interviewed executives of sample organisations viewed that the strengths of ICT employees in each country is different. Meanwhile the ICT employees in every country have the same weakness, which is English communication.

Based on AEC in 2015, most ICT companies in three countries will gain advantages from AEC by seeking business opportunities and expanding businesses. However, they must be emphasised manpower skill development. For ICT businesses in the future, Thailand has planned to develop Cloud Computing, Big Data, and Mobile Application and Business. Indonesia will develop Cloud Computing, Mobile Business, ICT Outsourcing, and Call Center. Meanwhile, Vietnam has emphasiseddevelopment in terms of Software Outsourcing Cluster, Data Center Service, and Cloud Computing. Thus, these countries should plan to developed ICT manpower skills to serve new ICT businesses.

In sum, the result of this study can help the public and private sectors in these three countries as well as in other countries in ASEAN to plan for the development of ICT manpower for a global labour-market competition and ASEAN.

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Water Quality Evaluation System for Assessing the Status and Suitability of the Citarum River Water for Various Uses and Its Aquatic Ecosystem

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Abstract

The Citarum river water is the most important water sources in Indonesia. The river that supports a population of 28 million people, delivers 20% of Indonesia's gross domestic product, and provides 80% of surface water to carry through the West Tarum Canal to the Jakarta's water supply authority, is one of the most polluted rivers in the world. Water quality degradation of this river increases from the year to year due to the increasing pollutant loads when released particularly from Bandung region of the upstream areas into river without treatment. This will be facing the chronic problems of water pollution for supporting the suitability of water for different uses. This study used the Water Quality Evaluation System to asses the suitability of water in term of the Water Quality Aptitude (WQA) for five different uses and its aquatic ecosystem. The assessment of ten selected stations was found that the WQA ranges from the suitable quality for agriculture and livestock watering uses to unsuitable for biological potential function, drinking water production, and leisure and sport upstream the Saguling reservoir, generally. The role of Citarum river water in providing the demands of multipurpose uses particularly for Jakarta's water supply will still be present in question for the years to come. The aptitude of water along the river is evaluated to contribute to decision support system for decision-making process and to provide as proper information for water users in allocating their water right wisely.

Keywords: Citarum River, water quality aptitude, water quality evaluation system, water use.

Introduction

The problems of water quality degradation in the Citarum river will increase from the year to year due to the increasing of the pollutant loads particularly from Bandung region located in the upper areas of the river basin when released without treatment. Deterioration of water quality causing by the human activities in upper river basin reduces the usability of the resources for stakeholders in the down-stream

areas. Over the past 20 years, rapid urbanization and industrial growth have resulted in growing quantities of untreated domestic sewage, solid waste and industrial effluents being dumped in the river. Pollution levels now compromise public health, and the livelihoods of impoverished fishing families have been jeopardized by widespread fish kill (DGWR, 2007). To handle the problems in implementing of integrated water quality management are necessary to consider all the related aspects entire the basin to ensure the quality of stream water managed will improve gradually. For example, a refined the waste load allocation process is proposed with a reexamination of water quality violation to improve the allocation decision under uncertainty (Chen and Ma, 2008). Participatory surface water management is emphasized in order to achieve a holistic and sustainable water management decision-making process (Hartmann et al., 2006).

The government of Indonesia has been acquainted with integrated approach since the Government Regulation No. 82 on water quality management and pollution control (PP No. 82/2001) was enacted in the year 2001. The PP No. 82/2001 serves as the national guideline to be referred in managing of water quality especially for water managers and operators who work at the national, provincial, and river basin level institutions. Although this regulation guides the role sharing amongst the related institutions and provides the technical arrangements including the classification of the national water quality criteria, the operational guidelines in implementing of the regulation to the specific characteristics of a river basin are still not envisaged properly. However, conducting an adaptive guideline in managing of water quality to the specific local condition is necessary (Fulazzaky, 2005). For example, salinity tolerance of macro-invertebrate communities varies in Eastern Australia; hence, water quality guidelines should be developed at a local or regional scale (Dunlop et al., 2008), and the nutrient pollution effects of moderate eutrophication to Runde river in Zimbabwe need to be addressed by appropriate agricultural and environmental policies that relate to water pollution and land use (Tafangenyasha and Dube, 2008).

Water quality evaluation system (WQES) has been developed to aim two objectives that are (1) to classify the water quality in accordance with the actual condition of water in the stream and (2) to classify the water suitability for different uses and its ecosystem in accordance with the available water quality in the river (Oudin et al., 1999). Thus, the WQES serves to assess the status of water quality in the stream and to identify what the level of water is suitable to provide for the different uses and its ecosystem. This tool is considerable to a comprehensive approach in evaluating of water quality. The earlier study showed that a modeling approach can be used to estimate the impacts of water quality management programs in river basins (Holvoet et al., 2007). The models are possible to analyze the best recommendations needed for different levels of treatment derived in order to improve the water quality (Muhammetoglu et al., 2005). The results of water quality analysis using the WQES are offered to be considered in formulating of the water quality standards and the priority of measures needed to each region in the country, or anywhere, based on the specific local conditions. A systematical analysis of water quality data scientifically introduces to translate the data to actual explanations may be envisaged as decision support system (DSS). The accurate information obtained helps the decision makers in preparing the locally adaptive

policies and guidelines to water quality assessment and management besides serves as the proper tool to water users in allocating their water right wisely.

The objectives of this study are (1) to identify the suitability of Citarum river water in providing the different water uses and its aquatic ecosystem, (2) to warn the water users in allocating their water right wisely based on the actual quality of water, and (3) to recommend the priorities of measures needed to be envisaged by the local authorities, central government, and all related stakeholders for improving water quality.

The importance of WQES to assess the Citarum river water

The Citarum river is the largest river in western Java, the region which contains Jakarta, the capital of Indonesia. The river originates in the mountain range near the southern coast of Java that includes many high volcanic peaks including Mount Wayang (elevation 2,200 m), and travels in a generally north-westerly direction for about 270 km until it empties into the Java sea east of Jakarta. Its drainage area is about 6,600 km^2. The upstream reaches of the river run in mountainous to gently undulating hilly lands for about 200 km while the lower 70 km stretch drains a vast plat alluvial plain. The total area of the river basin to include certain bordering rivers and its tributaries as shown in Figure 1 is about 11,500 km^2 situated at *latitude* of 6°43′ S to 7°04′ S and *longitude* of 107°15′ E to 107°55′ E. The climate of the basin area is characterized by two distinct seasons: rainy season and dry season. The rainy season occurs during the months of November to April, while the dry season occurs during the remaining months. January is the wettest month, while August is the driest month. Naturally, runoff follows the same seasonal pattern. The average annual rainfall varies from 1,500 mm in the coastal areas to 4,000 mm in the mountainous areas in the upper part of the basin. This total runoff from the catchments is generally considered to be adequate to supply demands for all uses well into the future. To regulate surface water the Citarum river system has three cascade reservoirs, i.e., Saguling in the uppermost, Cirata in the middle, and Jatiluhur in the lower location. However, the spatial distribution of surface water resources is not uniform, and shortages do occur from time to time in certain areas.

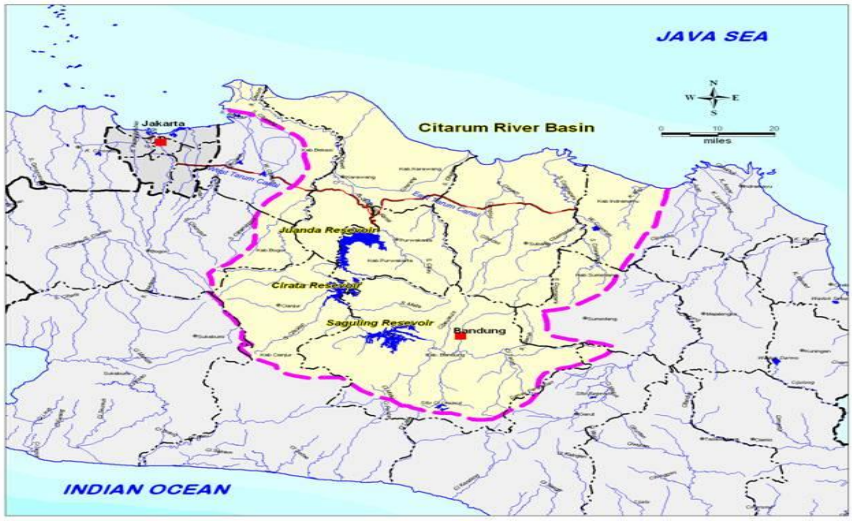

Figure 1. Location of Citarum river basin

The population in the river basin area in 2003 was 17.8 million, with 4.1 million households – 30% derived livelihood from agriculture, 25% from industry and 45% from services. The population is projected to rise to 21.3 million by 2010. Industrial locations are generally interwoven with settlement and there is no clear zoning or separation of these land uses in the region. The area is a key rice producer for the country. There are a total of 390,000 ha of irrigated paddy fields, with 240,000 ha served by the Jatiluhur reservoir and canal system in the lower basin. Average annual demand from the Jatiluhur dam has increased from 140 m^3/s in 1996 to 156 m^3/s in 2004. The river that supports a population of 28 million people, delivers 20% of Indonesia's gross domestic product, and provides 80% of surface water to carry through the West Tarum Canal to the Jakarta's water supply authority is one of the most polluted rivers in the world (DGWR, 2007). Urbanization in the last three decades was followed by rise in untreated household sewage, solid waste and industrial effluents. The more waste enters the river the more chances for spreading diseases, and already there are many fishing families that are starving because of tremendous decrease in fish population due to heavy pollution.

Methodology

General of quality evaluation system

The assessment of river quality as shown in Figure 2 is commonly based on three choices, which are: (1) water choice, referred to as the WQES, to assess the physicochemical and biological quality of water in terms of the water quality index (WQI) and the suitability of water for supporting natural functions of the aquatic environment and water uses in terms of the water quality aptitude (WQA); (2) physical structures choice, referred to as the physical quality evaluation system, to assess the level of manmade change on the main channel, channel margins, and river banks; and (3) biological choice, referred to as the biological quality evaluation system, to assess the state of the biosciences of the aquatic environment (Oudin et al., 1999). The qualities of water and physical structures of a river influence the quality of biological aquatic substances component. This economically influences the exertions of water resources management in order to ensure the sustainable environmental development technicality.

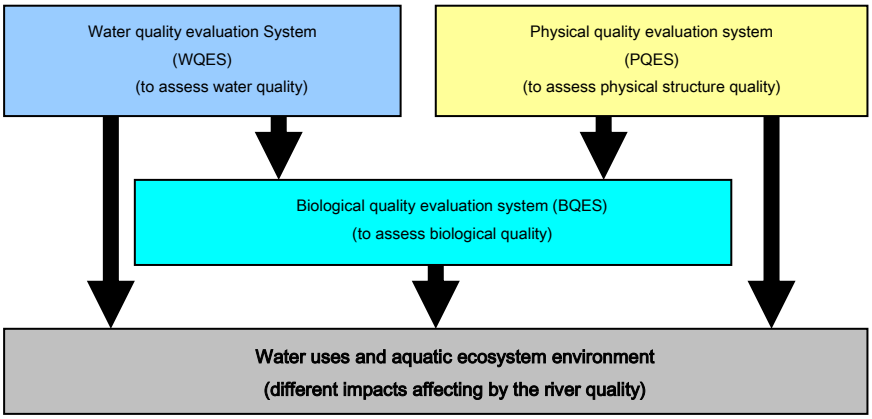

Figure 2. Global quality assessment of a river

The aims of the system are to assess river quality according to the qualities of each component, to identify the alterations in water quality or physical environment which are the cause of biological inbalances, and to assess the effects of an alteration of the river quality for human uses or on the natural functions of rivers. The tools for the assessment of the quality of rivers have been defined in a modular way and are adaptable to scientific and technical development as well as regional peculiarities. For example, water quality is assessed by reference to average alterations of parameter groups; new parameters can be included later in the description of quality by modifying the framework and functions of the evaluation tool. The evaluation tools for river quality consider three quality evaluations system that are: (1) common to all water partners consisting of the technicians, decision makers, and water users, (2) consistent with the international, regional, and local water regulations, and (3) help appreciate the environmental and asset problems. They make a link among partners. In this way, they are a tool for decision-making in the monitoring and the planning of the protection of rivers.

Application of WQES is a part of river quality assessment that aims to convert the data of water quality to information is more suitable. This envisages possess the operational procedure standard generating the data to information based on all the parameters monitored. The information produced from the WQES as shown in Figure 3 provides two categories that are the water quality status and the water suitability for different uses and its aquatic ecosystem (Fulazzaky, 2009; Fulazzaky at al. 2010). Besides, to identify the critical parameter(s) affecting the quality of water and to verify the sources of pollution discharged to the stream water are reasonable (Fulazzaky, 2005). The WQES is based on the notion of indicators of modification from natural conditions. Parameters of similar nature and impact on environment are grouped into 15 alterations of indicators of water quality (see Table 1).

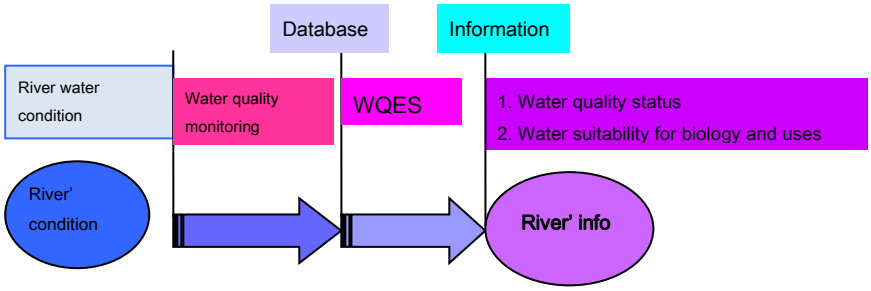

Figure 3. Link of river water quality condition to river water quality information

Sources: Fulazzaky 2009; Fulazzaky et al. 2010

Certain institutions have the different objectives of water quality standardized such as WHO's water quality standards specifically aim to standardize drinking and recreational water qualities, it is not compatible to only use the standard formalized by an institution to assess all the criteria of river water quality for the different uses of aquatic biota, drinking water production, recreation and aquatic sports, irrigation, livestock watering, and aquaculture comprehensively. This study used the thresholds criteria of French Water Agencies Study No. 64 original from the different sources of water quality standards i.e., Directive European, France, EPA USA, WHO and Canada, and completed by the rational advices from

the water quality experts (Oudin et al., 1999). The WQES promotes a tool to synchronize the evaluation of all water quality parameters data monitored to convert to the WQI or WQA. Hence, this study only focused on the analysis of WQA for understanding the suitability of Citarum river water for the different uses and its aquatic ecosystem.

The use of WQES in examining the valid data to assess the suitability of water for different uses and aquatic biota is systematized using an aggregation method. Since the aggregation method to study the data of water quality monitored from a river is not necessary to conduct with a statistical analysis, the probability of exceptional situation takes account into evaluation in excluding the inconvenient results of lower than 10% from the list of useable data when the anomalous consequences of samples monitoring were verified. To assess the classes of WQA of stream water in a river using the WQES is to carry out after screening of the data via the Rule of 90% that is

$$F = (i - 0.5)/N \text{ or } i = 0.9\ N + 0.5 \quad (1)$$

where i is row of the results, N is total number of results; and $F = 0.9$ is percentage or 90% of acceptable data to evaluate.

To assess the alteration of suspended particles, the withheld rule is the 50% percentage, to avoid qualifying water after rainfall events which no exceptional characteristics and with a frequency superior to 10%. The formula is then

$$i = 0.5\ N + 0.5 \quad (2)$$

The rules need to be implemented due to the results monitoring the same parameter(s) of water quality are numerous. For instance, the parameters used to be analyzed as the valuable data in preparation of water quality management plan are indispensable to monitor regularly for certain locations along the river.

Table 1 Water quality parameters in accordance with their alteration

No	Alteration	Parameters
1	Oxidized organic matter	O_2, $\%O_2$, COD, $KMnO_4$, BOD, DOC, NKJ, NH_4^+
2	Nitrogen matter	NH_4^+, NKJ, NO_2^-
3	Nitrates	NO_3^-
4	Phosphorus matter	PO_4^{3+}, P-total
5	Suspended particles	SS, Turbidity, Transparency
6	Colour	Colour
7	Temperature	Temperature
8	Mineralization	Conductivity, Salinity, Hardness, Cl^-, SO_4^{2-}, Ca^{2+}, Mg^{2+}, K^+, Na^+, TAC, Hardness
9	Acidification	pH, Dissolved Al
10	Micro organisms	Total Coliforms, Feacal Coliforms, Feacal Streptococci

11	Phytoplankton	ΔO_2, ΔpH, $\%O_2$, and pH, Chlorophyl a + pheopigments, Algae
12	Mineral micro pollutants in raw water	As, Hg, Cd, Cr-total, Pb, Zn, Cu, Ni, Se, Ba, CN
13	Metals in Bryophytes	As, Hg, Cd, Cr-total, Pb, Zn, Cu, Ni
14	Pesticides in raw water	List of pesticides (see Oudin et al., 1999)
15	Organic micro pollutants non pesticides in raw water	List of organic micro pollutants non pesticides (see Oudin et al., 1999)

Sources: Oudin et al., 1999

WQA assignment for different purposes

The assignment of WQA as shown in Figure 4 is fixed to assess the suitability of water for different destinations of water uses and to verify the impact of pollution downgrading biodiversity. The biological potential function shows the suitability of water for aquatic life, when hydrological and morphological conditions of the habitat are good. The pollutants in the stream water such as metals and organic matters affect the declination of biodiversity and sediment quality. For instance, despite high metal concentrations associated with roots, the major part of the metals in the marsh soil is still associated with the sediment as the overall biomass of roots is small compared to the sediment (Teuchies et al., 2008). Five suitability classes of WQA have been defined. They indicate a gradual impoverishment of the biological structure, including the disappearance of the taxa most sensitive to pollution.

Defining the suitability classes for drinking water production depend on (1) the related regulations which are held as priorities for defining the blue/green class thresholds associated with suitability for consumption and orange/red class thresholds associated with unsuitability for production of drinking water and (2) the opinion of the producers and of the suppliers in defining intermediary thresholds for simple and complex treatments of raw water. The definition of suitability classes is grouped into five classes. The use of leisure and aquatic sports is mainly applied in bathing areas and the legislation thresholds which principally relate to the turbidity of the water and the occurrence of microorganisms. Three suitability classes for recreation and aquatic sports have been defined.

The main factors to classify the suitability of water for irrigation are: ground texture, irrigated crop, frequency, and duration of irrigation. Crops have been divided into four sensitivity groups, ranging from very sensitive plants to very hardy plants. The crops taken into account in these groups are liable to differ from one parameter to another, meaning that the composition of each group is also variable. For instance, the arsenic content in soil and plants is influenced by the degree of arsenic amount in irrigated water (Dahal et al., 2008). It is equally necessary to take into account the type of soils. These have been divided into two groups which overlap, i.e., (1) all soils including the most sensitive and (2) neutral or alkaline soils, which are the most resistant. Combinations of soil/plant groups have been limited to

sensitive-very sensitive plants/all soils and to resistant-very resistant plants/alkaline or neutral soils. Five suitability classes for irrigation uses have been defined. Water quality indices provide a simple and understandable tool for managers on the quality and possible uses for irrigation water (Almeida et al., 2008).

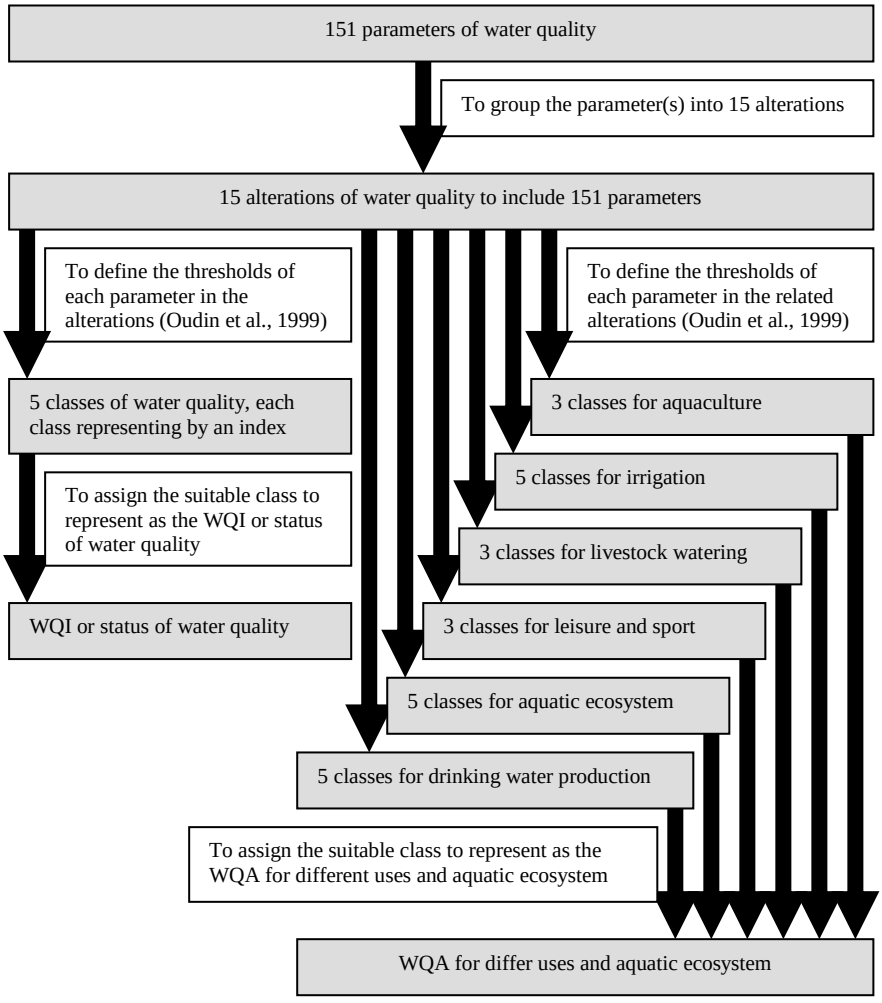

Figure 4. Flow chart of WQI and WQA class assignment

Livestock watering use is the suitability of water to allow the watering of breeding animals. These can be classified according to three age classes and sensitivity i.e., (1) young animals as chicken, pigs, calves, which are growing fast and are very sensitive to all pollutants, (2) animals of mature age which have a slow growth and are less vulnerable, and (3) animals for reproduction, they have strict needs during the gestation and milking period. In the case of livestock watering, water has to be useable immediately by the breeder. If the water is not useable, the breeder will then turn to the water supply. Three suitability classes for livestock watering use are adopted (Oudin et al., 1999).

Aquaculture use mainly shows the water suitability to be used in fish breeding. Water is the main factor of production in intensive fish breeding, particularly in salmon breeding. Water carries oxygen, eliminates

wastes, and conductions production performances by its physicochemical variability. Three suitability classes for aquaculture have been defined.

WQES to assess the suitability of water for different uses

Since the aggregation method is only performed to assess the suitability of river water for the different uses and its aquatic ecosystem, the following steps are carried out using the WQES that are: (1) grouping 151 parameters of water quality into 15 alterations that classify in accordance with their similar nature and its impact on environment (see Table 1); (2) defining the thresholds of each parameter into five classes with respective colors of blue, green, yellow, orange, and red to express the most suitable aptitude of unpolluted water, good suitable aptitude, moderate suitable aptitude, bad suitable aptitude, and unusable aptitude of very polluted water, respectively, except thresholds defining by three classes with respective colors of blue, yellow, and red to asses the water uses suitability for leisure and sports, livestock watering, and aquaculture; (3) formulating the classes that are five classes to assess the WQAs of aquatic ecosystem, drinking water production and irrigation uses and three classes to assess the WQAs of leisure and aquatic sports, livestock watering, and aquaculture uses, as shown in Figure 4 and the aptitude of water for the different uses and its ecosystem in accordance with the level of suitability or WQA that ranges from the most suitable to unsuitable water, as shown in Figure 5; (4) assessing the value of each parameter and put it into the respective classes of WQA for water suitability to the different uses and its ecosystem; (5) verifying the worst quality of parameter(s) and choose it to represent the aptitude of related alteration; and (6) identifying the worst quality of alteration(s) and choose it to represent the WQA for water suitability for the different uses and its ecosystem (aquatic biota).

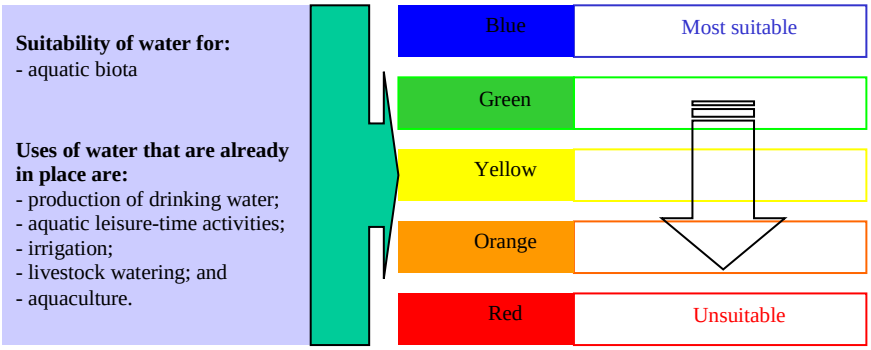

Figure 5 Classification of water suitability for different uses and aquatic biota

Source: Oudin, et al., 1999 modified by Fulazzaky, 2008

Results and Discussions

Application of WQES for the Citarum' river

The Citarum river segments distinguish into three different parts of water uses destination. The government of West Java province in the local regulation No. 39 Year 2000 (Perda Jabar No. 39/2000) enacted the water quality category in the upper and lower parts of the river as the standards Class C and D for the segments of main river in the upstream of Curug Jompong station and immediate the

downstream of Tanjungpura station. The middle parts from immediate the downstream of Curug Jompong to the upstream of Tanjungpura station as shown in Figure 6 is destined as the standards Class B, C and D. Whereas, the stream water in all the tributaries entire the river basin is the standards Class B, C and D. The Class B, C and D means the class of water which is suitable to provide the uses of drinking water production, aquaculture, livestock, agriculture, municipal and industrial affairs, and hydropower energy. The Class B and C means the class of water which is suitable to provide the uses of aquaculture, livestock, agriculture, municipal and industrial affairs, and hydropower energy. The stations of water quality monitoring were chosen at 10 locations that are: 01 Cijeruk, 02 Margahayu, 03 Nanjung, 04 Curug Jompong, 05 Saguling dam, 06 Cirata dam, 07 Jatiluhur dam, 08 Bendung Curug, 09 Tanjungpura and 10 Rengasdengklok along the main river (see Figure 6).

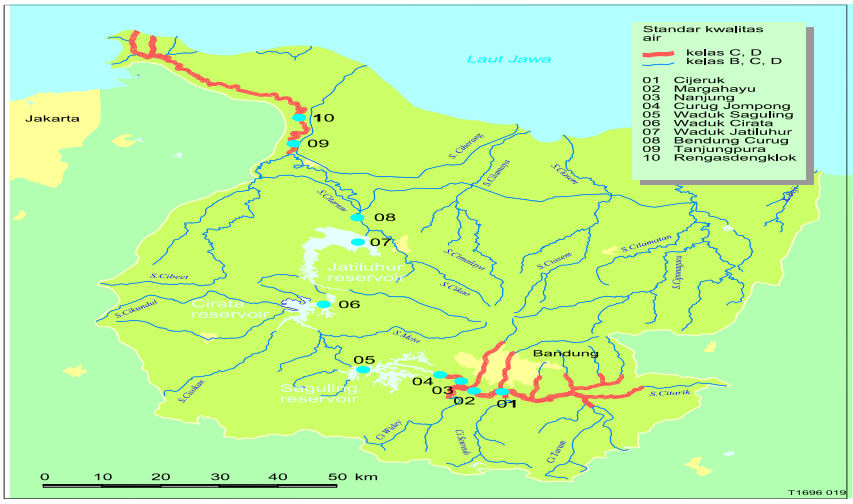

Figure 6. Water quality monitoring stations along the Citarum river

The rules in the Equations (1) and (2) need to implement due to the results of water quality monitoring along the Citarum river are numerous. Since 1990, the Jasa Tirta 2 Public Corporation (PJT2) as the institution in charge to monitor water quality of this river has been traditionally monitored at 10 locations, as shown in Figure 6. This study specifically uses the data that were monitored by the Centre for Water Resources Research and Development of the Indonesian Ministry of Public Works in 2005 to concentrate in the upstream areas of river segment. The data monitoring as shown in Table 2 were tested of 33 parameters. To assess the classes of quality and water suitability in the river were used the data monitored from 10 stations that are: 01a Wangisagara, 01b Majalaya, and 01c Sapan as the additional stations in the upstream of Cijeruk, 01 Cijeruk, 03a Dayeuhkolot and 03b Brujul as the additional stations in the upstream of Nanjung, 03 Nanjung, 08 Bendung Curug, 09a Bendung Walahar as the additional stations in the upstream of Tanjungpura, and 09 Tanjungpura along the main river. This is due to the pollutant loads are more important to discharge the river coming form the Bandung region. The need to insert three additional stations in the upstream of Cijeruk and two stations in the upstream of Nanjung is to investigate the impacts of untreated household sewage, solid waste and industrial effluents on the quality of stream water. One more additional location was also monitored in the upstream of Tanjungpura to understand the impact of industrial pollution loads discharging from the industries located in the

downstream areas. Because of the lack of data monitoring, two alterations i.e., pesticides in raw water and organic micro pollutants non pesticides in raw water as shown in Table 2 were no included to evaluate in this study. To assess WQA, this study examines 3,960 testing results that were specially monitored from 10 selected stations above along the main river during the period of 1 year with the frequency of monitoring was one per month.

WQA of the Citarum River

The excessive pollutants in the stream water will face the problems of biodiversity degradation. The earlier study supports the need for incorporating functional measures in evaluations of stream ecological integrity (Castela et al., 2008). The effects on zooplankton were caused by changes in habitat structure due to the strong decline of macrophytes. The slow degradation of metazachlor combined with the absence of recovery in both chlorophytes and macrophytes is likely to cause long-lasting effects on aquatic ecosystems (Mohr et al., 2008). Considering the results of WQA analysis, this study remarks that the stream water in the upper part of Saguling dam as shown in Table 2 is unusable to conduct the sustainability of aquatic ecosystem, judging the WQA class is red. This translates water capability of considerably reducing the number of sensitive taxa or eliminating them with a very low diversity. In the downstream areas of Jatiluhur dam, water quality causing the disappearance of certain sensitive taxa with adequate diversity is evident, see location 09a Bendung Walahar, judging the WQA class is green, or water capabilities of considerably reducing the number of sensitive taxa with adequate diversity are manifested, see locations 08 Bendung Curug and 09 Tanjungpura, judging the WQA classes are yellow. To improve the quality of the stream water particularly in the upper part of the basin is still will be suitable for aquatic biota this study recommends to the related local authorities including all the stakeholders to envisage as high priority the problems of river pollution. This suggests the need to have a specific legal instrument of integrated water quality management plan in order to guide all the participatory of multiparty entire the river basin to involve in improvement of water quality in accordance with the role and responsibility of each participant.

A deeper understanding of the practical and theoretical underpinnings of risk management can be made between organizational capabilities in the essential water business process (MacGillivray and Pollard, 2008). This preventive feature lies at the core of risk management for the provision of safe drinking water (Hrudey et al., 2006). Referring to this study, water in the upper Citarum river as shown in Table 2 is not recommended to produce drinking water generally excluding in the stream water from the upper part of Bandung city see upper part of the station 01a Wangisagara and at the station 03a Dayeuhkolot, judging the WQA classes are red. Because of no more industries located in the upstream areas of Bandung city, water quality upper the station 01a Wangisagara was justified as moderate (yellow). The improvement of water quality at the station 03a Dayeuhkolot was verified as orange due to a good water quality from Ciwidey river penetrates the water quality of Citarum' river. Utilization of Citarum river water from the upstream areas of Bandung city is acceptable to produce drinking water. This study recommends to perform the conventional technologies in producing of drinking water for raw water in the stream from the

upper Bandung and the advanced technologies to treat water from the station 03a Dayeuhkolot. Because the intake of raw water from the Jatiluhur dam to supply water for the Jakarta city in the downstream area is still operated, the study recommends to the Jakarta water supply authority to use conventional technology in treating the water since the closed conveyance is used to transport the water from the Jatiluhur dam to Jakarta. This recommendation based on the moderate quality of river water, judging the WQA class as show in Table 2 is yellow. Unfortunately, to date the transport of water is still operated in the open canal. The use of this system will face the risk of pollution discharged from the industrial and domestic wastewaters along the canal when water flows. The contamination of water eventually declines the WQA of such as from the yellow classes at the stations of 08 Bendung Curug and 09a Bendung Walahar to orange class at the station of 09 Tanjungpura so the advanced technologies should be considered to be implemented by the Jakarta water supply authority in treating the river water purposed to public consumers.

Table 2. Application of WQES to assess the WQA for the Citarum river water

Type of water uses	Results of WQA analysis									
	01a	01b	01c	01	03a	03b	03	08	09a	09
Aquatic ecosystem	r	r	r	r	y	r	r	y	g	y
Drinking water production	y	r	r	r	o	r	r	y	y	o
Leisure and aquatic sport	r	r	r	r	r	r	r	y	y	r
Irrigation	b	g	g	g	g	g	g	b	b	g
Livestock watering	b	b	y	y	y	y	y	b	b	b
Aquaculture	r	r	r	r	r	r	r	y	y	r
Number of parameters	33	33	33	33	33	33	33	33	33	33

Notes: 01a Wangisagara, 01b Majalaya, 01c Sapan, 01 Cijeruk, 03a Dayeuhkolot, 03b Brujul, 03 Nanjung, 08 Bendung Curug, 09a Bendung Walahar, 09 Tanjungpura, b = blue, g = green, y = yellow, o = orange, and r = red.

Water in the main river as shown in Table 2 is not acceptable to be used for leisure and aquatic sports excluding the stations 08 Bendung Curug and 09a Bendung Walahar, judging the WQA class is red. A moderate water quality at these stations caused by self purification occurs in three cascade reservoirs, i.e., Saguling, Cirata, and Jatiluhur. Due to the pollutant loads from industries discharging the river in the downstream area are evident, degradation of water quality as shown in Table 2 increases gradually in the stream towards the sea. Considering the strategic role of Citarum river regulated effectively by three cascade reservoirs functioning as the potential recreational parks, hydropower generation, sources of

water for domestic, municipality and industry, as well as the source of irrigated water for paddy fields and fishponds, delivers 20% of Indonesia's gross domestic product, this study recommends to the central government of Indonesia to envisage as first priority the problems of this river pollution. This suggests the need to install correctly the wastewater treatment plants for each industry and for each city of the entire the Citarum river basin particularly for the upstream areas of the basin to reduce the pollutants of organic matter, microorganisms, and suspended particles. Besides to improve the quality of water related to suspended particles, there is a need to consider the occupation of lands to implement the best practice of soil conservation effectively.

To analyze the suitability of water for irrigation purpose is summarized in Table 2. This informs that water quality in the river is still suitable to irrigate especially for paddy fields of as the major part of water uses in the region, judging the WQA classes for all the station selected are classified as blue or green aptitude. It is remarkable that the Jatiluhur dam serves suitably water for 240,000 ha of paddy fields in the downstream areas. Unfortunately, the overflow of irrigated water is usually to drain back into the river. The runoff from paddy field as verified in the Ile de Camargue, France, carries important loads of dissolved pesticides to the wetlands including river (Comoretto et al., 2008). Drinking water pollution in the Evros region Northern Greece can be attributed to excessive fertilizer use from agricultural sources (Nikolaidis et al., 2008).

For more accurate assessment of the effects of water quality, for a given livestock production system the format should be based on ingestion levels, as opposed to a mg/l basis, and should take into account site-specific synergistic and antagonistic interactions within and external to the water to a greater extent (Meyer et al. 1997). The aggregation method of WQES using in this study led to the formulation of a water quality guideline index system based on WQA basis. Referring to the classification in the literature (Oudin et al., 1999), this study concludes that utilization of Citarum water to provide the livestock watering of all animals including the most sensitive such as young animals, animals in gestation or milking is still suitable for the stream waters from the upper Bandung city (see the stations 01a Wangisagara and 01b Majalaya) and the downstream of Jatiluhur dam (see the stations 08 Bendung Curug, 09a Bendung Walahar, 09 Tanjungpura), judging the WQA classes are blue (see Table 2). The stream water along the river segments between Bandung city and Saguling dam is suitable to provide the livestock watering of mature animals that are less vulnerable such bovine and ovine and needs to control strictly the quality of water used, judging the WQA classes as shown in Table 2 are yellow (see the stations 01c Sapan, 01 Cijeruk, 03a Dayeuhkolot, 03b Brujul, 03 Nanjung).

Fish and crayfish perform all bodily functions in water which include eating, breathing, excreting wastes, reproducing and taking in or removing salts. Water quality can affect these functions and therefore will determine the health of the fish and consequently the success or failure of a fish farming operation. For example, carbohydrate addition in water affects to (1) increase the nitrogen retention in harvested shrimp biomass, (2) reduce the demand for feed protein, (3) reduce the concentration of NKJ and NO_2^-, and (4) reduce nitrogen discharge making extensive shrimp farming more ecologically sustainable and economically viable (Hari et al. 2006). Despite the stream water in the river is unsuitable for direct use in

aquaculture generally, judging the WQA classes are red (see stations 01a Wangisagara, 01b Majalaya, 01c Sapan, 01 Cijeruk, 03a Dayeuhkolot, 03b Brujul, 03 Nanjung, and 09 Tanjungpura), Table 2 shows that the river water immediate the downstream of Jatiluhur dam is suitable for all adult fishes which are not very sensitive to pollution, judging the WQA classes are yellow.

Conclusion

This study used the WQES to assess the suitability of water for different uses and its ecosystem for the Citarum river water. The suitability of the river water was examined through WQA assessment to forbid strongly the uses of water in the upstream the Saguling dam to provide (1) the suitability of biodiversity growth and productivity, (2) drinking water production except the stream water upper Bandung city, (3) leisure and sport activities, and (4) aquaculture uses. Although the stream water of the river segment between the Bandung city and Saguling dam needs to be controlled strictly, the quality of water is still suitable to be used for irrigated lands and livestock watering. The improvement of water quality was verified immediate the downstream areas of Jatiluhur dam due to the self purification occurs in three cascade reservoirs, i.e., Saguling, Cirata, and Jatiluhur, consecutively. This gives the advantage to supply raw water from the Jatiluhur dam to Jakarta city for drinking water production with adequate quality since the closed conveyance is used for transporting the water.

The stream water upstream the Suguling dam (see upper the station 03 Nanjung) is totally prohibited for supporting the biological potential function, leisure and aquatic sports, and aquaculture purposes judging the WQAs of these water uses are unsuitable, indicating as red color (see Table 2). This study justifies that the factual water quality of the river no matches the standards regulated in Perda Jabar No. 39/2000. This gives the rational argument to urge the local authorities, central government, and all related stakeholders to concern for improving the river water quality. This study shows that the use of WQES practically remained comprehensive in evaluating water quality systematically. There is the analysis of water quality data to convert into the usable information that serves as DSS in managing of available water comprehensively.

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Religious Memory and Scientific Ethics after Hiroshima and Nagasaki

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Abstract

2015 has been a year of anniversaries, notable for the 70th anniversaries of the events of the last year of World War II (or the Asia-Pacific War) and the advent of our still postwar world. Japan's surrender on August 15th, 1945, followed a series of heavy fire-bombings of Japanese cities, including Tokyo on March 10th; the fall of the German Reich in April; the invasion of Okinawa in April and its surrender in June, culminating in mass, coerced suicides; the Potsdam Declaration promising "complete and utter destruction" in July; and then, on August 6th, and again on the 9th, the destruction in a flash of two Japanese cities. Because Indonesian independence was declared immediately after the collapse of the Japanese empire and because Americans were anticipating an invasion of the main islands as intensive as the one in Okinawa, the general perspective in both countries has been that the Atomic Bombs were somehow necessary, a perspective we can call "from above the mushroom cloud." At the same time, to consider what happened "below the mushroom cloud" and even begin to recognize the sheer horror of the instantaneous destruction and annihilation also forbid us to think only from that perspective, as this events as two more in the long history of hostilities, but rather as unparalleled, as also outside history. I went back to Hiroshima and Nagasaki this August. I went partly to grapple with what happened there and how it is remembered in the present and partly to try to see how religion and religious studies can be a helpful framework for examining the process of memory, which is at once deeply situated in political contexts and transcending such limits for the taste of existential destruction that happened there. In this paper, I attempt to ask about religion and memory after seventy years and to then raise the questions of science and ethics, given that Hiroshima (like Auschwitz) was a marvel of science, the result of intensive and secretive scientific inquiry, the largest in world history to that date.

Religious Memory

On August 6th 1945, 90% of Hiroshima was incinerated. Thousands in the immediate zone of the hypocenter disappeared, sometimes leaving a shadow of carbon on concrete or a bit of metal—a lunchbox, a watch, a tricycle. 140,000 were dead by the end of 1945 and as of this year a total of almost

300,000 victims—called in Japanese *hibakusha*-- have been entered into the memorial books. This was a city with military operations but it was a city and the victims were men, women, and children; Japanese citizens and Korean forced laborers, Southeast Asian students, European prisoners of war. A smaller city in the far southwest, Nagasaki was not the first target for the 9th but cloud cover over Kokura led the plane carrying the second atomic bomb to be redirected. Nagasaki has a long history as a trading port, the one place the Dutch were allowed to maintain a base during the 250 years during which the country was closed to the West, and a center for Catholics who just thirty years earlier had dedicated a cathedral barely a kilometer from where the bomb was detonated. 70,000 were dead by the end of 1945 and the memorial books now record close to 170,000. The average age of the survivors is now past 80 but it still possible to hear their testimonies directly, of the flash and the boom (*pika* and *don* in Japanese), of the blistering bewildering heat, of making their way home to discover who among their family and community was still alive, of health problems without end, of discrimination.

Memory can be understood in at least three interconnected senses here. First, memory as an operation of the human mind to store and recall the past in the present is paired with the two operations which disrupt this humanly fallible process: forgetting, on one hand, happens to us all and trauma, on the other, follows injury to the body, the psyche, the community. Such memory is also at times set against history that is defined and seemingly supported through a documentary basis and bias. As in the case of the so-called comfort women or *jugun ianfu* whose memories of sexual enslavement by the Japanese military have challenged the documented and often male official narrative, it can be what the subaltern possesses in order to make claims on dignity and justice. Second, as famously explicated by Pierre Nora and his research team in their search for the *lieux de memoire* that define the French nation, memory can mean the explicitly political narration of a past that holds together a nation or other community. Two decades ago, a controversy over the exhibition of the B-52 called *Enola Gay*, from which the atomic bomb was detonated on Hiroshima, was reduced to simplistic terms and then reached the United States Senate which felt compelled to pass a resolution declaring the use of the A-bomb morally good and force the elimination of nuanced historical explanation, an indication of the moral ambivalence still pervading the U.S. Third, memory can mean remembrance, the obligation to the dead to hold onto and honor their existence until it too, with us, slips into oblivion. Memory is pursued through the activities of memorialization and commemoration, of holding rituals and erecting monuments, of visiting graves and memorials as a moral and emotional obligation. This is one of the tasks of religion, though one it often rejects.

To inquire into religion likewise means to take on two interconnected meanings. First, there are the ways that religious language and ritual patterns pervade memory and the ways of commemoration, particularly at sites and on occasions that are sanctified with reference to memory and the community—which remains, by design, not clearly designated. Second, there are the activities of specifically religious groups that extend beyond this occasion and which bring religious and inter-religious purposes to the project of memory. Though Robert Bellah reportedly described “civil religion” in response to questions from Shinto priests visiting Washington in the 1950s and asking how it could be that American

nationalism was so full of God-talk while the American occupiers had banned the State Shinto of the prewar state, this is not quite his civil religion because it does not make clear who it defines—indeed it is generally, on one hand, a specific community of experience transposed onto a modern city, often at odds with the national government, and, on the other, a "universalized" experience that could easily be the fate of any person anywhere, regardless of the specificities of culture or history. It does however retain the prophetic potential pointed to by Bellah to make demands from its own logic and sense of what is right

In the first category, I can point to four ways religious forms pervade these commemorations.

1. **Prayer**. In the official ceremonies, "prayer" occupies a prominent place in the name and function of the ceremony. Consider the very names of the official annual ceremonies held on the anniversaries of the two atomic bombings: (in my literal translation; the usual English is simply "Memorial") the Hiroshima City Atomic Bomb Dead Spirit Consolation Ceremony and Peace Prayer Ceremony and the Nagasaki Atomic Bomb Sacrificed Spirit Consolation Peace Prayer Ceremony. There is a homonym at work here as well: *ki'nen*, with one of two other characters pronounced *ki*, ones meaning to record, indicates memory in the sense of memorial: such a *ki'nen* appears in the names of the museum and park at Hiroshima though not at Nagasaki: the setting for transcendent memory is within secular memory. Prayer, in the form of silent prayer (*mokutō*), is at the heart of the official ceremonies which are timed such that the moment of the detonation of each bomb—8:15am, 11:01am—is one of silence and/or the tolling of a bell. Wordless and led by no one, no direction is suggested for this prayer and it concludes as the moment of the detonation passes. In both locations, silence is immediately followed by speech act by the central event of the commemoration: the peace declaration read by the mayor. Beginning in 1947 and 1948, these declarations have issued annually without interruption since 1951. They are appeals to world leaders to enact and enforce treaties against nuclear weapons and to the Japanese government to provide adequately for the surviving *hibakusha*. One might also see prayer in the practice of folding origami cranes and bringing strings of a thousand to lay before the children's monument recalling the story of Sadako Sasaki, a girl who was exposed to radiation in the womb and died of leukemia.
2. The **concept** of witness is also key to the memory of the atomic bombs and of particular importance at this juncture of 70 years, for as was noted repeatedly the average age of the survivors has now passed 80. Because of instant annihilation of untold thousands followed by the agonized deaths from internal and external burns of thousands more, many beyond recognition (totaling, by the end of 1945, 140,000 in Hiroshima and 70,000 in Nagasaki), the physical presence of those who did survive has come to be of great importance. As Lisa Yoneyama has shown, the process of narrating memory as *kataribe* or testifiers is fraught with a kind of politics of recognition as survivors (for whom access to specialized health care

was contingent on proving where one was at the moment of the blast or if one entered the city later) but at the same time it carries a kind of urgency on behalf of others who cannot speak and on behalf of a future peace in which nuclear weapons will not be used again.

3. **A third way religious concepts** are central to memory is in the hallowed ground of the memorial sites, the two Peace Parks and adjacent areas. In the delta of Hiroshima, the park was built between two branches of the river, below a T-shaped bridge said to have provided the target, and a central memorial was put in place in line with the ruins of one of the few structures to have survived the blast, the Prefectural Products Exhibition Hall now known as the A-Bomb Dome. It is now known that the architect Tange Kenzō's cenotaph is the repurposing, on a smaller scale, of an earlier design that was meant to align with Mt. Fuji and commemorate Japan's victory in Asia. Few other traces of the mostly wooden neighborhood remain in Hiroshima, though one of the many smaller ceremonies each year commemorates that neighborhood. Instead, a new park was built on the burned out grounds, centered on the museum and the cenotaph, but with space for a variety of monuments that met certain "universalizing" gestures. Famously, the monument to Korean victims was constructed outside the park, on the facing river bank, and was moved into the grounds only in the late 1990s. At Nagasaki, the Peace Park or grounds for the annual official ceremony face a statue of a seated man with arms and legs in different directions, echoing in that way a Buddha but looking more like a Greek god. (for years I assumed it represented Prometheus who brought down fire from the heavens to the earth) This "sacred ground" is in fact the site of a prison, the foundations of which remain visible, in striking contrast to the structure that parallels most closely the A-bomb dome: the Urakami Cathedral which was reconstructed with only a few pieces of its previous existence preserved in statuary. The monuments that fill this peace park are of two types: memorial greetings primarily erected in the 1980s by socialist states and recent monuments to the diversity of the victims, including for example the Chinese (forced laborers) who died in the prison. On the anniversaries, these grounds and the surrounding streets become the site of multiple commemorations as well as protests. Perhaps because of its more central location and its historical position, there were far more groups in Hiroshima, high school students with petitions, leftists with alternate publications, religious groups considered outside the mainstream, peace commemorators seeking out foreigners, and so on. Most moving were the *hibakusha* who came to speak without a platform other than their story. There were also government directed memorial activities in the twilight: the famous floating lanterns in Hiroshima echoed by wax candles at Nagasaki.

4. The language of "comforting souls" *irei* is present in the titles of the Hiroshima cenotaph and the memorial ceremonies in both cities. It is linked to what we might call a Japanese "mystic

synthesis," in which the spirits of the dead are present alongside the divinity within nature and do need consolation, especially when they have died traumatically. One unique and moving addition to atomic bomb commemorations is water imagery, recalling how those who were badly burned but not killed instantly sought water to relieve their unquenchable thirst and cool their burned flesh. They were often heard crying "*mizu kure*" "give me water" but often their badly shocked systems could not accept the water they did find and they died immediately. When water is poured from individual containers—as in those carried by various religious leaders into their shared ceremony in Hiroshima or when, in the official ceremony in Nagasaki, brought from springs in various corners of the city—into one bowl, it can be a reminder of the collectivity of life itself. The second is that the most material remains honored in these places is a set of books containing the names of the atomic bomb dead. These books have been and will be updated annually until the last *hibakusha* has died. This August, 5,359 names were added to bring the total to 297,684 (recorded in 109 books) in Hiroshima and 3,373 names were added in Nagasaki to bring the new total to 168,767 (recorded in 170 books). Each city maintains an office to manage the books and to process applications for inclusion and the names of non-Japanese are also included. Curiously, the other place this act of memorializing through names handwritten in books is at the Yasukuni Shrine in Tokyo, where nearly 2.5 million war dead from Japan's modern wars from 1868 to 1945 are enshrined as kami. There are significant differences in that the Yasukuni Shrine is formerly part of a state civil religious apparatus and now technically a private religious organization that uses religious language a ritual, which, when patronized by government officials, potentially violates the Constitution's proscription against government use of religious activities. Moreover, there have been no new entries into enshrinement register since 1978, when the top-level officials executed as a class-A war criminals were added, ratcheting up the controversy over the lack of remorse the shrine represents to the countries in Asia Japan invaded. Still, the same question of how physical presence following the devastation of war, either through the advanced weaponry or through death in distant lands and oceans, is part of memorialization. These books, stored deep inside monuments, are also different from the Cornerstone of Peace in Okinawa, an extensive black granite monument carved with the names of combatants and civilians from all sides killed in the Battle of Okinawa (April to June 1945).

The second meaning of religion and memory is, of course, the activities of religious groups and surrounding the official ceremony in each place are both joint and specific memorial services and actions. At Hiroshima, this took the form of first a joint Buddhist-Shinto-Christian service early on the morning of the 6th, followed throughout the day by various sects of Buddhism as well as Catholicism and Protestantism. Not included are the so-called new religions which originated in Japan (some of which,

like Tenri, date to the nineteenth century). These services face the *genbaku kūyōtō*, a mound-style grave containing unclaimed *hibakusha* remains, with a list nearby inviting families to take these ashes back to the family graves. *Kuyō* is Buddhist language originating in the concept of *pūja* or reverence for the presence but seemingly shared here.

At Nagasaki, the 43rd Genbaku Junnansha Ireisai (Festival to Console the Spirits of those who Suffered from the Atomic Bomb) was held on the night of the 8th in the park surrounding the hypocenter, at the base of the hill where the peace ceremony would be held the next day. While this service had many of the same elements as the public ceremony, each was led by a different religious leader and member of the sponsoring organization which translates its name to English as the Fellowship of Religionists in Nagasaki for Dialogue. According to its roster, it is made up of clergy of Japan's religions including eleven Christians (among them the organization's advisor, the archbishop), eight Shinto priests, thirty-six Buddhist priests, and nine "miscellaneous," including Tenri which invited a Turkish Sufi to do whirling meditation. This category of religionist (*shūkyōsha*) was a new one for me, invoking a category as reified in law and academia as agama but one which most Japanese reject as requiring some kind of extreme doctrinal loyalty that takes them into dangerous territory, as with AUM Supreme Truth which launched apocalyptic terror in the subways in 1995: it seems to recognize that religion has a definite interest in certain issues, especially peace and the memory of atrocity (regardless of the religious identities of the victims) and it is always plural. The most prominent use of the terms is in the name of the global network Religions for Peace which was launched in Kyoto in 1970, but its Japanese branch dates to 1951 and a sense of the shared responsibility of religious organizations for the war, an opportunity for penitence (metanoetics).

Scientific Ethics

In the weeks following this commemoration, from the perspective of many Japanese, the memory of the A-bomb victims was violated in two ways by the actions of the current Liberal Democratic Party-led government of Prime Minister Shinzō Abe. First, two days after the Nagasaki memorial, the Sendai Nuclear Power plant 100 miles to the south was restarted, the first nuclear power plant to go back into operation since all were taken offline in the wake of the triple disaster that hit northeast Japan on March 11th, 2011. In its wake, and in the fears of long-lasting radiation contamination over a wide area, Fukushima has become a third disaster in which a city name is written with phonetic syllabary. But this requires a redefinition of what happened at Hiroshima and Nagasaki, from technologically advanced atrocities that have not been repeated and serve as warning to the use of nuclear weapons and the need for disarmament to a broader warning against nuclear energy in all forms. While the Nagasaki Museum and the Nippon Myozan (Buddhist) peace marchers already included those exposed to radiation from nuclear weapons tests in the South Pacific and elsewhere (most famously the Japanese fishing boat Lucky Dragon #5, exposed in the Marshall Islands in 1955), Fukushima is something new and unresolved (and part of a history in which the U.S. foisted "atoms for peace" onto the same country it had used two atomic bombs on just years earlier.). Where the appeals remain directed against nuclear weapons and in

support of the non-proliferation treaties, the Religionist group fasted instead for "a 21st century without nuclear weapons or nuclear power."

Second, as the commemorations were going on, Japan was being shaken by perhaps the most substantial public political demonstrations since Prime Minister Abe's grandfather forced through a renewal of the U.S.-Japan Joint Security Treaty in 1960. The bill the government finally did push through the Diet in September re-interprets Article 9 of the 1947 Constitution, "forever renounc[ing] war as a sovereign right of the nation," as allowing something called a "right of collective self-defense" through which Japan may enter, for example, U.S.-led military interventions. The movement against it, which took form in mass demonstrations in many cities as well as surrounding the Diet building, was quick to name it the "War Bill" and to see in it a dark turn in Japanese politics away from democracy and peace. Prime Ministers have spoken at both ceremonies for several decades and their remarks, which follow the "pledge for peace" (*heiwa he no chikai*) read by local children, are the one unscripted part of the program. Abe's remarks at Hiroshima were criticized for mentioning neither Article 9 nor Japan's so-called "Three Nuclear Principles" (not making, not possessing, not harboring nuclear weapons) and in Nagasaki he did make a gesture at the latter. Because the programs are timed so carefully around the exact moment of the detonation, demonstrators were able to intrude sonically on Abe as he spoke, reminding the assembled that he had not earned a sacralized atmosphere.

By way of conclusion, I would like to go a little deeper into the work of religion in memory: to the concept of sacrifice. Recently, the secular philosopher Takahashi Tetsuya has named a sacrificial system which inculcates the belief that some part of the community must accept that it must be sacrificed for the whole: his examples are Okinawa, where American military bases are an obnoxious and destructive presence, and Fukushima, the cost of which is far from understood but the calculations were made long ago by politicians, electric company executives, compliant scientists and the public. Since I first visited Hiroshima and Nagasaki in the mid1990s, the Japanese State has built its own memorial halls in each place (Hall to Pray for Peace and Eulogize the Atomic Bomb Dead). Borrowing methods from Holocaust memorials, these halls seem set to counter the city-run museums which set the cities apart as universalized sacrifices (hence the slogans: no more Hiroshima, no more Nagasaki, to which is now added no more Fukushima) apart from the nation. Even so I was surprised by the statement at the entrance in Hiroshima: in the official translation: "The National Peace Memorial Halls for the Atomic Bomb Victims in Hiroshima and Nagasaki are an effort by the Japanese national government to remember and mourn the sacred sacrifice of the atomic bomb victims. They are also an expression of Japan's desire for genuine and lasting peace." Sacred sacrifice by whom, for what? Can we continue to allow there to be sacrifice without meaning? Is that a question religions and/or religionists should try to answer?

One answer is in the refusal to sacrifice or to sacrifice others. Here the example of a second Japanese intellectual Takagi Jinzaburō. Takagi promoted the idea of the "citizen-scientist" who can utilize the knowledge and method of science but is self-consciously independent of power, including the intimate relationship of the university with the military, government, and the corporate world. For a nuclear

chemist like Takagi, severing ties with this kind of power meant loss of access to the high-tech methods of research but it also gave him the freedom to use his knowledge to counter the government and academic experts, particular in their interpretation of data most citizens cannot make sense of, which sometimes, as with nuclear power, has life-and-death consequences. With the prize money from the 1997 Right Livelihood Award, sometimes called the alternative Nobel Prize for lives well lived, his little community gives small grants to independent science and, after the March 11th triple disaster, they, the Citizens' Nuclear Information Center (www.cnic.jp) were some of the very few independent experts who could understand what was happening and counter the official government-corporate assurances that nothing was wrong. On one hand, citizen science might be understood as the most secular conclusion to the idea of the rational scientist, but on the other was Takagi's Buddhist ethic of reverence for all life, which came through less in some kind of religionist practice than in his love of the Buddhist Japanese writer Miyazawa Kenji, who died in 1937 and did not see the destruction of August 1945. But we have seen it and we must learn to see it from below the mushroom cloud. And remember.

Undertaking Global Health Issues through Research and Innovation

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Abstract

There is an estimated 8.2 million under –five child deaths per year, and from this number, 3.3 million occur during the neonatal period – babies in their first 28 dyas of life. Around 66.67% of these newborn deaths are preventable if effective health interventions are provided at birth & during the first week of life.Moreover, maternal mortality is exceesively high, around 830 women die daily from preganancy or childbirth - related complications globally and these deaths could have been prevented. The aim of this study is to identify the contributory factors of maternal and neonatal mortality globally and to determine interventions in addressing these global health issues. Meta – analysis showed that the contibutory factors of both maternal & neonatal deaths include LACK, this is an acronym, which stands for L- location, A – age, C – cultural beliefs, and K – knowledge deficit.For the location, it has been validated by published researches that the distance of the home residence among pregnant mothers would greatly affect their utilization of maternal health care services, as to age, it has been found out that extreme age, adolescents (13 – 17 years old) and 42 years old and above have been associated with both high maternal & neonatal deaths, in addition, cultural beliefs was the priority measure that pregnant mothers would embrace in dealing with their pregnancy problems, and employing health care services would be their last resort, regarding knowledge , it has been revealed that insuffient knowledge of mothers on the complication of pregnancy and the importance of pre natal check up affects their utilization of health care services, furthermore, deficient knowldge of the health care providers also contributed to the increasing maternal & neonatal deaths. For the interventions, HEALTH should be implemented, H – stands for health education, educating mothers, families, communities on the importance of pre- natal and post – natal check – up, nutrition, exclusive breastfeeding, complications of pregnancy, would change the mothers behavior, there will be improvement in their utilization of health care services, educating health care providers through trainings, seminars and workshops, E – stands for empowerment , building capacities of mothers families and comminity, A stands for access, health care insurance should be provided to all mothers, focusing on those living in the remote areas, establishing birth camps should also be introduced to those far away areas, E also refers to the implementation of

Essential Intrapartum Newborn Care, L – stands for leadership and governance, which specifically comprised five (5) equally important variables, and these include, transparency & accountability, community participation, fair access to quality care, increase coverage of skilled care at birth in health facilities, and sustainable programs, T – stands for technology, all health care facilities should be equipped with sufficient supply of medicines, devices, laboratory agents, equipments for medical and surgical procedures, laslty, H – stands for home visits, health care providers should visit the mothers and their newborn on the first day, third day and seventh day after delivery, to thoroughly assess the mothers and their babies , to be able to address any untoward complcations. Employing the HEALTH interventions may be able to solve the maternal and neonatal deaths.

Keywords: Location, access, cultural beliefs, knowledge, health education, empowerment, essential intrapartum newborn care, leadership & governance, technology, home visits, maternal & neonatal deaths

Climate Change: Its danger for our production and why it escapes our prediction

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Abstract

Our planet earth has a unique but complicated climate that presently is changing due to the influence that our (mankind's) activities appear to have on the composition of its atmosphere. It is called anthropogenic (man made) climate change. The world's agricultural systems face an uphill struggle in feeding a projected nine to ten billion people by 2050. Climate change introduces a significant hurdle in this struggle. There is general and widely held scientific consensus that the observed trends in atmospheric & ocean temperature, sea ice, glaciers as well as climate extremes, during the last hundred years, cannot be explained solely by natural climate processes and so reflect human influences. The argument that what we experience could be natural climate change can also be refuted by the fact that present understanding of cyclic climatology of the past points to a cooling planet without the presence of mankind. On the simplest level, the weather is what is happening in the atmosphere at any given time. The climate, in a narrow sense, can be considered as the "average weather". In a more scientifically accurate way, it can be defined as: "the statistical description in terms of the mean and variability of relevant quantities over a period of time". One may argue that "global warming" is like "ageing": You can reduce the consequences but it will continue to happen. Stopping it is impossible, so adaptation is necessary.

LIFE SCIENCE CHAPTER

Microorganisms Found In Oxygen Humidifier among Selected Hospitals in Iligan City: Implications for Infection Control Measures

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Abstract

Nosocomial infection is a major public health problem striking globally among 8.7% of hospitalized patients with more than 1.4 million people suffering worldwide. Hospitals contain microorganisms such as viruses and bacteria. These infecting microorganisms can come from contaminated equipment; one example is the contaminated water from an oxygen humidifier. Oxygen therapy is the administration of oxygen at a concentration greater than that found in the environmental atmosphere. The main purpose of this study is to identify the presence of microorganisms in Oxygen Humidifier among selected hospitals in Iligan City. Fifteen swab samples were obtained from each hospital. Swab samples were then isolated on nutrient agar plates. Hospital Y samples yielded fourteen bacterial isolates whereas all 15 samples in Hospital X showed bacterial isolates. Swab samples underwent gram-staining to distinguish between gram positive and gram negative bacteria. *Staphylococcus* species, *Streptococcus* species, *Klebsiella* species and *Legionella* species are the most common organisms that cause pneumonia while *Mycobacterium* species cause tuberculosis. These five organisms were among the identified bacterial species. The facts are frightening: with the increasing prevalence rate of nosocomial infection, it is recommended that proper care and maintenance should be observed to reduce, if not eliminate, potential sources of infection, potentially threatening the patient's health. In all cases, the patient's interest must be put first.

Key words: Infection Control, *Legionella* sp., *Mycobacterium* sp., Nosocomial Infection, Oxygen Humidifier,

Introduction

Hospital is an institution for the treatment and care of sick or injured people. The hospital provides the needed treatments and interventions depending on the patient's condition. However, the hospital contains microorganisms, such as viruses, prions, bacteria, and viroids, and larger organisms like macro parasites

and fungi. These infecting microorganisms can come from contaminated equipment; one example is the contaminated water from an oxygen humidifier.

Oxygen therapy is the administration of oxygen as a medical intervention, which can be for a variety of purposes in both chronic and acute patient care. Oxygen is essential for cell metabolism, and in turn, tissue oxygenation is essential for all normal physiological functions, but since it is a dry gas, it can dry the mucous membranes in the upper airway. This can lead to sticky chest secretions, which are difficult to expectorate. If oxygen is to be administered for more than a short period, humidification should be considered by the use of an oxygen humidifier. The Oxygen Humidifier is a bubble-type humidifier, which provides stable moisture content for maximum patient comfort during the administration of oxygen. There are several points to consider when humidifying oxygen. This includes the risk of encouraging bacterial growth, as humidification provides a moist environment. These microorganisms, once introduced through the nose and mouth, colonize the throat area. This means that they grow and form a colony, but have not yet caused an infection. Once the throat is colonized, it is easy for a patient to aspirate the microorganisms into the lungs, where infection develops (Andreoli, *et al.,* 2003)

The Environmental Protection Agency (EPA) has published an article about Humidifier fever to warn people about breathing in germs from humidifiers. Humidifier fever is a disease of uncertain etiology. It shares symptoms with hypersensitivity pneumonitis, but the high attack rate and short-term effects may indicate that toxins (eg. bacterial endotoxins) are involved. Onset occurs a few hours after exposure. It is a flu-like illness marked by fever, headache, chills myalgia and malaise but without prominent pulmonary symptoms. It normally subsides within 24 hours without residual effects, and a physician is rarely consulted. Humidifier fever has been related to exposure to amoebae, bacteria, and fungi found in humidifier reservoir. Only rigorous, daily and end-of-season cleaning regimens, coupled with disinfection, have been shown to be effective. Manual cleaning of contaminated reservoirs can cause exposure to allergens and pathogens (EPA, 2011).

Basing on the above grounds that humidifier could pose risk of infection to the end users the researchers were impassioned to conduct this study so as to assess and evaluate sterility of humidifiers from infection control management. The main purpose of this study is to identify the presence of microorganisms in Oxygen Humidifier among selected hospitals in Iligan City.

Materials and Methods

Preparation of Media

- **Nutrient Broth**

  13 grams of nutrient broth was mixed in 1L of distilled water. The broth was sterilized in the digital autoclave at 121 ^{O}C for 15 minutes. About 5mL of broth was poured to 30 sterile 10mL test tubes with sterile cotton plugs.
- **Nutrient Agar**

23 grams of nutrient agar powder was mixed thoroughly with 1L of distilled water. It was heated and boiled for at least one minute to completely dissolve the powder. The solution was then poured and sterilized in digital autoclave at 121^{O} C for 15 minutes. It was poured on sterile petri dishes and allowed to cool and set.

- **Mannitol Salt Agar**

  111 grams of Mannitol Salt Agar was suspended in 1000 ml of distilled water. The solution was poured into sterile petri dishes.

- **Eosin Methylene Blue Agar**

  37.5 g of EMB agar powder was mixed thoroughly with 1 L distilled water. It was heated and boiled for at least 1 minute to dissolve the powder completely. The solution was poured into sterile petri dishes.

Results and Discussion

Swab samples were obtained from the oxygen output of the oxygen humidifiers in Hospital X and Y. Areas in the hospitals include the surgery and medicine wards. The samples were then subjected to Gram staining and a series of biochemical tests for further identification of bacterial isolates.

(For ethical purposes, we have changed the names of the two hospitals into Hospital X and Hospital Y. This is to prevent comparison between the two hospitals.)

Thirty samples were collected from the two hospitals. Among the thirty samples that were streaked in petri plates, twenty-nine plates yielded colonies. These were the samples from surgery and medicine wards of Hospitals X and Y. Shown in Table ___ are the number of bacterial isolates from the two hospitals.

Table 1. Number of bacterial isolates from the Oxygen output of oxygen humidifiers in surgery and medicine wards in two selected Hospitals in Iligan city.

	Hospital X	Hospital Y	Total
Number of bacterial isolates	15	14	29

Pathogenic bacteria can be spread through a human population in a range of ways. Air, water and soil are all common vectors and people may also pass bacteria directly to each other through physical contact. Some bacteria are very adept at colonizing locations like medical equipment, allowing them to move from person to person with ease. Most pathogenic bacteria are susceptible to disinfectants. Regular sanitizing of oxygen humidifiers may prevent bacterial growth/proliferation.

Figure 1A. Oxygen Humidifier used in Hospital X (Reusable)

Figure 1B. Oxygen Humidifier used in Hospital Y (Pre-filled)

Sample collection was conducted in the Medicine and Surgery Wards of Hospital X and Y in Iligan City. The sampling date was determined randomly, as there can be no way of predicting the days of oxygen humidifier use.

Figure 2. Vials with Nutrient Broth

Before going to the sampling site, test tubes covered with cotton plugs and filled with 5-mL nutrient broth were sterilized. The sterile test tubes were labeled accordingly and kept in vertical position during transport to the sampling site to prevent the broth from being tilted to the edge of the tube and becoming contaminated. The sterile test tubes were then kept inside an ice bucket, submerged in ice and wrapped in sterile plastics, still in vertical position. Each sample was swabbed with a wet sterile cotton applicator (previously soaked in sterile water), observing aseptic technique to eliminate unnecessary contaminants. After every swabbing, the swabbed cotton applicator was put into its respective test tube, dipping it into the 5-mL nutrient broth. The tube was then submerged into the ice to inhibit further proliferation of bacteria. The tubes with the swabs were incubated for 24 hours, then transported carefully back to the laboratory for the bacteria to be grown, cultured, and identified.

Isolation, Purification and Maintenance of Bacterial Isolates from Oxygen Humidifier

The samples collected were streaked for isolation onto a nutrient agar plate using Multiple Interrupted Streak method. The samples were then allowed to incubate for 24 hours at room temperature. The isolated colonies that formed were streaked and isolated twice over to ensure that the bacterial isolates were contaminated. Modified sterile vial slants with nutrient agar were utilized for stocking the pure bacterial isolated for further testing.

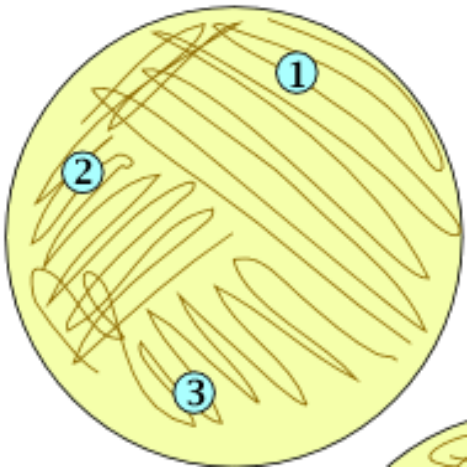

Figure 3. Multiple Interrupted Streak Method
(http://inst.bact.wisc.edu/inst/index.php?module=book&type=user&func=displayarticle&art_id=6)

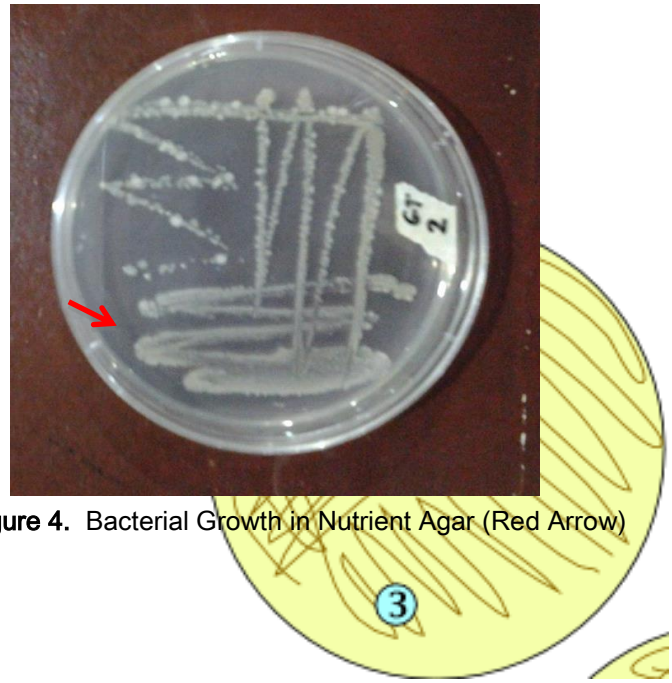

Figure 4. Bacterial Growth in Nutrient Agar (Red Arrow)

Cellular Characterization on Cell Shape and Cell Arrangement

Characterization of the different bacterial isolates include the whole shape of the colony, size in millimeters, edge/margin, elevation, color, opacity, surface, and consistency.

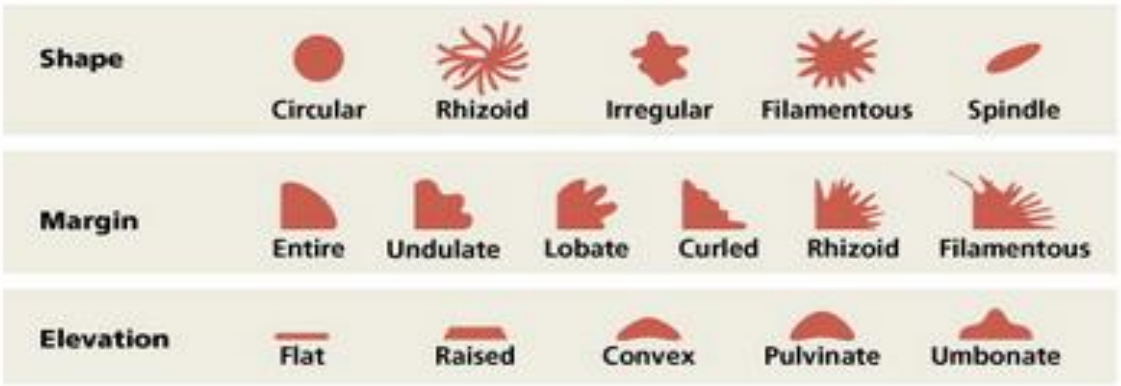

Figure 5. Different types of colonial morphologies, regarding the shape, edge, and elevation of the colony (http://apoptosis.persianblog.ir/page/20)

The shape of the colony refers to the overall figure exhibited by the bacterial colony: round, irregular, filamentous, rhizoid, and curled. The edge of the bacterial isolate is a colony morphology characteristic likewise considered in such forms as: entire, filamentous, undulate and lobate. Another cultural characteristic of bacterial isolates on nutrient agar growth is the elevation which assumes the forms as: raised, flat, convex and pulvinate.

Mannitol Salt Agar

Mannitol Salt Agar is used as a selective media for the isolation of pathogenic *Staphylococci.* It is recommended for the detection and enumeration of coagulase-positive *Staphylococci* in milk, food and other specimens. Mannitol is the fermentable carbohydrate source. *Staphylococcus aureus* grows on this medium and ferments mannitol to produce yellow colonies. Most coagulase negative species of *Staphylococci* and *Micrococci* do not ferment mannitol and grow as small red colonies (Sigma-Aldrich Inc., 2011, as cited by Baguio et al., 2012).

Mannitol Salt Agar was prepared and was then poured in petri dishes. Using aseptic technique, an inoculum from the mother culture was then streaked onto the petri dishes. It was then allowed to incubate at room temperature for 48 hours.

Table 2. Identification of bacteria based on mannitol fermentation

Organisms	Color
Staphylococcus sp.	Red
Streptococcus sp.	Yellow
Mycobacterium sp.	Red

Eosin Methylene Blue

Eosin Methylene Blue agar, Levine is a slightly selective and differential plating medium for the isolation of gram-negative enteric bacteria. The use of Eosin Methylene Blue enables differentiation between lactose-fermenting and non-fermenting organisms. When the bacteria ferment the lactose the pH decreases in the medium and the medium changes to a purple color. Gram-negative bacteria that ferment lactose appear with a green metallic sheen. Those that cannot ferment lactose appear clear on the medium (Jett et al., 1994, as cited by Baguio et al., 2012).

Eosin Methylene Blue agar was used as culture medium. Gram-negative bacilli were streaked on this agar and incubated at room temperature for 24-48 hours. Purple growth on this agar suggests *Klebsiella sp.* and *Legionella sp*.

Table 3. Identification of bacteria based on lactose fermentation

Organisms	Growth	Color
Klebsiella sp.	+++	Large, pink with blue center
Legionella sp.	+++	Dark Violet

Conclusions

Swab sample collection from Hospitals X and Y was conducted to determine the presence of potentially pathogenic bacterial strains and to identify which bacterial specie is present in the oxygen output of the oxygen humidifier on both hospitals.

Five isolated bacterial strains were identified using the conventional methods of identification. The cultural morphologies and cellular characteristics were observed and used in the first step of identification. Gram staining yielded gram isolates which were further subjected to a number of biochemical tests to help in its identification.

Among the identified bacterial species were *Staphylococcus sp., Stretococcus sp., Mycobacterium sp., Klebsiella sp., and Legionella sp.*

The five identified bacterial species are potentially dangerous since the oxygen output is where the humidified water goes out and into the patient's respiratory tract. Therefore, oxygen humidifier must be

properly cleaned every 24 hours to prevent cross-contamination. The entire oxygen humidifier must be washed in a solution of mild dish soap and warm water (NO anti-bacterial soaps) and then mix one part white vinegar and three parts water in a small pan or bowl and soak the entire humidifier bottle for 30 minutes and discard the vinegar after. Run warm tap water for three minutes, then rinse the bottle thoroughly and shake off the excess water and refill the bottle with distilled water to a level between the minimum and maximum fill lines.

It is important for the health workers to observe proper infection control trough cleaning and disinfecting equipment, such as oxygen humidifiers, every 24 hours in order to prevent respiratory nosocomial infection.

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Land Suitability Evaluation of Oil Palm on Degraded Lands

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Abstract

Area of oil palm plantation in Bireuen district increases every year. Low productivity of oil palm was caused by inappropriate physicall land since oil palms were planted in degraded land. The objective of this study was to evaluate the land suitability of degraded land which was planted with oil palm. Data analysis was conducted by using qualitative and quantitative descriptions. Descriptive qualitative analysis was perfomed and presented by map. The result showed that land characteristics for oil palms in districts of Bireuen were various. Classification of actual land suitability for oil palm trees was S2, S3 and N with limited factors namely slope, erotion of hazard and duration of dry months.

Keywords: Suitability, evaluation, oil palm, degraded land, limiting factor

Introduction

Land suitability evaluation involves characterizing the soils in given area for spesific land use type. The information collected in soil survey helps the development of land use plans, evaluates and predicts the effects of land use on the environment (Rossiter, 1990). The suitability of a given piece of lands is its natural ability to support a spesific purpose. According to the FAO methodology (1976), this strongly related to to the land qualities such as erosion resistance, water availability and flood hazard that are not measurable. As these qualities derived from the land characteristics, such as slope angle and length, rainfall and soil texture which are measurable or estimable, its advantageous to use these latter values to study the suitability.

For assessing the land suitability for plantation crops, soil requirements of crops must be known (Tan et.al, 2012). Also, these requirements must be understood wihin the contex of limitations imposed by landform and other features which do not form a part of the soil but may have a significant influence on use that can be made of the soil (Ande, 2011). From the basic soil requirements of crops, a number of soil characteristics are directly related to crop yield performance. For most crops, optimal, sub-optimal, marginal and unsuitable levels of these soil characteristics are known and have been quantified.

Development of annual crops, especially oil palm in Bireuen from year to year has increased. This is due to the increase of commodity demand. Data of Bireuen Plantation Office (2011) mentioned that the number of oil palm productions in form of fresh fruit bunches in the same year reached 36.328 tons with

estimation value of IDR 36.328.000.000. The large increase of palm oil production over the past 30 years explains in part why LUC has become a concern for the sustainability of palm oil production. The global land area of mature oil palm increased from 3.5 Mha in 1975 to 13.1 Mha in 2005. Most of this increase is found in Malaysia (increasing from 0.4 to 3.6 Mha) and in Indonesia (increasing from 0.1 to 3.9 Mha) (FAOSTAT, 2008). Including the area of immature oil palm (0.4Mha in Malaysia (MPOB, 2008) and 1.6Mha in Indonesia (IPOC, 2005) in 2005), a total land expansion for palm oil production of nearly 9 Mha took place in Malaysia and Indonesia between 1975 and 2005.

In Indonesia, oil palm plantations in large scale responsible for 29% of the total loss of forest cover between 1982 and 2007 (Uryu et al., 2008), this means that 85% of all oil palm plantations were made of former natural forest land (Uryu et al., 2008). The value of these exports triggered farmers in the region to develop the commodity. The development of oil palm plantations can be seen from the increase ofused land area and total production. According to the data from BKPM (2012) mentioned that extensive use of land for oil palm plantations in Bireuen in the years 2006 to 2011 was 4.372 ha.

Land productivity of oil palm plantations in Bireuen district is still low namely (8.3 tons/ha/year). The low productivity of oil palm plantations is caused by the less physicall suitability of land to support optimal plant productivity, where many of these plants are particularly planted on lands that have been degradated. Degradated land area in Bireuen reached 28.231 ha (BPS Bireuen, 2011), with land use in the form of shifting cultivation, open land and reed land (Satriawan and Fuady, 2012). The tendency of people to plant oil palm without supported by knowledge of the land potential and suitability causes un-optimal production. Similarly, the farmers' lack of understanding of farming analysis results leds them not know and not have production and revenue forecast data that can be accepted on any land units to develop oil palm plantations. Meanwhile, farmers are also poor understanding on the obstacles that must be faced physically and economically in the development of oil palm plantations.

Material and Methods

The study was conducted in Bireuen district of Aceh province, Indonesia on 2014-2015. The location of research was focused on degraded land which is located in the district of Bireuen. The determination of degraded land was based on distribution maps of critical land issued by the Regional Development Planning Agency of Bireuen district. The collected data were the soil physical properties, soil morphology and soil chemical properties. Physical land suitability analysis included the boundaries of the horizon, soil color, soil texture, soil structure, soil consistency, soil drainage, soil pores, soil reaction (soil pH), cation exchange capacity, base saturation, organic C, salinity and alkalinity.

The data were analyzed with descriptive qualitative by presenting data in the form of a map. Determination of land characteristics was based on land quality on each unit of land. Determination of the physical land suitability classes for each unit of land was based on criteria of land suitability for oil palm plantations. The class determination was classified into four classes namely: very suitable (S1), is quite appropriate (S2), marginally suitable (S3) and not suitable (N). Data from the land suitability classes are

then transferred into a Geographic Information System (GIS) that can be done by using a spatial depiction of Arc GIS software that generates the type of map: Map of the physical land suitability for oil palm plantations.

Results and Discussion

Land Characteristics

Land quality is the complex attribute of a land, each land quality. Each land quality that has a certain diversity will affect the productivity of the land. Based on the range of the value of land characteristics at study sites connected with the growing requirements or the value of the optimum range for oil palm plantations, showed that most of the land characteristics that determine the quality of land air temperature, water availability, availability of oxygen, nutrient availability, the potential for mechanization and flood hazards no longer be a limiting factor for oil palm plantations are intensively managed to produce optimally. However, a few land characteristics that determine soil quality rooting media, nutrient retention, toxicity, and the danger of erosion is quite varied and determine the diversity of palm oil production at the sites.

Air temperature

Oil palm plantations can be grown in areas with air temperatures of 20^0C - 35°C. Growth declines at temperatures <20°C or > 35°C, while the optimum temperature for the growth of oil palm is 25°C - 28°C (Djaenudin et al., 2003). Based on the information above, air temperature in all units of land use (SPL) at the study site is very suitable for the growth and development of oil palm plantations, with annual average temperature of 26.51°C - 28°C.

The availability of oxygen

Drainage land characteristic of the soil determines the land quality of oxigen availability for plants. Oil palms need soil with impeded to rather impeded drainages but in good aeration condition. This adjusts the fisologi growing characteristic of oil palms which need soil that is well capable of binding waterl. On the whole SPL at the study site, the soil drainage of 100 m depth from surface is very appropriate and quite appropriate for the growth of oil palms, which is characterized by a homogeneous soil color without spots or rusty iron and manganese; and no gley color. Soil drainagewith rather impeded is the soil with slow hydraulic conductivity and high water holding capacity, moist, and wet enough near the surface. While the soil with moderate drainage has good air circulation in the root zone, no spot of yellow, brown or gray on top and bottom layer of soil.

Flood danger

The danger of flood will affect the growth of plants. The soil is reduced due to the long time under water so that a lot of plants that can not grow. In all SPL of the study sites, there is no danger of flood. One location is said to never get flood, if within a period of one year the land is never closed by flood for more than 24 hours. Therefore the flood danger does not become a barrier against to use land in the study sites

Availability of water

Oil palm plantations require enough water, especially in the entire period of their growth. The quality of water availability for crop land is determined by the characteristics of rainfall, humidity, length of dry

months and availability of soil pore. Oil palm plantations need water/rainfall ranging between 1250 - 4000 mm/year, while the optimal rainfall is 1700-2500 mm/year for oil palm. While the optimum length of dry months for oil palm is more than 2. Based on the research data, rainfall in the study site is very suitable and appropriate enough for the growth and development of oil palm plantations.

Condition of rooting media

Condition of suitable rooting medium for plants is determined by the characteristics of the soil texture, soil density, soil effective depth and fragments of coarse material in the soil. In a land suitability criteria LREP II (1994) and Djaenudin et al. (2003) claim that peat layer existing also determines the land quality of rooting medium, but these characteristics are not relevant for this research sites. Land characteristics that determine the quality of the plant rooting medium at the study site is quite varied to view the soil texture class, abrasive materials, and the effective depth of the soil. Nevertheless, it is still suitable for oil palm plantations. Soil texture in the study site on the surface layer (0-25 cm) was quite varied with medium texture and subtle class.

Land dominated by the fine fraction is rather difficult to be penetrated by the roots of plants, but the land dominated by clay soil will be easier to bind with water, and this characteristic is required by oil palm. Land in the study site has an effective depth of the soil ranges from 90-150 cm, which means it is still suitable for oil palm plantations, and it is in line with the criteria of classification of land suitability CSR/FAO (1983) namely the effective optimum depth for oil palm plantations is more than 100 cm. Likewise, the number of coarse fragments of coarse material which are not more than 15% and the total pore space that ranges from 36.25% to 60.43%, are suitable to oil plant palm.

Land quality of nutrient availability

The availability of nutrients in the soil can be determined from the content of N-total, P-availability, K swapped (K-dd), and the content of the secondary macro nutrients such as Ca-dd, Mg-dd, and micronutrients such as Na. The factor combination of land sub-group, slope, production levels and land use types that make up the SPL at the study site adequately describes the variation of soil quality and nutrient availability. Results of laboratory analysis showed that soil nutrient content at the study site is quite varied. N total (%), P-available, K-dd, and Mg-dd range from 0.10 to 0.46, 0.19 to 3.41 ppm (very low), 0.1 to 0.56 me/100g (medium), and 0.44 to 2.00 me/100g (low) respectively.

Nutrient retention

Oil palm plants need soil with a pH of 5.0 to 6.5 (Djanudien et al, 2003). According to Purseglove (1978), at the lower soil pH, the growth is rather stunted due to delay in the release of nutrients. The optimum base saturation (KB%) for oil palm plantation is morev than 20%. The optimum C-organic soil for growth of oil palm is more than 0.8%. Laboratory test results showed that a pH range of soil in the study were between 5.13 and 5.86 (acid). While recorded organic-C levels ranged from 0.92% to 4.99%. In some locations, nutrient retention of soil pH is not the important limiting factor to the growth of oil palm plantations. Nutrient retention is quite varied expected to determine the level of productivity of oil palm plantations.

Toxicity

Poisoning danger for plants can be caused by salinity and alkalinity, as well as the depth of sulfidic (LREP II 1994). In addition, Djaenudin et al. (2003) reveals that poisoning danger can also inhibit the growth of plants. Salinity and alkalinity as the impact of the presence of salts in the soil can reduce the production of oil palm untill 50% when the salinity of the electrical conductivity (EC) is more than 4 dS/m (Sys et al., 1993). Results of laboratory analysis showed that there was no threat of salinity in the entire SPL at the study site so that it is expected to be unlimiting factor for the growth and production of oil palm plantations.

Land Preparation

The ease of soil processing can be expected from the existing surface rocks and outcrop rocks. The land characteristics of surface rocks and outcrop rocks do not vary (<5%) and are not a problem for mechanization activities at the sites. Besides the above characteristics, the potential of mechanization is also influenced by the slope of the study sites ranging from 15 to 50%. Slope conditions at the location of the research will be the major limiting factor in the determination of land suitability classes of oil palm plantations.

Land Suitability Class

Land suitability class for oil palm plantations in Bireuen district can be grouped according to the research site-specific conditions of each district. The development of oil palm cultivation in the district of Bireuen is directed to the suitable land biophysical conditions and has a minimal constraint of land management because of no protected forest area or forest conservation, no rice field cultivation area, and no residential area, and the land conditions has fulfilled the growing requirements in very appropriate category for oil palm plantations. Based on the analysis of land characteristics and criteria of oil palm crop needs, it was derived the classes of actual and potential land suitability in Bireuen district showed in Figure 1.

The level of actual and potential land suitability for oil palm plantations should also be based on socio-economics and cultural aspects of farmers in each sub-district of Bireuen district. Cultivation and land development of new oil palm plantations are prioritized on land with slope 2-15%, with the erosion rate of low to moderate and effective soil depth of 50-70 cm.

Land Suitability Potential in Bireuen District

Results of the evaluation showed that land suitability classes could be used to determine the relationship between the land use at present and the availability of existing land resources. In addition, it can also be used to predict the potential of land use in the future. If there is a discrepancy between land resources with the land use in a certain area, it means that there has been an error in the existing land use. This can carry a wide range of damage or degradation consequences in either erosion or degraded land. Lands which were assessed with actual land suitability evaluation for oil palm plantations showed that matching method of Djaenuddin (1994) had seven locations with five of those in category of Sland suitability class S3 land suitability class, which meant that the lands were appropriate for limited oil palm cultivation. Five locations had land suitability class of N1 which meant that the soil at the site did not fit to be planted with

oil palm, but with land characteristic development, it will allow to be planted in the future. Two locations had S2 land suitability class for planting oil palm with erosion delimiter factor. There were not any different results in the evaluation of actual land suitability class between simple delimiter matching method and the delimiter number and intensity (Sys et al., 1993), even at subclass land suitability, the two matching methods provided five sites with land suitability class of S3, which meant that at these locations, the lands were limited suitable for oil palm plantations ; and two sites with land suitability clsass of S2, which meant that at those locations, the lands were quite suitable for planting oil palm.

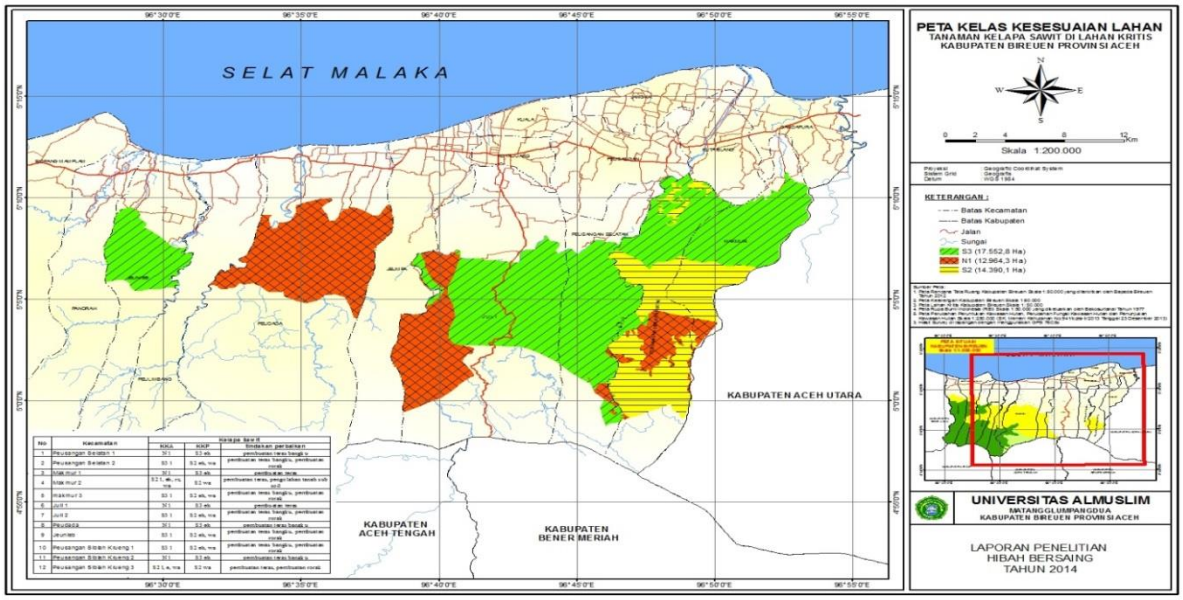

Figure 1: Map of land suitability classes of oil palm plantations

Delimiter is a determinant in land suitability subclass in matching the growing requirements of oil palm plantations (Sys et al., 1993) and in this case, it was dominated by limiting the land slope delimiter. Generally the land slope delimiter on the location of the land assessed is S3 category and this land slope delimiter (t) is the main delimiter that appears almost in all land locations assessed because of the difficulty of land development.

Conclusions

The results showed that the characteristics of the land for oil palm plantations in Bireuen district varied. The actual land suitability classes of oil palm were S2, S3 and N with the limiting factors of slopes, erosion and the dry month length. The range of land characteristic value at study sites connected with the growing requirements or the optimum range value for oil palm plantations, showed that most of the land characteristics that determine the quality of land such as air temperature, water availability, oxygen availability, nutrient availability, mechanization potential and flood hazards are not longer be limiting factor for oil palm plantations which are intensively managed to produce optimally.

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Prevailing Problems of Exclusive Breastfeeding: Implications for Interventional Roles of Health Professionals in Breastfeeding

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Abstract

WHO (2011) recommends mothers worldwide to exclusively breastfeed infants for the child's first six months to achieve optimal growth, development and health. .Breastfeeding was associated with a reduction in childhood obesity risk (Armstrong, J., & Reilly, J. J. 2002). One of the most serious public health challenges of the 21st century is childhood obesity, and the prevalence has increased at an alarming rate. Asthma has become a major health priority in Asia (Wong, G. W.et al., 2013) , nevertheless, breastfeeding was associated to have a protective role against asthma throughout the early years of childhood (Oddy, W. H. 2012). However, in a 2011 Family Health Survey by the Philippine Statistics Authority(psa) 2013, only 27 % of children 6 – 25 months were exclusively breastfed. Low rating of exclusive breastfeeding in the country is a major concern. This paper aims to determine the prevailing problems of exclusive breastfeeding. Random sampling survey was utilized in gathering data from four barangays. In Iligan City. Among the 100 mothers, only 3% of them exclusively breastfed their child until 6 months.. Amidst the identified significant factors, prevailing breastfeeding problems such as breast pain ranked first (26.12%); returning to work/school ranked second (24.63%); lack of time ranked third (20.90%); low milk supply ranked fourth (16.42%); infant formula being good for baby's health ranked fifth (5.97%); family's or friends' opinion ranked sixth (4.48%); and other reasons like being uncomfortable in front of the people ranked last (1.49%), are the most crucial factors that affects the duration of exclusive breastfeeding,

Keywords: prevailing breastfeeding problems, duration of exclusive breastfeeding, employment, maternal age

Introduction

Breastfeeding is the foundation of children's survival, nourishment and prompt development. Breastfeeding not merely supply children with optimum start in life, but it is also helpful in maternal health, shields against non-communicable diseases and conducive to environmental sustainability. Even with all the benefits discovered number of countries over the last decade, global breastfeeding rates have seen only protracted progress since 1995 (UNICEF &WHO 2015).

One of the advocacies of the World Health Organization (WHO) 2011 is exclusive breastfeeding, in which the infants' sole source of food is breast milk for the first six months of life, to attain maximum growth, development and health. Moreover, the single most cost effective intervention to reduce infant mortality is the promotion of exclusive breastfeeding (News Desk 2014). However, "globally, less than 40 per cent of children fewer than six months of age are fed only breast milk with no additional foods or liquids, including water. The purpose of this study is to explore the prevailing problems that have an impact on the duration of exclusive breastfeeding among lactating mothers in Iligan City.

Materials and Methods

Descriptive correlational research design was used in this study. It determined the profile of the selected lactating mothers in terms of their demographic profile. It utilized the correlation method in identifying the relationship between the demographic profile of the respondents and duration of exclusive breastfeeding. Moreover, it evaluated the association between the demographic respondents' profile and the duration of exclusive breastfeeding. The respondents were purposively taken from the given list of the names of the mothers with reference to the total number of children below 2 years old that are receiving vaccines.

The respondents of this study are lactating women of any age group as long as they have a child that is 2 years old and below and must be healthy and born term. Moreover, these respondents are residing in any of the four (4) barangays namely Barangay Hinaplanon, Pala-o, Poblacion, and Canaway from the months of August 2010 up to January 2011. The research limits on the lactating mothers who had stopped breastfeeding within the span of 2 years and that the child is not any experiencing any feeding difficulty (e.g. cleft palate, cleft lip, food intolerances). To identify the prevailing problems of exclusive breastfeeding among the respondents, a self – structured questionnaire was employed with Cronbach's $\alpha = 0.784$ upon validation. After the data has been gathered, percentages were computed and frequencies were tallied. Chi – square was used as a statistical analyser to test for the goodness of fit and the significant relationship of the variables being investigated.

Results and Discussion

The table below shows that the respondents belonged to age range 24 – 27 years old got the highest percentage which is thirty (30) %, & the respondents belonged to age range 32 – 35 years old, got the lowest percentage which eight (8) %. As to educational attainment, most of the respondents 89 % have attained secondary & tertiary level, while only 11 % obtained elementary level. Regarding employment, 66 respondents were employed and, 34 respondents were unemployed. With reference to income, majority of the respondents belong to the income group of less than 5,000 with a 49 percentage, while the minority of the respondents belong to the income group ranging from 15,001 – 20,000 with a percentage of 6% & lastly, in connection with the number of children exclusively breastfed, 59 respondents had no child exclusively breastfed; 24 respondents had one (1) child exclusively breastfed; 12 respondents had two (2) children exclusively breastfed; three (3) respondents had three (3) children exclusively breastfed; and two (2) respondents had four (4) children exclusively breastfed.

Table 1. Demographic Profile of Respondents

	Frequency	Percentage
Age		
16- 19 years old	10	10 %
20 -23 years old	27	27 %
24 -27 years old	30	30 %
28 -31years old	25	25 %
32- 35 years old	8	8 %
Educational Attainment		
Elementary level	11	11 %
Secondary/Tertiary level	89	89 %
Employment		
Employed	66	66 %
Unemployed	34	34 %
Income		
< 5,000.00Php	49	49 %
5,001.- 10,000.00Php	23	23 %
10,001 – 15,000.00Php	22	22 %
15,001 – 20, 000.00Php	6	6 %
Number of children exclusively breastfed	59	59 %
No child exclusively breastfed	24	24 %
One (1) child exclusively breastfed	12	12 %
Two (2) children exclusively breastfed	3	3 %
Three (3) children exclusively breastfed	2	2 %
Four (4) children exclusively breastfed		
Total	100	100

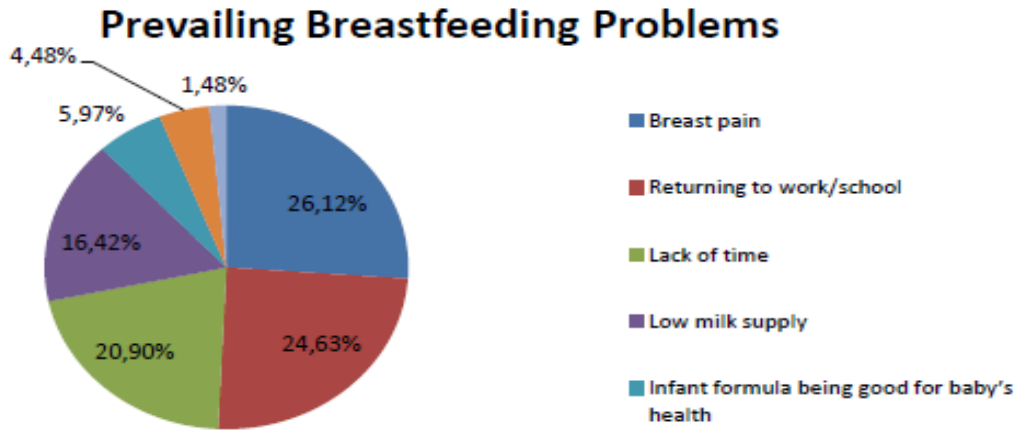

Figure 2. Prevailing Breastfeeding Problems of the respondents

The above figure presents the common difficulties encountered by the respondents. Breast pain ranked first (26.12%); returning to work/school ranked second (24.63%); lack of time ranked third (20.90%); low milk supply ranked fourth (16.42%); infant formula being good for baby's health ranked fifth (5.97%); family's or friends' opinion ranked sixth (4.48%); and other reasons like being uncomfortable in front of the people ranked (1.49%). Studies of Hegazy, R. A., et al., (2015), Nabulsi, M (2011), Otoo, G. E., et al., (2009), and Hurley, K. M. et al., (2008), reinforced breast pain as the priority problem encountered by the respondents. Concerning returning to work as a prevailing problem in exclusive breastfeeding, it is supported by the studies of Hegazy, R. A., et al., (2015), Thomas-Jackson, S. C.et al., (2015), Nabulsi, M (2011), Cherop, C. et al., (2009), Otoo, G. E., et al., (2009), Hurley, K. M. et al., (2008), Manaena-Biddle, H.et al., (2007) and Sloan, S. et al., (2006). With respect to lack of time, Maduforo, A. N. et al., (2013), Maduforo, A. N., & Onuoha, R. O. (2011), and Shaheen Premani et al., (2011) supplemented this finding. Moreover, a number of studies have shown that low milk supply hinders exclusive breastfeeding. Infant formula being good for baby's health is another difficulty encountered & this result is supported by Hegazy, R. A., et al., (2015).

The relationship between the mother's age and the duration of exclusive breastfeeding can be seen that a large number of mothers that belong to the age group of 24 – 27 had breastfed longer than 6 months and the mothers that belonged to the age group of 32 – 35 had not reached the ideal period of breastfeeding. The calculated chi-square value of 21.026 was greater than the tabulated chi – square value of 15.507 at 0.05 level of significance at 8 degrees of freedom. This showed that there was a significant relationship between the mother's age and duration of exclusive breastfeeding. This implied that the duration of the exclusive breastfeeding is dependent on the mother's age. Mothers that belong to the youngest and oldest age group are therefore seen in this table as the mothers to less likely breastfeed their infants up to 6 months and could actually impede the nutritional value needed by the infant. This is strengthened by Souza, et al., (2012) in which they found out those women younger than 20 years of age breastfed for a shorter time, possibly because mothers who are older have more knowledge and experience concerning breastfeeding. This indicates the need to offer individualized care to adolescent mothers to support those regarding factors that may discourage breastfeeding. Moreover, Baxter, et al., (2009), Li, R. et al., (2002) and Lawoyin, et al., (2001) stressed that exclusive breastfeeding was least common among mothers, who were younger than 20- 25 years.

The relationship between the educational attainment and the duration of breastfeeding can be seen that most of the mothers included in the study had graduated from secondary and tertiary levels. The calculated chi-square value of 1.5416 was less than the tabulated chi – square value of 5.991 at 0.05 level of significance and 2 degrees of freedom. This showed that there was no significant relationship between the mother's educational attainment and duration of exclusive breastfeeding. This implied that the duration of the exclusive breastfeeding is not dependent on the mother's educational attainment.

The relationship between employment and the duration of exclusive breastfeeding can be seen that only 6% of these mothers can exclusively breastfeed their infants and 46 employed mothers stopped breastfeeding before the end of the 3rd month postpartum. . The calculated chi-square value of 11.8648 was greater than the tabulated chi – square value of 5.991 at 0.05 level of significance and 2 degrees of freedom. This showed that there was a significant relationship between the mother's employment and duration of exclusive breastfeeding. This implied that the duration of the exclusive breastfeeding is dependent on the mother's employment. Maternal employment was identified to be the major obstacle in exclusive breastfeeding.

The relationship between income and duration of exclusive breastfeeding can be seen that 48 mothers with less than 5,000 pesos as an income will breastfeed less than 6 months. This can imply that most mothers with less income tend stop breastfeeding when compared to those mothers with higher incomes. However, the calculated chi-square value of 13.7069 was less than the tabulated chi – square value of 15.507 at 0.05 level of significance and 8 degrees of freedom. This showed that there was no significant relationship between the mother's income and duration of exclusive breastfeeding. This implied that the duration of the exclusive breastfeeding is not dependent on the mother's income. Similar findings were made by Dubois, L., & Girard, M. 2003, which highlighted family income do not influence exclusive breastfeeding.

The numbers of children exclusively breastfed and the duration of the exclusive breastfeeding can be seen in the table that 58 mothers have failed to exclusively breastfeed their other children. Most of them would stop during the first three months of postpartum. Only two (2) mothers had successfully exclusively breastfed 1 or 2 of their children. With this result it can be said that many of the mothers fail to continually exclusively breastfeed all their children. The calculated chi-square value of 12.592 was greater than the tabulated chi – square value of 9.488 at 0.05 level of significance and 4 degrees of freedom. This showed that there was a significant relationship between the number of children exclusively breastfed and duration of exclusive breastfeeding and that the duration of the exclusive breastfeeding is dependent on the number of children exclusively breastfed. Mother's with 1-2 children have longer duration of breastfeeding than the mother's with 3-4 children does. Similar findings were made by Vaahtera, M. et al., 2001 which highlighted that better adherence to exclusive breastfeeding was associated with smaller number of children in the family. As also shown in table 6, infants aged three months and below were three (3) to four (4) times more likely more likely to be on EBF than infant aged four to six months. Similar finding was reinforced by Alemayehu, T. et al., (2009), in which it was found out that infants less than two months of age were five times more likely to be on EBF than infant aged four to six months.

During the first three (3) months a large number of breastfeeding problems were complained to be the reason of stopping the breastfeeding process with 52 coming from the reason that they needed to go back to work. In the 4th – 6th month postpartum most problems came from experiencing breast pain and the need to go to work. Those mothers who eventually breastfeed longer than 6 months mostly

experienced breast pain but had later on stopped. With mothers complaining a large number of breastfeeding problems as a reason for stopping the breastfeeding process, then it can be inferred that breastfeeding problems can shorten or definitely stop the breastfeeding process. The calculated chi-square value of 29.1401 was greater than the tabulated chi – square value of 21.026 at 0.05 level of significance and 12 degrees of freedom. This showed that there was a significant relationship between the mother's prevailing breastfeeding problems and duration of exclusive breastfeeding. This implied that the duration of the exclusive breastfeeding is dependent on the prevailing breastfeeding problems encountered by the mothers. This finding is supported by the studies of Hegazy, R. A. et al.,2015, Thomas-Jackson, S. C.et al., 2015, Hinsliff-Smith, K. et al., 2014, Maduforo, A. N.et al.,2013, Radwan, H. 2013, Uchenna, O. 2012, Nabulsi, M. 2011, Shaheen Premani, Z. et al.,2011, Cherop, C.et al., 2009, Otoo, G. E et al., 2009, Hurley, K. M., et al., 2008, McCann, M. F.et al., 2007, and Manaena-Biddle, H.et al., 2007.

Conclusion

According to the findings in this study, there is no significant relationship between the respondent's demographic profile, specifically the educational attainment, and income in the duration of exclusive breastfeeding. However, statistics in this research shows that there is a significant relationship between the respondent's maternal age, employment and number of children exclusively breastfed to the duration of exclusive breastfeeding. Furthermore, there is a significant relationship between the prevailing breastfeeding problems to the duration of exclusive breastfeeding. It is therefore appropriate to develop plans specifically on the interventional roles of health professionals to address the identified significant factors influencing the duration of exclusive breastfeeding.

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A Five Year Retrospective Study: Pulmonary Tuberculosis and Blood Type

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Abstract

Philippines has a long way to go in eradicating Pulmonary Tuberculosis although the Department of Health confidently announced that the country will be able to attain the millennium development goal of reducing Tuberculosis deaths by fifty percent (50%) within five years or 2015(WHO). Although advanced technology and research found new effective ways to eradicate its incidence there are still variables or risk factors that are needed to b taken into account like the Blood. Hence, the main objective of the study is to investigate and determine the relationship between Pulmonary Tuberculosis and other intervening variables such as the patient's age, gender and the residence. The study was conducted from January 2009 until December 2013 at Gregorio T. LLuch Memorial Hospital. The data was gathered using purposive sampling and retrospective correlation method of research. The 665 respondents were respondents were chosen based on inclusion criteria. Results of the study showed that blood type and Pulmonary Tuberculosis are significantly related. As well as age, gender and location of the residence. Finally, this study has been that blood type O has innately low levels of Vitamin D and that low Vitamin D levels has been found to be a factor which makes people more susceptible to Pulmonary tuberculosis.

Keywords: Pulmonary Tuberculosis, Blood type, Millennium Development Goal, Vitamin D

Introduction

The Philippines is among the 22 high-burden TB countries that account for more than 80 percent of the world's cases. The other three countries in the Western Pacific Region in this category are Cambodia, China and Vietnam, the global health body noted. The WHO said that the Philippines and these other three countries account for 93 percent of the cases in the Region (Manongdo, 2013). The Philippines is one of the highest tuberculosis (TB) burden countries in the world with nationwide coverage of directly observed treatment, short-course (DOTS) achieved in 2003. This study reports on the National TB Control Programmed (NTP) surveillance data for the period 2003 to 2011. The performance trend

suggests that the Philippines are likely to achieve Millennium Development Goals and Stop TB targets before 2015 (Vianzon, et. al., 2013).

The number of deaths due to Tuberculosis stands at an average of 75 Filipinos every day. Diagnosed as curable, it ranks 6th among the top leading causes of mortality and morbidity in the Philippines. Tuberculosis prevalence is high among the high risk groups such as the elderly, urban poor, smokers and those with compromised immune systems such as people living with HIV, malnutrition and diabetes (WHO Philippines, 2014). This maybe because the Philippine government detects only the full-blown TB cases rather than the latent ones, "It easily evades our immune system and you may carry it as a child but be diagnosed with the disease 50 years later," (Kawamura, 2013). She added that accurate identification of latent TB bacteria is required since these persist in our body for years and decades; they are only inactive.

In Northern Mindanao, the number of people affected with tuberculosis is increasing (DOH). According to Emiliano Galban Jr., DOH Spokesperson for Northern Mindanao, the increase in reporting Tuberculosis cases meant that more people are now becoming more aware and seek treatment for the highly communicable disease. According to Dr. Rosalinda Vianzon, National Tuberculosis Program Manager, that as of 2011, the number of TB cases in Northern Mindanao was nearly 8,800 and the figure was 1,000 more than the number of cases monitored in the region in 2010 (Bobby L., Inquirer Mindanao, 2013).

The researchers were interested in this study because though efforts were made to decrease the incidence of pulmonary tuberculosis the fact remains that up to date. Pulmonary tuberculosis is still a menace to people from the country because of its more uncontrolled form, the Multi Drug resistant Tuberculosis (Crisostomo, 2013). Although advanced technology and research found new and effective ways to eradicate its incidence, there are still variables or risk factors that are needed to be taken into account like the blood type. This disease may turn out to be resistant and in turn leave the patient incapable of work. It doesn't necessarily mean that when a patient gets treated for this disease, a full recovery can be expected within months or years.

Finding out the specific blood type more prone to having Tuberculosis will help in lessening its occurrence together with proper knowledge dissemination. Through this study, the researchers have known the likelihood of a person contracting Tuberculosis. Thus, appropriate precautions will be taken into account to safeguard high risk people from contracting tuberculosis. This study aimed in helping to identify what blood type among the respondents are commonly affected by Tuberculosis and what percentage do other blood groups have in terms of contracting Pulmonary Tuberculosis. This study primarily aimed to inquire the relationship of ABO blood group to patients diagnosed with Tuberculosis from January 2009 to December 2013.

Material and Methods

Data collection accomplished through patients' record at the record section of the chosen hospital (Gregorio T Lluch Memorial Hospital) from January 2009 to January 2014. Identified patient's record must have a final diagnosis of Pulmonary Tuberculosis. Pertinent information was obtained that includes the demographic profile of the patient and blood type.

Results and Discussion

A total number of 665 identified patients' records with Pulmonary Tuberculosis as final diagnosis. Of which, 424 males and 241 females, majority of them belongs to ages 18-24 (30.2%), 25-40 (42.3%) and 41 and above (23.4%). Profiles of the respondents are summarized in the Table 1.

Table 1. Distributions of Respondents According to Age

Age	Frequency	Percentage
0-14	4	0.6
15-24	22	3.3
25-39	201	30.2
40-65	282	42.3
Above 65	156	23.4

Table shows the age group percentage of patient diagnosed with Pulmonary Tuberculosis. Almost half of the population contracted Pulmonary tuberculosis belongs to the age 40-65 years old accounting to 42.3%, followed by ages between 25-39 and above 65 years old, 30.2% and 23.4% respectively.The remaining number belongs to younger age at 3.9%.

Table 2. Distributions of Respondents According to Gender

	Frequency	Percent(%)
Female	241	36.2
Male	424	63.7
Total	665	100.0

Table evidently shows a comparison between male and female contracting pulmonary tuberculosis. About two thirds of the population were males (63.7%) while the remaining belongs to female at (36.2%). Male individuals of all ages are more prone to infection because of their lifestyle (WHO, 2010).

The corresponding barangay who have more incidence of Pulmoanry Tuberculosis. The highest incidence rate within Iligan City are the following barangays: Tambacan (8.2%) being the highest, Saray (7.2%) and Tubod (5.4%). Apart from that, patients outside Iligan City accounts (13.4%).

Table 3. Distribution of Respondents According to Location of Residence

Barangay	Observed	Percentage (%)
Abuno	14	2.1
Acmac	11	1.7
Bagong Silang	6	0.9
bayug	4	0.6
Bonbonon	3	0.5
Bunawan	2	0.3
Buru-un	33	4.9
Dalipuga	20	3
Del Carmen	7	1.1
Digkilaan	4	0.6
Ditucalan	4	0.6
Dulag	1	0.1
Hinaplanon	26	3.9
Kabacsanan	6	0.9
Kiwalan	8	1.2
Luinab	6	0.9
Mahayahay	22	3.3
Mandulog	8	1.2
Maria Cristina	14	2.1
Pala-o	21	3.1
Poblacion	24	3.6
Puga-an	12	1.8
San Miguel	13	1.9
San Roque	4	0.6
Santiago	20	3
Saray	50	7.5
Santa Elena	15	2.3
Santa Filomena	15	2.3
Suarez	26	3.9
Tambacan	55	8.2
Tibanga(canaway)	23	3.5
Tipanoy	22	3.3
Tomas Cabili	5	0.7
Tubod	36	5,4
Ubaldo Laya	26	3.9
Villaverde	10	1.5
outside Iligan	89	13.4
Total	665	100

Table 4. Distribution of Respondents According to Blood Type

Blood Type	Frequency	Percent
A+	109	16.4
AB+	44	6.6
B+	119	17.9
O+	393	59.0
Total	665	100.0

Table depicts the allocation of blood type of the patient. Preponderance of the patients blood type are O at 59%, followed by blood type B and A ranking almost at the same frequency, 17.9% and 16.4% respectively, and the least belongs to group blood type AB at 6.6%. According to American Red Cross (2013), “O” blood type is the most common blood type of human and highly requested at the hospital. In addition to the survey conducted by Philippine National Red Cross (2013) results that almost 50% of the filipino Blood type is “O”.

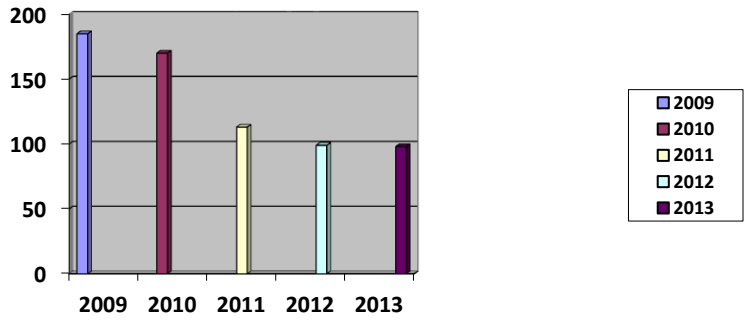

Figure 1. Annual Distribution of Pulmonary Tuberculosis

The graph compares the rate of Pulmonary tuberculoshis is admitted at Gregorio T LLuch Memorial Hospital between the years 2009 and 2013. It can be clearly seen that the rate of Pulmonary Tuberculosis is currently declining throughout the period. In 2009, nearly 180 patient diagnosed with Pulmonary Tuberculosis. This number decreased gradually to 170 by 2010 and continued to decrease but more steeply to 110 in 2011 and continued slowly to 100 for the rest of the two period 2012 and 2013. WHO (2010) stated that mortality rates at global level fell by 35% from 1997 to 2009 and a target of 50% by 2015.

Table 5. Test of Relationship of the Respondent's Profile and Pulmonary Tuberculosis.

	Value	Df	P – value	Conclusion
Pearson Chi-Square	7.986[a]	3	.046	Significant

Legend: if P-value is less than α=0.05 level of significance, then the test is significant, otherwise the test is not significant.

Table shows a significant relationship between the respondents profile and their diagnosis of having Pulmonary tuberculosis. According to the study, ages 40-65 are bombarded with stress and tyranny of vices that weakens the immune system thus causing them to be more likely to get illness.(TB Alert,2009).In addition, Male individuals of all ages are more prone to infection because of their lifestyle.(WHO,2010). Furthermore, a study entitled Gender disparities in tuberculosis: report from a rural DOTS programme in south India supported that 66% of males and 57% of females had tuberculosis infection (Balasubramanian, et.al, 2004). This implies that male are more prone to have Pulmonary Tuberculosis than female. Moreover, the study by Martin McKee (2006) entitled Risk factors for pulmonary tuberculosis in Russia: case-control study results that living in overcrowded conditions is one of the risk factor in of Pulmonary Tuberculosis.

Table 7 . Test of Relationship between Pulmonary tuberculosis and Blood Type

Blood Type	Chi-square Value(CS)/Likelihood Ration(LR)	Df	P –value	Conclusion
O	7.890	3	.048	Significant

Legend: if P-value is less than α=0.05 level of significance, then the test is significant, otherwise the test is not significant.

Table provides a clear evidence a significant relationship between blood type O and Pulmonary Tubercul osis. It runs a more aggressive and detrimental course in blood group A, while blood group A is afforded t he highest degree of protection. A further complicating factor appears to be ethnic background. Rh positiv e and Rh negative blood type might have some impact on tuberculosis survival as well. Research demon strate that more Rh negative persons died than Rh positive (D'Adamo, 2001).

Conclusion

Globally, various studies attempt to relate Human Blood Type and Pulmonary Tuberculosis. A five year retrospective study comparing patient diagnosed with Pulmonary Tuberculosis and their blood type in

Iligan City concluded that there is a significant relationship with the blood group Os than any other blood type.

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The Use of Bagasse and Rice Straw as Alternative Growth Media for White Oyster Mushroom

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Abstract

White oyster mushroom (Pleurotus ostreatus) is one of fungi widely cultivated in Indonesia. Generally, white oyster mushroom is cultivated in sawdust media that has limited abundance in Indonesia. The purpose of this research is to search for alternative media other than sawdust to grow white oyster mushroom in Indonesia. White oyster mushroom has been grown in rice straw media and bagasse as well as on media combination of sawdust, straw, and bagasse. The parameters studied were fresh weight, cup diameter, and fruiting body morphology. The results showed that highest fresh weight white oyster mushroom obtained from media combination of sawdust, straw, and bagasse while the lower fresh weight yielded from the 100%-straw media. There was no significant difference observed in the mushroom cap diameter as well as in the fruiting body diameter among variation composition of the media. The study concluded that the mix of sawdust, straw, and bagasse might serve as an alternative media for white oyster mushroom growth.

Keywords: Pleurotus ostreatus, oyster mushroom, rice straw, bagasse

Introduction

Edible mushrooms are widely consumed in Indonesia where the climate is suitable for the natural growth as well as the cultivation of certain mushrooms. White oyster mushroom (*Pleurotus ostreatus*) is one of the most commonly cultivated edible mushrooms in Indonesia (Suriawiria, 2002). The cultivation process of white oyster mushroom usually makes use of a sawdust baglog as a substrate for the mushroom growth. Nowadays, the availability of sawdust tends to be limited, hampering the oyster mushroom cultivation in general. Therefore, search efforts for alternative substrates providing sufficient nutrition for the mushroom growth have gained a big interest.

According to Cahyana et al. (2006), the necessary nutrient composition for oyster mushroom growth more or less includes 27% lignin, 70% karbohidrat (selulosa dan glukosa), protein, nitrogen, fiber, and vitamins

like tiamin at 100µg/L. All those nutrients are available in sawdust (Senyah, 1989). Rice straw and bagasse are examples of agricultural solid waste obtained easily in huge amount in agricultural countries like Indonesia. They are used so far only as mix components for making fertilizer. The carbohydrate content in rice straw and bagasse has been reported to be high enough, making them potential as alternative growth substrates for mushroom growing on sawdust.

This work aimed to evaluate the capacity of those materials in substituting the sawdust portion in the common growth substrate. Their percentage in the total baglog composition was varied to see the influence on the fresh weight and morphology of the fresh mushroom yielded.

Materials and Methods

The experiment was carried out at the Laboratory of Microbial Biotechnology, University of Surabaya, Indonesia, between September 2014 and February 2015. Sawdust was collected from the different sawmills in Mojokerto, East java. Rice straw and bagasse used as substrate mixture were collected from Surabaya. They were grinded before usage. The experiment was laid out in a completely randomized design with 7 treatments and replicated 10 times.

Substrates preparation and spawn inoculation

Each sawdust (30% of volume) was supplemented with rice straw and bagasse at certain ratio as written in Table 1, also mixed with calcium carbonate (0.02%) and water (50%) and thoroughly mixed. Polyprophylene bags (22.5 × 30 cm) were filled with 1 kg of each substrate, sterilized once at 121°C and 1 atm pressure for 3 h and for several hours allowed to cool down to the desired inoculation temperature in a dark room. Each baglog was stood up, the mouth was opened and the spawn (3% w/w) was placed into each bag at the approximate center using a sterilized metal implement. Bags were closed with paper.

Cultivation conditions

The bags were subsequently placed, longside down, into a spawn running room at 25 - 30°C in the dark and 65 - 70% relative humidity until completion of spawn running (approximately 30 days after spawn inoculation). After completion of spawn running the temperature and relative humidity was changed to 19 to 25°C and 80 - 90% RH, respectively. The baglogs were slit and the paper cover was removed. Water was sprayed for maintaining moisture up to the desired level in the form of fine mist from a nozzle.

Fructification and Harvest

During the fruiting process, temperatures of 19 to 25°C and 80-90% RH were maintained in almost total darkness. All mushroom fruit was harvested by pulling out the stalk and the yield was calculated based on the cumulative fresh weight of the mushroom fruits harvested from each baglog. In general, fresh weight, diameter of carps and the morphology of the mushroom fruits were observed. Production in each bag will gradually decrease until there is no more fructification because of degradation in the mycelium.

Results and Discussion

Days to complete mycelium running

No remarkable differences were observed in mycelial running rate on spawn packets of the different substrates used, except for composition of rice sawdust:straw (0.5kg:0.5kg). It ranged from 5-6 days, while others for 7 to 8 days. Variation in the time might be due to variations in log texture, where the rice straw lowered the hardness and compactness of the logs. The result might be different if the rice straw would have been grinded as small as the size as the sawdust before used as a substrate mix component.

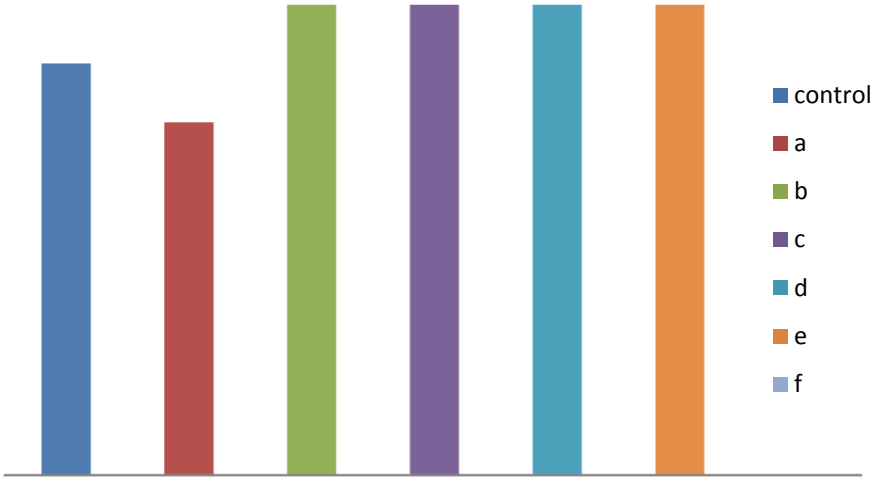

Figure 1. Time to complete the mycelium running affected by substrate composition
Control = 100%(1kg) sawdust, a = sawdust : rice straw (0.5kg:0.5kg), b = 100%(1kg) rice straw, c = rice straw : bagasse (0.5kg:0.5kg), d = sawdust : bagasse (0.5kg:0.5kg), e = sawdust : crice Straw : bagasse (0.5kg:0.25kg:0.25kg), f = 100%(1kg) bagasse.

Fresh weight of harvested mushroom fruits

Analysis of data reveals no significant effect of the substrate composition to the cap's diameter. Yet, in terms of fresh weight, it was clearly shown that the bagasse alone was not suitable for growing the mushroom, while the composition of (sawdust:rice straw 0.5kg:0.5kg) performed as well as the control (sawdust) did.

Number and morphology of effective fruiting bodies

Number of well-developed fruiting body was recorded and presented in Table 1. Dry and pin headed fruiting body was discarded but twisted and tiny fruiting body was included during counting. The percentage of effective fruiting body did not vary significantly in different substrates. They were rather similar in numbers, size, color and also cap's diameter.

Table 1. White oyster mushrooms growth on various media/substrate compositions

Substrate composition			Average of mushroom fresh weight (g/baglog)	Number of fruiting body*	Average cap diameter (cm)	Color, size
Saw-dust	Rice Straw	Baga-sse				
1 kg	-	-	235.7^{a} ± 28.8	many	6.9 ± 0.943	white. normal size
0.5 kg	0.5 kg	-	70.4^{c} ±17.3	many	6.7 ± 2.899	white. normal size
-	1 kg		102.9^{c} ± 31.6	many	6.8 ± 1.076	-
	0.5 kg	0.5 kg	89.3^{c} ± 33.2	many	6.2 ± 0.882	white. normal size
0.5 kg	-	0.5 kg	202.5^{ab} ± 40.8	many	7.3 ± 1.056	white. normal size
0.5 kg	0.25	0.25 kg	179.2^{b} ± 36.5	many	6.9 ±1.088	white. normal size
-	-	1 kg	-	-	-	white. normal size

*1-6 caps per baglog was identified as '*few*', while >6 caps was identified as '*many*'

Yield per packet

Significant variation was found in yield of white oyster mushroom grown on different substrates used. The maximum biological yield was recorded with control (1kg sawdust) and also with the composition of saw dust:bagasse (0.5kg:0.5kg). The lowest biological yield was observed in composition of 100% bagasse (1kg). Chaudhary et al. (1985) explained the process of break-down of lignin. There is an apparent correlation between the ability to degrade lignin and the production of phenolases. Which oxidize phenolic compounds to simple aromatic compounds that can be absorbed by mushroom mycelium and is used for it growth. The product of cellulolytic action in simple and soluble carbohydrates and the end products being glucose was absorbed by the fungal mycelium for growth and energy. Therefore, cellulose rich organic substrates are good for the cultivation of mushroom (Gerrits and Muller. 1965; Quimio, 1987). High cellulose content in wood results in enhanced cellulose enzyme production and increased yield of mushroom (Ramasamy and Kandaswary. 1976). The substrates with high lignin and phenolic content should decrease the activity of the enzyme, hence slow growth and low yield.

Conclusions

Variation on substrate composition did not give different results on the morphology (color. size and the cap's diameter of white oyster mushroom. except the fact that the bagasse alone did not showed any growth of mycelia. Yet, in terms of fresh weight, it was clearly shown that the composition (sawdust:bagasse 0.5kg:0.5kg) performed as well as the control (sawdust) did. Thus, that composition can be considered as an alternative growth media for white oyster mushroom.

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The Balances of Amino Acids from a Mixtures of Bovine Blood and Agri-Industrial Waste Fermented by *Bacillus amyloliquefaciens* as Poultry Feed

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Abstract

Blood meal has the unbalanced amino acids composition which is characterized by richest source of leucine and lysine but less of isoleucine. The research was carried out to balance a composition of amino acids between leucine: isoleucine and lysine: arginin with the amino acids of fishmeal as a comparison. The bovine blood (BB) were mixed with coconut pulp (CP), palm kernel cake (PKC) and coconut cake (CC) and inoculated with Bacillus amyloliquefaciens and then fermented for 120 hours. The research designed was a completely randomized design (CRD) with five replicate. The results showed that there was a highly significant (P<0.01) difference among the types of agri-industrial waste on the balanced amino acids. Mixtures of BBPKC had a balanced amino acids compared to other mixtured. Ratio of leucine: isoleucine BBPKC was 6 : 1, there was higly significant (P<0.01) compared ratio of the BBCP and BBCC was 11 : 1 and 7 : 1 respectively. Whereas, ratio of lysine: arginine BBPKC was 1.3 : 1, there was highly significant (P<0.01) compared ratio of the BBCP and no significant (P>0.05) difference compared BBCC was 2.2 : 1 and 1.3 :1 respectively. Meanwhile, BBCP had the highest protein was 53.24%, there was highly significant (P<0.01) compared BBPKC and BBCC was 40.06% and 40.67% respectively. The research can be conluded that the amino acids balance BBPKC was approaching the amino acid balance of fishmeal.

Key words: amino acid balanced, bovine blood, agri-industrial waste, B. amyloliquefaciens.

Introduction

Poultry is a commodity that is demand by the people in Indonesia. Central Bureau of Statistics (2014) reported population of poultry, especially broilers increased from 1.34 became 1.48 million in 2013-2014. This population increase is not followed by the availability of feed ingredients. Fishmeal is one of the

ingredients of poultry feed are still imported from foreign country, in 2014 Indonesia imported fish meal as much as 90% of requirement (Finance, 2015). Therefore, it is necessary to find a replacement for fish meal as a protein source in poultry rations.

Bovine blood is slaughterhouse waste that can be used as a substitute for fishmeal in the form of blood meal. This is caused the blood meal has a very high protein content. Rasyaf (1994a) reported bovine blood containing 80% crude protein, 1.6% fat, and crude fiber 1%. Meanwhile, blood meal has a unbalance amino acids that can be decrease feed consumption and production of livestock. NRC (1994) reported blood meal is richest sources of lysine, arginine, methionine, cystine, and leucine but very poor in isoleusine. Blood is also very difficult to be dried so that the necessary absorption into Agri-industrial waste to facilitate the drying process Therefore, processing of bovine blood necessary to conducted for a amino acid balances. Fermentation is one of method the processing blood meal which can improve the quality of blood meal.

Materials and Method

This research was conducted to balances amino acids of blood meal through absorption bovine blood into Agri-industrial waste and then fermentation with *Bacillus amiloliquefaciens* for 120 hours.

Research materials

Bovine blood: Fresh bovine blood was collected from Slaughtering Hause in Padang, West Sumatera, Indonesia.

Agricultural wastes: Agricultural wastes such as coconut pulp (CP), palm kernel cake (PKC) and coconut cake (CC) collected from agriculture industry and traditional market in Padang, West Sumatera, Indonesia.

Research methods

The method used in this study was a completely randomized design (CRD) factorial with 5 replicate. Differences between treatments were tested by Duncan's Multiple Range Test (DMRT). Treatment of the research: A = Mixtures of bovine blood and coconut pulp (BBCP), B = Mixtures of bovine blood and palm kernel cake (BBPKC), and C = Mixtures of bovine blood and coconut cake (BBCC). Ratio of bovine blood and agri-industrial waste = 1.2 : 1.

Research procedures

The fresh blood was weighed according to the desired ratio and mixed with agri-industrial waste (coconut pulp, palm kernel cake, and coconut cake) and then inoculated *Bacillus myloliquefaciens* (3%). The mixture is fermented for 120 hours. After fermented, that was dried in a oven at low temperature 60^{o}C for 2-3 days and then ground into flour.

Parameters observed

Chemical analysis: Blood meal sample was analyzed in laboratory for protein content (AOAC, 2005).

Amino acid analysis: Analisis of amino acid from blood meal used HPLC (High Performance Liquid Chromatography) method.

Results and Discussion

Tabel 1 showed the ratio of isoleucine : leucine, lysine : arginine , and crude protein from a mixtures of bovine blood and agri-industrial waste.

Table 1. Ratio of Leucine : Isoleucine, Lysine : Arginine, and crude protein

Parameter	Blood meal (control)	BBCP	BBPKC	BBCC	SEM
Leucine : Isoleucine	11 : 1[c]	11 : 1[c]	6 : 1[a]	7 : 1[b]	0.061
Lysine : Arginine	1.9 : 1[b]	2.2 : 1[c]	1.3 : 1[a]	1.3 : 1[a]	0.013
Crude Protein	80.61[a]	53.24[b]	40.06[c]	40.67[c]	0.113

Note: Different letters in the same raw indicated highly significant differences (P<0.01).

Ratio of leucine : isoleucine from BBPKC had a ratio approaching fishmeal compared to control and other mictures. DMRT test results showed that Ratio of leucine : isoleucine from BBPKC was 6 : 1, there was higly significant (P<0.01) difference compared ratio of the control, BBCP and BBCC was 11 : 1, 11 : 1 and 7 : 1 respectively. Blood meal contains less isoleucine and excess leucine. The excess of leucine can be inhibit the absorbtion of isoleucine which resulted les isoleucine. National Research Council (1993) reported a ratio of leucine : isoleucine from fishmeal was 1.6 : 1. The ratio of leucine : isoleucine from fishmeal is as a comparison, this is caused the blood meal being fed to livestock as a replacement for fish meal. The ratio between the amino acids that are interrelated affect the growth of livestock as leucine and isoleucine. Widodo (2002) said that amino acid deficiency can be corrected by an amino acid that is the antagonism of the amino acid itself, when leucine increased and lead to growth inhibition can be neutralized by increasing isoleucine and valine.

Meanwhile, ratio of lysine : arginine from BBPKC and BBCC had the same value was 1.3 : 1. This ratio is approaching ratio of lysine : arginine from fishmeal. Ratio of lysine : arginine from fishmeal was 1.2 : 1 (NRC, 1993). DMRT test results showed that ratio of lysine : arginine from BBPKC was 1.3 : 1, there was highly significant (P<0.01) difference compared ratio of the control and BBCP and no significant (P>0.05) difference compared BBCC was 1.9 : 1, 2.2 : 1 and 1.3 : 1 respectively. Excess lysine will inhibit the absorption of arginine and can cause poisoning. Poisoning occurs when one of the amnio acid exceeds of needs (Widodo, 2002).

Crude protein of BBCP had a higher content compared other treatment. DMRT tes results showed that crude protein of BBCP was 53.24%, there was highly significant (P<0.01) difference compared BBPKC and BBCC was 40.06 and 40.67 respectively. Meanwhile, crude protein of blood meal is still higher compared with all treatments. Blood meal contains about 80% crude protein (Rasyaf, 1994a). The concept of feed formulation lately is how to get the value of the required amino acids not required protein. Amino acid imbalance is one important concern in formulating rations. Blood meal is richest sources of lysine, arginine, methionine, cystine, and leucine but very poor in isoleusine and contains less glycine

than fishmeal that resulting amino acids become unbalanced (NRC, 1994). This imbalanced amino acids is caused blood meal in poultry rations is very limited that only around 6% (Enkunseitan *et al.,* 2013)

Harper (1976) defined amino acid imbalances as resulting from additions to a low protein diet of one or more amino acids, other than the one that is growth limiting, in amounts that individually are not toxic. They cause depressions in food intake and growth that are readily prevented by a supplement of the growth-limiting amino acid. Harper (1964) categorized the adverse interaction of disproportionate balance of amino acids as imbalances, antagonisms, and toxicities. Cieslak and Benevenga (1984) says that amino acid imbalance can result in reduced feed consumption which resulting in lower performance of livestock, this is caused the amino acids in the plasma is reduced that amino acids carried to the brain slightly. Hier, et al. (1944) observed growth depression of rats fed a diet containing excessive concentrations of individual amino acids and attributed the effects to amino acid imbalances. They also suggested that an amino acid imbalance induced by excessive amounts of other amino acids in the diet increased the requirement for the most limiting amino acid.

Samadi (2012) says formulation of animal feed should also be noted the balance of amino acids, especially the essential amino acids. Samadi also says formulation of essential amino acids that are not appropriate either excess or less will result in an imbalance of amino acids, antagonists and also be toxic to livestock. Harper (1964) also categorized the adverse interaction of disproportionate balance of amino acids as imbalances, antagonisms, and toxicities. The maximum productivity of poultry will be achieved when the poultry got feed which a balanced amino acids. Amino acids balanced can be obtained by way mixing various of protein sources in the rations. Increased of amino acids balanced from BBPKC is caused donation of protein from palm kernel cake and microba protein from *Bacillus amyloliquefaciens.*

Conclusion

The mixtures of bovine blood and palm kernel cake fermented with *Bacillus amyloliquefaciens* had a good ratio of amino acids compared other than mixtures. The ratio of lysine : arginine is approaching the fish meal, but the ratio of leucine: isoleucine is far closer to fishmeal. Therefore, further research needs to be improve isoleucine that the mixture of blood and palm kernel cake can replace fish meal.

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Mannan Hydrolysis on Coconut Waste by using Degrader-Fungus of Polisacaride and Mannanase Enzyme

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Abstract

This research was conducted to study the mannan hydrolysis on coconut waste using the degrader- fungus on polysacaride and mannanse enzyme with quantitative method. Hydrolyzing the mannan on the coconut waste was done microbiologically by using microorganism of mannanolitic group as *Aspergilus niger* and *Aspergilus awamori*. The mannanolitic fungus was fermented with the coconut waste by using the SSF. The pure mannanase enzyme was found to react with various coconut waste concentrations. The mannan hydrolysis was done to determine the content of the dissolved sugar by applying Dubois Method. This research used the completely random design of the factorial pattern for the microbiologic method, and the completely random design for the enzymatic method. The results of the research are as the follows: 1) By applying the microbiologic method, the content of dissolved sugar is higher, 5,25 gr/ml of sugar, the reduction is 8,02 gr/ml, and the polymerization degree is 0,66. 2) By applying the enzymatic method, the content of the dissolved sugar is lower, 7,90 of sugar, the reduction is 8,74 gr/ml and the polymerization degree is 0,90.

Key words: hydrolysis, mannan, microbiologic, enzymatic

Introduction

Indonesia is one of coconut producing countries that produced 14 billion ton of coconuts in 1991 (Santoso et al, 1996), and since 2002 Indonesia has been yielding 15.6 billion coconuts per year (Agustian et al, 2003). Coconut crop (*Cocos nucifera* L.) is kind of palm crop which has multifunction if it is processed economically, for almost all parts of the crop can be exploited. This crop is grown in many places in Indonesia as the second biggest copra producer in the world after the Philippine. The coconut crop grown in the estate or farm is processed to produce coconut oil, coconut milk and coconut paste. These products are made from coconut kernel, while the waste is recycled as the by-product.

Exploiting the coconut waste is also a promising business since the waste is available in a great amount at the places such traditional markets, home industries or factories that produce food whose main ingredient is coconut. This waste is not saleable (has no economical value) if it is not recycled (Goenarso et al, 2003).

Mannan or galactomannan found in the coconut waste mostly contains anti-nutritional nature. The Non-Strurch Polysacaride (NSP) in the coconut kernel contains 78% of mannan, 3% of arabinoxylans, 3% of glucoronoxylans, and 12% of soluble cellulose (Duesthorft, 1992). The NSP of the kernel contains 26% of Mannan, 61% of insoluble/soluble galactomannan, and 13% of cellulose. (Balasubramanian, 1976). The content increases in dry condition.

Mannan is the compound of hemi cellulose that exists in nature and as the second polisacarida that is much abundant after cellulose. Mannan can be classified in various types of mannopolysacarida. They are linear mannan, galactogluco manan, galaktomanan, and glukomanan (Zahura e*t al*. 2011). Mannan consists of simple sugar formation of manosa; galactomanan consist of manosa and galactosa; gluctomannan consists of glucose and manosa, while galactogluko mannan contains manosa, glucose and galaktosa (Sachselehner*et al.* 2000). Mannan can be hydrolyzed to be manosa or manno-oligasacaride functioning as prebiotic by enzyme of endo β - mannase. (1,4- β-D-mannanmannanohydrolase) and exo β-manosidase (β-D mannanopyranosidehydrolase). For the mannan hydrolysis, besides mannanase, the glucosidase or galactosidase is also needed (Yopi *et al*, 2006).

Lee (2007) also reports that *Aspergilus niger, Penicillium* sp *and Trichoderma reesei* can break the mannan component in the coconut waste (residue of coconut flesh after extracting oil) to be manosa sugar through medium solid fermentation. Mananase enzyme is an enzyme decomposer of heteromanan to be manosa, glucose, and galactosa. The Mananase enzyme is the enzyme that functions to catalyze the hydrolysis process of manan as the compound of polisacarida (Duffaud et al. 1997). Endo-β-mannase is an enzym to catalyze and hydrolyze the mannan from polisacarida. Mannan is one of four polymers bound by mannose sugar that exist in guar gum, coconut kernel, bean gum, palm kernel, coffee, etc. Mannan turned into galactosa of galactomannan in the form of glucose, mannosa, galactosa, heksosa and can be fermented by yeast. (Sundu *et al*, 2006). β-mannanase enzyme can hydrolyze the abundant β-manna, in order to eliminate the negative effects on poultry even it can increase the availability of energy. (Trobos, 2012). Mannanase is potential enough to produce manno oligosacaride which is very selectively used by bifirido species of bifirido bacterium. (Lin and Chen, 2004)

Materials and Methods

Mannan was hydrolyzed microbiologically by using 2 kinds of microbamannanilitic whose ability has been tested to produce the mannanase enzyme, that is *Aspergilus niger* (Kasmiran, 2011), *Aspergilusawamori* (Kurakake and Komaki, 2000). The fermentation method used was SSF. The coconut waste (after the milk is extracted) was obtained in the traditional market. The SSF was treated by using

plastic bag. Each plastic bag contains 80gr of coconut waste as a first substrate; then added 60-80% of sterile water (Aquades) as the final substrate. The substrate was sterilized by using autoclave, cooled off at room temperature for one hour, put 10 ml of spore suspension into plastic bag, mixed thoroughly, and incubated at 30°C for 10 days. The sample was harvested on 4th, 7th, and 10th day. All samples were harvested twice, and the coarse enzyme was directly extracted.

The design used for microbiological method was a complete random of factorial 2x3 patterns that was repeated twice, where factor A is microbe type and factor B is incubation time. The data analysis used variant analysis (ANOVA). If there were any differences, it would be analyzed by t-test (Steel and Torrie, 1995). Pure Enzyme of Mannanase was reacted with various coconut waste concentrations 0.5%, 1%, 1.5% and 2%. The total of sugar reduction was counted in every 4 hours. The total of sugar was counted by degree of polymer of the hydrolysis product. This aims to determine the substrate concentration and incubation time of coconut waste hydrolysis till it became the oligosaccharide.

Measurement of sugar

Sugar content was measured by using concentrated sulfate acids reactant and phenol 5%. Then it was measured by using spectrophotometer at the wave length 490 nm with D-Glucose as a standard used by Dubois *et al* (1956).

Results and Discussion

Microbiology method

The total of sugar that can be dissolved, the total of sugar reduction and polymerization degree by using microbiologic method can be seen in Table 1.

Table 1. The average number of total dissolving sugars, Total sugar reduction and Degree of Polymerize.

Factor A	Factor B	Total of Dissolved Sugars (g/ml)	Total of Sugar Per Reduction (g/ml)	Degree of Polymerization
a1	b1	$5,25^{Aa}$	$8,02^{Aa}$	0,66
	b2	$4,02^{Aa}$	$4,32^{BCa}$	0,93
	b3	$5,95^{ABa}$	$4,16^{Ca}$	1,45
a2	b1	$4,43^{Ab}$	$5,37^{Ab}$	0,85
	b2	$4,26^{Aa}$	$6,16^{ABb}$	0,69
	b3	$4,22^{Aa}$	$4,83^{Aa}$	0,88
BNT		1,26	1,47	

The qualitative result analysis of the highest dissolved sugar content from microbiologic method was found at the treatment of a1b2 (*Aspergilusniger*by by 7 days fermentation). The total of dissolved sugar content is 5, 95g/ml. There was an interaction occurred on the dissolved sugar content ($P<0.01$, in which there was a change on the value of dissolved sugar total toward the fermentation time. The longer

fermentation didn't increase the dissolved sugar content. As for fungus of Aspergilus Awamori, the research result shows that the longer fermentation decreased the content of the dissolved sugar.
The research result of the content total of sugar reduction by using microbiologic method showed that there was an interaction on the fungus with the time of fermentation (P< 0.01). The highest total of sugar content reduction was found at the treatment of a1b1 (*Apergilus niger* the time of fermentation was 4 days. The analysis result shows that there was no interaction (P>0.05) on the polymerization degree by using microbiologic method. The best polymerization degree was found at a1b1 (Aspergilus niger treatment time was 4 days).

Enzymatic Method

The analysis of total sugar content, sugar reduction, and polymerization degree of coconut waste showed a real effect (P< 0.01). The enzyme used in this analysis was mannose enzyme.

Table 2. The Average Total of Dissolved Sugars, Total of Sugar Reduction and Polymerization Degree

Treatment	Dissolved Sugar (g/ml)	Sugar Reduction (g/ml)	Polymerization Degree
A	7,90^{a}	8,74^{a}	0,90^{a}
B	4,47^{bcd}	7,76^{c}	0,58^{bd}
C	4,20^{cd}	8,26^{b}	0,51^{c}
D	4,06^{d}	8,44^{ab}	0,48^{cd}
SE	0,93	0,14	0,11

Table 2 shows that the total dissolved sugar affects on the addition of the enzyme concentration (P<0.01), where the content of thet highest dissolved sugar was found at A treatment, that is the addition of 0.5% of concentrated enzyme in the coconut waste. After the further test of DMRT was done, it showed a difference between treatment A and treatment B, C, and D.

The result of the sugar reduction by using enzymatic method on the coconut waste shows that there was the effect occurred (P< 0.01), the highest sugar reduction was found at treatment A (enzyme concentration 0.5%); this is the same as the total of sugar content produced. After the further DMRT test was done, the difference was found (P<0.01) in inter- treatment, where the difference was found between treatment A, B, with C and D.

Enzymatic method by using mannose enzyme that was incubated with coconut waste at various enzyme concentration show the real difference (P< 0.01) between the treatment, where the best polymerization degree was found at treatment C, that is by adding enzyme concentration 1,5%. In this condition, the polymer is not much formed; it was predicted that the bond released was from monosacarida carbohydrate group. After the further DMRT test was done, it was found that there was a difference (P< 0.01) on polymerization degree toward enzymatic method.

Conclusion

Mannan can be hydrolyzed by microbiologic and enzymatic methods. The highest total content dissolves the sugar by using microbiologic method that contains total content 5.25/g/ml sugar reduction 8.02g/ml with degree of polymerization degree 0.66. The Whileenzymatic method dissolves the sugar 7.90g/ml, sugar 8.74 g/ml, polymerization degree 0.90.

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Egg Weight of Quail to hatchability

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Abstract

Hatchability of egg is one of indicate for determine success levels of hatching. The research was purpose for determine influence of egg weight to hatchability of quail egg. The consisted of completely randomized design with 4 treatment and 4 replication: T1 = light weight (8.0-8.9 g), T2 = medium weight (9-9.9 g), T3 = heavy weight (10-10.9 g), T4 = highly weight (11.0-11.9 g). The observed is hatchability of quail egg. The result showed that quail egg weight can defend of hatchability. The best hatchability and fertility contained on the 11,0-11.9 g quail egg weight with percentage of hatchability is 98.33% and 91.67% hatchability outcome.

Key words: hatchability, egg weight, quail

Introduction

Hatching is an activity in poultry breeding to increase livestock population. Hatching of eggs can be done with two ways, namely hatching naturally and artificially hatching. To get the bird seed in accordance with our desires in a way that is more efficient can be done by using the artificially hatching incubator. Hatching using the incubator is a way that is done as a substitute for natural hatching and this way is intended to have chick poultry in relatively large amounts (Mahi, *et al*, 2006). Artificial hatching is more practical and efficient than the natural hatching, and with greater capacity at a artificial hatching. Superiority of hatching incubator can be made in large quantities at once, and the a hen is still in production because it does not interfere with the activity of hatch egg. In contrast to hatching of eggs with hatch naturally the hen, the egg hatching machine (parent boards artificial) need the bigest human intervention (Jayasamudera and Cahyono, 2005). Hatching with hatching machine also can increase the hatchability of eggs because the temperature can be regulated more stable but it needs higher costs and treatment and intensive (Ningtyas, *et al*., 2013). The success of the incubator is influenced by several

factors, one of which is the weight of the eggs. The eggs used for hatching eggs have a uniformity of weight egg, this is because affects the weight of hatching eggs.

Hatching of quail eggs done to increase the livestock population of quail are now starting favored by farmers. This is due to high consumer demand for quail eggs containing high protein for growth and brain development in children age. The quail eggs is one contributor of protein from animal other than meat and dairy. Moreover, quail production was relatively quickly because the quail can reach sexual maturity at the age of 42 days with egg production 250-300 eggs per year.

The quail population in Indonesia is still low when compared with the population of other poultry such as chickens and ducks. Therefore, there should be a way to develop of the quail population. One way that can be done is to repair the hatchery management. However, the handling and the selection is very influential on the success of egg hatching quail eggs.

The study focused on the effect of the weight of the quail egg to hatchability, and is expected to determine the appropriate weight to get the highh of the egg hatchability.

Materials and Methods

The Research using quail eggs (*cortunix-cortunix japonica*) aged 1-2 days were 240 grains and water. Incubator used partitioned into 16 plots using a wire. Each treatment was placed in a different plot then coded treatment.

This study is evaluated the weight of the egg to hatchability of quail eggs. The treatment given is T1 = light weight (8-8.9 g), T2 = weight of medium (9-9.9 g), T3 = heavy weights (10- 10.9 g) and T4 = very heavy weights (11-11.9 g).

The Eggs are selected in advance by separating the eggs are broken at the time of purchase eggs by not taking the eggs are damaged or defective, then the eggs are cleaned and wiped with a clean cloth eggs, quail eggs subsequently weighed using electric scales, then the eggs are grouped based treatment. The eggs are then put into the incubator as scheduled treatment. Reversal of eggs conducted from day 3 to day 14. Reversal was done 3 times a day, at 07:00 am, 13:30 pm and 21:00 pm. Temperatures were used 38-39 ^{0}C during the hatching process. The eggs hatch in the day to 16.17, and 18. The parameters measured were hatchability (%) is calculated by comparing the number of eggs that hatched the number of fertile eggs and multiplied by 100. The hatchability outcome is the large number of hatching eggs to hatch compared with eggs inserted into the incubator and expressed in percent.

The design was used a completely randomized design with 4 treatments and 4 replications. The data obtained were analyzed statistically using ANOVA (Analysis of Variance / ANOVA). If there is a significant then tested further DMRT (Duncan's Multiple Range Test) according to Steel and Torrie (1995).

Results and Discussion

Hatchability

Based on the results of variance showed that differences in hatching of quail eggs weight had non significant (P> 0.05) on hatchability (Table 1). The effect non significant is caused by the weight of quail eggs in each treatment in this study was of normal size is 8 -11 grams, so it has no effect on hatchability. Additionally, caused also by setting a stable temperature in the incubator during the study so that the process of development of the embryo in the egg could walk normally, and organs can be shaped and develop optimally. In accordance with the opinion of Sugiharto (2005), stating that it should be normal-sized eggs that hatched weighing 11-13 grams per egg, normal size can be achieved after 2.5 month old master, thus making hatching quail eggs implemented since the parent aged 2.5-8 months. Tetas power is affected by the preparation of an egg, genetic factors, temperature and humidity, age of the mother, the cleanliness of the eggs, egg size, egg nutrition and fertility (Sutiyono and Krismiati, 2006).

In this study the hatchability levels in each treatment including hatchability in accordance with the standards. Quail egg hatchability is highest in T4 treatment by 98.33% and the lowest was in the hatchability of T3 treatment by 92.12%. High and low percentage of hatchability in this study caused by technical handling hatching eggs while hatching, which is the reversal process when hatching. Errors in the reversal of eggs can lead to early embryonic death. According Lisma (2009), stating that the standard hatching of quail eggs good is 85-95%. According Kartasudjana and Suprijatna (2006), the physical state of the eggs affect hatchability, to maintain hatchability the physical state of the eggs should be selected before it hatched a few things to consider when selecting hatching eggs are as follows: 1) choose the eggs are clean, smooth and evenly , 2) the color is not too thick, 3) skin spots eggs must be clear, 4) the skin does not crack, 5) new eggs, eggs that are kept open longer than 7 days. Hatchability is a number that indicates the level the ability of eggs to hatch.

Fertility is closely associated with the egg hatchability, high and low fertility will cause due to the high and low hatchability, more and more the higher fertility hatchability of eggs then the higher of hatchability,as well the other way. Fertility of quail eggs on all treatments in this study still include fertility in accordance with the standards, where the percentage of fertility in this study is still included in the category of good fertility quail eggs. According Lisma (2009), stating that the standard fertility good quail eggs is 60-80%. Fertility is defined as the percentage of fertile eggs based on the number of eggs that incubate. Fertlitas is the percentage of fertile eggs of all eggs used in hatcheries.

Hatchability outcome

Based on Table 2 showed that the weight difference of quail eggs is non significant on the outcome of hatching. The influence non significant on the outcome of hatching quail eggs is caused by the weight of eggs used to produce a uniform hatching and hatching results were not different, is 90.00%, 86.67%, 88.33% and 91.67%.

The average of the highest hatching results contained in T4 treatment is 91.67%, this is caused by the weight of the eggs were hatched according to the weight of normal eggs for hatching quail eggs. Resulting in hatchability and hatching optimal results as well. The average of the results contained in the lowest hatching T3 treatment is 88.33%, it is influenced by the death of the embryo in the last week of hatching. This embryonic death was caused by the humidity in the incubator. Low humidity in the incubator can cause evaporation of water from the egg, so the egg embryos preformance will be drought. Air humidity in the incubator serves to keep the liquid inside the egg. If the humidity is not optimal, the embryo is not able to break the shell is too hard. The humidity in the incubator are optimal for hatching must be maintained, so there is no dehydration or too damp. Optimal moisture ranges from 50-60% (Suprijatna, *et al*., 2005).

Diagram the quail egg weight to the percentage of hatching and hatching outcome

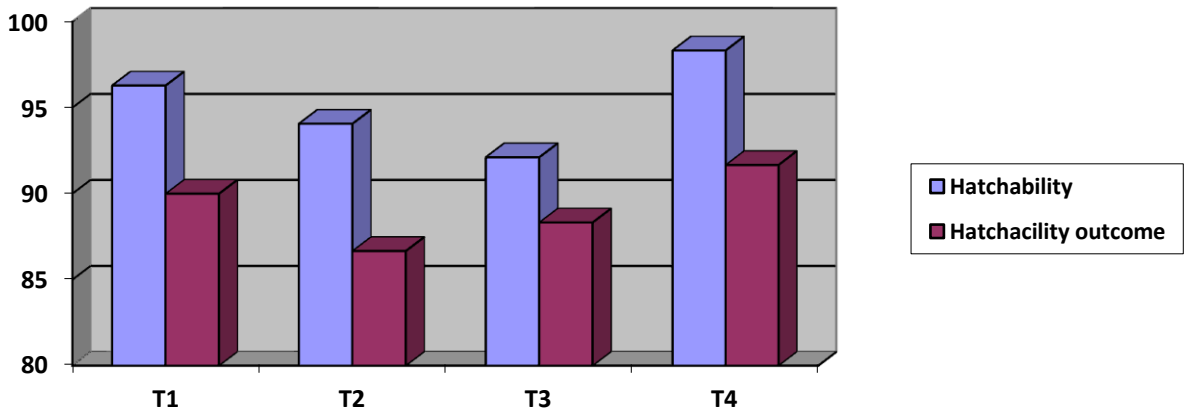

Table 1. Percentage hatchability of quail egg

Object		hatchability (%)
T1	(light weight 8-8.9 g)	96.29
T2	(medium weight 9-9.9 g)	94.07
T3	(heavy weight 10-10.9 g)	92.12
T4	(highly weight 11-11.9 g)	98.33

Table 2. Percentage hatchability outcome

Object		Hatchability Outcome (%)
T1	(light weight 8-8.9 g)	90
T2	(medium weight 9-9.9 g)	86.67
T3	(heavy weight 10-10.9 g)	88.33
T4	(highly weight 11-11.9 g)	91.67

Conclussion

The treatment T4 resulted in hatchability and hatching best results in hatching quail eggs

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Soil Chemical Properties, Rice Yield and Efficiency of Urea Coated with Activated Charcoal

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Abstract

Urea coated with activated charcoal is believed to release N slowly. The research objective was to determine the effect of activated charcoal and urea to the chemical properties of soil and yield of lowland rice (*Oryza sativa* L.). The study was designed in the form of factorial arrangement in a randomized pattern. The results showed that activated charcoal has significantly affected the total soil N, C-organic soil, and rice yields. Urea has significantly affected the total-N and C-organic soil. The combination treatment of activated charcoal and urea has a significant effect on total-N and organic-C in the soil.

Keywords: activated charcoal, urea, lowland rice

Introduction

The Rice (*Oryza sativa L.*) is a staple food for most people in Indonesia, mainly produced in both irrigated lands or without irrigation. Intensive wetland management has managed to increase rice production in Indonesia, but the quality of paddy fields has decreased. The quality of the environment in Indonesia at this time was ranked 134 out of 163 countries in the world. In 2008, the environmental quality in Indonesia is at position 102 with a value of 66.2, which means that its quality has decreased within the last 10 years (Harsanti & Ardiwinata, 2011). The symptoms are characterized by a decrease in the efficiency of input, output stagnation, a decrease in soil fertility, and the intensity of pests and diseases increased (Ministry of Agriculture, 2008). One way to increase the efficiency of input and maintaining soil fertility is through low input fertilization and amelioration of environmentally friendly and sustainable. Amelioration is a technology that can increase nitrogen fertilizer efficiency by slowing the availability (slow release) in paddy fields (Jamilah, Muyassir, & Syakur, 2012). Some research indicates that most plants absorb about 30-40% of the N fertilizer N supplied (Siregar & Marzuki, 2011; Setyorini & Widowati 2008).

Amelioration materials which have the potential to absorb N include activated charcoal produced through the pyrolysis process at a temperature of 600-900 °C. Activated charcoal can improve the physical, chemical, and biological soil (Soemeinaboedhy & Tejowulan 2007; Harsanti & Ardiwinata, 2011). It was

used as a coating of urea so that urea be slow release, non-volatile, insoluble or leached so as to increase the efficiency of fertilization to 40% (Ardiwinata, 2010). Its use in paddy fields is able to increase the population of bacteria and nitrogen fixation bacteria (*Azotobacter*) in soil especially around the roots (Harsanti & Ardiwinata, 2011). However, its use in paddy fields in Indonesia has not provided satisfactory information concerning both the impact on soil properties, plant growth or yield of rice paddy.

Materials and Methods

The research was conducted in the village of *Tampieng Tunong Indra Jaya* Sub District of *Pidie* District by using a factorial randomized block design. Activated charcoal as the first factor consisted of 4 levels; 0, 60, 120, and 180 kg ha^{-1}. The second factor is urea consisted of 3 levels; 0, 150, and 300 kg ha^{-1}. All treatments are applied on 4 m x 3 m plot and each treatment was repeated three times. Rice seedling at the age of 10 days from the nursery transplanted to the rice field with one seedling per hole and planted with *legowo* system 2: 1. A half does of activated charcoal and urea were applied at 14 Days After Planting (DAP) and a half the dose activated charcoal and urea were applied at 35 DAP in accordance with the treatment level. Harvesting was done when the plant was mature physiologically (± 105 DAP). The soil sampling for laboratory analysis was carried out for four times and analyzed the content of C organic, N-total, biological soil properties and plant yield parameter. Efficiency of nitrogen fertilization (EAN) or nutrient use efficiencies (NUE) using the following equation: $NUE_N = (Y_N - Y_{N0})/F_x$ (Doberman, 2004), where: NUEN = N fertilizer use efficiency; YN = Result of paddy with treatment N; YN0 = Result control (without fertilizer N); FN = fertilizer N. The data were analyzed statistically by F test (ANOVA) using SPSS, if the F test is significant then continued with Least Significant Difference (LSD) test at 5% significance level.

Results and Discussion

C-organic and Soil Nitrogen

The results of variance analysis showed that activated charcoal and urea treatment had interaction effect significantly on C-organic. The average C-organic of soil at 35, 49 days after planting (DAP) and after harvest shown in Table 1.

The average C-organic at 21 DAP was 1.24% in the control and 1.74% at the highest dose activated charcoal 180 kg ha^{-1} with urea 150 kg ha^{-1}. The average of the C organic did not show a significant effect at any doses of applied urea. The observations of soil properties at 35 DAP showed that the average C-organic was 1.19% in the control and the highest C-organic was 1.69% at the dose of activated charcoal 60 kg ha^{-1} with urea 300 kg ha^{-1}. The highest soil C organic during the phases observation showed no significant difference with the increase of the doses of activated charcoal and showed significant different with lower doses of urea. The average of C-organic at 49 DAP was 1.12% to 1.78%, the lowest C organic was found in the control and the highest C organic was found on the treatment of activated charcoal 180 kg ha^{-1} with urea 300 kg ha^{-1}. It was significantly different between each level of activated charcoal and urea were tested. The C-organic soil after harvest increased with the increase of the doses of activated charcoal and decreased with the increasing the doses of urea. In the treatment of 180 kg ha^{-1} activated

charcoal and 300 kg ha^{-1} urea fertilizers resulted the highest C-organic around of 1.14 to 1.96%. The dynamics of C-organic in the soil during the study is shown in Figure 1.

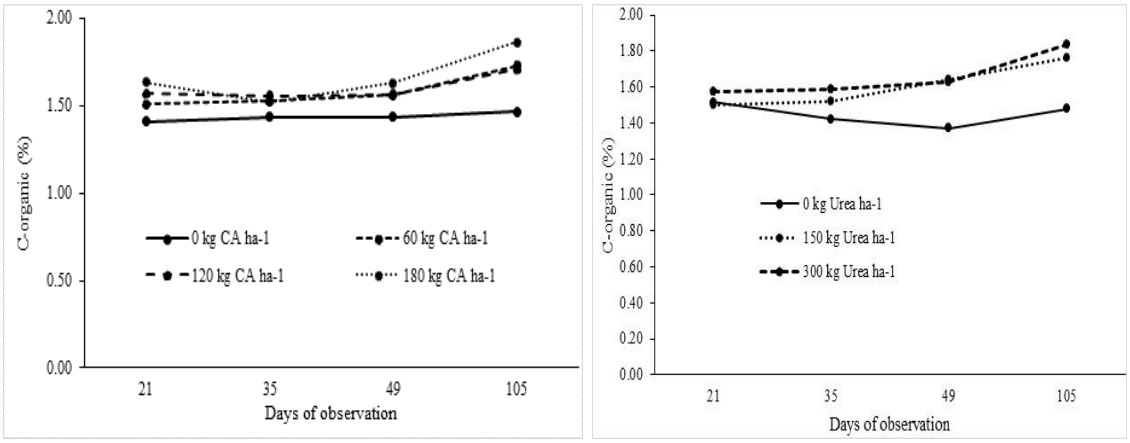

Figure 1. Relationship activated charcoal and Urea with C-organic soil during the observation phases

Table 1. The average C-Organic (%) in the observation of 21, 35, 49 days after planting and after harvest (105 DAP) due to the interaction effect of activated charcoal and Urea treatments

Activated Charcoal (kg ha^{-1})	Urea (kg ha^{-1})		
	0	150	300
21 days after planting			
0	1.24 a	1.37 ab	1.62 b
	A	A	A
60	1.63 a	1.38 a	1.51 a
	B	A	A
120	1.56 a	1.52 a	1.63 a
	B	AB	A
180	1.63 a	1.74 a	1.53 a
	B	B	A
35 days after planting			
0	1.19 a	1.56 b	1.56 b
	A	A	A
60	1.47 a	1.42 a	1.69 b
	B	A	A
120	1.57 a	1.55 a	1.55 a
	B	A	A
180	1.46 a	1.56 a	1.55 a
	B	A	A
49 days after planting			
0	1.12 a	1.6 1 b	1.57 b
	A	A	A
60	1.40 a	1.73 b	1.55 a

	B	A	A
120	1.45 a	1.64 b	1.61 ab
	B	A	A
180	1.52 a	1.59 a	1.78 b
	B	A	B
after harvest (105 days after planting)			
0	1.14 a	1.62 b	1.64 b
	A	A	A
60	1.58 a	1.77 b	1.84 b
	B	B	B
120	1.48 a	1.74 b	1.90 c
	B	AB	B
180	1.72 a	1.91 b	1.96 b
	C	C	B

Note: Values followed by the same letter in the column do not differ significantly (LSD 0.05), small letter read horizontally and capital letter read vertically

Analysis of variance showed that the interaction effect between activated charcoal and doses of urea was found on total N in the soil. The influence of these interaction effects occurred was at 21, 35 days after planting (DAP) and after harvest, while urea treatment had significant affect total N at 49 DAP as shown in Table 2. The average total-N due to the influence of the interaction was classified from low to moderate, at 21 DAP ranged from 0.17% to 0.23% in controls. The highest total-N due to activated charcoal treatment was obtained at 180 kg ha^{-1} with urea 300 kg ha^{-1}, and did not significant effect at all doses other urea. The average total-N at 35 days after planting ranged from 0.15% to 0.20% in the control to 0.20% at the maximum dose of activated charcoal and urea. At 49 DAP observation, urea had highly significant effect on total-N, as result it can be increased up to the dose of urea 150 kg ha^{-1} (0.17-0.21%). The average of total-N in the soil after harvest increased with the increased of the doses of urea. The doses of activated charcoal 180 kg ha^{-1} with urea 300 kg ha^{-1} resulted in the highest of total-N (0.23%), whereas in the control resulted in the lowest of total-N (0.11%). The activated charcoal and urea relationship in term of total-N in the soil during the observation presented in Figure 2.

The interaction effects of activated charcoal and urea application can improve soil total N, especially after the rice harvest. There was predicted that the application of activated charcoal could improve the growth of soil microorganisms due to the providing the growth media to soil microbes, while the urea to be one source of the nutrients needed to complete its life cycle. One of the N source is the result of weathering soil organisms that have died and there is a possibility the soil microorganism had the capability of fixing N from free of air either free-living or in symbiosis with the host plant.

According to Ballingtan (2010) that the raw material of activated charcoal used as a coating of urea is expected to affect the effectiveness and the efficiency of fertilizers. The use of activated charcoal from corn cobs to coat urea in the early growth of mustard plants showed high effectiveness in reducing loss of N as nitrous oxide emitted into the atmosphere and loss of nitrate in the water percolation. This can mean

that the activated charcoal from corn cobs can inhibit nitrification of urea, so nitrate resulting from nitrification process can be inhibited or delayed, as a result the increased of nitrogen in the soil and plants can be utilized efficiently.

Table 2. Average total-N at 21, 35, 49 days after planting and after harvest due to the interaction effect of activated charcoal and urea application

Activated Charcoal	Urea (kg ha-1)		
(kg ha-1)	0	150	300
	21 days after planting		
0	0.17 a	0.22 b	0.20 b
	A	A	A
60	0.22 a	0.21 a	0.21a
	B	A	A
120	0.22 a	0.21 a	0.22a
	B	A	AB
180	0.23 a	0.23 a	0.23a
	B	A	B
	35 days after planting		
0	0.15 a	0.20 b	0.20 b
	A	A	A
60	0.18 a	0.19 a	0.19 a
	B	A	A
120	0.19 a	0.19 a	0.21 a
	BC	A	AB
180	0.21 ab	0.19 a	0.22 b
	C	A	B
	49 days after planting		
0	0.15	0.21	0.22
60	0.17	0.21	0.20
120	0.17	0.21	0.22
180	0.18	0.21	0.22
Rerata	0.17 a	0.21 b	0.21 b
	after harvest (105 days after planting)		
0	0.11 a	0.21 b	0.20 b
	A	A	A
60	0.18 a	0.20 ab	0.22 b
	B	A	AB
120	0.19 a	0.21 ab	0.23 b
	B	A	B
180	0.20 a	0.22 ab	0.23 b
	B	A	B

Note: Values followed by the same letter in the column do not differ significantly (LSD 0.05), small letters read horizontally and capital letter read vertically

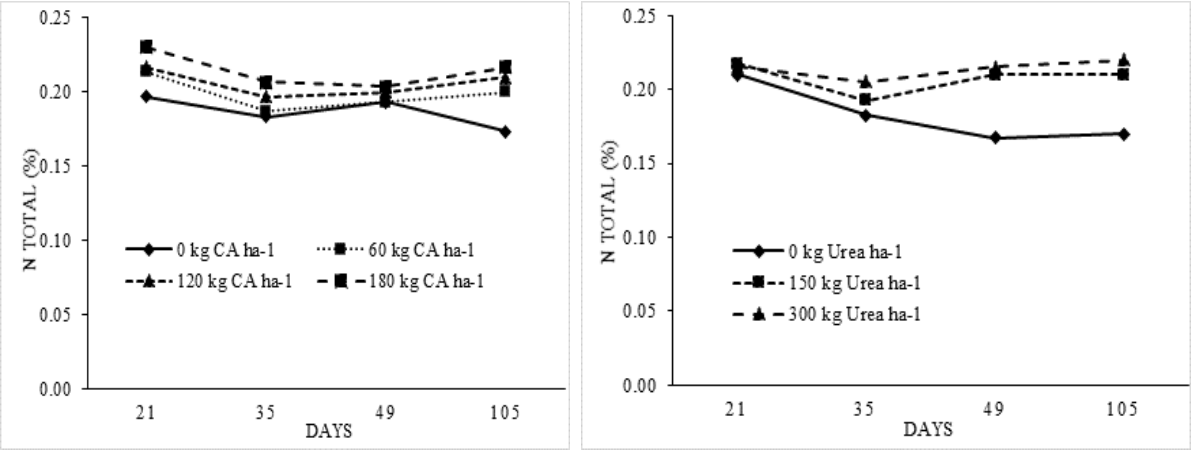

Figure 2. Relationship activated charcoal and urea to total-N in the soils during the observation phases

Rice Yield

The results showed that activated charcoal was significantly affect the plant production, and urea significantly influenced the weight of 1000 grains and rice production. The average weight of 1000 grains and the yield per hectare due to the application of active charcoal and urea can be shown in Tables 3 and 4.

The activated charcoal application increased rice production inconsistently with increasing the doses of urea (6.92 to 7.15 tons ha^{-1}). The application of activated charcoal 60 and 120 kg ha^{-1} showed no significant effect on the rice yield. The rice yield under the influence of urea showed a consistent increase with increasing the doses applied urea (5.72 tons to 7.93 tons per hectare).

The increase in rice yield due to application of activated charcoal for each kg of urea was calculated (the agronomic efficiency, EA). The results showed that the value of the agronomic efficiency of urea nitrogen fertilization ranged from 7.37 to 11.24 64 kg per kg of urea with EA average of 8.64 kg per kg of urea.

Table 3. Average percentage of grain, 1000 grain weight and production of rice due to the influence of activated charcoal application

Activated Charcoal (kg ha^{-1})	Grains (%)	1000 grain weight (g)	Production (ton ha^{-1})
0	96,77 a	28,33 a	6,92 ab
60	97,17 a	28,33 a	7,22 b
120	97,18 a	28,56 a	6,79 a
180	97,56 a	28,44 a	7,15 b

Note: Figures followed by the same letter within a column are not significantly different according to LSD test 0.05.

Tabel 4. Average percentage of grain, 1000 grain weight and production of rice due to the influence of urea application

Urea (kg ha-1)	Grains (%)	1000 grain weight (gram)	Production (ton ha-1)
0	96,84 a	28,92 b	5,72 a
150	97,52 a	28,42 ab	7,40 b
300	97,16 a	28,17 a	7,93 c

Note: The numbers followed by the same letter are not significant

The content of soil organic C increased after the addition of activated charcoal, activated charcoal it is supposedly capable of sustaining microorganisms in the soil. In accordance with the opinion of Harsanti and Ardiwinata (2011) which states that activated charcoal can improve the physical, chemical and biological properties of soil, activated charcoal plays a role as a home to soil microorganisms, micro pores, macro pores or cracks in the activated charcoal functioned as a residence, furthermore the death of soil microbes would add the soil organic matter. In addition, the number and size of the soil pores were able to provide oxygen for the survival of soil microorganisms. The urea coated by activated charcoal has improved the biological properties of soil, soil structure as shown by the increased yield of rice as well as the availability of slow release nitrogen fertilizer to be more efficient absorbed by plants (Jamilah et al., 2012; Rosannie Wati et al. 2014).

Activated charcoal can lower the solubility of NH_4^+ and NO_3^- in the soil of 4 to 44% compared with control. Activated charcoal made from rice husk and coconut shell has the capability to lower the solubility of the nutrients effectively that have an impact on the increase in rice yield in the treated plots compared to the control. Besides that, the availability of N was in sufficient quantity shown the growth of rice due to the growth of roots. Soil microorganism phosphate solvent generally like to live and thrive around the rhizosphere and root surfaces contained organic matters (Zulfadli et al, 2012). According to Hamzah et al. (1998) that the fertilization without inorganic fertilizers with manure, Bokashi or biofosfat may reduce the number of phosphate solvent microorganisms.

Activated charcoal is used as a coating of urea has been made into a slow-release, non-volatile and insoluble/washed, and fertilizers are used more efficiently. The activated charcoal is able to bind insecticide residues (organochlorine and organophosphate) so that it is not washed by the surface flow (run off) and is not absorbed into the plant tissue. Therefore, the efficiency of urea increased with the addition of activated charcoal. According to Fairhurst et al. (2007) that the optimal EAN resulted the increase in grain yield between 16.7 and 25 kg per kg of N fertilizer. To increase the efficiency of the agronomic needs the improvement of crop management to adjust the dose of fertilizer at the recommended dose and the target results.

Conclusion

Activated charcoal and urea fertilizer has significantly influenced the total-N and C-organic, total of soil microorganisms, the total of *Azotobacter* (phosphate solvent microorganism) and soil respiration rate. The combination of activated charcoal 180 kg ha^{-1} and urea fertilizer dose of 300 kg ha^{-1} treatment had

significant effect on rice yields (8.16 tons ha^{-1}). Activated charcoal can increase the efficiency of urea by 36.45% compared to the control.

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Adolescent Risk Free Sex In The Village Ilie District Ulee Kareng Banda Aceh City

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Abstract

Teenager is one of the stages in the life from childhood tol adulthood. During this time span, a stage of development has begun but every man and woman will certainly experience some changes. One of the changes which occur in adolescents is the emergence of sexual impulses, a feeling that occurs in adolescence that could cause various forms of sexual expressions. This research was conducted at Ilie village, Ulee Kareng district, Banda Aceh municipality. There were ten adolescents 15-20 years old, but of these ten, only three adolescents who know about the risks of free sex in general. The aim this study is to determine the relationship between sex education and the media as indicated by the knowledge young women have about the risk of promiscuity in Ilie village of Ulee Kareng District of Banda Aceh. The design of the research was analytic survey method by using Proportional Stratified Random Sampling. The total of samples is seventy-eight (78) persons. In collecting the data, questionnaires and tests were used. Test was analyzed by statistical tests chi square test using the program SPSS 15. It was found that teenager in Ilie village that receives sex education at school or college and have a good knowledge of the environmental risk of free sex was 60.7%. While the information was obtained of the media and a good knowledge of the risk-free sex was 70.5%, with a P value = 0.000 (P <0.05). From the research that has been done it can be inferred that sex education and media are associated with adolescents' knowledge of risk-free sexual relationships. Educational institutions can be used as input in the library, where research can be done in order to improve the counseling activities for adolescents about the risks of casual sex, and for researchers to further develop and in expanding both the variables and methods.

Keywords: Knowledge, Sex Education, Media, Risk Free Sex

Introduction

Teenagers are one of the stages in the life of childhood to time adulthood, a stage of development has begun but certainly every man and woman will experience some changes, which occur in adolescents is the emergence of impulses of sex, feeling that occurs in adolescents cause various forms of expression

of sex (Pangkahila, 2008). Among adolescents has been a revolution in sexual relations moving towards liberalization indefinitely. Pride in the ability to maintain virginity until the wedding has gone, since both sides accept a new position in the art of social life. Information quickly in various forms has led the world increasingly belong to teens. Information about sexual relations culture has influenced the youth of Indonesia, so there has been a revolution leading to increasingly free premarital sexual relations (Manuaba, 2009). According to WHO every year, approximately 15 million adolescents aged 15 to 19 years of childbirth, 4 million abortions, and nearly 100 million are infected with HIV. Globally, 40% of all HIV cases occur in young people aged 15 to 24 years. Last estimate is that every day there are 7,000 HIV-infected adolescents.

There is a half of the world's population under the age of 25 years and 80% of them live in developing countries. The world's population aged between 10-24 years the amount of 30%, while in Indonesia the number aged 10-24 years to reach 29.5% of the total population is 61.925 million inhabitants. Seeing the enormous amount then the teenager as the next generation needs to be prepared to become a healthy human physical, spiritual, mental and spiritual. But the fact of various studies indicate that many teens at an early age has been stuck in unhealthy sexual behavior (Pandiangan, 2007).

Researchers and health experts who conducted research on the teen sex in 33 provinces in Indonesia, including Aceh, recommending the need for sex education to adolescents. It was in respect of the results of the study which found 63% of middle and high school teenagers, already having sex outside marriage. In fact, 21% of whom had an abortion (abortion) (Serambi NAD, 2010). Data were obtained from a population of adolescence in the district of Banda Aceh's Ulee Kareng aged 10-24 years is 51,837 inhabitants of the 10 adolescents aged 15-20 years, 10 of which only three people who know the risks generally free sex.

From the description in the above background, it can be formulated problem in this research is "the" is there any sex and Media Relations Education of Young Women With Knowledge About Risk Free Sex in the village of Ulee Kareng Ilie District of Banda Aceh 2014?. This research purposed to determine relationship of sex education and the media with knowledge of young girls about free sexual risk in terms of: 1) relationships sex education with the knowledge of young women about the risk of casual sex; 2) media relations with the knowledge of young women risk free sex.

Material and Methods

This research was used analytic survey with cross sectional approach is a study which studied the relationship between independent variables with the dependent variable measurement and research as well. This research was conducted in the village of Ulee Kareng Ilie District of Banda Aceh in 2014. The population in this study were all young women aged 16-20 years who totaled 346 people total sample in this study were 78 people obtained using Proportional Stratified Random Sampling technique. Research data was analysis chi-square test with *P* significance ($\alpha = 0.05$).

Results and Discussion

Results of statistical analysis using chi square test showed the significant relationship where P value = (<0.005) 0.000. This means that the research hypothesis which states that there is a relationship sex education to adolescents knowledge about risk free sex is proven or acceptable.

Table 1. Relationship Sex Education with Knowledge

No	Sex Education	Knowledge								P
		Poor		Fair		Good		Amount		
		F	%	F	%	F	%	F	%	
1	Ever	2	3.6	20	35.7	34	60.7	56	100	0,000
2	Never	12	54.5	10	45.5	0	0	22	100	
Amount		14	58.1	30	81.2	34	60.7	78	100	

The results showed that adolescent girls in the village of Ilie who receive sex education at school or college and have a good knowledge of the environmental risk free sex is as much (60.7%). Appropriate sex education is a series of efforts to influence other people, ranging from individuals, groups, families, and communities, to the implementation of healthy life (Setiawati, 2008). From the results of research conducted by the Adolescent Health Indonesia (SKRI) conducted in 2009-2010 mention of men aged 20-24 years who have not been married friends had sexual intercourse as much as 57.5 percent and as much as 15-19 years old 43.8 percent. While women aged 20-24 years who have friends are not married and had sexual intercourse as much as 63 percent. Meanwhile women aged 15-19 years who have friends are not married and had sexual intercourse reached 42.3 percent. On the other hand they had sexual intercourse before marriage is just not knowing its impact as a result of such behavior. In the above conditions, the efforts to improve the understanding of sex among teenagers became very important. Efforts - such efforts can be done through the provision of information either directly or indirectly. One effort that is currently intensively done is through the provision of sex education to adolescents (sex education program)

According to the researchers the assumption that girls who received sex education in particular on the risk-free sex in schools and colleges have good knowledge about the risk-free sex. Education gained quite important to help adolescents increase their knowledge on reproductive health, so avoid deviant behavior.

The results showed that there were (70.5%) who frequently obtain information from the media and a good knowledge of the risk-free sex. Results of statistical analysis using chi square test showed the significant relationship with P value = (<0.005) 0.000. The flow of information through the media in the form of magazines, newspapers, tabloids and electronic media such as radio, television and computers, speeding up the changes that affect adolescent knowledge of sexual risk-free (Dizzy, 2010).

Table 2. Media Relations With Knowledge

No	Media	Knowledge								P
		Poor		Fair		Good		Amount		
		F	%	F	%	F	%	F	%	
1	Often	0	0	13	29.5	31	70.5	44	100	0.000
2	Sometimes	4	20	13	65.0	3	15.0	20	100	
3	Never	10	71.4	4	28.6	0	0	14	100	
	Amount	14	91.4	30	123.1	34	85.5	78	100	

Results of the study conducted by Widyastuti entitled Attitudes and Media Relations With Sexual Behaviour in SMU Bakti Ibu 8 Palembang showed that 65.5% of students who have a poor attitude, 61.9% of students who do not obtain healthy information via the media and 65.5% of students who had sex less. From the results of Chi-square test of the relationship between attitude and behavior of known sex p value = 0.016, so that there is a relationship between attitudes bemakna with sexual behavior. While the results of the chi-square test of the relationship between media with known sexual behavior p value = 0,000, so there is a significant relationship between media with sexual behavior. According to media researcher assumptions affect adolescent knowledge of sexual risk-free. Inevitably, the media is one of the easy access to information encountered by teens to answer curiosity about sexual risk-free, this makes the media in response.

Conclusion

There is a relationship between sex education with the knowledge of young women and media with knowledge on adolescent girls

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The Effect of Nutritional Status To Pregnant Women In Ingin Jaya Aceh Besar

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Abstract

Nutrition during pregnancy is very important. Malnutrition in pregnant women is still a public health problem that needs special attention. In 2014 the number of pragnant mothers found and reported by KEK in Aceh Besar regency was 330. Want Jaya Puskesmas working area has the highest number of cases recorded by KEK was 30 (9.09%). Based on the survey results of preliminary data on upper arm circumference measurements that researchers do against the 10 pregnant women who visit the health center, there are 3 people Want Jaya 2nd trimester pregnant women with upper arm circumferences below 23.5 cm. This study aims to determine the factors that affect the nutritional status of pregnant women at health centers Ingin Jaya, Aceh Besar in 2014. Analytical research with cross sectional study design was conducted on 22 through 27 June, 2015 at the health center Want Jaya with a population of 141 pregnant women. Accidental sampling is also found with a sample of 69 pregnant women. This study used a questionnaire. Data were analyzed using SPSS statistical computer program. The results showed in the test statistic that there is a relationship with the knowledge of the nutritional status of pregnant women, so Ha turned out with a value of p = 0.014 (p <0.05); no economic relationship with the nutritional status of pregnant women, so Ha turned out with a value of p = 0.015 (p <0.05), and there is a cultural connection with the nutritional status of pregnant women, so Ha turned out with a value of p = 0.005 (p <0.05) of all the variables examined regarding the influence of knowledge, economy and culture on the nutritional status of pregnant women. Local health workers are expected to conduct intensive monitoring on pregnant women with KEK in the effort to increase their knowledge, especially regarding nutritious food intake.

Key words: Nutritional Status, Pregnant Wowen

Introduction

Nutrition during pregnancy is very important. During pregnancy, the adjustment of metabolism and body functions, especially in terms of mechanisms and energy use. Besides the nutrients contained in food will

be absorbed by the fetus to grow and develop during in utero. In the first trimester fetus requires nutrients such as micronutrients essential for the formation of the central nervous system and other vital organs (Waryono, 2010).

Malnutrition in pregnant women is still a public health problem that needs special attention. Lack of iron intake in women, especially pregnant women can cause anemia. The prevalence of anemia in pregnant women ranges from 40.1%. Other nutritional problem is Chronic energy deficiency (CED) and the consumption of iodized salt is still low. Women of childbearing age who are at risk of KEK approximately 13.6% and only 62.3% of households consume enough iodized salt (Ministry of Health, 2012).

The proportion of women of childbearing age (WUS) with less chronic energy (KEK), which WUS with upper arm circumference less than 23.5 cm. Based report of Riskesdas (2013), an increase in the proportion of pregnant women aged 15-19 years with KEK from 31.3% in 2010 to 38.5% in 2013. The upward trend also occurred WUS also occur at 15-19 years of age who are not pregnant, that proportion increased from 30.9% in 2010 to 46.6% in 2013 (Ministry of Health, 2013). Data from the Aceh Provincial Health Office in 2013 showed of 30 701 pregnant women have as many as 4,467 KEK (14.5%) of pregnant women (MOH, 2014). The incidence of KEK in 2013 has been decreased by 50%, in 2012 the incidence of KEK amounted to 317 cases and in 2013 to 160 cases, but this rate is still considered high (Health office in Aceh Besar, 2015).

In 2013 the number of mothers understood by KEK in Aceh Besar District as many as 330. InginJaya health centre working area has the highest number of events KEK as many as 30 cases (9.09%), followed by health centre Darussalam 24 cases (7.28%), health centre Krueng Barona Jaya 24 cases (7.28%), health centre Montasik 19 cases (5.76%), Puskesmas Kuta Baro 15 cases (4.55%), health centre Leupung 12 cases (3.64%), health centre Lampupok 7 cases (2.13%), health centre Kuta Cot Glie 6 cases (1.82%), health centre Ie Alang 6 cases (1.82%), health centre Lhoknga 2 cases (0.61%), health centre Indrapuri 2 cases (0.61 %), health centre and health centre Seulimum Lamteuba each 1 case (0.31%). Whereas in January-March 2015 there were 84 cases of KEK with most cases found in local health center Want Jaya total of 14 cases (16.67%), followed by health centre Mesjid Raya 13 cases (15.48%), health centre Seulimum 8 cases (9.53%), health centre Baitussalam 6 cases (7.15%), Indrapuri health centre, health centre and health centre Darussalam Emirate Darul each 5 cases (5.96%), Puskesmas Kuta Malaka 4 cases (4.77%), health centre Leupung , health centre Kuta Baro, health centre and health centre Montasik Pulo Aceh respectively 3 cases (3.58%), Cot Glie health centre, health centre and health centre Suka Makmur Blang Bintang each 2 cases (2.38%) and health centre as much Lhong 1 cases (1.19%) (Profile health office in Aceh Besar, 2013).

This research was conducted to determine the factors that influence nutritional status in terms of 1) knowledge of factors influence on nutritional status in pregnant women; 2) the influence of economic

factors on nutritional status in pregnant women; 3) the influence of cultural factors on nutritional status in pregnant women.

Material and Methods

This research is a type of research is to be analytic survey with cross sectional study to determine the factors that affect the nutritional status of pregnant women in Puskesmas Kuta Baro 2014, that was conducted at the health centre Ingin Jaya, Aceh Besar. The population in this study were all pregnant women with antenatal care to PHC Want Jaya, Aceh Besar in 2014 in the January-March amounted to 141 people. How to sample in this study was accidental sampling is done by taking a case or respondents who happen to be there, the sample is a pregnant woman who visited the health center Ingin Jaya, Aceh Besar number of samples in this study were 69 people. Univariate analysis was conducted to determine the frequency distribution and percentage of each variable, then the data is displayed in tabular and narrative. Otherwise bivariate analysis to determine the relationship of each independent variable on the dependent variable using chi-square test with significance (α = 0.05).

Results and Discussion

Results of statistical analysis using chi square test showed a non-significant relationship with P value (> 0.005) 0.014.

Table 1. Influence of Knowledge With Nutritional Status of Pregnant Women

No	Knowledge	Nutritional Status				Total		P Value
		Good		Less				
		f	%	f	%	f	%	
1	Height	12	100	0	0	12	100	0.014
2	Low	37	64.9	20	16.5	57	100	
Total		49	71	20	29	69	100	

The results showed that the high knowledgeable mostly had good nutritional status, namely 97.1%. While the 34 respondents who have low knowledge are mostly located in poor nutritional status, namely 55.9%. Stasitik analysis results using the chi square test showed a non-significant relationship with the value of P values (> 0.005) 0.000. The results are consistent with the theory put forward by Savitri (2009), which states that knowledge is closely associated with the health of the mother during pregnancy, where the more knowledge a person has, the more accurate information about the health of pregnant women during pregnancy. One way to improve knowledge in pregnant women is to educate about nutrition during pregnancy so that they can undergo the process in a healthy pregnancy.

The research result is in line with research Anastasia, et al (2012) with the title of Knowledge and Attitudes Relations Pregnant Women With Nutritional Status During Pregnancy On Shoulder PHC Manado. The results showed knowledge of the nutritional status of pregnant women have a relationship

with values obtained (p = 0.000 <0.05) and the attitude of the nutritional status of pregnant women have a relationship with values obtained (p = 0.003 <0.05)
Similarly, the study of Aisyah, et al, (2013) with the title of Cultural Never Eat, Economic Status and Knowledge Substance Maternal Nutrition In Pregnancy Trimester III With Nutritional Status. The results showed no relationship between culture abstaining and nutritional status at third trimester pregnant women, there is no relationship between economic status and knowledge of nutrition and nutritional status at third trimester pregnant women (p = 0.002; p = 0.097; p = 0.097; α = 0.05)

Assuming the researcher to the results of this study are some mothers who do not have a low knowledge tends to follow the rules set by their parents eat (culture), so it appears that the nutritional status of pregnant women who do not normally all have less knowledge. This is what underlies there is influence between knowledge of the nutritional status of pregnant women.

Table 2. Influence of Economic Condition With Nutritional Status of Pregnant Women

No	Economics	Nutritional Status				Total		P *Value*
		Good		Less				
		F	%	F	%	F	%	
1	Height	16	94.1	1	5,9	17	100	0.015
2	Low	33	63.5	19	36.5	52	100	
Total		49	71	20	29	69	100	

Results of statistical analysis using chi square test showed a non-significant relationship with P value (> 0.005) 0.015. The results showed that having high economic status mostly had good nutritional status, namely 94.1%, while of the 52 respondents who have low economic status mostly had good nutritional status, namely 63.5%. After statistical test of chi square obtained p value of 0.015 means that no economic impact the nutritional status of pregnant women.

The results are consistent with the results Fairuz (2011), which states that if a person with social and economic conditions, the better he will likely meet nutritional needs. Where a pregnant woman with socioeconomic relatively good to be able to receive and capture information better, compared to a pregnant woman who have their own income usually position or a better position in family life is a mother who is not overly dependent on her husband and more tend to jump to conclusions included in enentukan food intake during pregnancy.

Similarly, the theory advanced by Ekayani (2007), in which one of the consequences of poverty is the inability of households to meet food needs in the amount and quality of the good state of the economy, where more than 10 percent of the population in each province experiencing food insecurity, except in the province West Sumatra, Bali and West Nusa Tenggara. This leads to malnutrition, both macro and micro

nutrients, which can be indicated on the nutritional status of children under five and pregnant women. The results are consistent with research Aisyah, et al, (2013) with the title of Cultural Never Eat, Economic Status and Knowledge Substance Maternal Nutrition In Pregnancy Trimester III With Nutritional Status. Results pebelitian showed no relationship between culture abstaining and nutritional status at third trimester pregnant women, there is no relationship between economic status and knowledge of nutrition and nutritional status at third trimester pregnant women ($p = 0.002$; $p = 0.097$; $p = 0.097$; $\alpha = 0.05$). Assuming the researcher to the results of this study are most respondents have jobs as farmers and traders with incomes below the minimum wage. so it appears that the nutritional status of pregnant women who do not normally all have less knowledge. This is what underlies there is influence between income and nutritional status of pregnant women.

Table 3. Influence of Culture With Nutritional Status of Pregnant Women

No	Culture	Nutritional Status				Total		p *Value*
		Good		Less				
		f	%	f	%	f	%	
1	Support	28	59.6	19	40.4	47	100	0.005
2	Does not support	21	95.5	1	6.4	22	100	
Total		49	71	20	29	69	100	

The results showed that the opinion that support abstinence culture eat most have normal nutritional status is 59.65, while of the 22 respondents who did not support the culture of abstaining most have normal nutritional status of 95.5%. Once the chi-square test p value of 0.005 means that there is value to the cultural influence of the nutritional status of pregnant women.

The results are consistent with the theory put forward by Wibowo (2012), which states that culture plays a role in the nutritional status of the community because there are some beliefs, such as the taboo eating certain foods by specific age groups are actually food is actually nutritious and required by that age group. Such as pregnant women who eat fish taboo. Similarly, the theory Afiyah (2009), where the insufficiency of nutrients as a cause of anemia in pregnant women is due to the food problem, related to food availability and vulnerability to food consumption are affected by poverty, low education, and customs / beliefs related to food taboos Abstinence or taboo is a prohibition to consume foods taboo food is a culture that determine when someone should or should not eat a meal.

The results are consistent with research Aisya, et al, (2013) with the title of Cultural Never Eat, Economic Status and Knowledge Substance Maternal Nutrition In Pregnancy Trimester III With Nutritional Status. Results pebelitian showed no relationship between culture abstaining and nutritional status at third

trimester pregnant women, there is no relationship between economic status and knowledge of nutrition and nutritional status at third trimester pregnant women (p = 0.002; p = 0.097; p = 0.097; α = 0.05). As well as research Aman and Ida (2013) with the title Geographical Factors and Cultural Relations With Nutritional Status of Pregnant Women in Kuta Limbaru Deli Serdang. Results showed no association with the geographical location of the nutritional status of pregnant women (0,007) and there is a cultural connection with the nutritional status of pregnant women (0,000).

Assuming the researcher to the results of this study are most mothers still trust culture abstaining from both parents and the environment, apart from the majority of pregnant women have an income rendang and if it is not supported by either will lead to a lack of knowledge of the nutritional status in pregnant women. This is what underlies there is influence between the cultural and nutritional status of pregnant women.

Conclusion

Based on the above discussion it can be concluded that there is Influence of Knowledge, economic condition, and culture of Mother to Maternal Nutritional Status

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Analysis on the Importance of Familiy towards Exclusive Breastfeeding in Aceh Province

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Abrtract

Research has shown infants receiving breast milk without additional supplements are less likely to incur adverse health symptoms and have lower mortality rates than non-breastfed infants. In the province of Aceh, 48.8% of 67, 831 new born infants were breastfed in 2014. This value is lower than the target set by the Indonesian government, which is 80%. This discrepancy led to the exploration of family support associated with exclusive breastfeeding. Factors such as cultural traditions, lack of knowledge and awareness on the benefits of exclusive breast feeding in addition to minimal family support contribute to a mother's decision to consider alternatives to breastfeeding. The purpose of this paper is to analyze the significance of family support in the decision-making process for exclusive breastfeeding. In this study the cross-sectional based associative correlation method and purposive sampling were employed. The sample pool consisted of 40 breastfeeding mothers with infants aged 6 to 12 months. Chi-square test was used to evaluate the collected data and the result obtained showed that statistically, there is a significant relationship between a family support) and a mother's decision to breastfeed exclusively.

Keywords: exclusive breastfeeding, breast milk, nutrition, family, family support, health, infant feeding, newborn

Introduction

Exclusive breastfeeding is the practice in which a newborn infant receives only breast milk in the first 6 months of life without complementary feeding. This practice has been proven to benefit both mother and child. The skin on skin contact promotes maternal bonding as well as sensory and cognitive development of the infant. Breastfeeding has also been linked to lower morbidity and mortality rates. Breastfed infants are less likely to be malnourished and die before reaching the age of one to their non-breastfed counterparts.

Breast milk is the ideal source of nutrition in the first six months of an infant's life. It contains various vitamins and proteins required for a baby's growth and development. Moreover, the antibodies in breast milk prevent infants from contracting common illnesses. The growth rate and development of an infant is determined by the initiation and continuation of exclusive breastfeeding. World Health Organization (WHO) and UNICEF have recommended mothers to initiate breastfeeding within the first hour of birth and continue to breastfeed exclusively for the first six months. Ideally, complementary feeding should start from six months onward up to two years of age without reducing breastfeeding duration. This is because the long-term health benefits and wellbeing inherent in breastfeeding is irreplaceable with formula or other feeding methods.

Breastfeeding is an innate characteristic of a new mother, however it is also a teachable practice. Extensive research has revealed socio-cultural factors, strong support system and family involvement influence women's behavior and attitude towards successful breastfeeding practices. Albeit the gradual improvement in promotion to breastfeed, the global breastfeeding rates remain considerably low. In February 2014 WHO recorded less than 40% of infants below six months were exclusively breastfed. Moreover, due to non-exclusive breastfeeding practice approximately 1.5 infants die each year.

The low breastfeeding rate is echoed in the province of Aceh, Indonesia where 48.8% of 67.381 infants received breast milk exclusively in 2014. This percentage is below the target set by the Indonesian government, which is 80%. The 40% gap in expectationis due to several factors. The first contributing factors is the cultural norm
to introduce complementary food and drink earlier than recommended while reducing breastfeeding duration. Secondly, the minimal education, counseling and encouragement available to new mothers contribute to the gap in breastfeeding practices. Lastly, the propaganda on using infant's formula as supplement, especially for working mothers, has influenced the decline in breastfeeding practices. The above-mentioned prove social, cultural and economic variables are strong indicators of breastfeeding practice.

Maternity practices, particularly, the initiation and continuation to breastfeed does not solely depend on the mother. Physical and emotional support from spouse and family, in addition to positive exposure to role models are desirable contributions to a mother's perception and motivation towards breastfeeding. The absence of physical, mental and emotional support has the potential to inflict psychological burden on the mother and consequently breast milk production. From this literature review, factors influencing the choice of effective early feeding method should be assessed among mothers. Modifiable influencing

factors, such as lack of education and limited family/spouse involvement should be scrutinized in particular to provide an insight on how to minimize their effects.

This study looks to analyze the significance of family support in the decision-making process for exclusive breastfeeding. It will also suggest an action plan for mothers and family members to be more involved in promoting a healthier attitude towards exclusive breastfeeding.

Materials and Methods

In this study the cross-sectional based associative correlation method and purposive sampling were employed. Information about maternal feeding practices and active family support were collected using a 24-question questionnaire. The study was conducted in the Province of Aceh, Indonesia from February to August 2015. Specific locations of the study are Desa Paya Meuneng and Desa Paloh in Bireuen, Aceh.

The population sample consisted of fourty mothers with infants aged 6 to 12 months. The questionnaire was administered to each mother through door-to-door interaction. Mothers who breastfeed exclusively without complementary feeding in the first six months of her infant's life were categorized as "practicing mothers", otherwise they were categorized as "non-practicing mothers". This rating was compared to a baseline average value to determine whether or not a strong support system is available and involved. A rating less than the baseline average indicates support is unavailable and uninvolved. Conversely, a rating greater than or equal to baseline average indicates support is available and involved.

Results and Discussion

Quantitative data analysis of the study shows 37.5% of the sample population breastfeed exclusively and 52.5% of the 40 mothers receive continuous support from family members and spouse. From the chi-square test with a predetermined alpha (α) value of 0.05, the calculated probability value (p-value) is 0.041 (p-value < 0.05), degree of freedom level is 1, the value of Pearson chi-square is 4.177 (> 3.841). This proves there is a statistically significant correlation between the availability of active family support and successful exclusive breastfeeding practice. In other words the categorical variables, shown in Table of Chi-Square Tests below :

Active support and engagement displayed by family members or friends promote the initiation and continuation of exclusive breastfeeding. The practical and emotional support provided by spouse in particular also eases the choice for mothers to initiate and maintain breastfeeding practices. This is because any form of support is favoured as the desirable interactive approach in handling stressful situations. It is a two-way, responsive coping mechanism with necessary and sufficient displays of love,

appreciation and acceptance. Any form of support predominantly enhances an individual's potential, in this case, to inspire confidence and assurance for breastfeeding mothers.

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.177[a]	1	0.041	0.055	0.042	
Continuity Correction[b]	2.947	1	0.086			
Likelihood Ratio	4.304	1	0.038	0.055	0.042	
Fisher's Exact Test				0.055	0.042	
Linear-by-Linear Association	4.073[c]	1	0.044	0.055	0.042	0.034
N of Valid Cases	40					

It should be noted in Indonesian society and Acehnese culture, the perception and attitudes of extended family members play a significant role as breastfeeding advocates. Positive influence and exposure to skilled role models will assure mothers that breastfeeding is the optimal and natural feeding practice. Without adequate motivation and encouragement from a sound support system, it is conclusive mothers with newborn infants will not fulfill experts recommendation to breastfeed exclusively for the first 6 months.

Conclusion

The majority of mothers in Bireuen, Aceh do not practice exclusive breastfeeding and only 52.5% of the mothers in the sample population received moral and emotional support from family members. The null hypothesis of this study was not accepted using the chi-square test. The latter confirms a statistically significant correlation between an active family support and the decision to practice exclusive breastfeeding. This result however, should be scrutinized further to assess how the variables correlate.

Further, the data also give an insight to how exclusive breastfeeding is viewed in Aceh. It is evident that higher rates of the practice can be achieved if adequate support is available to new mothers. More effort is required to promote exclusive breastfeeding as an ideal and natural infant feeding practice. Increasing the availability of support and professional counseling to breastfeeding mothers and family members will overcome the disparity of exclusive breastfeeding practices in Bireuen, Aceh.

The health and well-being benefits of breastfeeding on mother and child are unequivocal. The skin-on-skin contact allows mother and infant to bond and the almost continuous feeding frequency act as a

natural birth control mechanism. These two reasons should be enough to inspire healthcare facilities and government representatives to be proactive breastfeeding advocates. Initiatives to strengthen and protect breastfeeding should be developed and instigated. For example: organize training sessions and classes to educate women and family members on the importance of breastfeeding, overcoming lactation problems and appropriate combination of early feeding methods.

Implementation and practice of this initiative will take time, and so will changing the attitude of individuals. Furthermore the implementation process will inevitably face challenges, which is the reason why it is crucial for action to be taken now. Positive influences and motivated support system are crucial to improve the rate of breastfeeding practice among new and experienced mothers.

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Vegetative Soil Conservation on Oil Palm Plantation

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Abstract

Land cover crops play an important role in influencing erosion. Cover crops provided protection against the destruction of soil aggregates by rain and runoff. This research aimed to study the effectiveness of vegetation as soil conservation in controlling erosion and runoff. This study was a field experiment on erosion plots measuring 10 m x 5 m which were arranged in a Split Plot design with replications as blocks, consisting of a combination of two factors: the age of the oil palm and slope as the first factor, and conservation techniques as a second factor. The results showed that the soil conservation techniques in oil palm cultivation could reduce the rate of surface runoff, soil erosion and nutrient loss. Soil conservation with upland rice planted with soybean sequence + strip Mucuna bracteata (T3) most effectively reduced runoff and prevented soil erosion and nutrient loss.

Key words: runoff, erosion, sediment, nutrients, soil conservation

Introduction

Soil erosion on agricultural land mostly occurs due to the loss of soil organic matter. This condition is important to learn since approximately 13% of the earth's surface is affected by agriculture-related human activities (Chen, et.al, 2011). Erosion carries down surface soil layers which are generally fertile and rich in organic matters and nutrients, causing the loss of plant nutrients. In the event of erosion, fine soil fraction is taken away first, more than the more coarse fraction, so that clay content in sediment is higher than the original sediment soil. This is related to the carrying capacity of the surface runoff of soil grains with different weights. The removal of fine particles by erosion leads to an increase in the percentage of sand and gravel on the ground, and at the same time reducing the percentage of silt and clay (Blanco and Lal, 2008). Thus the soil that has been eroded has coarser texture compared to the one that has not been eroded. Furthermore, erosion causes a decline in soil fertility owing to the loss of essential nutrients and soil organic matters.

Oil palm trees are plantation crops that develop rapidly in the province of Aceh, including in Bireuen. The oil palm planting area in Bireuen regency in the period 2008-2012 reached 4,644 ha (BPS Aceh, 2013), which were generally young plants that had the potential to cause land degradation such as increased

erosion and reduced infiltration rate, especially if not properly managed. This condition often occurs not only when oil palm trees are still young and the land cover is still low, but also when the soil surface is disturbed due to the land preparation. The prediction results of soil erosion rate in the region showed that the erosion ranged from 54.6 to 344.01 tons.ha^{-1}.year^{-1} (Satriawan and Azizah, 2011), which was still higher than those allowed for soil erosion in the region, namely 25.1 - 40 tons.ha^{-1}.year^{-1} (Fitri, 2010).

Cover crops play an important role in influencing erosion intensity. In this case, the cover crops provide protection for soil against the process of destroying aggregates of rain and surface runoff, thereby limiting the destructive power of the rain and surface runoff (Morgan, 2005). Besides, cover crops can also improve soil physical and chemical properties through their contribution to increased levels of soil organic matters (Zuazo et.al, 2004). An understanding of the effectiveness of the vegetation in protecting the soil surface to resist the erosion can be an alternative technology of good and effective land resource management. Related to this, Fuady and Satriawan (2011) reported on degraded land with a slope of 15%, with the application of vegetative combination (intercropping between maize and peanuts) and ridges could control runoff and erosion by 63.50% and 90.27% compared to the absence of conservation measures. Plantation crops and reforestation crops grown in an agroforestry manner are also known to be able to control soil erosion. *Sengon* (*P. falcataria*) aged 3 years and cocoa aged 5 years are more effective to control erosion compared with reeds and *pinang* (areca nut) aged 5 years (Satriawan et.al, 2012; Satriawan et.al, 2011).

This study aimed to obtain a vegetative soil conservation technique which is effective for controlling erosion and preventing the loss of nutrients in young oil palm trees.

Materials and Methods

The research was conducted on young oil palm plantations (ages: 5-7 months and 25-27 months) with 15-40% slope in the village of Blang Mane, the sub-district of South Peusangan, Bireuen regency, Aceh, from March to June 2015 (the second year of treatment).

The materials used consisted of upland rice seeds, soybean seeds as intercopping, and *Mucuna bracteata* as strip plant, urea fertilizer, SP-36, KCl and insecticides, chemicals for soil analysis. The tools used consisted of a profile meter, drill ground, zinc for bordering erosion plots, sediment collectors for collecting surface runoff and sediment, infiltrometer, ombrometer, and AAS.

Research design

This research was a field experiment on erosion plots measuring 10 mx 5 m arranged in Split Plot Design with replications as a block consisting of two factors, namely the combination of the ages of oil palm and the slopes as the first factor, and conservation techniques as the second factor.

1. Ages of oil palm crops / slopes consisted of 4 levels, consist of: a) the ages of oil palm crops were 5-7 months and the slopes were 15-25% (P1); b) the ages of oil palm crops were 7-25 months and the slopes

were 15-25% (P2); c) The ages of oil palm crops were 5-7 months and the slopes were 30-40% (P3); d) the ages of oil palm crops were 7-25 months and the slopes were 30-40% (P4)

2. Conservation technique with 3 levels, consist of: a) weeds were allowed to grow on the oil palm spacing areas (T1); b) upland rice was planted in sequence with soybeans (T2); c) upland rice was planted in sequence with soybeans + strip *M. bracteata* (T3).

Observation

Surface runoff (m^3.ha-1) was observed when the sediment collector was nearly full by measuring the water level in the container. Water samples taken were used to calculate the suspended sediment and analyze the level of organic C, N, P and K carried away. Observations and sediment sampling were in conjunction with the surface runoff. All sediments in the sediment collector were taken out in each observation after the sampling of 100 g was previously done for the analysis of nutrient levels and organic C sediments. The sediments removed from the sediment collector were wind-dried and then weighed to determine the wet weight. To determine the dry weight of sediment, the sediment sample weighing 250 g was dried in an oven with a temperature of 105°C for 24 hours. Then from the sediment sample an analysis was conducted to find out the content of organic C (Method of Walkley and Blake), total N (Kjeldahl method), P2O5 (method of Bray-1) and K2O (extraction with 1 N NH4OAc pH 7.0).

The amounts of organic C, N, P and K carried away by erosion were calculated by the equation:

X = Y x E

where: X = the amounts of organic C, N, P and K carried by erosion (ton.ha^{-1}); Y = the concentration of organic C, total N, P and K available in sediments (mg / 100g,%); E = the total amount of eroded soil (ton.ha^{-1}).

Meanwhile the analysis of the sediment amount was calculated using the formula:

$$E' = \frac{\text{totalbobotbasahsedimen(gr)}}{0{,}25\text{kg}} \text{x bobotkeringsampel(gr)}$$

Total soil eroded was calculated using the formula:

$$A = E + E'$$

Where: A = total soil erosion (ton.ha^{-1}); E = the amount of suspended sediment in the surface runoff (ton.ha-1); E '= the amount of sediment in the sediment collector (ton.ha-1).

The data analysis used the analysis of variance (F test), and the analysis of further test used BNT test 5%.

Results and Discussion

Surface Runoff

Further test results on the average treatments showed that plant ages and slopes combined with soil conservation measures significantly affected surface runoff. Oil palm treatment aged 7-24 months with a slope of 15-25% (P2) with soil conservation measures of oil palm + upland rice planted sequentially with soybean + strip *Mucuna bracteata* (T3) resulted in the lowest surface runoff (111.99 m3 / ha) compared to the other treatments. Meanwhile oil palm treatment aged 5-7 months with a slope of 30-40% (P3) with

palm oil conservation measure + weeds which were allowed to grow on the spacing area of oil palms (T1) significantly resulted in higher runoff than the other treatments (334.94 m3 / ha).

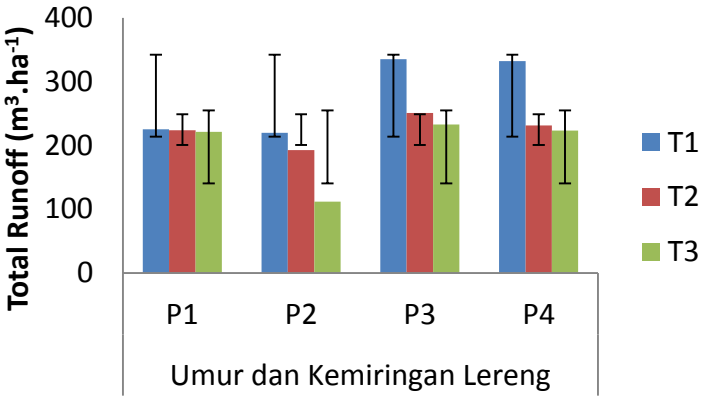

Figure 1. Total runoff on oil palm due the vegetative soil conservation

The low surface runoff of P2T3 was caused by two main factors: the closure of the plant canopy and slopes. In P2T3 the presence of intercropping in the oil palm crops which were planted soybeans + strip *Mucuna bracteata* (rainy season / plant I) generated a sizeable land cover where approximately 75% of the land surface was evenly covered, as well as the more varied surface roughness condition of the soil by plant roots. In P2T3 treatment, the existence of *mucuna bracteata* became a differentiator compared to the other treatments. *Mucuna bracteata* with a high growth rate becomes an additional filter besides soybean so that the energy of the rain drops reaching the land surface can be suppressed, reducing the volume of surface runoff although the infiltration is greater.

Soil Erosion

Further test results of the average treatment showed that the age of the plant and the slope combined with soil conservation measures had a significant impact on soil erosion. The treatment of oil palm aged 5-7 months with a slope of 15-25% (P2) with soil oil palm conservation measures + upland rice planted sequentially with soybean + strip *Mucuna bracteata* (T3) produced the lowest soil erosion (11.96 tons / ha) compared to the other treatments. Meanwhile, the treatment of oil palm aged 5-7 months with a slope of 30-40% (P3) with the oil palm conservation measures + weeds allowed to grow on the oil palm spacing area (T1) really resulted in soil erosion higher than the other treatments (34.94 m3 / ha).

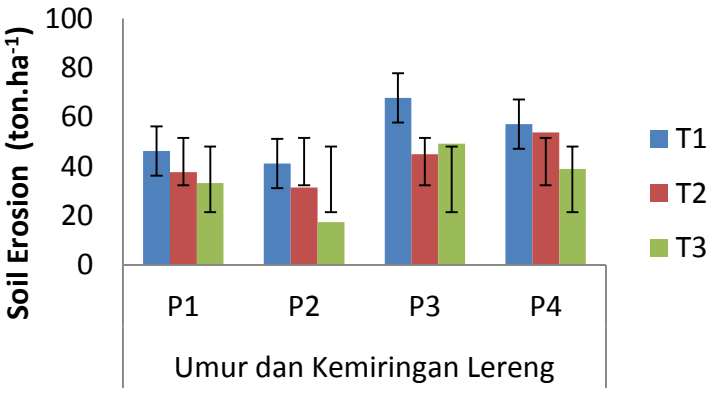

Figure 2. Soil erosion on oil palm due the vegetative soil conservation

The amount of soil erosion is closely related to surface runoff generated from each treatment. The erosion was significantly lower in the combination treatment of P2T3 compared to the combination of other treatments caused by the planting of seasonal crops and legumes group that served as land cover, which could have a positive impact on the improvement of soil properties, especially on physical and biological properties of the soil. The existence of seasonal crops and legumes could improve soil aggregate stability by 12.5% of the initial condition, which is extremely important in reducing soil erodibility. Meanwhile, other soil conservation treatments could only increase soil aggregate stability by 8% - 10.7%.

Nutrient level of Sediment

Nitrogen

The loss of N which was measured in the sediment was in the form of total N. Further test results of variance showed that soil conservation techniques significantly affected the amount of nitrogen loss, while age and slope did not significantly affect the amount of the total soil N loss in the sediments (Figure 3).

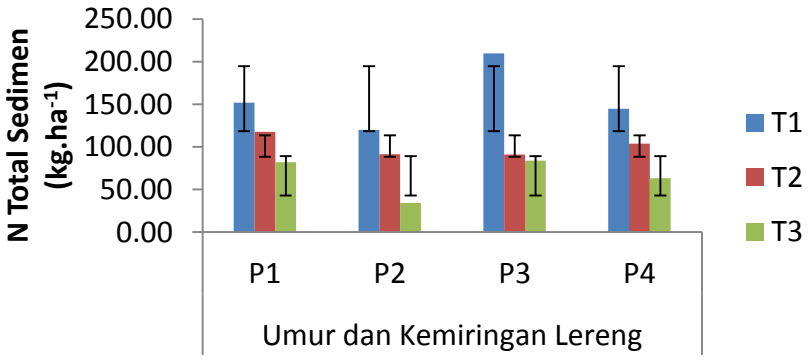

Figure 3. Total N in the sediments due the soil conservation

Soil conservation treatment of T3 caused the total loss of N to be significantly lower at the age and slope of P2 compared to the soil conservation treatments of T2 and T1. The total loss of N which was lower in T3 was caused by not only the lowest soil erosion (Figure 2) but also the low loss of soil organic C which was greater in T3 treatment. Organic C is a major source of N soil in addition to coming from the air fixation, and the higher leaching of organic C will cause a big loss of N.

Phosphorus

Further test analysis of the total P of land showed that the soil conservation treatment had an effect on the weight of P in the sediment transported along with the sediment, but age and slope did not have a significant effect. Table 4 shows that T3 treatment produced the lowest weight of P contained in the oil palm ages of 7-24 months at 15-25% slope. Meanwhile, the highest weight of P was found in T2 treatment in oil palm plantations aged 7-24 months at 30-40% slope.

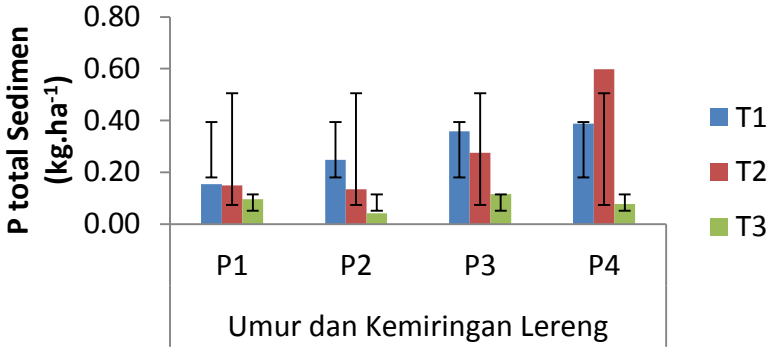

Figure 4. Total P in the sediments due the soil conservation

Figure 4 also shows that T3 treatment was very effective in preventing the loss of P in all ages and slopes, but in general the high loss of P nutrient occurred in the soil conservation of T1 treatment. The high loss of P in T1 treatment was related to the great amount of erosion on the treatment, in which the soil transported through erosion was topsoil that had a higher nutrient content than subsoil.

Potassium

Further test analysis of the average amount of K which was transported along with the sediments indicated that treatment of soil conservation and plant age significantly affected the weight of K in the sediment. Figure 5 shows that T3 treatment resulted in the lowest K weight contained in the oil palm aged 7-24 months at 15-25% slope. Meanwhile, the highest weight of K was found in T1 treatment in oil palm plants aged 5-7 months at 15-25% slope (P3).

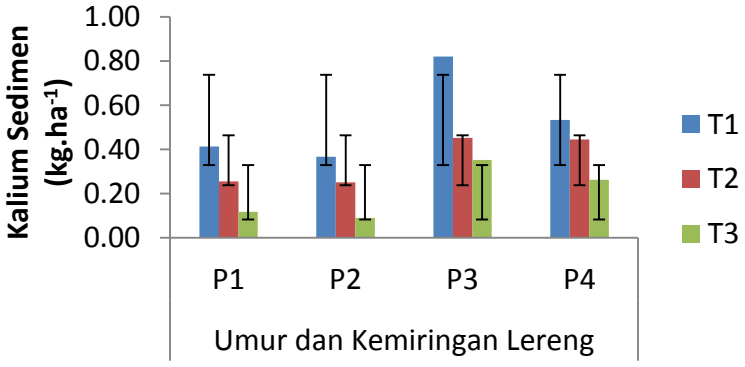

Figure 5. Total N in the sediments due the soil conservation

The high loss of K nutrien in T1 treatment in oil palm plants aged 5-7 months at 15-25% slope (P3) was caused by the element of potassium that is very susceptible to leaching / washing compared to N and P.

Organic C

Further test analysis of the average amount of organic C showed that the soil conservation treatment had an effect on the weightof organic C in the sediments transported along with sediments, but the age and slope were not significant. T3 treatment resulted in the lowest weight of organic C contained in the oil palm aged 7-24 months at 15-25% slope. Meanwhile, the weight of the highest organic C was found in T1 treatment of oil palm trees aged 5-7 months at 15-25% slope (P3).

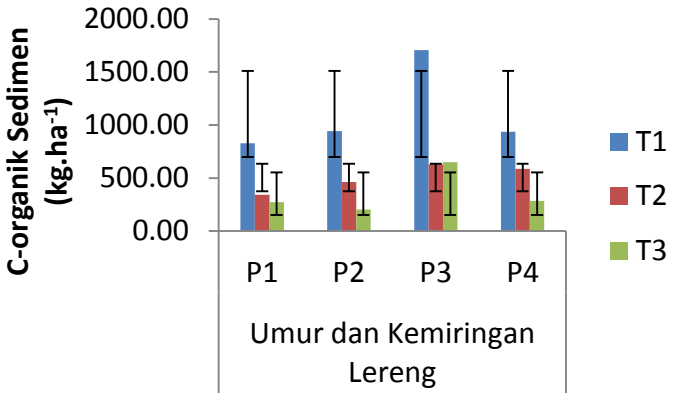

Figure 6. Total Organic C in the sediments due the soil conservation

The high loss of organic C in T1 treatment was related to the high amount of erosion in the treatment, in which the soil transported through the erosion of topsoil was the top layers of soil that contain carbon in the form of organic C. The low loss of organic C in T3 was probably because of the effectiveness of strip Mucuna bracteata plant and upland rice in filtering soil particles transported by erosion so that the sediment organic C levels became low.

Conclusions

Soil conservation techniques in the cultivation of oil palm can reduce the rate of surface runoff, soil erosion and nutrient loss. The soil conservation treatment of upland rice planted sequentially with soybean + strip *Mucuna bracteata* (T3) was the most effective to reduce surface runoff and soil erosion and to prevent the loss of nutrients.

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The Relationship Between Dental And Oral Cavity Health With Nutritional Status in Panti Sosial Tresna Werdha Lhokseumawe

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Abstract

The elderly always be at risk of malnutrition because decrease in food intake due to changes in biological conditions and the ability of elderly to consume nutrient. Reduced of saliva can make discomfort in mouth, pain, increased dental caries and oral infections, difficulty speaking and swallowing, so that decreased nutrient intake will be followed by weight loss. This complaint can affect the health of dental and oral cavity that would affect the quality of life. This reasearch aims to determine the relationship between dental and oral cavity health with nutritional status in Panti Sosial Tresna Werdha (PSTW) Lhokseumawe and Aceh Utara in 2015. This research is analytical research using cross sectional design. The research was conducted in four PSTW Lhokseumawe and Aceh Utara since March to October 2015. The sampling technique is total sampling with inclusion and exclusion criteria and obtained 61 elderly. The analysis applied the Kruskal Wallis test with the significant level $\alpha = 0.05$. The Kruskal Wallis test showed that there was a relationship between dental and oral cavity health by OHIP-14 and nutritional status in the elderly ($p = 0.004 < 0.05$). The results showed an average of OHIP-14 scores in each dimension of quality of life in the elderly malnourished group was higher than malnutrition risk and good nutrition group. The average score OHIP-14 based on the dimensions of quality of life in three groups differed significantly ($p < 0.05$) except the dimensions of psychological discomfort and psychical inability.

Key words: Dental and Oral Cavity Health, OHIP-14, Nutritional Status, MNA, the Elderly

Introduction

The elderly age is someone who has more than 60 years. The elderly population in the world aged 60 years and over in 2009 was 747.305.348 and the number of elderly people is increasing in 2010 to 770.850.882 (Depkes, 2013). Complaints arising from dental and oral cavity health will affect the quality of life. One instrument that is often used to measure dental and oral cavity health related quality of life is

the Oral Health Impact Profile (Slade & Spencer, 2012). The older a person, the higher the risk of malnutrition, if not handled properly will cause energy deficiency of protein and other nutrients such as iron (Yuniarti et al., 2011). One method of screening for malnutrition in the elderly is done with the Mini Nutritional Assessment (Wulandari, 2010).

This reasearch aims to determine the relationship between dental and oral cavity health with nutritional status in Panti Sosial Tresna Werdha (PSTW) Lhokseumawe and Aceh Utara in 2015.

Materials and Methods

This research is analytical research using cross sectional design. The research was conducted in four PSTW Lhokseumawe and Aceh Utara since March to October 2015. The sampling technique is total sampling with inclusion and exclusion criteria and obtained 61 elderly. The instrument used was a Questionnaire Oral Health Impact Profile (OHIP) and the Mini Nutritional Assessment (MNA).

Results and Discussion

Table 1. Distribution characteristics of study subjects according to age

Age	Amount (n)	Percentage(%)
60-74 years old	39	63,93
75-90 years old	22	36,07
> 90 years old	0	0
Total	61	100

Based on the most elderly age category obtained in the range of 60 to 74 years amounted 39 person (63.93%).

Table 2. Distribution characteristics of the study subjects by sex

Sex	Amount (n)	Percentage (%)
Male	8	13,1
Female	53	86,9
Total	61	100

Based on the results, the more elderly female with a number of 53 people (86.9%) than in men with a number of 8 (13.1%).

Table 3. The frequency distribution of nutritional status by MNA

Nutritional Status	Amount(n)	Percentage (%)
Good Nutrition	11	18,04
Malnutrition Risk	28	45,90
Malnutrition	22	36,06
Total	61	100

Based on the assessment of the 61 elderly with MNA obtained nutritional status, highest groups is malnutrition risk with 28 people (45.90%).

Table 4. Score Distribution OHIP-14 based on the nutritional status of elderly

	Nutritional Status	Median	Mean ±SD	Min	Max
OHIP-14 Score	Malnutrition	26	23,68±8,29	4	37
	Malnutrition Risk	12,5	14,46±10,52	2	37
	Good Nutrition	9	13,81±10,62	0	33

Based on OHIP-14 scores showed that the mean score was higher in the elderly group malnutrition compared with malnutrition risk and good nutrition.

Table 5. *Kruskal Wallis test* relation OHIP-14 scores with nutritional status

	Nutritional Status Mean ±SD			
	Malnutrition	Malnutrition Risk	Good Nutrition	*p-value*
OHIP-14 Score	23,68±8,29	14,46±10,52	13,81±10,62	0,004 *

Kruskal Wallis test showed that there was significant relationship between dental and oral health by OHIP-14 with nutritional status by MNA in the elderly with a value of p = 0.004 (p <0.05).

Table 6. Distribution of OHIP-14 scores per dimensions of quality of life according nutritional status

Dimensions Quality of Life	Mean ±SD			
	Malnutrition	Malnutrition Risk	Good Nutrition	*p-value*
limitations of function	3,90 ±1,57	2,21±1,81	2,27±1,61	0,03*
Physical pain	4,27±1,188	2,82±2,19	1,81±2,27	0,01*
psychological discomfort	2,95±1,29	2,14±2,25	2,09±1,75	0,191
Disability	3,63±1,32	2,42±1,81	2,63±2,20	0,049*
inability psychic	2,50±1,33	1,82±1,51	2,00±2,14	0,236
social incapacity	2,77±1,30	1,46±1,47	1,27±1,34	0,002*
Handicap	3,18±1,36	1,57±1,68	1,72±1,73	0,001*

* significant < 0,05; *Kruskal Wallis Test*

The mean OHIP-14 scores in each dimension of quality of life in elderly malnourished group was higher than good nutrition and malnutrition risk group. Based on the *Kruskal Wallis* test showed that the average

score of OHIP-14 based on the dimensions of quality of life in these three groups differed significantly ($p < 0.05$) except the dimensions of psychological discomfort and inability psychic.

Assessment of quality of life per dimension related dental and oral health include 7 of these dimensions (functional limitations, physical pain, psychological discomfort, Disability, inability psychic, social incapacity, and handicap) is the impact from disorders or problems in the oral cavity which will affect on quality of life. In this study indicate that there are five dimensions related quality of life and nutritional status that is functional limitations, physical pain, physical disability, social incompetence, and handicap.

Mouth problems experienced by the elderly are chronic such as dental caries, tooth loss and periodontal disease. Mouth chronic disorders in elderly can occur because lack of visits to the dental health center or other personnel dentistry (Ahluwalia & Sadowsky, 2003). Oral disease may include pain, infection, and disruption of the mastication function can reduce quality of life in the elderly. The negative impact of poor oral health on quality of life is an important public health problem (MeGrath & Bedi, 2001). Loss of teeth resulting the selection of food, so nutrients intake will be reduced and continue to be a deficiency that could affect public health (Ibrahim & Woda, 2002).

Results the assessment of physical pain in oral cavity and discomfort when chewing food is often experienced by the elderly patients. Oral problem because of biological changes such as gingival recession, loss of alveolar bone will trigger the loss of teeth, so that the dimensions of quality of life related to oral health is physical function increasingly affected. This will make the elderly a longer experience of the pain of oral disease than other populations (Saub, 2004).

Elderly also often have physical disabilities such unsatisfactory diet and stopped eating. Selection of food is closely related presence of teeth. Bone loss due to aging also affects alveolar bone resulting loss of teeth and edentulous condition. In the elderly with a missing tooth portion, nutrient intake will decrease. Patients with severe tooth loss, periodontal condition, edentulous condition, ill fitting denture will tend to change the diet to reduce the mastication process or fear of choking (Stegemen & Davis, 2005). Decrease masticatory function will affect the selection of food from fresh food and fibrous be cooked for a long time so it can decline in nutritional quality (Madan, 2011)

In this study indicate that the dimension of psychic discomfort and psychological incapacity is not related to the nutritional status of the elderly. On 5th the dimensions of quality of life (mental incapacity), 32.8% of respondents expressed very rarely trouble feel relaxed because of the problems in the oral cavity and 45.9% said they never felt ashamed of their oral cavity problems.

This is consistent with Nizel statement (Manurung, 2012) in the elderly, eating with other people (psychosocial factors) will lead to a better perception of the food. Elderly affected the psychosocial functioning in this study then will increasingly provide a strong relationship with nutritional status. This

shows that despite the inconvenience and mental incapacity can be found in the elderly, but can not result in lower levels of quality of life of an individual that affect the nutritional status of the elderly. But there are more aspects relating to the quality of life that is the physiological condition, general health and social functioning of a person.

Conclusions

Nutritional status based MNA on the elderly in Panti Sosial tresna Werdha Lhokseumawe and Aceh Utara in 2015 at most at risk of malnutrition (45.90%). Dental and oral health based OHIP-14 scores showed that the mean score was higher in the malnutrition elderly group than malnutrition risk and good nutrition. There is a significant association between oral health by OHIP-14 with nutritional status by MNA in the elderly in Panti Sosial Tresna Werdha Lhokseumawe and Aceh Utara in 2015 with a *p value* = 0.004 (p <0.05).

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Relapse Prevention in Substanse Abuse Patient: A Case Report

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Abstract

There is an increasing cases of substance abuse in Indonesia. This condition makes Indonesian government launched one hundred thousand rehabilitation programs for substance abusers. Substance abusers often relapse, even after undergoing rehabilitation and become abstinence. Here, we describe a case of substance abuse that relapse after an inpatient rehabilitation. Case Presentation: A 22-year-old Acehnese male with mental and behavioral disorders due to use of other stimulants, with predominantly hallucinatory psychotic disorder was successfully treated. But when returning home from inpatient rehabilitation, two months later he relapse. Therapy unsustainable makes patients vulnerable to relapse. In the treatment of substance abuse, relapse prevention needs to be done to help patients remain abstinence. Relapse prevention service providers are still limited in Aceh that affect the management of patients with substance dependence for optimal outcome.

Key words: relapse prevention, substance abuse, treatment

Introduction

Substance abusers worldwide in 2012 between 162 million to 324 million (3.5-7%) of which the most widely used is marijuana, opioids, cocaine or groups of amphetamines/ stimulants. Badan Narkotika Nasional/ National Narcotics Agency (BNN) estimates, with steady state, in 2015 there are 4.098 million people who substances abuse in the past year (Badan Narkotika Nasional, 2015). This situation led to the Indonesian government made one hundred thousand addicts rehabilitation programs throughout Indonesia. This will be conducted by BNN and related ministries. Rehabilitation is done either medical or social rehabilitation. Rehabilitation can be done in the form of outpatient or inpatient setting. The Government through the Ministry of Health has prepared thirty four “Institusi Penerima Wajib Lapor” (IPWL). Ministry of Social Affairs has also prepared the places for rehabilitation (Waluyo, 2015).

Substance abuse is a chronic and relapse condition (Drake, Wallach and McGovern, 2014). Treatment for this disorder require specific procedures and distinct profession. In general, the treatment is distinguished by a prominent character, such as whether intended primarily to control withdrawal symptoms and

consequences of substance abuse (detoxification) or for long-term behavior change, giving priority to pharmacological therapy, individual or community approach. Research shows that the combination inpatient with outpatient detoxification can give effective results. Use nonpharmacological therapy combined with pharmacological therapy also showed a more optimal result. Treatment plan for substance abuse is different in each case, both the type and duration of therapy (Strain and Anthony, 2009).

Substance abuse treatment are generally divided into assessment, detoxification and maintenance phase. The target are to reduce the use and effects of substances, achieve and maintain abstinence condition/ reduce the frequency of relapse. Relapse is a manifestation of dysfunctional behavior that is continually improving and re-using the substance. This is a process that can be controlled or overcome (Husain, 2010). The recurrence rate of substance abuse is quite high, ranging between 40-60% (National Institute on Drug Abuse, 2000).

Case Presentation

A 22-year-old Acehnese male with mental and behavioral disorders due to use of other stimulants, with predominantly hallucinatory psychotic disorder (F15.52) (World Health Organization, 1992) was Referred to a specialist ward for the treatment of substance abuse. History of substance abuse was initially using marijuana at the age of 12 years. He smoked marijuana as much as 3 bars per day. He also drank alcohol. But according to the patients he was not using these substances since 3 years ago. He using methamphetamine (shabu) since 7 years ago, as much as a quarter of a gram weekly inhaled. Patients said he knew that his drugs use was bad but he cannot stop. Patients spend most of his time and money in order to buy shabu. Patients become sensitive and irritable. Patients often angry with his families, both parents and his wife. He have a problems with his father. He said that he have a visual and auditory hallucination. His family concern with this conditions that become worse, so they take him for treatment.

Patients received therapy detoxification and inpatient rehabilitation for 6 months. Patients follow a rehabilitation program based on therapeutic community. He also received pharmacological treatment is olanzapine. By the time the patient is in a stable home with no symptoms of hallucinations and abstinence. Patients are encouraged to keep taking the drug and therapy group, but because at the residence is not available substance abuse services he did not carry it out. Two months later the patient again brought the family to be hospitalized because he returned angry and experiencing hallucinations. Patient said that he used shabu again.

Results and Discussion

Relapse is preventable. Factors associated with relapse are: stress, negative emotions, positive emotions, interpersonal conflict, social pressure, use of other substance and presence of drug-related cues. Strategist to relapse prevention is critical in the success of addiction therapy. Approach that is commonly used in relapse prevention are social support, lifestyle change and cognitive/behavioral approaches (U.S. Department of Health and Human Services, 1994; Husain, 2010).

Support from family, friends and fellow abusers may play a role in relapse prevention. Support can help this relapse prevention by modeling desired behavior; creating a supportive interpersonal environment; eliminating stress or helping the addict avoid or cope with the source of the stress; helping the person to face the temptation to use again, encouragement to continue the process; and keep an eye on the behavior of the early signs of relapse. Social support programs such as employment, vocational training and legal advice can also help. Self-help support groups complement the existing therapies (U.S. Department of Health and Human Services, 1994; National Institute on Drug Abuse, 2000). In this patient, there is lack of support from family, especially his father because conflict with him. But talking with the family about the need for family support is expected to help the patient from relapse.

Life style change is by releasing the habits associated with substance abuse and adapt to the social environment. Another important aspect is to make healthy relaxation activities and controlling negative emotions that can arise as a result of stress, frustration and other negative things (U.S. Department of Health and Human Services, 1994).

Psychotherapy such as cognitive behavioral therapy (CBT) and motivational interviewing (MI) gives good results. CBT trying to find and fix the cognitive distortions associated with substance use, increase self-efficacy and coping skills needed to maintain abstinence. MI is a counseling approach that emphasizes motivation to change. Motivation to change is a good point for behavior changed (de Jesus Mari et al., 2013; Dutra et al., 2008) In this case, the patient did not receive psychotherapy after returning to home from treatment, because he did not control. It is can be influenced by the absence of addiction services center near his home. He also did not get social support because of the lack of activity in his area, including self-help group.

Substance abuse patients with additional psychiatric disorder requiring treatment in psychiatry to produce optimal results (National Institute on Drug Abuse, 2000). This patient experienced a psychotic disorder that requires continuing evaluation of pharmacological therapy. But because he did not follow the treatment as recomended.

Continuous treatment is necessary for relapse prevention. This sustainable form of treatment can transform in a telephone communication with the therapist or case manager or a regular meeting individual or group therapy (Roberts et al., 1999).

Conclusions

- Relapse prevention helps the patients to maintain abstinence condition.
- Increased number of substance abuse service providers availability in remote area for better access.
- Continuous treatment is essential for better outcome in substance abuse patient

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The −1355G/C Polymorphism of Ferroportin (*FPN1*) Gene Among Adolescent Girls With Iron Deficiency Anemia

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Abstract

Ferroportin is a cellular iron exporter protein that has been identified in human and plays an important role for iron homeostasis in tissues. The −1355G/C polymorphism in ferroportin *(FPN1)* gene promoter region leads to increase in ferroportin expression and iron export, decreases in hemoglobin and serum ferritin levels that manifest as iron deficiency anemia (IDA). The aim of this study was to investigate the *FPN1* −1355G/C polymorphism as a risk factor of IDA. Polymerase chain reaction–restriction fragment length polymorphism (PCR-RFLP) with B*fa*1 restriction enzyme was used to determine the −1355G/C polymorphism among 20 adolescent girls with anemia (cases) and 52 healthy controls. The blood samples were collected and analyzed for complete blood count. Serum ferritin levels were measured by ELISA. All of the data was obtained by statistically analyzed by the chi-square test or Fisher's exact test, independent sample t-test and Mann-Whitney Test. Genotypes distribution showed no significant differences between IDA group (CC 38.5%, CG 53.8%, and GG 7.7%) and control group (CC 36.5%, 55.8% CG, 7.7%). The odds ratio (OR) of C allele having IDA was 2.036 (95% CI, 0.518-7.995, p=0.249). Subjects carrying the C allele in the IDA group had lower serum ferritin levels than the non-IDA group (p=0.000). This study suggests that the C allele of *FPN1* −1355G/C genetic polymorphism is a risk factor for iron deficiency anemia among adolescent girls.

Key words: Polymorphism, iron deficiency anemia, ferritin serum levels, ferroportin, *FPN1* −1355G/C

Introduction

The prevalence of iron deficiency varies based on age, sex, physiological condition, pathological, environmental, socioeconomic and life stage (World Health Organization, 2001 & Deegan *et al*., 2005). One of the most vulnerable groups are young women and this is proven by the high prevalence of iron deficiency anemia in adolescent girls. According to World Health Organization, the incidence of anemia in non-pregnant women of reproductive age in Indonesia is 33.1% (World Health Organization, 2008).

In Indonesia, there are 20 provinces that have anemia prevalence greater than national prevalence (14.7%), one of which includes the Special Region of Yogyakarta with the prevalence of 15% (Ministry of Health Republic of Indonesia, 2008). The results of the study conducted by Yogyakarta City Health Department and Faculty of Medicine Universitas Gadjah Mada in 2012 showed that 34% of 280 high school female students were anemic (City of Goverment of Jogjakarta, 2013). These data indicate that anemia is still a public health problem in Indonesia, especially in Yogyakarta. The prevalence of anemia in adolescent girls in Islamic boarding school in Surabaya was 65.5% (Wahyuni *et al*., 2002). Another study in the Islamic boarding school of Tarbiyah Islamiyah Candung West Sumatra found the prevalence of anemia was 39.6% (Isniati, 2007).

Ferroportin (*FPN1*) or *SLC40A1* is one of important genes in iron metabolism that encodes ferroportin for iron absorption, release, and recycle inside the body. Ferroportin (FPN) is a cellular iron exporter protein that has been identified in human and plays an important role for iron homeostasis in tissues (Nemeth *et al*., 2004; Cui *et al*., 2009). Ferroportin expression is also regulated by *FPN1* gene promoter region. In-silico examination of the G/C nucleotide transversion in the *FPN1* gene promoter at positions -1355 showed a new activation of transcription factors FOXC1 bound to the 5'-iron responsive element (IRE), thus the translational process of ferroportin still occur (Hallendorf, 2008). Increased expression of ferroportin cause increased iron export to lower serum ferritin.

The variant of *FPN1* −1355G/C in the promoter region leads to increase in ferroportin expression and iron export, increases in cellular iron needs, decreases in hemoglobin and serum ferritin levels that manifest as iron deficiency anemia. In Indonesia, research related to *FPN1* −1355G/C gene polymorphism was conducted in pregnant women in Surakarta. The genotype frequency of GC and CC were 100% in pregnant women with iron deficiency anemia (IDA) and 95.2% in pregnant women without IDA. Subjects carrying C allele had a risk of 1.6 times higher to experience IDA than subjects carrying G allele (Istiqomah *et al*., 2013).

This research investigated the effect of *FPN1* −1355G/C gene polymorphism on the incidence of iron deficiency anemia in adolescent girls.

Materials and Methods

This research was a case-control study with protocol approval by The Medical and Health Research Ethics Committee (MHREC) Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia (No. Ref: KE/FK/887/EC, October 2 2013). The study participants were adolescent girls at four Islamic boarding schools in Yogyakarta and Sleman Regency. Ethical approval for this study was granted from The parents or caregivers were informed about the objectives of the study and their informed consent was obtained. The girls were also informed and the objectives and procedures in this study were explained. Those who fulfilled the inclusion criteria and gave their assent were recruited to join the study.

Before the recruitment of study participants, a screening for anemia was conducted among adolescent girls. Postmenarcheal girls with anemia (Hb < 12.0 g/dL), aged 14-19 years, Javanese, not suffering from any major illness or disease at the time of data collection, were recruited to join the study. The study participants were interviewed using a questionnaire about the history of the disease. A healthy and non-anemic adolescent girls were recruited as a control group.

The sample size was based on a requirement for case-control study. The minimum sample in each group is 41 adolescent girls so that the total sample is at least 82 adolescent girls. After screening of hemoglobin levels, subject with anemia (cases) were only 20 subjects, and the number of control group was 52 subjects.

Ferritin serum level assay

Hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC) were determined by the automated hematology analyzer (Sysmex XT 2000i). Serum ferritin levels were determined using the a commercial ELISA DRG® Ferritin ELISA kit (EIA-1872; DRG International, Inc., USA).

DNA extraction and FPN1 −1355G/C *genotyping*

DNA extraction was carried out in Biochemistry Laboratory, Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia. Genomic DNA was extracted from peripheral leukocytes using The Wizard Genomic DNA Purification Kit (Promega Corporation, Madison, USA). Genotyping was determined by PCR-RFLP. Briefly, to amplify *FPN1* gene, forward primer: 5'-GTA GAC CTT TGG GGC TCC TG-3' and the reverse primer: 5'-TGG AGG GTG AGG TGA ATG AC-3' were used [Panton, 2008]. The final reaction volume of 30 µL contain of 2 µL DNA, 15 µL of master mix PCR (2x PCR buffer, 150 mM of dNTP, and 0,5 U of Taq DNA polymerase), 2 µL of primers (1 µL of primer forward and 1 µL of primer reverse) and 11 µL of nuclease free water. PCR amplification was performed in a PCR thermocycler (Esco Thermal Cycler, Esco Technologies, Inc.). The reaction conditions for amplification includes an initial denaturation at 95° C for 5 min followed by 35 cycles each consisting of denaturation at 95° C for 5 min, annealing at 60° C for 2 min, and extension at 72° C for 1 min. Final extension occurred at 72° C for 10 min. The PCR program ran for 2 hours and 55 min. These primers yielded PCR products of 288 bp in length.

Subsequently, the amplicons were digested with restriction enzyme B*fa*I (FspBI; Thermo Fisher Scientific Inc. #ER1761, Waltham, USA). PCR products were incubated for 16 h at 37° C to allow complete digestión and separated by 3% (w/v) agarose gel electrophoresis stained with ethidium bromide at 100 V for 55 min in 0.5x TBE buffer solution. The DNA fragments were visualized by ultraviolet light transilumination (Carestream Gel Logic 212 Pro).

Statistical analysis

Categorical variables were analyzed by Chi-Square or Fisher's exact test. An independent t-test used to examine numeric variables with normal distribution and Mann-Whitney as alternative for data not normally distributed. Deviation of of the genotype frequencies from the Hardy-Weinberg equilibrium (HWE) was assessed by chi-square test. A p-value of less than 0.05 was considered statistically significant.

Results and Discussion

A total of 20 anemia subjects and 52 healthy subjects (control) were eligible for analysis. Characteristics of both groups are shown in Table 1.

Table 1. Subjects characteristic between anemia and control groups

Variables	Anemia (n=20)	Control (n=52)	*p*-value
Age (years)	16.0 {2}	16.0 {2}	0.830*
Hemoglobin (g/dL)	11.6 {1.0}	13.3 {1.2}	0.000*
Hematocrit (%)	35.9 {3.0}	40.2 {2.6}	0.000*
MCV (fL)	74.3 {8.6}	85.1 {3.4}	0.000*
MCH (pg/cell)	23.8 {3.9}	28.5 {2.5}	0.000*
MCHC (g/dL)	31.7 {1.3}	33.3 {1.2}	0.000*
Serum Ferritin (ng/mL)[a]	12.9 ± 12.2	37.1 ± 18.5	0,000†

Data are expressed as mean ± S.D[a] or median {interquartile range (IQR), †Independent Sampel T-test; *Mann-Whitney Test (Wahyuni, 2014).

Twenty anemic subjects were divided into categories of iron deficiency anemia (IDA) and non-iron deficiency anemia (non-IDA) group based on the levels of hemoglobin and serum ferritin levels. Iron deficiency anemia was defined as anemia subjects who had serum ferritin levels < 15.0 ng/mL. Hemoglobin levels, hematocrit levels, all red blood cell indices were not different between two groups. There was a significant difference in serum ferritin levels in both groups (p = 0.002). Serum ferritin levels were lower in subjects in the IDA group compared to the non-IDA group (Table 2).

Table 2. Mean of hemoglobin, hematocrit, all red blood cell indices, serum feritin levels between IDA and non-IDA groups

Variables	IDA (n=13)	Non-IDA (n=7)	*p value*
Hemoglobin/dL)[a]	11.6 {1.2}	11.6 {0.8}	1.000*
Hematocrit (%)	35.3 ± 2.3	35.1 ± 2.1	0.878†
MCV (fL)	75.4 ± 7.0	70.2 ± 10.9	0.207†
MCH (pg/cell) [a]	23.5 {2.7}	22.4 {6.2}	0.500*
MCHC (g/dL)[a]	31.7 {1.8}	32.1 {1.6}	0.551*
Serum ferritin (ng/mL)	5.6 ± 4.0	26.4 ± 10.5	0.002†

Data are expressed as mean ± S.D. or median {interquartile range (IQR)}[a], †Independent Sampel T-test, *Mann-Whitney Test (Wahyuni, 2014).

Genotyping of *FPN1* −1355G/C gene polymorphism found all of the possible genotypes which were CC, CG, and GG. The CC genotype (mutan homozygous) was designated by a single band at 285 bp, the CG genotype by a three band at 285 bp and 255 bp and 30 bp, and GG genotype by a double band at 255 bp and 30 bp. The result for the genotyping is shown in Figure 1.

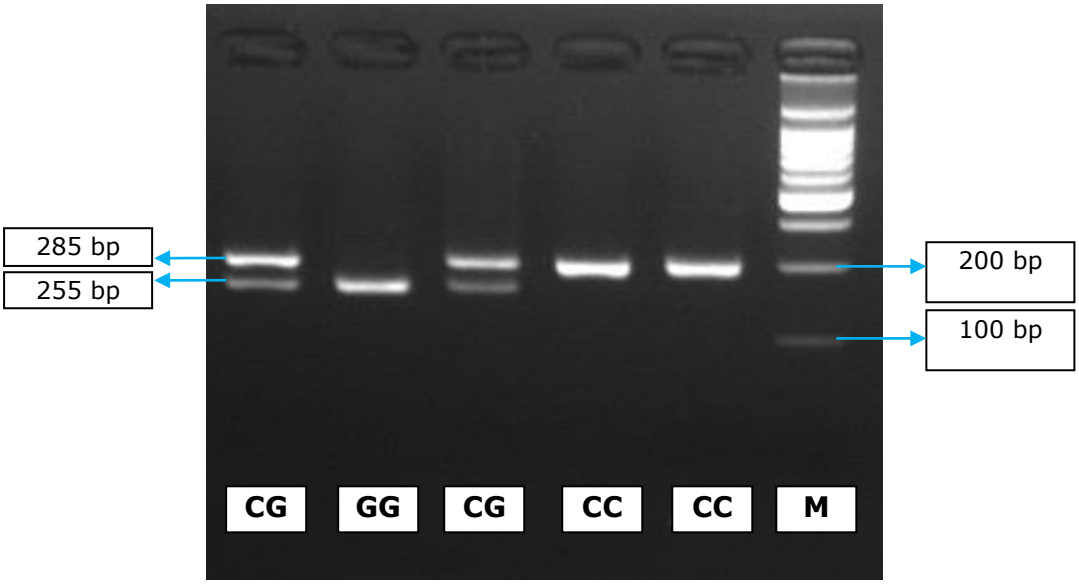

Figure 1. The genotyping result of -1355G/C in *FPN1* gene. M = 100 bp Marker (Geneaid); GG genotype = *wild type* (255 bp, 30 bp (unseen), CG = heterozygous mutant (285 bp, 255 bp and 30 bp (unseen) and CC = homozygous mutant (285 bp) [Wahyuni, 2014].

Genotype and allele frequencies between groups are summarized in Table 3 and Table 4.

Table 3. Genotype frequency of *FPN1* -1355G/C polymorphism between IDA and control groups

		IDA (n=13)	Control (n=52)	*p-value*	OR (95% CI)
Genotypes	CC	5 (38.5%)	19 (36.5%)	0.906*	-
	CG	7 (53.8%)	29 (55.8%)		
	GG	1 (7.7%)	4 (7.7%)		
	CC	5 (38.5%)	19 (36.5%)	1.000*	0.921
	CG+GG	8 (61.5%)	33 (63.5%)		(0.263-3.221)
Allele	C	17 (65.4%)	67 (64.4%)	0.927*	1.043
	G	9 (34.6%)	37 (35.6%)		(0.423-2.571)

Data are expressed as number (%), **Chi-Square Test. OR: Odds Ratio* [Wahyuni, 2014].

Table 4. *FPN1* -1355G/C genotypes and allele distribution between IDA and Non-IDA groups

		IDA (n=13)	Non-IDA (n=7)	*p-value* OR (95% CI)
Genotypes	CC	14 (53.8%)	3 (21.4%)	0.108#
	CG	11 (42.3%)	9 (64.3%)	
	GG	1 (3.8%)	2 (4.3%)	
	CG+CC	12 (92.3%)	7 (100.0%)	0.650* OR = 0.632 (0.448-0.890)
Allele	C	19 (73.1%)	8 (57.3%)	0.249*
	G	7 (26.9%)	6 (42. 9%)	OR = 2.036 (0.518-7.995)

Data are expressed as number (%), # *Chi-Square Test, OR: Odds Ratio*, *Fisher Exact Test (Wahyuni, 2014).

The frequencies of the C and G allele in the IDA group were 65.4% and 34.6%, respectively. Meanwhile, the frequency of the C allele was 64.4% and G allele was 35.6% in the control group. The frequency of CC genotype was higher (38.5%) on the IDA group than the control group (36.5%), although not significantly different (p = 1.000). Based on HWE calculation, this study found that the genotype distributions among cases and control were consistent within HWE (p=0.351). It means that the genotype distribution among subject of this present study had no HWE deviation.

The distribution of genotype frequencies in the IDA group and non-IDA did not differ significantly (p = 0.108). Twelve subjects (92.3%) of the IDA group had C allele. The GG genotype was found only in 1 subject of IDA group and was not found in the non-IDA group.

The independent t-test indicates there was no relationship between allele C with the mean of Hb, MCV, MCH and MCHC (p > 0.05). The mean of serum ferritin levels were lower in subjects carrying C allele in IDA groups (CG and CC) compared to non-IDA group (p = 0.000) (Table 5).

Table 5. The mean difference of hemoglobin levels, hematocrit, all red blood cell indices, serum feritin levels based on genotype between IDA and non-IDA groups

Variables	IDA		Non-IDA		p
	GG (n= 1)	CG+CC (n= 12)	GG (n= 0)	CG+CC (n= 7)	
Hemoglobin (g/dL) [a]	10.6	11.6 (7.5-11.9)	-	11.6 (9.8-11.9)	0.515*
MCV (fL)	77.0	75.3 ± 7.31		70.2 ± 10.9	0.453†
MCH (pg/cell)	24.1	23.4 ± 3.3		22.4 ± 3.7	0.804†
MCHC (g/dL) [a]	31.3	31.7 (25.6-32.6)		32.1 (30.7-33.7)	0.591*
Serum Ferritin (ng/mL)	9.3	5.3 ± 4.0		26.4 ± 10.5	0.000†

Data are mean ± S.D. or median (minimum-maximum)[a] for data not normally distributed, †Independent Sampel T-test, *Mann-Whitney Test (Wahyuni, 2014).

Ferroportin gene has a promoter region or transcription factor binding site (TFBS) bindings that play a role in gene expression at the transcriptional levels. Variations of TFBSs can disrupt the transcription and regulation of gene. The binding of specific transcription factors to gene promoter directly regulate and initiate transcription of a gene. Sequence variation in the promoter gene and will alter identification and binding of transcription factors that ultimately may affect gene expression (Guo & Jamison, 2005).

The in silico examination with the techniques of non-redundant Jaspar CORE database shows that the presence of the variant in the 5'UTR genes will disrupt transcription factors binding sites (TFBSs). This analysis proves that the *FPN1* variant-1355G/C will produce a new TFBSs FOXC1 bound to the iron-regulatory elements (IRE) that persists ferroportin protein translation activity that causes an increase in the export of iron and low ferritin levels in cells (Hallendorf, 2008).

Another study reported the frequency of CC genotype was 50%, CG genotype was 46.2% CG and GG genotype was 3.8% in the population of pregnant women (n = 74). The odds ratios (OR) of the C allele for the incidence of anemia was 1.008 (CI 95%, 0.471-2.156, p = 0.983), whereas the OR for IDA was 1.600 (CI, 95%, 0.296-8.653, p = 0.710). The OR of subjects carrying the C allele were 1.600 and indicates a

risk 1.6 times or 61.5% probability of suffering IDA compared to subjects with allele G (Istiqomah *et al*., 2013).

The C allele as a risk factor IDA was analyzed to assess its correlation with hemoglobin levels and erythrocyte indices. The results showed that there was no correlation between IDA and non-IDA groups of these parameters (p = 0.515). Subjects carrying the C allele in the IDA group had lower serum ferritin levels (5.3 ± 4.0) than non-IDA group (26.4 ± 10.5) (p = 0.000).

The previous study reported that *FPN1* variants may be categorized into two classes: variants that have a gain in function and those that result in a loss of function. Variants that result in a gain of function preserve the ability to activate the iron-response proteins (IRPs) and iron is exported from the cells and ferritin is depleted. Loss of function variants inhibit IRP activation activity and cause only a slight decrease in serum ferritin levels (Hallendorf, 2008). In this study, the frequency of CG and CC genotypes were 92.3% in the IDA group (OR = 0.923, 95% CI, 0.789-1.080, p = 1.000). The OR for the incidence of IDA was 2.036 (95% CI, 0.518-7.995, p = 0.249), while the OR for genotypes carrying C allele (CG and CC) for the occurrence of anemia was 1.583 (95% CI, 0.166-15.094). Based on the OR value, the C allele is a risk factor for iron deficiency anemia. Subjects carrying the C allele had a risk of 2 times or 67.06% probability to experience iron deficiency anemia compared to subjects with the G allele. Thus, our results indicate that the presence of variability -1355G/C of *FPN1* gene may increase the risk of iron deficiency anemia in adolescent girls (OR = 2.036, 95% CI, 0.518-7.995, p = 0.249).

Conclusions

This study suggests that the C allele of *FPN1* −1355G/C gene polymorphism is a risk factor for iron deficiency anemia among adolescent girls. Subjects carrying the C allele in the IDA group had lower serum ferritin levels than non-IDA group.

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The Determination of Effective Dose For Patients Undergoing Computed Tomography Cardiac Angiography Procedure (CTCA)

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Abstract

Heart disease is often regarded as the top rank killer of Indonesian society regardless of age and gender. The increasing of patient heart disease is also followed by the increasing of heart desease diagnostic tests and therapies in many hospitals. Generally, the patient will be given diagnostic radiographic test called angiography. One procedure that can be used for cardiac angiography is computed tomography (CT). CT procedure, iodine dye is injected into the blood vessels intervene and do not require a catheter, then CT medium will record X-ray images from various side to produce images of blood vessels. Its provided image better than to conventional angiography. However, the impact of this procedure is that patients received higher doses of radiation. Therefore, this study was conducted to measure the levels of the effective dose received by patients undergoing cardiac CT angiography procedures in one hospital in Riau. The effectiveness dose is obtained based on the dose-length product (DLP). The results of the study found only 5 patients who was given cardiac angiography CT procedure during a 6-month study. They show that the value of the effective dose are as follows: 27.17 mSv; 27.59 mSv; 24,19mSv; 26.05 mSv and 26.76 mSv. The effective dose's mean score is 25.54 mSv.

Key words: Effective Dose, Cardiac Angiography, CT Scan, Heart

Introduction

Heart disease is often regarded as the top rank killer of Indonesian society regardless of age and gender. Based on the information of Republika Online 25 September 2013, Dr. Rifnaldy Sp. Jp as Physician Cardiologist of Hospital Sriwijaya Siloam,Palembang said the mortality rate of people with heart disease

in Indonesia is still very high. He also added that based on data from various sources, the death rate for coronary heart patients in the country reached 7.6 million people per year (Mardiani, 2013).

Based on the phenomenon,the diagnostic tests and therapies for heart disease are increased in many hospitals. Generally, the patient will be given diagnostic radiographic test called angiography. Angiography is a technique that uses the light image capture and provides a visual representation of blood vessels, arteries and nerves on the heart. One procedure that can be used for cardiac angiography is computing tomography (CT)

CT procedure, iodine dye is injected into the blood vessels intervene and do not require a catheter, then CT medium will record X-ray images from various side to produce images of blood vessels. it provided image better than to conventional angiography (Gilbert et al. 2005). Cardiac CT refers to the image of the heart and coronary arteries using Computer Tomography Scanner. CT scanner will obtain the same information as invasive coronary angiography (coronary angiogram) without using a catheter. Cardiac catheterization aimed to evaluate the anatomy of the coronary arteries which is a technique that is recognized internationally as the best and most accurate technique to detect a blockage in the coronary blood vessels (Hollinger and Mitinach, 2005). Computing tomography cardiac angiography (CTCA) examine heart arteries and how the work of the heart. But this test is different from routine CT test because it is able to provide a more detailed picture within 5 to 10 seconds (Department of Radiology, 2006).

However, patients who are given CT cardiac angiography procedure received higher doses of radiation (Duncan et al ., 2005). Therefore, this study was conducted to measure the levels of the effective dose received by patients undergoing cardiac CT angiography procedures in one hospital in Pekanbaru. The effectiveness dose was obtained based on the dose - length product (DLP).

Materials and Methods

Data was collected to determine the levels of the effective dose received by patients undergoing cardiac CT angiography procedures in one hospital in Pekanbaru, Riau. Effective dose is obtained by multiplying the value of the dose-length-product (DLP) with a factor of conversion factor exchange. The data was collected for 6 months from January to June 2015.

There were two main parameters were used in this study; computed-tomographic-dose-index (CTDI) and the results of long-dos (dose-length-product, DLP). These parameters were used for measure the less effective dose.

Computed Tomography Dose Index (CTDI)

CTDI is a measure such as dos machine CT representing dos location exposed to the light in an induces. The different CTDI value between each CT medium and units of CT is the mGy.

Dose-Length-Product (DLP)

Dose-length product (DLP) was used to predict whole dos medium for measuring complete CT medium. Unit for DLP is mGy.cm.

$$\text{DLP} = \Sigma_{i=1}^{N} (CTDI_{vol}) . L_i$$

Where i represents each imbasan CT and Li also represents the length induced patients

Measuring Effective Dose

DLP mean value was used for the next process is that in the calculation of the mean effective dose, Deff. Calculation for cardiac CT angiography procedure is to use the following equation:

$$\overline{x}\, D_{\text{eff}} = \overline{x}_{\text{DPL}} \text{ X K}$$

Where k is a conversion factor. This procedures involve the heart, conversion factors for the chest is 0.017 mSv / mGy.cm (ICRP 1991).

Results and Discussion

In this study, data cover age, weight, height, CTDI and DLP values taken from one hospital in Pekanbaru. The number of patients who are found during the 6 months of the study are as many as five patients. The small number of patients who are found because the study is limited only to patients with heart and not a lot of heart patients who got the procedure of computing tomography Cardiac Angiography (CTCA) and it has the limited of time. In Pekanbaru, there are only two hospitals that serve the procedure CTCA. The data of each patient is classified based on the BMI (Body Mass Index) of patients, namely 18-24 and 25-29 kg / m2.

DLP Mean Value and Effective Dose

Data was classified according to the BMI of patients due to get the whole mean dose and 3rd quartile for dose length product (DLP) and the mean of effective dose. DLP is a parameter to use in calculating the mean of effective dose for CT angiography cardiac procedures. The mean value of the effective dose has been obtained by using Equation 3.2 by multiplying the mean value with a factor DLP exchanger. DLP mean and the mean of effective dose is shown in Table 5.1 below. Where it is found that the mean number of DLP is 1502.43 mGy.cm and the total of the mean effective dose is 25.54 mSv.

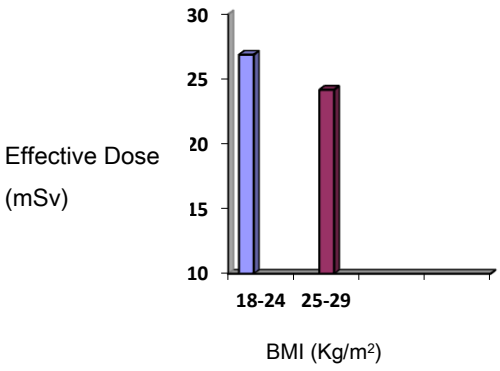
Table 1. Mean of *dose length product* (DLP) and mean of effective dose for CT Angiography Cardiac Procedure.

BMI (kg/m^2)	Total of Patient	Mean of DLP (mGy.cm)	Effective Dose (mSv)
18-24	4	1581.85	26.89
25-29	1	1423.01	24.19
Total	5	1502.43	25.54

The relationship of BMI with Effective Dose

Body - mass index (BMI) is a the obesity of people who determine the health of a person's based on body weight on height ratio (Nutrition Insights, 2000). The over of BMI represents of the body overweight. The Different body tissues absorb the different radiation doses and effective dose assessed based on the relative biological effectiveness (RBE) for the radiation used and the difference radiosensitiviti every organ and tissue. Type a scanner and scan protocol was an important factor in determining the radiation dose that will be given to each patient.

In this study, the difference in the mean of effective dose for each BMI group was small for cardiac CT angiography procedure . This condition indicated that a patient BMI changes did not give a significant impact on the change of the effective dose mean the patient received.



Conclusions

Based on the research, it could be concluded that based on the data that has been collected during six months there were 5 patients who were given CT cardiac angiography procedure . Based on the DLP value , it could be determined the value of the effective dose. The data show that the mean number of DLP was 1502.43 mGy.cm and the total of effective dose mean was 25.54 mSv

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The Assosiation of Hemodialysis Compliance and The Quality of Life of Chronic Kidney Disease Patients at Cut Meutia General Hospital, North Aceh 2015

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Abstract

Chronic kidney disease (CKD) is a progressive damage of kidney function that is irreversible. Renal replecament therapy such as hemodialysis (HD) is a therapy in CKD patients. Patients compliance in getting HD treatment is a very important aspect for making this therapy success. Noncompliance can cause complications that can interfere quality of life of patients. The purposes of the reseacrh were; 1) to analyze the relationship between HD compliance with the quality of life CKD patients. 2) to analyze the relationship between HD compliance and the quality of life of CKD patients. The research was designed by cross-sectional study with sampling technique using total sampling. The sample were 40 HD patients. Data were collected by interviewing based on the WHOQOL BREF questionnairre. All of the obtained data were statistically analyzed by the chi-square test. CKD patients who were getting HD treatment with 16-40 years of age were 11 people (27.5%), 41-60 years old were 24 persons (60%), and > 60 years old were 5 person (12.5%) with the highest was 73 years old and the lowest was 21 years old. Most gender is male were 28 people (70%) and female were 12 people (30%). There were 27 compliance patients (67.5%) and non-compliance CKD patients (32.5%) who were getting HD treatment. Quality of life of most CKD patients who were getting HD treatment was moderate type, amount 22 people (55,5%), while the good quality of life amount 10 people (25%), and poor quality of life for as many as 8 people (20%). This study was concluded that there was association between HD compliance and quality of life of patients with CKD who were getting HD treatment at Cut Meutia General Hospital, North Aceh in 2015.

Key words: Chronic kidney disease, hemodialysis, HD compliance, quality of life, WHOQOL BREF questionnairre

Introduction

Chronic renal disease is a kidney damage that occurs more than 3 months, in the form of structural or functional abnormalities, with or without Glomerular Filtration Rate (GFR) decreasing, with pathology abnormalities manifestations and kidney abnormalities sign, including the composition of blood or urine abnormalities or the abnormalities in imaging tests (Sudoyo, Setiyohadi, Alwi, Simadibrata & Setiati, 2009).

Based on the results of Basic Medical Research 2013 in Indonesia, the highest prevalence of Chronic Kidney Disease (CKD) was Central Sulawesi (0.5%), then followed by Aceh, Gorontalo, and North Sulawesi (0.4% respectively). While East Nusa Tenggara, South Sulawesi, Lampung, West Java, Central Java, Yogyakarta, and East Java were 0.3% respectively.

The number of CKD patients who are getting Hemodyalisis (HD) treatment in Indonesia are more increasing. Therefore, quality of life assesment is becoming increasingly recognized as a part of the measuring results (PERNEFRI, 2014). Variety of factors can affect the quality of life of CKD patients who are getting HD, one of which is the compliance of patients in HD. The compliance of HD patients is a very important aspect for the therapy success.

Quality of life assesment is assessed by World Health Organization Quality of Life BREF (WHOQOL BREF), which is a valid questionnaire to measure four quality of life dimensions: physical health, psychological health, social relationships, and environmental health. It is important in providing information to make decisions in terms of treatment, observed side effects emergence, and also as interventions guideline to improve quality of life better (Sinulingga, 2013).

Materials and Methods

This type of research was descriptive analytic research with cross sectional approach. Recruitment and study procedures were carried out at Hemodialysis Unit of Cut Meutia General Hospital, North Aceh on May 2014 until February 2015.

Fifty eight (58) CKD patients who were getting HD treatment at HD unit of Cut Meutia General Hospital, North Aceh and were recorded until October 2014. All patients were above 18 years of age, wanted to be respondents, and have been getting HD treatment for at least 3 months and 2 times a week. Patients who have been interviewed during the previous HD schedule and/or were loss of consciousness then unable to participate in the study were excluded. There are 40 patients whom were obtained by total sampling technique met criteria of exclusion and inclusion. Sixteen patients have been confirmed dead and 2 people did not want to become respondents. Baseline demographics, including age, gender, HD compliance, and quality of life were collected.

This study used two research variables: Independent and dependent variables. Independent variable was HD compliance and dependent variable was quality of life of CKD patients who were getting HD treatment at HD unit of Cut Meutia General Hospital, North Aceh in 2015. HD compliance measuring variables are categorized into 2 categories: compliance and non compliance. Quality of life variables were measured using a questionnaire that consisted 26 questions and each question used different response categories. Sources of data in this study were obtained from the primary data based on guided interviews results by researchers questionnaires to the patients with CKD who were getting HD treatment at HD unit of Cut Meutia General Hospital, North Aceh in 2015. Researcher used WHOQOL BREF questionnaire as study instrument. Firstly, researcher established respondents who met the inclusion and exclusion criteria. Then explained the purpose of the study to the selected respondents. After that, researcher asked the respondents consent to participate in this study. Next, researcher interviewed respondents according to the questions on the questionnaire. Finally, researcher collected data from questionnaire results. Data that have been collected then were processed with the following steps: editing, coding, entry, cleaning, tabulating, and computering. This study used univariate and bivariate analyzes. Statistical analysis was calculated using Chi Square test with a confidence level of 95% (α = 0.05%).

Results and Discussion

Table 1 showed the distribution of age of CKD was between 41-60 years of age which amount 24 people (60%) and at least age is > 60 years which amount 5 people (12.5%). This is similar to research conducted Vincent (2012) who has found that the most age group of patients with CKD undergoing HD at Adam Malik Hospital was between 41-50 years (46.8%). According to the IRR in 2011, patients with CKD was mostly in the age group 45-54 years was 27%.

Table 1. Age frequency distribution of CKD patients who were getting HD treatment at Cut Meutia General Hospital, North Aceh in 2015.

Categories	N	%
16-40 years of age	11	27.5
41-60 years of age	24	60
>60 years of age	5	12.5
Total	40	100

Table 2 shows the most gender of CKD patients was men which amount 28 people (70%) compared to women which amount 12 people (30%). This is similar to research conducted by Fadil (2015) who stated that CKD patients who were getting HD treatment was more on men which amount 30 people (60%) than female patients. IRR report in 2011 stated that CKD patients HD who were getting HD treatment in Indonesia from 2007-2011 was more annually exceeds on male patients than female patients.

Table 2. Gender frequency distribution of CKD patients who were getting HD treatment at Cut Meutia General Hospital, North Aceh in 2015.

Categories	N	%
Men	28	70
Women	12	30
Total	40	100

Table 3 shows the most HD compliance of CKD patients. There was 27 people (67.5%) who were compliance to run HD and 13 people (32.5%) who were non-compliance to run HD. Respondents said that they never gave up or stopped this HD therapy since they were first diagnosed as CKD and should undergo HD therapy. Although at the first, there were some respondents said that they felt scared and refused the therapy it because they did not know what HD was, but after the passage of time they can accept this condition because they believe only HD treatment can make them survive.

Table 3. HD compliance frequency distribution of CKD patients who were getting HD treatment at Cut Meutia General Hospital, North Aceh in 2015.

Categories	N	%
Compliance	27	67,5
Non- compliance	13	32,5
Total	40	100

Table 4. Quality of life frequency distribution of CKD patients who were getting HD treatment at Cut Meutia General Hospital, North Aceh in 2015.

Categories	N	%
Good	10	25
Moderate	22	55
Bad	8	20
Total	40	100

Table 4 showed that patients with good quqlity of life was 10 people (25%), moderate quality of life was 22 people (55%) and bad quality of life was 8 people (20%) who had good quality of life were 10 people (25%), moderate quality of life were 22 people (55%), and bad quality of life were 8 people (20%).

Bivariate analysis in this study aims to determine the relationship between HD compliance with quality of life of CKD patients. Table 5 shows there were 27 people (67.5%) was adherent to do HD among which there were 9 people (33.3%) who had good quality of life. 17 people (63%) had moderate quality of life, and 1 people (3.7%) had bad quality of life Mean while, in non- compliance patients group, there were 1 people had good quality of life, 5 people (38,5%) had moderate quality of life and 7 (53,8%) had bad

quality of life. Results of statistical test Chi Square showed that there is a relationship between compliance with the HD quality of life of patients with CKD with a p value of 0.001. Based on the significant level of p = 0.001> α = 0.05, which means that Ho refused meaning that there is a relationship between compliance with the HD quality of life of patients with CKD at RSU Cut Meutia North Aceh district in 2015.

Table 5. Relationship between HD compliance and quality of life of CKD patients

HD Compliance	Quality of Life						Total		*P* value
	Good		Moderate		Bad				
	n	%	n	%	n	%	n	%	
Adherent	9	33,3	17	63,0	1	3,7	27	100	0,001
Non-adherent	1	7,7	5	38,5	7	53,8	13	100	
Total	10	25	22	55	8	20	40	100	

Based on the table above, it can be seen from 40 patients with CKD, there are 27 people (67.5%) were compliance to do HD among which there are 9 people (33.3%) who had good quality of life, 17 people (63%) had moderate quality of life, and 1 people (3.7%) had bad quality of life whereas non- compliance patients in the running HD amounted to 13 people (32.5%) of them had 1 people (7.7%) which had good quality of live, 5 people (38.5%) had moderate quality of life and 7 (53.8%) had bad quality of life. Chi Square test showed there was a relationship between HD compliance and quality of life of CKD patients (p value =0.001). Based on the significance level of p = 0.001> α = 0.05, it stated there was a relationship between HD compliance and quality of life of patients CKD patients at Cut Meutia General Hospital, North Aceh in 2015.

CKD patients compliance is a very important aspect for making the therapy success. Non-compliance impacts the overwhelming negative effects for patients, as can be experienced many complications of diseases that interfere with quality of life of patients, physical, psychological, or social disturbances, fatigue or tiredness.

Conclusions

There was a significant association between HD compliance with quality of life of CKD patients who were getting HD treatment at Cut Meutia General Hospital, North Aceh in 2015.

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Social Autopsy on Maternal Mortality of Ethnic Acehenese

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Abstract

Aceh Province is not yet able to realize and reach the fifth goal of Millennium Development Goals (MDGs) - to promote the maternal health. In 2014, the rate of the maternal mortality still had no tendency to descend, 148 cases occurred in this year, and 153 cases in the previous year. North Aceh Regency had the highest rate of the maternal mortality compared to those of the other 23 regencies in Aceh Province, and compared to the case fluctuation in the previous years. The purpose of the research is to explore variety of determinants that caused the maternal mortality in Aceh Province. The research designed was the mixed method in using the data of maternal mortality recorded in Aceh Province in 2014, and to explore various determinants that contributed to the maternal mortality in one of regencies which underwent the highest rate of the maternal mortality. The main cause of the mortality was the bleeding and pre-eclampsia and eclampsia. The contributory factors were the domicile is too sparse to reach the healthcare units (PONED and PONEK Hospitals), and the topography. These factors contributed to the delay to reach the health-care facilities and medical treatment. Negligence on complication and delayed medical decision process were caused by the social-economic status and the disadvantageous cultural practice. The result showed that slow reduction of maternal mortality in Aceh Province was caused by the deterred access to healthcare units and deferred/delayed medical decision process.

Key words: Social autopsy, maternal mortality, ethnic Acehnese.

Introduction

Many countries included Indonesia is still not able to reach the target of Millennium Development Goals (MDGs), especial the fifth goal, that is to promote the maternal medical care (WHO, 2014). The target set by MDGs is to decrease to three fourth of maternal mortality rate in the period of 1990 to 2015, that is to reduce the mortality from 400 cases in 1990 to 100 cases per 100.000 live births in 2015 (WHO, 2014).

The record revealed that the maternal mortality rate in 2013 was 210 cases, the same rate also occurred in the developing countries, where the maternal mortality rate was still at the level of 240 cases (WHO, 2014)

The maternal mortality in the developing countries were 14 times higher than those in the developed countries, reaching 230 cases. The estimate of the maternal mortality risk in the high income countries was 1 out of 3,400 compared to the low income countries that rated 1 out of 52 (WHO, 2014). Indonesia is one of the countries in South East Asia that set the target to reduce the maternal mortality from 390 in 1991 to 102 in 2015 (Stalker, 2008; Bappenas, 2010). Indonesia is being heavily challenged to face the increment of the maternal mortality which hiked at 359 based on the Indonesian Health Demographic Survey in 2012, where the previous survey revealed that the maternal mortality could be downgraded to 228 per100.000 live births (BPS, 2007; 2012). MDGs target for 2015 is still hard to reach by Indonesia, for the data issued by the World Health Statistic in 2014 revealed that the maternal mortality in Indonesia was still at 190 per 100.000 live births (WHO, 2014).

Maternal mortality is one of main measuring rods in assessing the success of healthcare system in a country; therefore, this challenge requires overall improvement in the mother and infant healthcare system both in urban and rural areas (Trisnantoro, 2014). The medical study on maternal mortality had been conducted by many experts (Walraven, dkk, 2000; Al Seroure, dkk, 2009), then it was found that the non-medic aspects had played a vital role in caring maternal health (Waisha, dkk, 2012).

Some previous researches found the specific things in the culture adhered by the people living in the certain area concerning the death (Rahman, dkk, 2014; Nyuki, dkk, 2014). The research on the maternal mortality conducted in Bangladesh studied the contributory factors of socio-economic, culture, and healthcare system toward the high rate of maternal mortality suffering from *leismaniasis visceral*, a type of desease called by the people living in South Asia as *Kala-azar* or *black fever* (Rahman, et al., 2014).

In line with the target set by MDGs, especially the fifth goal, various literatures had been written about the determinants of socio-economic toward the maternal mortality (Bhalotra, 2010), highlighting the relationship between poverty and livelihood. Blass, et.al., Wilkinson & Marmot emphasize the significance of the social determinant on the health (Blass, dkk, 2011; Wilkinson & Marmot, 2003) .

McCarthy & Maine (1992) classify the determinants as *contexstual determinant*, *intermediate determinant* and *proximate determinant*. Thaddeus & Maine study the stages of delay (Thaddeus & Maine, 1994). Winkelman points out the relationship between culture and the health (Winkelman, 2009). Based on the theories and concept mentioned above that the determinants of the maternal mortality is a complex thing and multi factors.

Several previous researches strengthened the argument on the multi factors as the cause of maternal mortality (Gil_Gonzalez, dkk, 2006). Tanzin found that 50 percent of the delay was caused by the unability to pay the the fee for medical treatment and transportation (Tanzin, dkk, 2013). Cham presents several reasons of the delay, some of them are ignoring the severity of complication, cultural belief, and bad experience toward healthcare system (Cham, dkk, 2005).

Aceh as one of the provinces in Indonesia has health problem and is categorized as Health Problem Area. Until today, the trend to reduce the maternal mortality still did not fulfill the expectation. It occurred 148 cases in 2014, while 153 cases happened in the previous year. Based on the literature and empirical studies, the researcher found that some socio-cultural phenomena related to reproduction were assumed as the factors that contributed to the maternal mortality, especially the woman disadvantage.

Materials and Methods

This mixed method explored variety of information about socio-cultural phenomena on the healthcare system, which had affected the maternal mortality on ethnic Acehnese (Creswell, 2003; 2004; 2007; Tashakkori & Teddlie, 1998). The research, which took more than one year, was conducted in North Aceh Regency, one of the regencies/municipalities among 23 other regencies in Aceh Province. This research was an attempt to discover the relationship between the contextual determinant and the maternal mortality in the Acehnese cultural context; therefore, the selected data sources were the informants who were familiar with the research. The informants were selected by using maximum variation approach in order to have the reliable and detailed description on each case, have the uniqueness of each case, and have the patterns from the different cases (Poerwandari, 2001). The informants of this research were the persons or parties who know better the history of the maternal mortality.

Result and Discussion

Description of Mortality Cases

Maternal mortality cases in 2014 traced in Kabupaten Aceh Utara (North Aceh Regency) amounted to 28 from a total of 29 pregnancies, deliveries and post-delivery period that ended in fatalities. Cases that were executed were because they did not meet the inclusive requitements. Exploration of the causes of maternal mortalities showed they were dominantly caused by direct obstetric causes (71%). Of the 20 maternal mortalities, 7 cases (25%) were due to bleeding, 6 cases (21%) due to pre-eclampsia and eclampsia, 4 cases (14%) due to infaction; jammed partus, emboli of foetal membrance liquid and anathesis complication each representing 1 case (3.5%). While indirect causes occured in 8 cases (29%); anemia 2 cases, suspected TB infection 2 cases, diseases accompanying pregancy such as severe headache, syanosis and tachycardia, and abdoment and cholic febricity, the causes of which were not known.

The presentation of the above data indicates that there was inclination of uncontagious disease had begun to oncrease as an indirect cause of maternal mortality, in addition to TB infection problem and

anemia which had not been utterly purged. Based on the description mortality causes, bleeding and pre-eclampsia and eclampsia complications still contributes to the main causes of maternal mortalities in Aceh Utara Regency. In the analysis of specific causes of maternal mortality cases in the world, there found a tendency of direct causes to be more dominant both in developed countries and in developing countries like those in Asia, Africa and Latin America. In Africa, it is estimated 39.9% and in Asia 30% of maternal mortalities were caused by bleeding. While in Latin America and Caribbean, various hypertension disturbences during pregnency were the main factors responsible for the increased in marternal mortality rate (27.7%). If compared to the developed counstries, the highest mortality risk resulting from sepsis was in Africa, amounting to 2.71 times, in Asia 1.91 times, while in Latin America and Caribbean 2.06 times (Ahmed, dkk, 2010).

Along with findings in this study, which represents that bleeding and pre-eclampsia were the dominant causes in maternal mortality rate in Aceh Utara Regency, it is also furtherly important to analyze the reasons why the failures in the various interventions to prevent maternal mortalities tended to repeat.

This study found that in a number of cases, negligence of complication and the slowness factor turned to be something most responsible for the failures of a variety of programs and internventions.

Negligence on Complication

A number of mortality cases have been ditected, showing there were complications during pregnancy such as pre-eclampsia, anemia, and records for infectious and uninfectious diseases. Mortalities due to pre-eclampsia remained difficult to be reduced because the local culture tends to perceive initial symptoms of pre-eclampsia like udem (abnormal swelling) as a pregnancy physiology. In the local community, the symptom of udem, which is called 'basai' in the legs and face is perceived as an initial sign of the process of delivery, and it is their belief that three times of udem will soon be followed by delivery process.

Whereas eclampsia attacks like cramp and consciousness reduction are perceived as the result of being possessed by evil spirit, the local community called it *"jitamöng burông"*. In this condition, they are firmly apposed to be injected. Whereas the theraphy recommended by WHO is based on evidence (evidence based) and the best evication was intervention by providing the patient with Magnisium sulfat (Mso4) through injection.

The negligence of complication because of the local cultural perception reulted in the delay to receive treatment, moreover upon arriving in hospital the kidneys failed, thus the hospital was unable to save the mother's life. The delay of treatment was the result of the delay of arriving in hospital, and this was due to the slow decision process taken by the family wether to be treated in hospital or not, upon arriving in hospital the patient's condition was thus too late for proper treatment.

Deferment

First stage of deferment was the delay in decision making process. Several initial complication symptoms were neglected, a sign perceived as physiological and not of great concern. Due to the family's experience in the past when such condition was successfully overcome by the family, thus making them

reluctant to refer the patient to hospital immediately. In such condition, the woman who is suffering has little role in the decision making process. The environment would regard an ailing person is not the right person to make a decision. Local culture very much holds the deliberation tradition, and in this regard it is believed that those who should play key role in decision making are male members of the husband's family. Ironic as it was, some emergency conditions occurred just when the dominant decision makers of the family were not at home; the family should wait, resulting in the deferment of decision.

Second stage of deferment occurred due to the transportation infrastructure, public bus, the distance to be covered and the geographical condition remain part of the hindrance. Several Puskesmas PONED (Basic Emergency Obstetric Care/ EmOC) has not yet met minimal standard services, thus forcing the emergency cases to be taken to referral hospital at Regency level (Comprehensif Emergency Obstertic Care), which situated approximately 45-50 km away and all referral hospitals are situated beyond Aceh Utara Regency, in Lhokseumawe city. Several of these referral hospitals also give emergency services to obstretric emergency cases in Lhokseumawe city area and Aceh Utara Regency. The deferment as such was also caused by the weakness in the information management system.

The third stage of deferment was the delay in receiving treatment to the case. At this stage the factor contributing to the deferment was the fact that the ratio of skilled medical personnel is still very limited. Their relatively small number should treat cases from the two areas at 8 referral hospitals in Lhokseumawe city. The lack of supplies essential medicines and blood reserve would increase mortality risk ever more. Case management by less competent medical personnel was also a problem that could worsen the situation. Several cases where patients left the hospital before the management had allowed them to, only because they believed the ailment requred only mantra or prayers; called *rajah*.

Contributing factors were women's relatively low educational status (Bappeda & Badan, 2014), only 14% graduated higher education (Senior High School and Higher Education), most of them were farmers who help support their families. As muslims Acehnese ethnic women highly estime that 'men are leader over women', in every aspect of life. In the context of obstetric emergency that requires accurate and speed decision, 'waiting situation' is a factor that can increase the deferment risk. Treatment of cases mostly by midwives with limited competence and facilities would lead obstetric emergency condition to be referred to Regency Referral Hospital. A number of cases indicated a delay of refering to a referral hospital at the regency level met a hindrance due to the absence of the husband at home. The accompanying family members who happened to be mostly women who did not have the capacity to make a decision because according to the local culture decision maker must be men. Social culture status and the incompetence turned to be a factor that contributed to maternal mortalities.

Conclusion

The tendency of maternal mortalities dominantly occurred in areas with Acehnese ethnic population, one of which was Aceh Utara Regency. Dominant causes of maternal mortalities were bleeding, pre-

eclampsia and eclampsia. Factors that contributed to such condition were the breadth of an area and geographical conditions, the reach to Regency Referral Hospital and the low quality of Health Service Center at Kecamatan (District) resulted in the delay to arrive at medical facilities at regency or provincial referral levels for immediate treatment. The negligence of complication and the delay in decision making process was influenced by socio-economic status and disadvantageous cultural practices. The slowness in the reduction of maternal mortality cases in Aceh Province was the result of access hindrances and the deferment in decision making process.

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Growth Responses And Yield Of Local And New Superior Paddy Varieties In Different Irradiation Intensity

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Abstract

This study was determined on growth response and yield of local and new superior paddy varieties in different irradiation intensity. Research was done on November 2014 - March 2015 in Research Institute for Agricultural Technology (BPTP), Pasar Miring village, Deli Serdang district, North Sumatra State. A filed experiment was carry out using split plot design with main plot paddy varieties (Ramos, Kuku Balam, Mekongga and Inpari-4) and different irradiation intensity (100%, 75% and 50%) as the subplot. The result showed that with increase in plant height, tillers/hill, tillers productive, weight of 1000 grains and yield following the high irradiation intensity. However, as compare between local variety (Ramos and Kuku Balam) and new superior variety (Mekongga and Inpari-4) showed that plant height increase in local variety but decrease in new superior variety was significantly affected by different irradiation intensity. Unlike variety new superior variety (Mekongga and Inpari-4) which higher in yield as well as local variety (Ramos and Kuku Balam) was significant, respectively. Tillers/hill, tillers productive and weight of 1000 grains were insignificantly different both for two varieties (local and new superior). The result suggests that new superior variety was better than local variety in yield under different irradiation intensity.

Key words: paddy, growth, yield, local and new superior variety, irradiation intensity

Introduction

Rice (Oryza sativa L.) is a very important food crop and a main food in developing countries, including Indonesia. Increasing of population will cause food insecurity, which affect many aspects of life (Ramli, 2012). Rice is a plant belonging aquatic plants (water plant) that grows on the land continuously flooded either naturally on marshland or intentional inundation in paddy soil. Rice can also be grown on dry land rainfall will be sufficient for water plant (H Siregar, 1987).

Sunlight gives various influences on plant growth, in addition to providing a source of energy for photosynthesis. The absence of light will affect the physiological status of the plant tissue. Carbohydrate content will be reduced at low light intensity or darkness. Changes in hormone levels endogenis or other

physiological components can be affected by changes in light intensity, duration or quality of light. This influence may occur in plants elders or culture at a certain stage (Yuliarti, 2010).

Local yielding rice have the advantage of very good taste, fluffier and scented, have a high selling price (Saheda, 2008). The new superior rice / hybrid has genetic traits like sturdy stem, panicle length and dense, short life of 110-145 days, has a number of chicks that much, broad leaves dark green, high yield of 6-12 tonnes / ha. To get maximum yield, rice hybrid varieties to be planted in fertile soil, nutrients must be available, sufficient irrigation, integrated pest management and crop management must be done well.

Knowing the growth response and the yield of some local varieties and new superior to variations in the intensity of radiation is the purpose of this study, which will be used as information material applied study (Applied research) for all those who need to do the cultivation of rice in low light intensity.

Materials and Methods

This rescared activities has been carried out at the Agricultural Research and Development, Institute for Agricultural Technology (BPTP), Pasar Miring, Deli Serdang, North Sumatra. The research was conducted from November 2014 to March 2015, at the rice area of 20 x 20 m are given shade paranet 25% and 50%. Varieties tested Kuku Balam, Ramos, Mekongga, Inpari-4.

The method used separated plot, disign (RPT) factoral by two factors, namely: a. Shade (N), as the main plot N0 = without shade (intensity of direct sunlight 100%) N1 = paranet 25% (The intensity of the sunlight receiver 75%) N2 = paranet 50% (The intensity of the sunlight receiver 50%) b.Varietas rice (V), as subplots V1: Kuku Balam (Local Superior) V2: Ramos (Local Superior) V3: Mekongga (New Superior) V4: Inpari 4 (New Superior).

Observations were made on plant height (cm) starts after a 10-day-old plants to flowering plants, 2 twice a week (Dahlan, 2011). Number of tillers per hill, ranging from the age of 30 days after planting, performed 15 days till the age of 60 days after planting (Kaderi H, 2004). Rice productive tiller number is calculated based on the number of tillers produce panicles of rice plants and grains, conducted one week before harvest (Kaderi H, 2004). Grain weight of 1000 seeds (g) were obtained from the plots that have been dried to a moisture content of 14% by weigh as much as 1000 pithy grain seeds (Sham, A, 2001). The yield of grain per plot (kg / plot) and yield per hectare (t / ha) by weighing all the weight of grain yield per plot and converted into ha (Senewe, 2011).

Result and Discussion

Plant height

Based on the analysis of variance (ANOVA) with Separated plot design (RPT), showed that some of the growth response of local and high-yielding rice vareities new superior effectd on rice plant height parameter age 2 MST. Further test results Duncan with significance level of 5% shows that in some varieties gave significantly ducan different results, while giving shade and their interaction had no significant results. In Table 1 are presented the average height of rice plants age 2 MST with some varieties and notation Duncan test results.

Table 1. Mean High Rice Age 2 MST with some local rice varieties and New Superior and Variations of Intensity Radiation (Shade) (cm).

AP/PU	N_0	N_1	N_2	TOTAL
V_1	50.28	51.14	56.7	52.70a
V_2	48.88	51.66	50.16	50.23a
V_3	29.23	29.38	30.48	29.7 b
V_4	31.78	33.03	32.08	32.3 b
TOTAL	40.04	41.30	42.35	164.94

Note: Mark followed by the same letter are not in the same column differ significantly according to the level of 5% DMRT

Table 1 indicate that the variety has the highest plant height shown in V1 (52.70 cm) were significantly different when compared to V3 (29.7 cm) and V4 (32.3cm), but not significant with V2 (50.23 cm). In observation of high rice plants age 4 MST after averaging different according to Duncan test at 5% significance level indicates that the growth response of some rice vareities of new local superior and superior to variations in the intensity of the radiation gives a significantly different effect. While the interaction between the two treatments showed no significant results.

The highest Plants ware found in several local varieties and new superior contained in V1 (varieties Kuku Balam), namely (112 489 cm). This result is suspected of plant varieties that can adaptacced to the environment that was not the place of the original. As explained by Somaatmadja (1995) that said that a variety can grow well in the area of deplovment, with a high and stable yield, has a high economic value, socially acceptable and sustainable.

The number of tillers/hill

Table 2. Mean Number of tillers rice age 4 MST with some local rice varieties and new improved variation of intensity of radiation (shade)

AP/PU	N_0	N_1	N_2	TOTAL
V_1	15.86	10.63	8.5	35
V_2	15.56	9.9	8.46	33.93
V_3	15.13	8.46	7.03	30.63
V_4	14.2	8.93	7.63	30.76
TOTAL	15.19 a	9.48 b	7.90 c	130.33

Note: Mark followed by the same letter are not in the same row significantly different according to the level of 5% DMRT

Based on the analysis of variance (ANOVA) Separated plot design, showed that some local rice varieties and new superior of the intensity of the radiation (shade) affects parameter tiller number of rice plants aged 4 and 6 MST. Further test results with significance level of 5% shows that variations in the intensity of the radiation (shade) gave significantly different results. But in some local rice varieties and new

improved and the interaction between the two treatments provide no significant effect. Table 2 showed the data on the average number of tillers of rice plants age 4 MST, each of variations in the intensity of the radiation (shade), the following notation according to the average of the results of different test Duncan methods. The variation of the intensity of irradiation (shade) where the highest tiller shown in N0 (15:19 tillers) were significantly different when compared with N1 (9:48 tillers) and N2 (7.90 tillers).
By using the technique of regression and correlation analysis, regression equation of Y = 14.50-0.145x with r = 0.903.

Number of Tillers Productive

Based on the analysis of variance (ANOVA) Separated plot design, showed that some local rice varieties and new superior to variations in the intensity of irradiation parameters affected the number of productive tillers of rice plants. Further ducan test results with significance level of 5% showed that variations in the intensity of the radiation (shade) give significantly different results, while in some local rice varieties and new improved and their interactions gave different results is not significant. Data presented in Table 3, the average number of productive tillers of rice plants with variations in the intensity of irradiation (shade), the following notation according to the average of the results of different Duncan test methods.

Table 3. Mean number of productive tillers of rice plants with some local rice varieties and new improved variation of intensity of radiation (shade)

AP/PU	N_0	N_1	N_2	TOTAL
V_1	15.4	10.8	10.56	12.25
V_2	15.03	11.73	8.96	11.91
V_3	13.9	12.56	12.43	12.96
V_4	14.16	13.5	12.4	13.35
TOTAL	14.62 a	12.14 b	11.0913 c	50.48

Note: mark followed by the same letter are not in the same row differ significantly according to the level of 5% DMRT

Based on data in Table 3 showed that the variation of the intensity of irradiation (shade), where the crop with the highest number of productive tillers shown in N0 (14.62 tillers) were significantly different when compared with N1 (12:14 tillers) and N2 (11:09 a.m. tillers). By using the technique of regression and correlation analysis, regression equation of Y = 14.38-0,070x with r = 0.949.

The parameter number of tillers 4 MST obtained results from the variance can be determinited variations of the intensity of irradiation (shade) and replicates the real effect primarily on observations of 6 MST. At the highest number of tillers present in N0 (variation of radiation intensity 100%), namely (21 816 tillers). It is presumed that the different number of tillers on each variety as found in the description of the plant, and the variations in the intensity of the radiation (shade) 100% which can lead to plant growth more quickly multiply quickly in comparison with shaded plants. Soemartono (1990) said that the high temperature on vegetative phase to raise the number of tillers, due to increased activity of the plant to take up nutrients. It is presumed that the number of tillers during vegetative change in number when the

plant will turn into the generative phase. Canisius (1990) said that the maximum number of tillers achieved at the age of 50-60 days after planting. Then tillers formed after reaching the maximum limit will be reduced because growth is weak, and even die.

Weight of 1000 grains (g)

Results of analysis of variance showed that some local rice varieties and new superior of the irradiation intensity variations along with interaction effect was not significant to the weight of 1000 grains in rice plants.

Table 4. Mean Weight of 1000 grains (g) Rice with Superior Local Rice Varieties and New Superior and variation of intensity irradiation (Shade)

AP/PU	N_0	N_1	N_2	TOTAL
V_1	100.2	104.11	94.3	298.61
V_2	99.95	94.95	95.44	290.34
V_3	102.6	108.3	103.55	314.45
V_4	101.5	95.15	95.9	292.55
TOTAL	404.25	402.51	389.19	1195.95

The 1000 grain weight of seed parameter response of local rice varieties and new high yield no significant effect. It is foreseeable environmental conditions at flowering so that no water can lead empty grain. Ismail et al. (2003), Said that the weight of 1000 grains correlated rainfall and soil moisture.

The amount of production per plot

Based on the analysis of variance (ANOVA) with Separated plot design, showed that some local rice varieties and new superior to variations in the intensity of irradiation parameters affected the amount of yield per plot of rice plants. Further Duncan test results with significance level of 5% showed that some local rice varieties and new improved and variations in the intensity of the radiation gives significantly different results while the interaction between the two different effects are not significant.

Table 5. Average of Production Per Plot Rice With Superior Local Rice Varieties and New Superior and variation of intensity irradiation (Shade)

AP/PU	N_0	N_1	N_2	TOTAL
V_1	0.87	0.26	0.17	0.43 b
V_2	0.97	0.19	0.20	0.45 b
V_3	1.62	0.37	0.87	0.95 a
V_4	1.72	0.79	0.52	1.01 a
TOTAL	1.30 a	0.40 b	0.44 b	2.86

Note: Markfollowed by the same letter are not the same columns and rows are significantly different according DMRT level of 5%

The yield parameters per plot and yield per ha obtained results from the variance can be seen the response of local rice varieties and new high yielding significant. The amount of yield per plot is V4 (Variety Inpari-4) (1,051 kg / plot), and the amount of yield per ha ie V4 (Variety Inpari-4) (6,185 tons / Ha). This result is unexpected by the influence of the dose of fertilizer and planted varieties that can increase the production of rice plants increased. Lopez et al. (1999) and Baehaki (2001), that said that the new varieties is one effort to improve results and anticipate the failure of paddy rice at the farm level, where varieties are circulating now at one time the result will be decreased and resistance to pests and diseases certain to be reduced.

Conclusions

Local and new improved varieties significantly different effect on plant height parameter (4, MST), production per plot, the yield per ha. The grain of 1000 grains, not significant. And good yielding varieties V1 (Variety Nails Balam), new varieties are either V4 (Variety Inpari-4). The influence of variations in the intensity of radiation 100% (N0) increased plant height, accelerating the number of tillers and productive tillers, and increase the yield of rice plants per plot. There is no significantly different relationship between local varieties and new superior to intensitass irradiation on all parameters of growth and yield of rice.

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Isolation and Characterization of Phosphate Solubilizing Fungi From Andisol impacted by Mount Sinabung Eruption, North Sumatera

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Abstract

Isolation of microbial solvent phosphate from Andisol affected by the eruption of Mount Sinabung has been done in the laboratories Soil Biology of the Faculty of Agriculture USU. This study aimed to obtain microbial solvent phosphate sourced from Andisol affected by the eruption of Mount Sinabung. Isolation using pikovskaya media with a source of phosphate $Ca3_3$ $(PO_4)2$. Results of the research that has been conducted done produce 5 isolates were grouped by similarity of color colony which is then purified ie fungal isolates that have the colony color Black coded AJ1 , fungal isolates which have a colony color yellowish coded AJ2 , isolates fungal colonies which have color coded green light AJ3 , fungal isolates which have a Black colony color coded AJ4 and isolate colonies of fungi which has a dark green color coded AJ5 .

Keywords : Andisol, Isolation, phosphate solubilizing fungi

Introduction

The major and most essential macronutrient, phosphorus (P), is required by the plants for vital functions such as cell division, energy transfer, signal transduction, macromolecular formation, nucleic acid synthesis, photosynthesis and respiration, nitrogen fixation and production of oil, sugars and starches (Saber et al. 2005; Zaidi et al. 2009; Eftekhari et al. 2010; Elser 2012). However, of the total soil P, only 0.1 % is plant available and the remaining soil P is inaccessible to plants. Andisol have the ability to retain large amounts of phosphate, Research Mukhlis *et al* (2014) retention of P in Andisol ranged from 94.22 to 99,91 % indicate that the retention of P is very high. In this regard, the bio-preparation containing viable and sufficient number of efficient phosphatesolubilizing microorganisms (PSM) has provided some solution to the P problems (Ahemad and Khan 2010; Hui et al. 2011; Xiang et al. 2011; Khan et al. 2013).

The existence of microorganisms phosphate solvent from one place to another is very diverse. One of the factors that cause such is the nature of biological diversity. There are living under acidic conditions , and some are living in neutral and alkaline conditions , there are hipofilik , mesophilic and thermophilic , living

there as there are aerobic and anaerobic, and severa other properties that vary. Each of these microorganisms has special characteristics and optimal environmental conditions different influencing the effectiveness of dissolving phosphate. In addition, the pH also affects the activity of microorganisms in the soil. The content of volcanic ash from the eruption of Mount Sinabung the relatively acidic pH from 3.6 to 4.98. Soil mixed with volcanic ash pH 4.83 (Balitbangtan, 2014; Sukarman and soeparto, 2015)

Phosphate solvent microorganism growth is strongly influenced by soil acidity. On acid soils, microorganisms activity dominated by fungi because the fungi growth optimum at pH 3 to 5.5. Fungi growth decreases when the pH increases. Shaped fungi in soil or vegetative mycelium spores (Waksman and Starkey,1981). Phosphate solubilizing microorganism activity is highly dependent on soil pH (Soepardi,1983). In the laboratory, the detection and estimation of the ability of microorganisms phosphate solubilizing is done by using the Petri dish method. Selective media commonly used to isolate and multiply organism phosphate solubilizing is a medium that Pikovskaya, the potential for microorganisms to dissolve the phosphate unavailable qualitatively characterized by a clear zone (halozone) around the colony.

Material and Methods

Sampling was conducted in the District Naman Teran Karo district of North Sumatra province . For insulation in Soil Biology Laboratory of the Faculty of Agriculture USU. The experiment was conducted in February 2015- June 2015. Materials used in this study is that soil samples taken from the rhizosphere of potato plants affected by the eruption of Mount Sinabung, Media Pikovskaya, distilled water and chemicals used for analysis in the laboratory . The tools was used in this study is a drill ground, autoclave, petridish, Laminar Air Flow, as well as other tools used during the study.

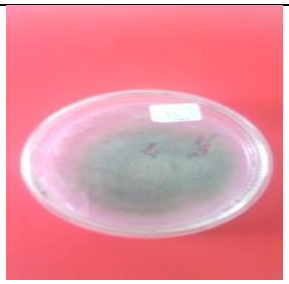
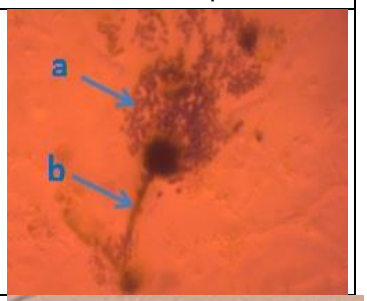
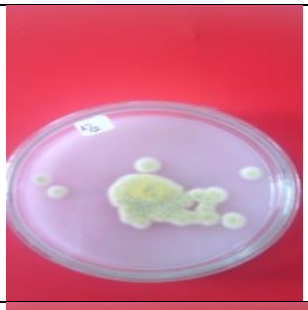
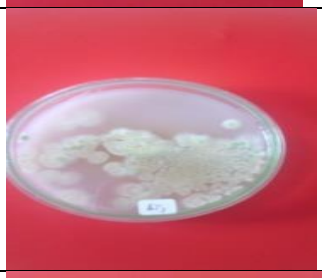
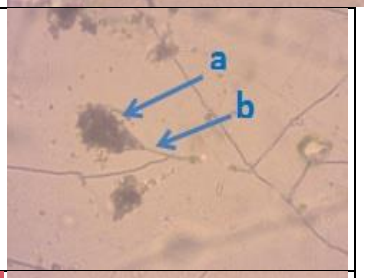
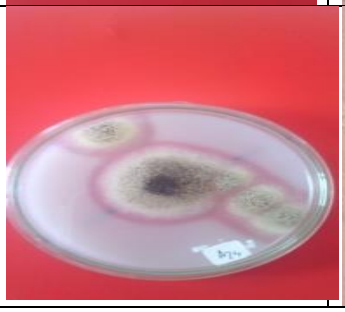
Soil sampling taken from a potato plant rhizosphere area affected by volcanic eruption Sinabuang composite at a depth of 0-20cm

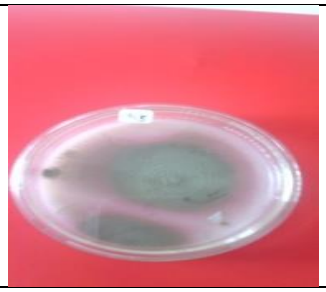
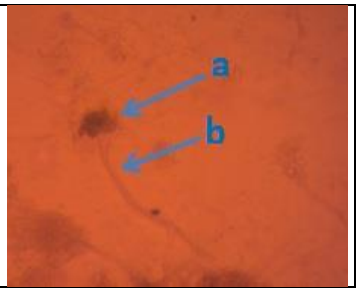
Isolation of phosphate solubilizing microorganisme. Soil 10g put into 250 ml Erlenmeyer flask containing 90 ml of sterile physiological solution and then made up to 5 times dilution. Worn suspension of 3 dilution land in anticipation of the dilution is not obtained fungus phosphate solvent. Furthermore, pour 12 ml of media Pikovskaya (temperature 45 - 50ºC) into a petri dish containing 1 ml suspension had been ground, let it media harde (solid), the petri dish was incubated in an incubator and upside down for 3 days with a temperature of 28-30ºC. After incubation for 3 days was observed growing on the media. The existence of microbial phosphate solvent indicated by the formation of clear zone (holozone) surrounding the colony. The colony is then purified and separated by color similarity colonies formed. Hypa or fungal colonies placed on a glass slide, the glass culture incubated for 3 days at room conditions. After an incubation period, a fungus that grows on a glass slide which was observed mikroskopisnya characteristic feature of hyphae, hyphae branching type, as well as the characteristics of conidia under the microscope.

Results and Discussion

Andisol soil samples which have been isolated were observed growth by presence or absence of clear zone (holozone) is formed. Isolation fungal phosphate solubilizing has been done produce 5 isolates were grouped by similarity of color colony that fungal isolates that have the colony color green coded AJ1, fungal isolates which have a colony color yellowish coded AJ2, fungal isolates which have a colony color light green coded AJ3 , fungal isolates which have a black colony color coded AJ4 and fungal isolates which have colonies of green color - black coded AJ5 . To more clearly seen in the following Table 1.

Table 1. Characterization of isolates phosphate solubilizing fungal macrocopic and microscopic and ability to form a holozone

Isolates code	Macroscopic	Microscopic
AJ1		
AJ2		
AJ3		
AJ4		

AJ5		

Description: a = conidia, b = conidiophores

Characterization of phosphate solubilizing fungal macroscopically and microscopically directly and microscopically using a microscope that fungal isolates obtained results with macroscopic characteristics AJ1 code shown in the form of a light green colored colonies that grow slowly for approximately 9 cm in 7 days. Surface looks like velvet with a flat edge colony. Microscopic characteristics unbranched conidiophores and conidia are smooth walled with elliptical or oval. Isolates AJ2 code macroscopic characteristics such as the color yellow colonies initially but over time turn green with thick velvety surface. Growth reached 9 cm in 7 days, with branching conidiophores and conidia are elliptical.

Isolates AJ3 code in the form of macroscopic characteristics of the early colony color light brown then develops into greenish white but brown the more dominant colony by colony uneven edge. Growth colonybe come slow, reaching more than 3.2 cm in 7 days, growth is irregular. While microscopic characteristics that branched conidiophores conidia form a pyramid with a round to oval. Isolates AJ4 code macroscopic characteristics such as the color of colonies was originally white then black as powder . Growth reached 9 cm in diameter in 7 days. One colony joined with the others so that the petri dish full of black spores. Microscopic characteristics that conidia are black, round and tend to split and has ornamentation in the form of thorns irregular. Conidiophores unbranched and thin-walled.

Isolates AJ5 code has a characteristic macroscopic colonies in the form of color green with a flat edge colony. Growth reached more than 9 cm in 7 days. Form colonies in petri dishes like flowers and very quickly meet the petri dish. While microscopic characteristic that is thin unbranched conidiophores with conidia are round to oval.

Conclusion

Activity insulation produces 5 isolates were grouped by similarity of color colony which is then purified ie fungal isolates that have the colony color Black coded AJ1, isolates fungus colony color yellow code AJ2, fungal isolates which have a colony color light green code AJ3, fungal isolates had colony color black coded AJ4 and fungal isolates which have a green colony color coded AJ5.

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Supplementation of *Saccharomyces cerevisiae, Aspergillus oryzae, Bacillus amyloliquifaciens* as *Direct Fed Microbials (DFM)* and Their Combination on *In Vitro* of Ammoniated Palm Frond

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Abstract

This study was to determined the effect of supplementation *Saccharomyces cerevisiae, Aspergillus oryzae, Bacillus amyloliquifaciens* as *Direct Fed Microbials (DFM)* and their combination on *in vitro* of ammoniated palm frond. Palm frond previosly treated with 6% urea. The treatments were of, P0 = ammoniated palm frond, P1= P0+*SC*, P2= P0+*AO*, P3= P0+*BA*, P4= P0+*SC+AO*, P5= P0+*SC+BA*, P6= P0+*AO+BA*, P7= P0+*SC+AO+BA*. Variables measured were DM and OM *in vitro* digestibility, cocentration of VFA and NH_3-N. Data were analyzed using analysis of variance (ANOVA) and difference among means were tested using LSD. The results showed that the addition of DFM were significantly ($P<0,05$) increased on digestibility of DM, OM, cocentration of VFA and NH_3-N. Digestibility of DM and OM increased from 47,5% (without DFM) to 51,55% (with DFM), 48,89% to 52,41%. The concentration of NH_3-N and VFA increased from 12,28 mM to 14,28 Mm and 108,35 mM to 125,90 mM respectively. The results showed that *SC* was suitable to be used single or in combination with *AO* or *BA*, but the combination of *SC* + *BA* (P5) give the best results on digestibility of DM, OM, concentration of NH_3-N and VFA.

Key words : Ammoniated palm frond, S. cerevisiae, A. oryzae, B. amyloliquefaciens

Introduction

Agriculture by-product such as palm frond potential to be used as feed for ruminants (Zain *et al.*, 2014). Utilization of palm frond as feed has limitations due to the high content of cellulose and hemicellulose which binds to lignin, so the nutritional value and low digestibility. To improve the digestibility once the nutritional value of palm frond should be conducted prior to treatment given to livestock (Zain *et al.*, 2011; Herawati *et al.*, 2013). However, processing alone is not giving optimal results in cattle (Zain *et al.*, 2008). Therefore, optimizing the utilization of fiber feed need to be followed attempt to optimize rumen microbial growth with additional supplementation. One approach that can be used is the addition of probiotic

supplements or microbial life (Fallon and Harte, 1987; Mustangwa *et al*., 1992, Zain *et al*, 2011, Herawati *et al*, 2013). The term probiotic is the same as the term *Direct Fed microbials* (DFM).

Yeast culture and *Aspergillus oryzae* could be expected to produce digestive enzirn fiber and nutrients that are easily damaged by heat allegedly able to stimulate the growth of cellulolytic microorganisms (Offer, 1990). *Bacillus amyloliquefaciens* is cellulolytic and can degrade crude fiber because produce extracellular enzymes cellulase and hemicellulase (Wizna *et al*., 2007). In the first study (Nocek *et al*., 2003), the DFM combination significantly reduced early lactation drop in ruminal pH and increased DMI, milk yield, and milk protein percentage in early lactation. There are few studies focused on the impacts of *Saccharomyces cerevisiae* (SC), *Aspergillus oryzae* (AO) and *Bacillus amilolyquifaciens* (BA) together on the rumen charasterictic fermentation and nutrient digestibility. Thus, the aim of this study was to evaluate efect of inclusion of SC, AO and BA culture product and a combination of both on nutrient digestibility and rumen fermentation characteristicts *in vitro*.

Materials and Methods

This study was conducted in the laboratory Nutrition and Animal Food Science, Faculty of Animal Science, Andalas University.

Experimental design : This experiment carried out Randomized block design with eight treatments and three groups as replications. There were 8 treatments, P1 = ammoniated palm frond, P2 = P1 + *Saccharomyces cerevisiae* (1 % DM), P3 = P1 + *Aspergillus oryzae* (1 % DM), P4 = P1 + *Bacillus amyloliquefacien* (1 % DM), P5 = P1 + *Saccharomyces cerevisiae* (0,5 % DM) *+ A. oryzae* (0,5 % DM), P6 = P1 + *S. cerevisiae* (0,5 % DM) *+ B. amyloliquefacien* (0,5 % DM), P7 = P1 + *A. oryzae* (0,5 % DM) *+ B. amyloliquefacien* (0,5 % DM) , P8 = P1 + *S. cerevisiae* (0,3 % DM) *+ A. oryzae* (0,3 % DM) *+ B. amyloliquefacien* (0,3 % DM). Ruminal fluid was obtained from a cannulated steer. The measurement *in vitro* digestibility was conducted according to Tilley and terry (1963). Fermentation tubes cotained of 50 ml of ruminal fluid and 200 ml McDougall buffer solution. Ammoniated palm frond 2,5 g (DM) is used as this substrate plus DFM according to treatment. Three fermentation tubes that did not contain substrate were also incubated and used as blanks Incubation for 48 h at a temperature of 39ºC in a shaken water bath. After incubation for 48 h of fermentation activity was stopped by immersion in ice water to stop the activities of microbial activity. Rumen fluid pH was measured according to Apriyantono *dkk* (1987). Tubes were then centrifuged at 1500 rpm for 30 min and the supernatant was removed. Residu samples were oven dried at 60^{o}C for 24h and stored for later chemical analysis according to AOAC (1990) for dry matter (DM) and organic matter (OM). Supernatants were used of the analyzed of the cosentartion of total volatile fatty acids (VFA) and NH_3-N in rumen fluid were determined by distillation according to (Departement of Dairy Science, 1966) and Conway dan O'Malley (1942), respectively.

Statistical analysis: Data were analyzed by ANOVA using a completely randomized design with subsampling. Difference among means were tested using LSD (Statistik, 2008).

Result and Discussion

Data of DM and OM digestibility, cocentration of VFA, and NH_3 of the experimmental rations with and without DFM supplements are summarized in Table (2).

Table 2. Means of DM, OM digestibility, VFA, NH_3 cocentration and pH values of ration supplemented with DFM and their combination

Treatments	Parameters			
	DM(%)	OM(%)	VFA(mM)	NH_3(mM)
P0	47,65^{c}	48,89^{d}	108,35^{d}	12,28^{d}
P1	52,29^{a}	53,22^{a}	130,69^{ab}	14,97^{ab}
P2	51,08^{b}	51,78^{b}	125,10^{cd}	14,47^{ab}
P3	50,53^{b}	51,51^{bc}	123,24^{cd}	13,73^{bc}
P4	52,92^{a}	53,55^{a}	126,97^{bc}	15,25^{a}
P5	54,03^{a}	54,80^{a}	132,55^{a}	15,75^{a}
P6	50,44^{b}	51,41^{bc}	121,38^{d}	13,06^{cd}
P7	49,61^{b}	50,65^{c}	121,38^{dc}	12,78^{cd}
SEM	0,428	0,440	1,80	0,425

Description: Different letters (a,b,c,d) in the same column indicate significant differences (P<0,05)

Digestibility of Dry Matter (DDM) of Ammoniated palm frond: Supplementation of *Direct Fed Microbial* (DFM) on ammoniated palm frond against DDM was showed in Table 2. Analysis of variance showed that the treatment was significantly different (P<0.05) on DDM of ammoniated palm frond. LSD test results indicated that DDM of ammoniated palm frond without DFM (P0) were significantly different (P<0.05) from palm frond with DFM supplementation (P1, P2, P3, P4, P5, P6, P7). These results indicated that single or combination DFM supplementation on ammoniated palm frond *in vitro* can increase DDM of ammoniated palm frond from 47,65% (without DFM) to 51,55% (with DFM). This increase is likely due to the role of DFM in modifying rumen ecosystem. DFM is a living microbe, thus DFM given will increase the microbial population and activity in the rumen which lead to the increasing of digestibility. This is in line with the research conducted by (Zain *et al*., 2011, Zain *et al*., 2015), where addition of probiotics in the diet can stimulate the growth of microbes in the rumen and improve feed digestibility in ruminants.

The mean of DMM ammoniated palm frond with the supplementation of single *S. cerevisiae* DFM (P1) was not significantly different from the mean of DMM ammoniated palm frond with the supplementation of a combination of *S.cerevisiae + A. oryzae* (P4) DFM and a combination of *A.oryzae* + *B.amilolyquifaciens* (P5) DFM. Although it was not significantly different but there was an upward trend treatment supplemented with a combination of two types of DFM (P4 dan P5). This is presumably due to the addition DFM yeast type of *S. cerevisiae* containing 14 x 10^8 colonies/gr, be it single or combination, either of them could improve the digestibility of fiber because there was synergistic role occurred when

yeast is combined with other types of DFM such as yeast and bacteria.This is supported by a research conducted by Amin (1997), he stated that combination of combination probiotic supplementation of *S. cerevisiae* and *A. oryzae* can improve feed fermentability in the rumen *in vitro*. It occurred due to synergetic cooperation of both fungi. *Saccharomyces cerevisiae* is able to produce amylase enzyme that serves digesting starch, while *A. oryzae* produces cellulose and hemicelluloses that can digest crude fiber.

The mean of DDM in Table 2, it showed that the highest mean of DDM found in treatment with combination DFM supplementation with *S. cerevisiae* (P5 dan P4), compared to *A. oryzae + B. amiloliquifaciens* (P6) or combination of those there types of DFM (P7). This is in line with the research conducted by Shin *et al*. (1989), stated that *S. cerevisiae* is one of microbes that commonly used as probiotic for livestock, together with other bacteria and fungi such as *Aspergillus niger, A. oryzae, Bacillus pumilus, B. centuss, Lactobacillus acidophilus, Saccharomyces crimers, Streptococcus lactis* and *S. termophilus.* Besides, other opinion stated that forage DM increases in supplemented cow ration with a combination of *Enteroccoci* and yeast (Nocek and Kautz, 2006).

Organic Matter Digestibility (OMD) of Ammoniated palm frond: DFM supplementation on ammoniated palm frond against OMD was showed on Table 2. Analysis of variance showed that the treatment was significant (P<0.05) to OMD ammoniated palm frond. LSD test result indicated that OMD ammoniated palm frond without DFM (P0) was significantly different (P<0.05) from palm frond with DFM, either single or combination (P1, P2, P3, P4, P5, P6, P7). DFM supplementation is able to increase the OMD from 48,48% (without DFM) to 52,41% (with DFM). This result is also consistent with the high value of DM produced. The addition of DFM is not also able to stimulate the growth of cellulolytic bacteria but also able to inhibit the action of pathogenic bacteria. The reduced activity of pathogenic bacteria in rumen will maximize rumenal microbe activity and development. The increasing number of rumen microbes can level up degrading activity of organic matter into simpler soluble compounds and it will lead to the increasing of organic substance absorption. This is supported by Kamel *et al*. (2004) and Zain *et al*., (2015) who stated that an increase of OMD occurs with *S.cerevisiae* addition rather than control. Yeast culture effect on OMD was described by Chaucheyras Durand *et al*. (2008), he stated that yeast culture (*S. cerevsisae*) is the trigger rumen bacteria growth, particularly cellulolytic and lactic acid bacteria.

Table 2 showed that the highest mean value of OMD is P5 (54,80%). This is in line with the mean value of DDM produced which also high, namely (54, 03%). Besides, it is also supported by the high concentration of VFA produced in P5. This indicated there was synergistic performance when yeast combined with bacteria. Rojo *et al.* (2005) suggested that supplementation with a combination of *S. cereisiae* and *Bacillus licheneformis* is able to increase the digestibility of organic matter of water buffalo.
The mean of OMD of ammoniated palm frond with the addition of single DFM (P1) was not significantly different from OMD of ammoniated palm frond with the addition of combination DFM of *S. cerevisiae* + *A.oryzae* (P4) and (P5). Although P1, P4, and P5 were not significantly different but there was a tendency

of higher value of OM on P4 and P5. This indicates the combination of two types of DFM can improve rumen bacterial population, so that there will be more feed digested. The complexity of the ecosystem in rumen in terms of microbe activity and population structure can be optimized its function by adding DFM (yeast) and other additives in order to achieve a synergetic effect (Chaucheryas durand *et al*., 2008). The mean of OM P7 tended to decline due to supplementation of those three types of DFM at once was less effective in improving the efficiency of rumen fermentation. It is suspected due to the DFM competition in obtaining food.

Cocentration of total VFA: DFM supplementation of ammoniated palm frond against VFA *in vitro* was showed in Table 2. Analysis of variance showed that the treatment was significantly different (P<0.05) on VFA concentration. LSD test result indicated that VFA of ammoniated palm frond without DFM (P0) was significantly different (P<0.05) from ammoniated palm frond with DFM supplementation (P1, P2, P3, P4, P5, P6 P7). This indicates that DFM supplementation either single or combination can improve cellulolytic bacteria in digesting fiber so that rumen fermentation activity will increase. It is also in accordance with the increasing of DDM and OMD produced in ammoniated palm frond with supplementation, be it single or combination. DFM supplementation of the type *S.cerevisiae* and *A.oryzae* can improve the number of cellulolytic bacteria (Dawson *et al.* 1990), and improve VFA concentration (Beharka *et al*. 1991). Desnoyers *et al*. (2009), reported that yeast supplementation can increase VFA concentration (2.1 mmol L-1) and lower lactate concentration. Moreover, it is stated that the increase of VFA concentration reflects an increase in protein and soluble carbohydrate feed (Davies, 1982).

The supplementation combination DFM of (P5) was not significantly different (P>0,05) compared to supplementation combination DFM of (P4, P6, P7) and supplementation single DFM of (P2,P3). However, the supplementation combination DFM of (P5) was not significantly effect (P>0,05) compared to supplementation single DFM of (P1). There was an upward trend treatment supplemented with a combination of two type of DFM (P5). This is presumably due *B. amyloliquifaciens* could be able to produce cellulose enzymes. Thus, when *S. cerevisiae* is combined with with single DFM or beacteria, it can improve rumen fermentation which resulting in high VFA fermentation. *S. cerevisiae* produces growth factors such as organic acid, vitamin B and amino acids that stimulate growth and activity of rumen microbes (Wiedmeier*et al*. (1987). Furthermore, *Bacillus amyloliquefaciens* bacteria are cellulolytic and able to degenerate crude fiber since they produce extracellular enzym cellulase and hemicellulase (Wizna *et al*., 2007). Qiao *et al.* (2010) stated that *Bacillus licheniformis* supplementation lower Ammonium Nitrogen (N), increase total VFA concentration and acetate in the rumen *in vitro*.

N-NH_3 rumen fluid: Tabel 2 showed result NH_3-N cocentration of the ammoniated palm frond without DFM (P0) was significant effect (P<0,005) as compared P1, P2, P3, P4, P5 but not significantly different from treatment P6 and P7. NH_3-N concentration generated in this study ranged from 11.66 to 15, 33 mM. The results are classified as normal. The optimum range of NH_3-N in the rumen ranges from 85-300 mg / l or 6-21 mM. Concentration of NH_3 can show the feed protein degradation process is faster than the

formation of microbial protein, so that the resulting ammonia accumulates in the rumen (McDonald *et al*., 2002).

Conclusion

These conclusions indicated that single or combination DFM supplementation on ammoniated palm frond *in vitro* can increase digestibility of DM, OM, cocentration of VFA, and NH_3. Supplementation of single DFM type *S. cerevisiae* was suitable to be used single or in combination with *A. oryzae* or *B. amyloliquifaicens*, but the combination of *S. cerevisiae* and *B. amyloliquifaciens* (P5) give the best results on digestibility of DM, OM, concentration of NH_3-N and VFA.

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Topography Regional Relations With Intensity Nematodes Parasites Gastrointestinal (GI) At Cattle in Aceh Province

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Abstract

This study was conducted to determine the degree of gastro -intestinal nematode parasite infestation in cattle associated with the topography of the highlands and lowlands in the province of Aceh. The samples are derived from catlle feces of 150 cattle were divided into three age groups, namely 0-6 months, 7-12 months and >12 months. Examination of samples for counting eggs per gram of feces (TPGT) performed with Withlock method and the data obtained was analyzed by chi-square test. The results showed that at high altitude, of 150 cattle stool samples were examined a total of 33 head of cattle infected with gastro intestinal nematodes TPGT amount of 13 731, while in the lowlands of 150 samples of cattle feces, his TPGT number of 82.165. Chi -square analysis of the results showed that there were significant differences in the intensity (P >0.05) between the gastrointestinal nematodes in the highlands to the lowlands in the province of Aceh.

Key words: Topography, intensity, gastro intestinal nematodes, catlle.

Introduction

One of the common diseases that attack cattle, causing a decrease in the quality of health is an investment worms. Where parasitic worm is a disease that is economically detrimental, because catlle disease will experience obstacles in achieving production (Amaral, 2001; Widnyana, 2013). Economic losses due to parasitic worms are very big impact. Worm infestation will absorb some nutrients that should be for the body's needs and growth, parasitic worms also damage vital tissues and organs of cattle and other productive livestock so that livestock can cause lack of appetite (Anderson and Waller, 1983; Murtidjo, 1990).

The main factor of high infestation of parasitic gastro intestinal tract in cattle is the topography, geography, bad environmental conditions , the climate is not suitable, differences in age and health care

are not appropriate and the level of knowledge of livestock owners are still low (Bhattachryya and Ahmed, 2005). Based on research Mitchell and Somerville, (2005) note that the increase in the spread of this worm in recent years strongly associated with climate change, especially the type of nematode worms are Haemonchus contortus, teladorsagia circumcincta and Nematodirus battus as well as to the type of trematode Fasciola hepatica. This corresponds to Connor, *et al* (2007) that the relationship with the survival and free-living stages of parasitic nematodes in an environment strongly influenced by temperature and humidity, where the level of larval development is highly dependent temperature

Sub District of Pintu Rime Gayo as highlands district of Aceh province is an area of high plain with altitude 800 - 1200 meters above sea level (mdpl)which has a tropical climate with rainfall every year and long range 1.000-2500 mm rainfall ranges from 149-178 days a year , with the temperature an average of 18°C-28°C, has a maximum moisture content of about 75.8 % and a minimum of 30 % and extends between 04^0-$5,11^0$ LU dan 96^0 - $41,46^0$ BT (Anonymous, 2010). While the sub District July Bireuen district is bounded by the area directly to the District Bener Meriah as low-lying areas 100-300 meters above sea level (mdpl), with an average temperature of 26.3 ° C-32.5 ° C, humidity of about 82.5% and precipitation 3,247 mm per year, the amount of rain 138 days a year, its location ranges between 4.54 –$5,21^{0'}$ LU and $96,20^0$-$97,21^0$BT. With a height of 100-300 meters above sea level, with the topography of the land is flat, marshy land, watersheds (DAS) with a type of clay and sandy (BPS Bireuen, 2011).

This study was conducted to examine the relationship topography of factor attitude to intensity or degree of infestation of parasitic nematode gastrointestinal (GI).

Materials and Methods

Tool used is a digital camera, a plastic basin, test tubes, petri dishes, measuring cups, scissors, glass objects, glass coverings, refrigerator, room count Withlock, glass Becker, pasteur pipette, microscopes, scales and a box of ice. Materials needed: cattle feces, distilled water, 0.4 % formalin, salt saturated, plastics, rubber belt, paper board.

This study was conducted in March 2012 until June 2012 in the district Pintu Rime Gayo Bener Meriah and sub district July Bireuen. As for the process of examination and identification of gastrointestinal nematode parasite eggs done in the Laboratory of Parasitology, Faculty of Veterinary Syiah Kuala University, Banda Aceh.

The collected samples were taken and checked at the Laboratory of Parasitology Faculty of Veterinary Syiah Kuala University, Banda Aceh. Examination of samples was done by Withlock method to calculate the number of eggs per gram of feces (TPGT) (Whitlock, 1948; Jaroslav*, et al*. 2010).

Data analysis

To see the difference in the degree of infestation of eggs per gram of feces (TPGT) parasitic nematode worms gastrointestinal (GI) in cattle based on the topography of the area is done by the chi -square test analysis.

Results and Discussion

Gastro Intestinal Nematode Eggs intensity in the Highlands and Lowlands

The intensity by gastro intestinal nematodes TPGT catlle in the highlands and lowlands can be seen in Table 1.

Table 1. Comparison of gastro -intestinal nematodes TPGT highlands and lowlands

Parameter	The number of samples (tail)	Number of positives	Eggs per gram of feces (egp)	Average (Per Tail)
Highlands	150	33	13731	416[a]
Lowland	150	100	82165	822[b]

Notes : Different superscript letters in the same column indicate significant differences (P<0.05)..

Based on Table 1 above shows that the number TPGT nematode gastro intestinal environment topography of the plateau in the district Pintu Rime Gayo district highlands of 150 cattle in check , there are 33 cattle infected where there are 13 731 eggs (an average of 416 eggs nematodes/samples). When compared with lowland topography of the environment in the district July Bireuen of 150 animals examined samples , there are approximately 100 individuals infected with the eggs contained 82 165 (822 nematode eggs /sample). The results after the analysis looks for significant differences (P<0.05) between these environments. Where the average on the location of the highlands is lower than the value TPGT location on lowland

In connection with the results of these studies and expert opinions can be stated that the intensity or degree of gastro -intestinal nematode parasite infestation is higher in lowland. Such a situation is very likely related to the topography of the area in which relate to environmental conditions such as temperature, climate and humidity , and no connection with the management of maintenance, including stable conditions, population, grazing patterns (Noble, *et al*, 1989).

Such as the Central Bureau of Statistics reports Bireuen (2011), that Bireuen as area, topography is flat and low lying land with an area of 21 208 hectares or 212.08 km2, an area with marshy soil environment, has a watershed area with types of clay and sandy, with a dense animal population by the number of about 5,910 head of cattle. This is one of the supporters of high nematode infestation is associated with gastro-intestinal environmental conditions are a factor, humidity, factors other than management, with cage systems that do not meet the standards and health care are not optimal (Anonymous, 2011).

Compared to the highlands district as an area that has topographic highlands with an area of 140.01 km^2, has filled in the cattle population up to the year 2010 is still a bit which is the amount of about 120 head of buffalo, about 956 head of cattle, goats, there are 2,250 individuals (Anonymous, 2011)[b]. Where the gastrointestinal nematode infestation of lesser intensity. It is strongly associated with environmental factors, especially temperature and humidity are not conducive to further development of parasites, factors other than the management of the population is still small.

This is consistent with the explanation Boag and Thomas (1985), that a different environment, especially the season and the location is very influential on the availability of infective larvae on pasture. Like wise with Kusumamihardja (1995) suggest that low high degrees of infestation of parasitic nematodes are linked to seasons and topography of a region. Connor, *et al* (2007) also explained that the relationship with the survival and free-living stages of parasitic nematodes in an environment strongly influenced by temperature and humidity, where the level of development of the larvae is dependent temperature.

Patz, *et al* (2000), said that any change in the environment, both of which occurred due to natural phenomena or by human intervention, there will be changes in the ecological balance in which context the hosts or vectors of disease caused by the parasite will proliferate and transmit the diseas. Parasitic worm infestations in cattle can be caused by various factors, including geographic location, environmental conditions, quality cage, sanitation and hygiene, cage density, temperature, humidity, and vegetation Egido *et al.* (2001); Artama (2005). Fox *et al* (2012) suggest that the intensity and distribution of parasitic worms during strongly influenced by climate change and this is one of the most important challenges to livestock. Climate change has been implicated as a driving force for the expansion of parasitic worms.

Most gastro intestinal parasites live in a different location from the digestive tract while the geographical distribution of the parasite also vary depending on the environment, especially on the climate (rainfall primary), vegetation and livestock density (Levine, 1990; Egido *et al*., 2001)

Conclusion

1. The intensity of gastrointestinal nematode parasites in cattle in lowland higher when compared to the highlands, where the lowlands amounted to 66.6 % , while the highlands of 22%.
2. The degree of gastrointestinal nematode parasite infestation in cattle showed TPGT lower in areas where the topography highlands of 150 head of cattle samples , there were 33 cattle infected with TPGT number 13.731 (an average of 416 eggs/sample) in comparison with the topography of the area lowlands of 150 head of cattle samples were examined , there are approximately 100 individuals infected with TPGT number 82 165 (822 eggs/sample).
3. The difference in the topography of the region , between the highland with lowland can affect the intensity of gastro -intestinal nematode parasites in cattle.
4. Maintenance of cattle with shepherds system is a great chance of the occurrence of the disease. Besides the factors causing the disease is also due to the interaction between hosts (animals), the disease agent (helminth infections) and environments.
5. Environment with topographical differences can determine a positive or negative influence on the relationship between cattle with the disease agent.

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Evaluation of Morphological Characteristics and Production of Upland Rice Against Drought Stress

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Abstract

This study aims to determine the efficiency of water use between genotype and identify morphological characters of upland rice varieties tolerant to drought stress. The experiment was conducted in a plastic house in North Aceh, from January 2015 to May 2015. The study design was *Split-Plot* with three replications, by using two treatment factors, namely first factor is drought stress (C) consisting of 4 levels capacity airy namely: C1: 20%, C2: 40%, C3: 60% and C4: 80%. The second factor is the 10 varieties of upland rice varieties consists of 3 groups (the result of screening with PEG 6000), namely (tolerant varieties group) which consists of Ciapus, Inpago 4, Inpago 8. (Moderate varieties group) consisting of Inpago 5, Situ Bangendit, Inpago7, Towuti, and (susceptible varieties group) which consists of Inpari 6 JATE, Inpari 33 and Sintanur. Results of the study varied response of upland rice varieties in the group receiving the response of drought stress on the plant height, days to flowering, number of panicles and grain weight. Stress group 20% (C1) all varieties decreased plant height, number of panicles and grain weight as well as speed up flowering dates. Tolerant varieties are capable of producing that Inpago 4 and followed by Inpago 8. Groups of 40% field capacity (C2) tolerant varieties that adapt well to all the parameters are Inpago four varieties while the varieties best for moderate growth in the number of panicles and grain weight are mostly found in 60% of field capacity (C3) and the highest grain weight found in varieties Inpago 5. 80% field capacity (C4) group susceptible varieties are best found in Sintanur varieties.

Keywords: Upland rice, varieties, water stress

Introduction

Drought can be fatal and affect the stability of the results (Babu et al, 1996), especially if the varieties grown in the old and less resistant to drought stress (Hasmosoewignjo, 1962). Drought is also the most important limiting factor for the sustainability of the production of rice plants. This is a problem that is faced by all countries in the world producer of rice (Passioura, 2007).

Indonesia is also facing climate change due to global warming are unavoidable and will have broad impact on many aspects of life, including the agricultural sector. Climate changes impact on the increase in the frequency and intensity of extreme weather events, changes in rainfall patterns as well as the air temperature increases and rising sea levels. Changes in rainfall patterns and rising temperatures lead to decreased agricultural production, flooding and drought caused crop acreage increasing experiencing puso (Sumaini et al, 2011).

Upland rice varieties is a source of genetic material that can be used to study varieties that have characters that can be used to study the varieties that have characters that play a role in tolerance to drought stress. This study aims to determine the efficiency of water use between genotype and identify morphological characters of upland rice varieties tolerant to drought stress.

Materials and Methods

The experiment was conducted in a plastic house in North Aceh, from January 2015 to May 2015. The study design was *Split-plot* with three replications, with two treatment factors, namely First factor is drought stress (C) consisting of 4 level of field capacity, namely: C1: 20%, C2: 40%, C3: 60% and the C4: 80%. The second factor is the 10 varieties of upland rice varieties consists of 3 groups (the result of screening with PEG 6000), namely tolerant varieties group consists of Ciapus, Inpago 4, Inpago 8. Moderate varieties group consisting of Inpago 5, Situ Bangendit, Inpago7, Towuti, and susceptible varieties group which consists of Inpari 6 Jete, Inpari 33 and Sintanur. Further observation data were analyzed using test Duncan's Multiple Range Test (DMRT) at the level of the test α = 0:05.

Results and Discussion

Plant Height

The result of the three groups of varieties tolerant varieties of moderate and susceptible varieties showed plant height lowest in the treatment field capacity of 20% (C1) compared with treatment field capacity of 40% (C2), 60% (C3) and 80% (C4) in (Fig. 1).) is seen a decline in plant height due to the inhibition of cell elongation and cell division. Very noticeable decrease in plant height can be overseen at sensitive group which is Sintanur varieties (Table 2).

The plant height difference caused by the difference in the amount of water received every day at the same growth stage. In the field capacity of 20% (C1) with the provision of the amount of water 300 ml situation is not in accordance with the water needs of crops of upland rice, at field capacity of 40% (C2) by providing the amount of water 600 ml per day of two groups of varieties tolerant and moderate adapted to the circumstances The environment thus revealing good growth but not for susceptible groups varieties are the best at field capacity of 80% (C4) with 1200 ml of water per day. Water demand increase since the planting upland rice and the largest at the flowering stage (Israelsen and Hansen, 1962; Oldeman and Free, 1982). The rate in line with the needs of plant transpiration rate (Tomar and O'Toole in Oldeman and Free, 1982). Rice plant transpiration increases ranging from early growth and achieve 3-4 mm day -1 at the maximum rate of growth in the number of tillers. Kumar et al (2009) reported that in severe drought conditions in the decrease in plant height tolerant strains of 6-12 cm while the strains are sensitive about

16-27 cm. The results showed a decrease in plant height at Sintanur varieties (susceptible) reached 32.62 cm due to drought stress.

In addition, the influence of Variability in terms of growth and results in the show by 10 varieties were tested for each of upland rice varieties has its own adaptability to the conditions of the biophysical environment and is also influenced by genetic factors which are factors that exist in these plants. Differences in the genetic makeup are one of the factors causing the appearance of plant diversity in this case the high crops. In line with Mildaerizanti, (2008) that differences in plant height is determined by genetic factors. Gosh and Kashyap (2013) also found plant growth, besides influenced by genetic factors, are also influenced by environmental conditions to grow crops. Nyakpa et al (1988) also argues each variety has a different response to different environmental conditions.

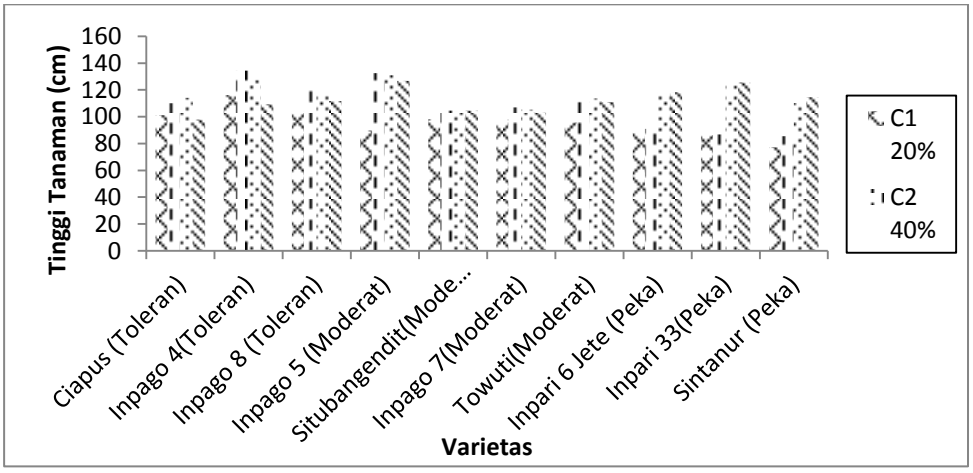

Figure 1. Effect of High 10 Varieties of Upland Rice Plants Due to Drought Stress.

Table 2. Average Relative Decline of Plants High

Varietas	C1 (20%)	Relative Decline (%)	C2 (40%)	Relative Decline (%)	C3 (60%)	Relative Decline (%)
Ciapus (Toleran)	101.26	-3.36	110.11	-12.39	114.11	-16.47
Inpago 4 (Toleran)	119.87	-9.68	134.39	-22.97	127.73	-16.86
Inpago 8 (Toleran)	104.11	6.77	122.11	-9.35	118.62	-6.23
Inpago 5 (Moderat)	89.84	29.06	132.47	-4.59	131.18	-3.57
Situbangendit (Moderat)	98.09	6.14	104.59	-0.08	103.51	0.95
Inpago 7 (Moderat)	98.08	4.59	106.89	-3.97	105.39	-2.52
Towuti (Moderat)	95.74	13.78	111.14	-0.09	113.62	-2.33
Inpari 6 Jete (Peka)	88.19	25.44	91	23.07	117.96	0.28
Inpari 33 (Peka)	86.1	31.46	86.79	30.91	123.37	1.80
Sintanur (Peka)	77.25	32.62	85.51	25.42	109.99	4.07

Flowering Age and Number of Panicles

Analysis of variance flowering dates indicate that tolerant varieties group of upland rice (Ciapus, Inpago 4 and Inpago 8) and the moderate varieties group (Inpago 5, situbangendit, Inpago 7 and Towuti) adapted well to the age of flowering timely in the treatment field capacity of 40% (C2) with the amount of water every day for 600 ml but susceptible varieties group (Inpari 6 jete, Inpari 33, and Sintanur) right days to flowering was at 60% field capacity (C3) with 900 ml of water per day. Based on the description of the susceptible varieties group have good adaptability in rain-fed field and classified into paddy rice meanwhile field capacity of 20% (C1) shows the flowering dates was faster for all groups of varieties. Flowering age was also very concerned with the efficiency of water utilization. Nguyen et al, (1997) suggests a tolerance mechanisms in plants in response to drought stress include the plant's ability to keep growing in conditions of water shortage is to reduce the size of leaves and shortening the growing cycle.

For a number of panicles at 20% field capacity (C1) gives the number of panicles at least compared to other water treatment provision, the amount of the highest panicle tolerant group contained in the water supply of 40% (C2). For moderate and sensitive group, number of panicles most found in the water supply of 60% (C3), presumably due to inhibition of the development of pollen which is caused by lack of water and varieties are grown under conditions of drought stress will shorten the phase of filling grains and decrease the number of panicle or productive tillers.

Acceleration of flowering also has implications for the number of panicle and crop production (Table 3) in the treatment of 20% field capacity (C1) causes almost all varieties decreased number of panicles and grain production except in the tolerant varieties group (Inpago 4), (Inpago 8). Moderate varieties group (situbangendit) and (Towuti) this indicates that some of these varieties could potentially tolerant to drought stress as compared to other varieties. Highest number of panicles for a group of varieties are tolerant to the treatment of 40% field capacity (C2) contained in (Inpago 4). Saragih (2010) Stating that the varieties Inpago 4 very adaptive to the environment is not good as water shortages cultivation time will not disrupt the formation and growth of rice. As for moderate and sensitive groups varieties of the highest number of panicle found on 60% field capacity (C3) which Towuti varieties and varieties Sintanur. This is influenced by plant genetic factors which is able to adapt in a good growing environment so as to produce plenty number of panicles. Decreased number of panicles formed and high sterility. (Pirdashti et al, 2004). Liu et al (2006) reported that water stress can derail pollinated pollen for up to 67 percent of the total grains per panicle.

The average age of flowering and number of panicles due to drought stress treatment and varieties are presented in Table 3 and Figure 2 shows the difference in the number of panicles due to drought stress treatment against upland rice varieties

Table 3. Average Age of Flowering and Total Panicles at 10 Upland Rice Varieties due to Drought Stress

Varietas	Drought Stress			
	C1 (20%)	C2 (40%)	C3 (60%)	C4 (80%)
Ciapus (Toleran)	56.68 ± 0.00 o	86 ± 0.57 de	82 ± 0.00 f	75 ± 0.00 hij
Inpago 4 (Toleran)	59.5 ± 0.00 n	88 ± 0.00 cd	82 ± 0.00 f	85 ± 0.00 e
Inpago 8 (Toleran)	55 ± 12.50 o	75 ± 0.00 hij	72 ± 0.00 k	77 ± 0.00 ghi
Inpago 5 (Moderat)	71 ± 0.00 k	88 ± 0.00 cd	87 ± 0.00 cde	88 ± 0.00 cd
Situbangendit (Moderat)	72.33 ± 1.15 jk	89 ± 0.00 c	95 ± 0.00 a	92 ± 0.00 b
Inpago 7 (Moderat)	74.67 ± 0.00 ij	81 ± 0.00 f	78 ± 0.00 g	85 ± 0.00 e
Towuti (Moderat)	61 ± 0.00 mn	73 ± 0.00 jk	77.67 ± 0.57gh	89 ± 0.00 c
Inpari 6 Jete (Peka)	43.67 ± 0.00 q	71.33 ± 0.00 k	75 ± 2.00 hij	77 ± 0.00 ghi
Inpari 33 (Peka)	49.67 ± 0.00 p	67 ± 0.00 l	88 ± 0.00 cd	68 ± 0.00 l
Sintanur (Peka)	44.33 ± 0.00 q	62 ± 0.00 mn	63 ± 0.00 m	67 ± 0.00 l

Notes : Angka yang di ikuti huruf yang sama tidak berbeda nyata berdasarkan uji DMRT pada α 0.05

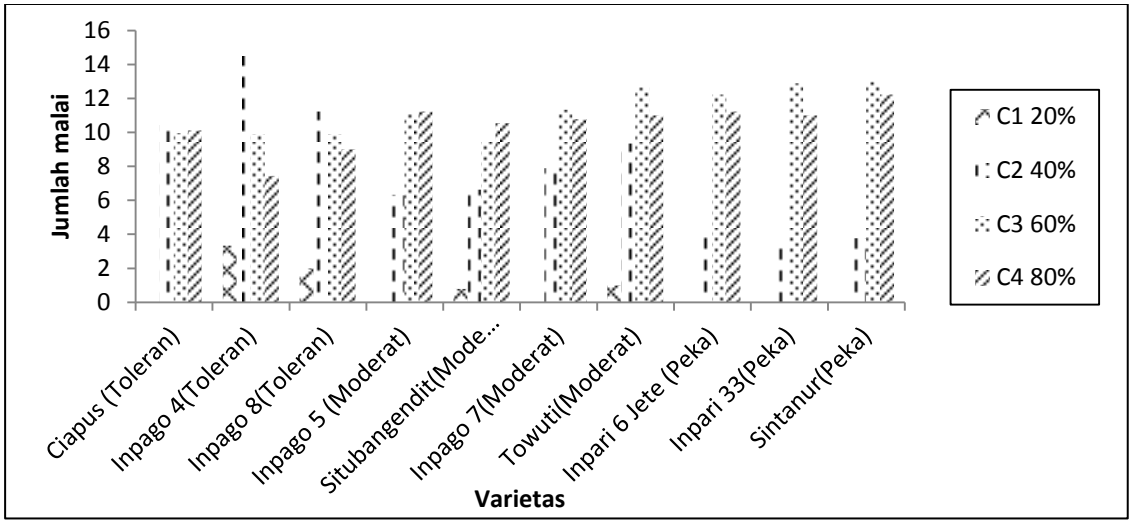

Figure 2. Effect of number of panicles 10 Varieties of Upland Rice Plants Due to Drought Stress

Grain weights per Clumps

Analysis of variance of grain weight at 20% of water supply (C1) showed the lowest grain production for all groups of varieties. It is a result of decreasing the number of panicles which implicate to grain production. For tolerant and moderate groups was largely obtained at 40% of water provision (C2), while for the sensitive groups, the highest production was obtained sensitive at 80% of water provision (C4).

Analysis of variance of grain weight in 20% of water provision of field capacity (C1) showed the lowest grain production for all groups of varieties, or do not even produce, except in the tolerant varieties group (Inpago 4), (Inpago 8). Moderate varieties group (situbangendit) and (Towuti) indicate that some of these varieties could potentially be tolerant to drought stress as compared to other varieties. Varieties Inpago 4, and Inpago 8 is a new upland rice varieties belonging to *care* group with early maturity and has a high yield potential (BPTP, 2011). In addition, the environment is a major contributing factor to the ability of a variety to improve its productivity. Likewise with the moderate group, most of the 4 varieties adapted really well to the environment grew with 40% field capacity (C2). This also indicates that the water needs for future growth and crop production according to the needs. For field crops during growth on a full canopy, the required amount of water is about 125 mm per month and the crop water requirement and maximum evapotranspiration (ETM) and the magnitude of the multiplication of potential evapotranspiration with a crop coefficient (Oldeman et al., 1979). For susceptible varieties group, highest results were obtained in the treatment field capacity of 80% (C4). This was because the type of varieties was tend to paddy rice then with water provision every day as much as 1200 ml of an actual condition for the environment to grow such varieties (Inpari 6 jete , Inpari 33 and Sintanur). Mean weight of dry grain per clump due to drought stress treatment and varieties are presented in Fig 3.

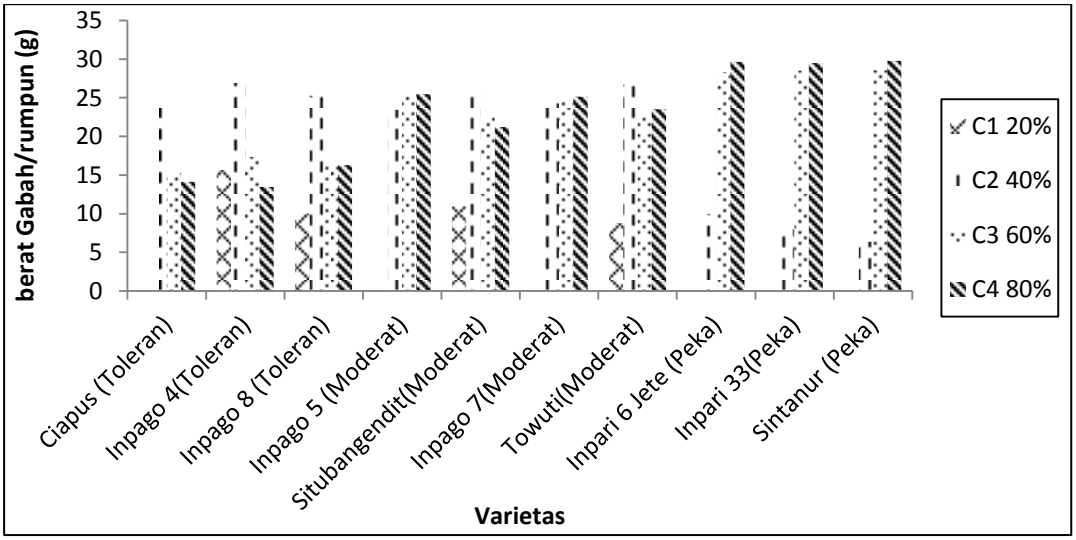

Figure 3. Effect of production of dry grain per clump 10 Varieties of Upland Rice Plants Due to Drought Stress.

Conclusion

Diverse group response of upland rice varieties in drought stress response received on the plant height, days to flowering, number of panicles and grain weight. Stress group 20% (C1) all varieties decreased plant height, number of panicles and grain weight as well as speed up flowering dates. Tolerant varieties are capable of producing that Inpago 4 and followed by Inpago 8. Groups of 40% field capacity (C2) tolerant varieties that adapt well to all the parameters are Inpago four varieties while the varieties best for moderate growth in the number of panicles and grain weight are mostly found in 60% of field capacity

(C3) and the highest grain weight found in varieties Inpago 5. 80% field capacity (C4) group susceptible varieties are best found in Sintanur varieties.

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Practice of Home Birthing: Maternal Volition and Its Implications to Health Care Promotion

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Abstract

Globally, women continue to die because of the major complications during pregnancy and childbirth. In the Philippines about 10 to 12 women die everyday due to pregnancy-related causes. Despite the government's effort in meeting the needs of proper healthcare assistance especially on maternal and neonatal healthcare still many women subject themselves in home birthing. The study is aimed in determining the factors affecting the choice of home birthing among mothers in Barangay Ubaldo Laya and Barangay Acmac having the highest number of home deliveries in Iligan City. Respondents have at least delivered one child at home since 2009 regardless of age, religion, civil status, educational attainment, occupation and family income. The 158 mothers were purposively sought and take their individual response. According to the findings of this study, there was a significant relationship between the mother's age, ages 27-35 (48.1%) and marital status, married (67.1%) to their choice of home birthing. Moreover, their awareness of the risk and complications of pregnancy greatly affects their choice of home birthing. On the otherhand, the mother's demographic profile consisting of age, marital status, religion, educational attainment, occupation of both the mother and husband, and income gives a highly significant relationship to the accessibility of the respondents which greatly affects the choice of mothers to opt home birthing.

Keywords: Maternal choice during delivery, Home delivery, Health care promotion, Maternal awareness, Accessibility

Introduction

An old Asian proverbs say, "women hold half the sky", hence, the healthier our women are, the healthier our families and our country will be. Globally, women continue to die due to some major complications of pregnancy and childbirth such as hemorrhage, hypertension, sepsis and unsafe abortion, at a rate of one per minute. Hemorrhage, the limited progress in making motherhood safer is more alarming in developing countries, where 99 percent of maternal deaths occur every year(Olarte,2008) Accordingto UNICEF, every year more than half a million women die worldwide as result of pregnancy of childbirth complications, including about 70,000 girls and young women aged 15 to 19. This is attributedto the lack

of information of prenatal and accessibilityes especially to women in urban poor areas and in far-flung places. In addition, according to its State of the World's Children 2009 report, the Philippines is among 68 countries, which contributed to 97% of maternal, neonatal and child health deaths worldwide. UNICEF (2009) also pointed to the common Filipino practices of deliveries outside a health facility as a major factor in the maternal or fetal deaths. Around 62% or 8 out of 10 births in rural areas delivered outside health facility attended by unprofessional attendants,commonly known as "hilot"or "comadrona"(Delfin, 2009)

About 10 to 12 women die every day due to pregnancy related causes in the Philippines. The government has been admitted that it may not meet its commitment to achieve Millenium Development Goal (MDG 5)- to drastically reduce the number of maternal deaths- by 2015 (Olarte,2008). The Department of Health (DOH) discourages home birthing because of high incidence of complications.(Castrillo et.al, 2009). Moreover, 6 out of 10 births attended by unprofessional birth attendant at home in Iligan City.(CHO,2010). Despite the government's effort in meeting the needs of rapidly growing population in terms of proper healthcare assistance especially on maternal and neonatal healthcare still many women subject themselves to home birthing. This study investigates the factors that affects the choice of home birthing amongst mothers of the selected barangays in Iligan City.

Materials and Methods

Descriptive correlational research design was used in this study. Descriptive as it identifies respondent's profile. It utilized the correlation method in identifying the relationship between the demographic profile and the respondent' knowledge on the availability and accessibility of the healthcare facilities, awareness towards risk and complications and comfort during labor and delivery. It also Identify the significant relationship between the respondent's demographic profile and the choice of home birthing. Moreover, it evaluated the association between the respondent's knowledge on the availability and accessibility of the healthcare facilities, awareness towards risk and complications and comfort during labor and delivery to mother's volition of home birthing. The respondents were purposively taken from the given list of the names of the mothers who had delivered at home.

Results and Discussion

The study composed of 158 respondents ages 16-26 (36.7%) 27-36 (48.1%) and 37-46(15.2%) years old. More than a quarter were married (67%) and the remaining are single (33%). Majority belongs to a Roman Catholic Religion (93.7%). In addition, respondent's educational attainment includes: Elementary Level (18.1%), High School Level (63.2%), and College Level (18.7%). Socioeconomic Income depicts at a very low income with an average of below Php 4,000/month (75.4%), above Php 4,000(24.6%). Moreover, almost all of the respondents were housewife with no income at all (93.6%). The participants of the survey are from Barangay Acmac and Ubaldo Laya, Iligan City.

Availability and Accesibility of Health Care Facilities, Awareness towards the risks and Complications of Pregnancy and Comfort

Table 1. Frequency distribution of the Availability of Health Care Facilities

Availability	Yes %	No %	Remarks
1. There is nearby hospital in our area	60.1	39.5	Yes
2. There is an available barangay health center near our are	88	12	Yes
3. The barangay health center is readily available	92.4	7.6	Yes
4. The barangay health center has complete and reliable equipment	74.1	25.9	Yes
5. The healthcare practitioner is always present in the said facility	93.7	6.3	Yes
6. The midwife who performs the delivery doesn't need a fix amount for me to pay and any amount for me to pay will do.	82.9	17.1	Yes

The table shows that number of respondents who agrees and disagree in terms of availability of health care facilities in the area. Mostly mothers agree that barangay health center in their area is available always (92.4%) and presence of practitioner in the healthcare (93.7%). With an overall remarks says Yes on all item.

Table 2. Frequency distribution of the Accessibility of Health Care Facilities

Accessibility	Yes %	No %	Remarks
1. I find time to visit health center to have a prenatal check-up and Listen to health teachings even if I have a work.	94.3	5.7	Yes
2. I don't have difficulties in transportation or finding ways in transporting to barangay health center or hospital.	94.9	5.1	Yes
3. I can readily use the services provided in the health center or hospital.	65.8	34.2	Yes
4. If there is any problem I can easily call or go to health care facilities and ask for help.	95.6	4.4	Yes

The table shows the convenience in going to a health care facilities like health center and hospital in the area. Majority of the mothers approved that they have time to visit for prenatal check-up (94.3%), no difficulties in moving to (94.9%) and ask for help in the health center (95.6%). Except for the item number 3, about a two thirds of the respondents agreed services provided in the health center or hospital can be readily utilize at (65.8%).

Table 3. Descriptive Statistics on the Awareness of the Respondents towards the Risks and Complications of Pregnancy

Awareness on Complications of Pregnancy	Agree %	Do Not Know %	Dis Agree %	Mean	Remarks
1. Completing the prenatal consultation is very important	*95*	0	5	4.78	Agree
2. It is safer to give birth at the hospital if I have already delivered at least 5 children.	43	53.2	3.8	2.83	I do not know
3. During delivery, I have to push with each contraction to speed the process.	74.4	1.6	24.4	4.05	Agree
4. During pushing I should not hold tension in my face rather I have to bear down and concentrate on pushing where it counts	69.7	1.8	28.5	3.89	Agree
5. It is possible that I may acquire infection at the site of perineal tear after delivery.	8.8	69.6	22.2	3.15	I do not know
6. Only sterile scissors can be used in cutting the cord that connects me and my baby.	78.8	1.6	19.6	4.08	Agree
7. I am not allowed to take in food or water while in labor.	*27.2*	1.6	71.2	2.18	Disagree
			Overall Mean	3.58	Agree

At first glance, we can see that the overall Mean response of the mothers where more aware of the complications such as the importance of prenatal check up(95%), by synchronizing pushing and uterine contraction (74.4%), placing tension on the perineum and not on the face (69.7%) and sterility of the scissors to used during cord cutting (78.8%).

In contrast, nearly two thirds of the respondents disagree on avoidance of taking food and fluids during labor (71.2%). Moreover, more than half do not know the risk and complication in (giving birth at home if more than five deliveries and possibility of infection of the perineal tear during labor), 53.2% and 69.6% respectively.

Table 4. Frequency Distribution on the comfort of the Respondents

Comfort	Yes %	No %	Remarks: Mode
1. I feel uncomfortable when giving birth at the hospital because my family members are not allowed inside the delivery room.	35.4	64.6	No
2. I feel comfortable in giving birth at home because my family members are there and will readily attend to my needs.	64.6	35.4	Yes

3. I feel uncomfortable delivering in front of people I don't really know.	75.3	24.7	Yes
4. I don't like my baby to be delivered inside the hospital because of many documents needed to fixed before receiving the services needed.	36.7	63.3	No
5. I don't like to deliver my baby inside a hospital because of episiorraphy.	38	62	No
6. I don't like doctor, nurses and midwives treated me when I gave birth at the hospital or barangay health center.	9.5	22.8	No response
7. I am afraid of needles	37.3	62.7	No
8. It is costly to give birth inside a hospital	69.6	30.4	Yes
9. I heard complaints from others that the doctors, nurses and midwives were not accommodating during the process of delivery.	39.9	60.1	No

Table shows the most of the respondents feel comfortable giving birth with 64.6% while feels uncomfortable delivering a baby in front of unknown person to them at about 75.3% and agreed that giving birth at hospital is costly at approximately 69.6%. Meanwhile, majority of them says they did not feel uncomfortable giving birth at the hospital because of family restrictions (64.6%), hospital requirements (63.3%), fear of needles (62.7%), and complaints from others about doctors, nurses and midwives accommodations during the process of delivery at a rate of (60.1%).

The table shows the association of the respondent's profile and option in home birthing. It can be clearly seen that, there is no significant relationship for religion, educational attainment, occupation of the mother and monthly income with p values greater than alpha 0.01. Hence, age and marital status affects the choice of home birthing since it has a p value of 0.000 with a less than the level of significance 0.01.

Table 5. Test of Relationship of the Respondent's Profile of the Choice of Home Birthing

Profile	Chi-square Value	Probability of Significance	Remarks	Interpretation
Age	LR=58.34**	0.000<.01	Highly Significant	Reject HO
Martial Status	LR=21.08**	0.000<.01	Highly Significant	Reject HO
Religion	LR=13.70	0.472	Not Significant	Accept HO
Educational Attainment	LR=19.22	0.083	Not Significant	Accept HO
Occupation(Wife)	LR-17.48	0.064	Not Significant	Accept HO
Monthly Income	LR=16.33	0.18	Not Significant	Accept HO

Table 6. Chi-Square Test on the Relationship of Availability of Health Care Facilities to the Choice of Home Birthing

Availability	Chi-square Value (CS) / Likelihood Ration (LR)	Probability of Significance	Remarks	Interpretation
1. There is nearby hospital in our area	CS=0.045	0.978	Not Significant	Accept HO
2. There is an available barangay health center near our	CS=1.327	0.515	Not Significant	Accept HO
3. The barangay health center is readily available	CS=1.584	0.453	Not Significant	Accept HO
4. The barangay health center has complete and reliable equipment	CS=1.533	0.465	Not Significant	Accept HO
5. The healthcare practitioner is always present in the said facility	CS=0.436	0.804	Not Significant	Accept HO
6. The midwife who performs the delivery doesn't need a fix amount	CS=10.10	0.258	Not Significant	Accept HO

Table reflects the connection between the availability of health facilities affects the choice of home birthing. It can be evidently seen that there is no significant relationship between the two.

Table 7. Chi-Square Test on the Relationship of Accessibility of Health Care Facilities to the Choice of Home Birthing

Accessibility	Chi-square Value (CS) / Likelihood Ration(LR)	Probability of Significance	Remarks	Interpretation
1. I find time to visit health center to have a prenatal check-up and Listen to health teachings even if I have a work.	CS=3.81	0.978	Not Significant	Accept HO
2. I don't have difficulties in transportation/finding ways in transporting to barangay health center or hospital	CS=4.41	0.515	Not Significant	Accept HO
3. I can readily use the services provided in the health center or hospital	CS=2.23	0.453	Not Significant	Accept HO
4. If there is any problem I can easily call or go to health care facilities and ask for help	CS=1.28	0.258	Not Significant	Accept HO

Table shows connection between accessibility of health care facilities and home birth option. There is no significant relationship between the two.

Table 8. Chi-Square Test on the Relationship of Awareness on the Risks and Complications of Pregnancy to the Choice of Home Birthing

Awareness on the Complications of Pregnancy	Chi-square Value (CS) / Likelihood Ration (LR)	Probability of Significance	Remarks	Interpretation
1. Completing the prenatal consultation is very important	CS=0.778	0.255	Not Significant	Accept HO
2. It is safer to give birth at the hospital if I have already delivered at least 5 children.	CS=0.961	0.293	Not Significant	Accept HO
3. During delivery, I have to push with each contraction to speed the process.	CS=1.723	0.028	Significant	Reject HO
4. During pushing I should not hold tension in my face rather I have to bear down and concentrate on pushing where it counts	CS=2.231	0.004	Highly Significant	Reject HO
5. It is possible that I may acquire infection at the site of perineal tear after delivery.	CS=0.694	0.543	Not Significant	Accept HO
6. Only sterile scissors can be used in cutting the cord that connects me and my baby.	CS=.110	0.258	Not Significant	Accept HO
7. I am not allowed to take in food or water while in labor.	CS=0.581	0.67	Not Significant	Accept HO

Table shows link awareness on the risks and complications of pregnancy and choice of home birthing. As depicted in the table, there is no significant relationship between the importance of completing prenatal consultation, giving birth in the hospital if more than five births, possible perineal infection during delivery, sterile scissors to be used during cord cutting and not taking any foods and water during labor.

Table 9. Chi-Square Test on the Relationship of Comfort to the Choice of Home Birthing

Comfort	Chi-square Value (CS) / Likelihood Ration (LR)	Probability of Significance	Remarks	Interpretation
1. I feel uncomfortable when giving birth at the hospital because my family members are not allowed inside the delivery room.	CS=0.411	0.814	Not Significant	Accept HO
2. I feel comfortable in giving birth at home because my family members are there and will readily attend to my needs.	CS=2.672	0.018	Not Significant	Reject HO
3. I feel uncomfortable delivering in front of people I don't really know.	CS=1.750	0.026	Not Signifi	Reject HO

				Cant	
4.	I don't like my baby to be delivered inside the hospital because of many documents needed to fixed before receiving the services needed.	CS=0.967	0.62	Not Signifi cant	Accept HO
5.	I don't like to deliver my baby inside a hospital because of episiorraphy.	CS=0.066	0.968	Not Signifi cant	Accept HO
6.	I don't like doctor, nurses and midwives treated me when I gave birth at the hospital or barangay health center.	CS=.400	0.135	Not Signifi cant	Accept HO
7.	I am afraid of needles	CS=0.623	0.73	Not Signifi cant	Accept HO
8.	It is costly to give birth inside a hospital	CS=7.850	0.002	Not Signifi cant	Reject HO
9.	I heard complaints from others that the doctors, nurses and midwives were not accommodating during the process of delivery.	CS=1.163	0.56	Not Signifi cant	Accept HO

Table shows interlink between comfort and the choice of home birthing. There is a significant relationship of the comfort giving birth at home because family members attention, uncomfortable giving birth in front of unknown person and costly at the hospital setting. Whilst, no significant relationship among other factor such as lack of family members during hospital delivery, documents needed, episiotomy, attitudes of doctors, nurses and midwives attending during birth, afraid of needles and negative feedback among healthcare attendants.

Conclusions

Maternal Volition of home birthing greatly affected by married couple and their age. It also influences their awareness on the risk and complications during pregnancy in terms of pushing down during uterine contraction and directed towards perineum and not on the face. Comfort greatly involved in respondents choice in home birthing especially attending her needs during delivery, uncomfortable in giving birth unknown to them and the cost to be paid at the hospital or health center during delivery.

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Root Characther of Drought Tolerant Rice In Lowland System

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Abstract

The objective of this research is to identify the characters of the root of rice that tolerance to drought stress. This research was done in the Rice Research Field, University Farm IPB, Bogor (± 240 m ASL). The research used a split plot design with three replications with drought stress as the main plots and variety as the subplots.The main plot consisting of drought stress at 3 Weeks After Transplanting (3 WAT) until the age of 7 WAT, and control (K0), whereas the subplot consisted of rice varieties namely IR 64, Ciherang, IPB 3S, Way Apo Buru, Jatiluhur, Menthik Wangi, Silugonggo and Rokan. The results showed that drought stress inhibits root development either vertically or horizontally at 0-10 cm, 10-20 cm, 20-30 cm and 30-40 cm depth. Decreased total root weight, root depth of achievement. Decrease in total dry weight of the roots is less due to drought stress on the Jatiluhur and IPB 3S varieties (12.41%, 36.41% respectively). The highest increasing in root depth achived by Way Apo Buru (46.05 cm) followed by IPB 3S (37.05 cm) varieties. Drought tolerance index was positively correlated with total root dry weight and relative leaf water content, and negatively correlated with the shoot root rasio. Total root dry weight, root depth, shoot root rasio during drought stress can be used as selection criteria for drought tolerant varieties.

Keywords: Drought stress, rootbox, root distribution

Introduction

Roots play important roles by exhibiting various adapted responses specific to the prevailing soil moisture stress conditions (Yamauchi et al., 1996). For instance, one of the adaptive responses of plants to drought conditions is the development of deep and extensive root systems (Fukai and Cooper, 1995; Serraj et al., 2004), which include thick roots (Price et al., 2000) and increased root length density (Siopongco et al., 2005) as a result of the plasticity in lateral root development (Azhiri-Sigari et al., 2000;

Ba˜noc et al., 2000; Kamoshita et al., 2000). These adaptations are perceived to be associated with increased water extractions (Kamoshita et al., 2000, 2004; Siopongco et al., 2005).

Rooting character becomes important in drought condition in which the ability of the roots to penetrate the solid ground to improve the extraction of water in the deeper zones, osmotic adjustment and dehydration tolerance of plant leaves. Deep root system, rugged and has a high ability to form root branching and penetration, high shoot root ratio, is a component of the essential nature of the roots associated with Drought avoidance (Yamauchi et al.1996; Samson et al., 2002).

In contrast to the flooded rice root has the ability to form cells aerenchym. This is important not only for adaptation to oxygen deficiency, but also to keep the extension of the roots and also to maintain the condition of the water loss that often occurs progressively. Increased aerenchym cells may facilitate the diffusion of oxygen to the roots when the low oxygen condition (Suralta and Yamauchi 2008). Rice root system has a unique morphological and physiological responses to drought, because usually adapt to the waterlogged conditions. Character facilitate the growth of the roots in waterlogged conditions that may affect the response of rice to drought, but the characteristics of the roots the condition of drought stress on the structurally and functionally rice in paddy system has not been known. It underlies related research to understand the mechanisms of plant roots to drought stress is primarily concerned with the root system of paddy systems. The objective of this research is to identify the characters of the root of rice that tolerance to drought stress.

Materials and Methods

This experiment was done in a plastic house at the Rice Research Bogor Agricultural University in 2012. Plant materials that were used in this experiment are IR 64, Ciherang, IPB 3S, Way Apo Buru, Jatiluhur, Menthik Wangi, Silugonggo and Rokan rice varieties. NPK fertilizers and insecticides. The tools used include plastic containers measuring 67 cm long, 47 cm wide and 42 cm in, yells, rulers, measuring cups, oven and analytical scales, microscopes and rootbox. Rootbox used was adopted from research Kono et al. (1987) and has been modified.

The experiment was arranged in a split plot design with three replications with drought stress the main plots that consisted of control (normal irrigation) and drought stress (drought imposed at three weeks after transplanting until harvest). The sub-plot consisted of eight rice varieties which are IR 64, Ciherang, IPB 3S, Way Apo Buru, Jatiluhur, Menthik Wangi, Silugonggo and Rokan.

Observation of water samples done at age 7 MST by opening the glass portion on one side, then take a picture of the distribution of root system intact and then also take pictures using griedline (Figure 1) to determine the root zone at a depth of 0-10 cm, 10-20, 20-30 cm and 30-40 cm. The depth of the root in each treatment outcome was measured by measuring the length of the roots from the base of the longest root to root. The root dry weight was measured based based deployment depth and radius of the base of the clump-which consists of: A: The depth of 0-10 cm (vertical), a radius of 0-5 cm A ': root depth of 0-10 cm (horizontal), 5-15 B: Depth of 10-20 cm (vertical), radius 0-5 B ': root depth of 10-20 cm (horizontal),

radius 5-15 C: Depth of 20-30 cm (vertical), radius 0-5 C ': The depth of 20-30 cm (horizontal), radius 5-15 D: The depth of 30-40 cm (vertical), radius 0-5 D ': The depth of 30-40 cm (horizontal), radius 5-15.

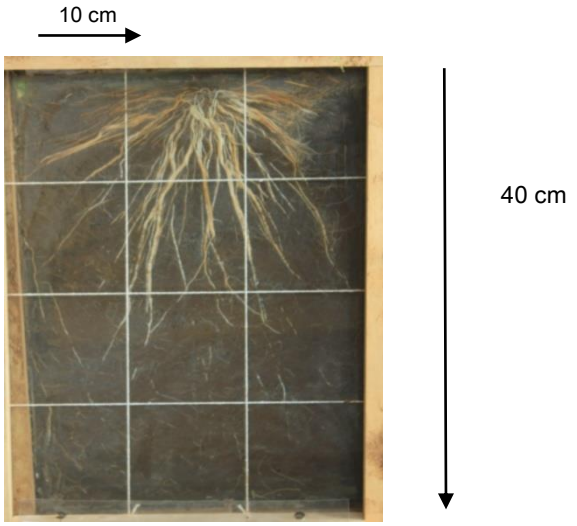

Figure 1. Gridlines that are used to determine the root zone (the root depth of 0-10 cm, 10-20 cm, 20-30 cm and 30-40).

The experiment was arranged in a split plot design with three replications with drought stress the main plots that consisted of control (flooded) and drought stress (drought imposed at three weeks after transplanting until sevent weeks after planting). The sub-plot consisted of eight rice varieties which are IR 64, Ciherang, IPB 3S, Way Apo Buru, Jatiluhur, Menthik Wangi, Silugonggo and Rokan.
observations conducted on root weight, the depth of the roots achievements, the total weight of the roots, shoot root ratio and relatif water content. The data were analyzed for significance by analysis of variance in the level of $\alpha = 0.05$ using Duncan's analysis.

Results and Discussion

Analysis of variance showed that drought stress treatment, variety and interaction significantly affect root weight at a depth of 0-10 cm, 10-20 cm, 20-30 cm, 30-40 cm (zones A, A ', B, B', C, C ', D and D'), total dry weight of root, shoot root ratio, depth of root achievment. Drought stress treatment caused decreased in root weight and development of roots vertically and horizontally (Table 1, 2, 3 and 4).

Table 1. The average weight of the root eight varieties at a depth of 0-10 cm (A, A') on drought stress treatment

Varieties	ZONE A					ZONE A'				
	Drought stress				Relative decrease (%)	Drought stress				Relative decrease (%)
	control		3 WAT			control		3 WAT		
	-g-					-g-				
IR 64	7.66	d	2.14	fg	72.10	2.66	a	0.85	f-i	68.00
Ciherang	9.95	c	1.08	gh	89.10	1.54	cd	0.43	jkl	72.10
IPB 3S	3.11	f	1.77	fgh	42.90	1.11	ef	0.61	h-k	45.10
Way Apo Buru	12.54	b	1.49	gh	88.10	0.94	e-h	0.31	kl	67.10
Jatiluhur	6.28	e	2.28	fg	63.70	1.18	c	1.05	efg	10.60
Menthik Wangi	6.30	e	0.48	h	92.40	0.70	i-l	0.54	g-j	22.90
Silugonggo	7.05	de	1.93	fg	72.50	1.32	de	0.20	l	84.60
Rokan	22.86	a	1.72	gh	92.50	2.28	b	1.04	efg	54.50

Note: Values followed by the same letter in the same column are not significantly different according to Duncan's analysis at *P<5%*

Table 2. The average weight of the root of eight varieties at a depth 10- 20 cm (B, B') on the drought stress treatment

Varieties	ZONE B					ZONE B'				
	Drought stress				Relative decrease (%)	Drought stress				Relative decrease (%)
	control		3 WAT			control		3 WAT		
	-g-					-g-				
IR 64	0.27	cd	0.41	b	[33.40]	0.69	cd	0.29	fg	58.00
Ciherang	0.20	ef	0.14	fgh	27.70	0.55	de	0.28	fg	48.00
IPB 3S	0.12	gh	0.26	cde	[50.70]	0.38	efg	0.45	ef	[16.20]
Way Apo Buru	0.19	efg	0.07	h	59.40	1.20	a	0.38	efg	68.00
Jatiluhur	0.28	cd	0.23	de	16.00	0.70	cd	0.71	cd	[0.28]
Menthik Wangi	0.14	fgh	0.08	h	40.70	0.52	de	0.53	de	[1.50]
Silugonggo	0.49	a	0.13	gh	73.60	0.81	bc	0.17	g	78.00
Rokan	0.23	[illegible]	0.32	[illegible]	[28.30]	0.99	b	0.53	[illegible]	46.00

Note: Values followed by the same letter in the same column are not significantly different according to Duncan's analysis at *P<5%*

Table 3. The average weight of the root of eight varieties at a depth of, 20-30 cm (C, C') on drought stress treatment

Varieties	ZONE C					ZONE C'				
	Drought stress				Relative decrease (%)	Drought stress				Relative decrease (%)
	control		3 WAT			control		3 WAT		
	--g--					--g--				
IR 64	0.14	bc	0.18	abc	[20.80]	0.52	bc	0.37	cde	27.90
Ciherang	0.07	e	0.16	abc	[58.30]	0.39	cde	0.29	de	25.30
IPB 3S	0.04	e	0.20	ab	[77.80]	0.45	bcd	0.34	cde	25.30
Way Apo Buru	0.08	de	0.22	a	[62.20]	0.47	bcd	0.26	e	45.10
Jatiluhur	0.18	abc	0.22	a	[17.50]	0.77	a	0.62	a	18.80
Menthik Wangi	0.06	e	0.05	e	10.90	0.58	b	0.33	cde	42.20
Silugonggo	0.16	abc	0.04	e	71.10	0.61	ab	0.31	de	48.70
Rokan	0.13	cd	0.15	bc	[14.30]	0.76	a	0.46	bcd	38.90

Note: Values followed by the same letter in the same column are not significantly different according to Duncan's analysis at *P<5%*

Table 4. The average weight of the root of eight varieties at a depth 30 to 40 cm (zones D, D') on drought stress treatment

Varieties	ZONAE D			ZONE D'		
	Drought stress		Relative decrease (%)	Drought stress		Relative decrease (%)
	Control	3 WAT		Control	3 WAT	
	g			g		
IR 64	0.04 e	0.25 b	[84.10]	0.15 d-g	0.47 c	[67.20]
Ciherang	0.05 de	0.06 de	[7.00]	0.06 fg	0.17 de	[63.40]
IPB 3S	0.02 e	0.27 b	[91.30]	0.06 fg	0.74 b	[91.80]
Way Apo Buru	0.04 e	0.19 bc	[78.50]	0.05 g	0.25 d	[76.90]
Jatiluhur	0.12 cd	0.35 a	[63.50]	0.11 efg	0.99 a	[88.70]
Menthik Wangi	0.04 e	0.02 e	52.20	0.07 efg	0.15 d-g	[53.20]
Silugonggo	0.05 de	0.25 b	[77.20]	0.12 efg	0.16 def	[24.30]
Rokan	0.03 e	0.25 b	[86.50]	0.09 efg	0.56 c	[83.50]

Note: Values followed by the same letter in the same column are not significantly different according to Duncan's analysis at *P<5%*

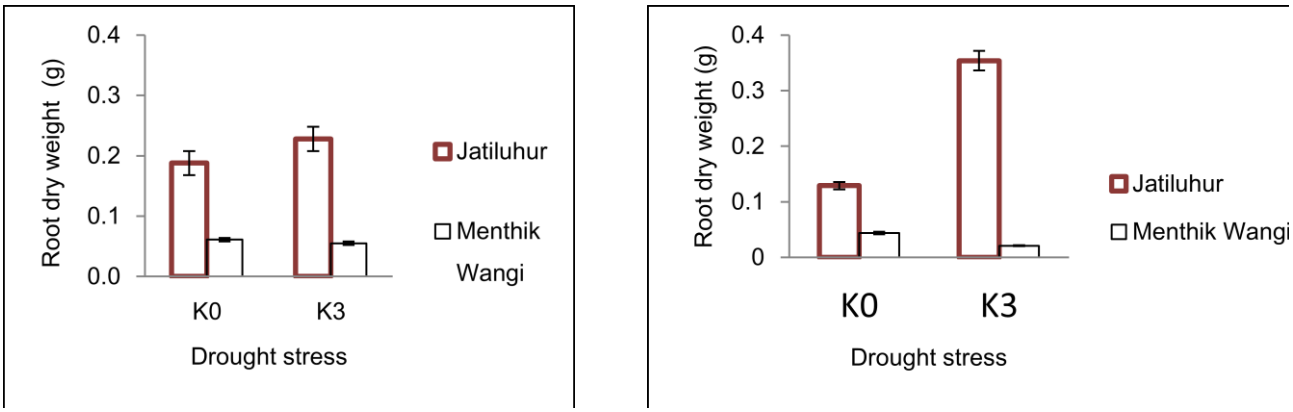

Figure 1. Root weight in zones C and D at a depth of 20-30 and 30-40 cm in Jatiluhur (tolerant varieties) and Menthik Wangi (sensitive varieties)

Due to drought caused a reduction in total dry weight of the roots reach 12.41-81.56%. IPB 3S and Jatiluhur shows a decline in the smaller root weight (12:31% and 36.41%). This shows that IPB 3S and Jatiluhur varieties has the ability to increased root weight in the deeper part or root expansion either vertically or horizontally to reach the water in deeper soil layers. One drought adaptation is elongation and expansion of roots. Elongation and extension of roots implications of total weight of the roots that would affect the balance of shoot and root growth.

The highets increase percentage ratio of the shoot root is Rokan and IR 64 varieties of drought stress treatment. This shows that drought stress occurs on the variety IR 64 and Rokan caused increased growth of canopy and inhibited growth of roots, thus causing that of ratio shoot root value becomes higher.

Table 2. Effect of drought stress and varieties to the total root dry weight and shoot root ratio

Varieties	Total root dry weight			Shoot root ratio		
	Control	Drought	Relative Decrease (%)	Control	Drought	Relative Decrease (%)
IR 64	12.16 c	4.98 g	59.05	1.47 fg	4.12 a	[64.13]
Ciherang	12.83 c	2.63 h	79.50	1.62 efg	2.872 b	[43.28]
IPB 3S	5.32 fg	4.66 g	12.41	2.34 bcd	2.076 cde	12.72
Way Apo Buru	15.53 b	3.19 h	79.46	1.33 gh	2.818 b	[52.70]
Jatiluhur	10.19 d	6.48 f	36.41	1.87 def	2.361 bcd	[20.75]
Menthik Wangi	8.01 e	2.6 h	67.54	1.44 fg	2.403 bc	[39.70]
Silugonggo	10.64 d	3.23 h	69.64	2.59 b	1.787 efg	45.22
Rokan	27.39 a	5.05 g	81.56	0.95 h	2.67 b	[64.16]

Note: Values followed by the same letter in the same column are not significantly different according to Duncan's analysis at *P<5%*

Drought stress treatment causes changes in the of root distribution on the ability of the roots to increase the depth of the roots achievement. IPB 3S and Way Apo Buru varieties has deeper depth achievement roots than other, while the Jatiluhur variety have high the depth of root achievement is also, but the depth of root of the achievements was not affected by drought stress treatment. Differences of the root distribution in the tolerant and sensitive variety can be seen in Figure 1. The depth of the roots of each variety achievement illustrates the ability to reached the water on the deeper layers by extending roots that a mechanism of drought stress. The depth of root achievement implications of the leaf relative water content. IR 64 has a most short depth of root achievements, inhibiting the ability to absorb water in the deeper layers of soil when drought stress, that make lower relative leaf water content (not show data).

The high ability to maintain relative water content of leaves remained is one of the mechanisms of plants to avoid drought stress, by increasing the absorption of water at deeper soil depths, or by reducing the density of stomata. IR 64 shows that drought led to a decline in the relative leaf water content in drought stress is significant. It is suspected IR 64 has a shallow root system and shortest depth of roots achievements, it can makes inhibiting the ability to absorb water in the deeper layers of soil.

The roots character become one of factors that determine plant resistance to drought. The paddy system of root have development of roots horizontally and when occur of drought, the development of

root will be inhibited both horizontally and vertically can be seen with decreased root dry weight in zone A on the Rokan, Menthik Wangi, Ciherang, IR 64 and Way Apo Buru varieties while in the zone A 'root development is inhibited on Silugonggo. Silugonggo variety although included into the type of upland rice but showed a decrease in root weight is relatively high in the zone A'. Jatiluhur (upland) showed a decrease in root weight is relatively small at a depth of 0-10 cm (A and A ') as the drought treatment. Differences in root system of upland rice and paddy system reported by Gowda et al. (2011) is in addition to the differences in water status in the paddy system, also there is a difference of root growth and adaptation to drought.

Upland rice varieties well adapted to the drought stress. But the results of this study show that upland rice varieties are also given the same level of water status with paddy. Turns at a depth of 10 cm has decreased root weight, reached 63.7%. Despite the higher paddy rice varieties ranging from 72.1% - 92.5%, but not on the type of new rice varieties that IPB 3S smallest decrease in root weight is 42.9%. A new type of rice with a good root vigor as one component of the result is expected to increase the percentage of filling grain the constraints of this type of plant. Rooting has good vigor in shallow layer of soil. Asch et al. (2005) reported tolerant variety would increase root growth was greater in drought stress conditions.

Conclusion

Characters of roots rice varieties have different response to drought stress. However, drought caused decreased root development either vertically or horizontally roots weight, the total weight of the root, the depth of the roots achievements, the shoot roots ratio and relative water content of leaf. Jatiluhur and Way Apo Buru is tolerant varieties that indicates different ways avoidance mechanism to drought stress. Tthe increased weight of the root zones C and D in Jatiluhur,by increasing depth of root achievement on Way Apo Buru. The increase in total root weight, depth roots achievment, shoot root ratio and relative water content during drought stress were root characters that the important role in tolerance to drought stress in paddy systems.

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Response of Three Varieties of Patchouli (*Pogostemon cablin*, Benth) to Varies Range of Drought Stress and Fertilization

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Abstract

The aim of this research was to response the growth and yield of three varieties of patchouli on a variety of drought stress conditions and fertilization. Research was conducted at Reuleut Timu village of Muara Batu sub-district North Aceh District from July to October 2015. The study was designed by using Split-split Plot with two replications of three factors in plastics home which consist of provision of water factor (K) at field capacity (fc), patchouli varieties factor (V) and fertilizers factor (P). Parameters measured were the number of leaves, plant height, and number of branches, root length and wet weight of the plant canopy. The result showed that the provision of water at field capacity has very significant effect on the wet weight of the plant canopy. Best field capacity found in K_1 (100% fc) and K_2 (75% fc). Variety treatment has significant influence to wet weight of the plant canopy shown by Tapaktuan variety (V_2). Fertilizers has very significant effect on the number of leaves and plant canopy wet weight and significantly affect on number of branches indicated by the recommended dosage Balittro (P_1).

Keyword: Patchouli, Drought Stress, Verieties, Fertilization

Introduction

Patchouli (*Pogostemon cablin* Benth) is one kind of aromatic essential oil plant that is included in the family of Lamiaceae. Originating from the subtropical regions of the Himalayas, Southeast Asia and the Far East, cultivated in Indonesia, Malaysia, China and Brazil (Carbone *et al.*, 2013). Production centers of patchouli in Indonesia are Aceh, North Sumatra, West Sumatra, South Sumatra, Bengkulu, Lampung, West Java, Central Java and East Java, South Kalimantan, Central Kalimantan, Central Sulawesi, South Sulawesi, West Sulawesi and Southeast Sulawesi (Dirjenbun, 2012).

Patchouli plants are included in shallow roots plant, so less resistant to drought. Such roots morphological characters caused patchouli sensitive to soil moisture deficits (Pitono *et al.*, 2007). Generally, patchouli plants are cultivated on dry land under fain-fed irrigation and no fertilization in accordance with the needs of the plant. Patchouli plants need water or rainfall ranging between 2500-3000 mm per year to grow and

produce well. The average rainfall per year in North Aceh amounted to 1,478 mm. With such amount of rainfall, patchouli will experience shortage of water and drought stress.

The use of varieties that have response to drought is one of the most technologically efficient and inexpensive. Several national superior patchouli varieties have been released in Indonesia, three of which are Sidikalang, Tapaktuan, and Lhokseumawe varieties which have high yield production (Nuryani *et al.*, 2005). All three are still relatively vulnerable to high drought stress, and unknown suitable dose of fertilizer to increase production.

For efficient fertilization, fertilization process does not only consider soil condition and environment only, but also should consider the basic needs of the plant nutrients. Right use of type and dose of fertilizer should be based on the results of soil and plant analysis thus thefore can be used as recommended fertilization within the area. This study aims to study the response in term of growth and yield of three varieties of patchouli on varies range of drought stress conditions and fertilization.

Materials and Methods

The study was conducted in the village of Reuleut Timu sub-district of Muara Batu district of North Aceh with altitude of ± 8 m above sea level (asl). Research was performed in the plastic housing from July 2015 to October 2015. The materials used are patchouli *pogostemon cablin* Benth seeds Tapaktuan, Lhokseumawe and Sidikalang varieties, cow manure, polybag, urea, SP-36 and KCl, MgO, Sevin 85 SP and Dithane M 45. The tools used are digital scales, sprayer, scissors, yells, plastic rope, ruler, computer, stationery and other tools. Using random group split plots design as the basic design with two replications of three factors, namely, the factor of irrigation (K) at field capacity (fc) as main plot, K_1 = water supply 100% fc, K_2 = water supply 75 % fc, K_3 = 50% fc water supply, water supply K_4 = 25% fc. Patchouli variety factor (V) as a subplot, V_1 = Lhokseumawe (origin Lhokseumawe / North Aceh), V_2 = Tapaktuan (origin Tapaktuan / South Aceh), V_3 = Sidikalang (origin Sidikalang North Sumatra) and fertilizers factor (P) N, P, K and Mg as sub-sub plot, P_1 = 284 kg urea / ha (128.8 kg N / ha) + 70 kg SP36 / ha (25 kg P_2O_5 / ha) + 140 kg KCl / ha (84 kg K_2O / ha) + 140 kg Mg / ha (42 kg MgO / ha) (Balittro, 2011), P_2 = 518 kg urea / ha (233 kg N / ha) + 544 kg SP-36 / TSP / ha (196 kg P_2O_5 / ha) + 200 kg KCl / ha (120 kg K_2O / ha) + 450 kg Mg / ha (135 kg MgO / ha) (Emmyzar & Fery, 2004), P_3 = 691 kg urea / ha (311 kg N / ha) +220 kg SP-36 / TSP / ha (35 kg P_2O_5 / ha) + 790 kg KCl / ha (394 kg K_2O / ha) +208 kg Mg / ha (63kg MgO / ha). There are 72 (seventy-two) experimental plots and each plot has 7 (seven) polybag planted 1 (one) patchouli seed.

Implementation of Research

The plant materials derived from shoot cuttings with a diameter of 0.8 to 1.0 cm and were taken from young branches but have woody. Shoot cuttings were cut with a length of 20 cm. Cuttings are grown in 1 kg polybags size containing a mixture of soil and cow manure. Seedlings that already have buds and leaves are moved to big polybag with the size of 60 kg of land. Drought stress treatment is given at the age of 1 month after planting in accordance with the treatment. Polybag plants are arranged with a

distance of 60 cm x 40 cm on randomized plots. Maintenance includes watering, weeding and pest eradication. Patchouli fertilization was done two weeks before planting in accordance with the treatment.

Soil water content at field capacity was measured every day with a tensiometer (soil moisture tester) to determine when and how much water should be given to each experimental plot. Growth and yield observations was made at the age of 120 days after planting (dap) to the number of leaves, plant height, number of branches, root length and weight of the wet canopy. The data were analyzed by ANOVA. Should real differences occur, further test using BNT at the level of 5% was conducted.

Results and Discussion

The Number of Leaves (NL)

Analysis of variance showed that the dose of fertilizer given to patchouli significantly affect the amount of plant leaves. Best dose of fertilizer is the recommended dosage of Balitro (P_1). Although it did not give a noticeable difference in the treatment of varieties, but the varieties Tapaktuan (V_2) has more leaves than other varieties. Water provision levels at field capacity did not significantly affect the number of leaves of the plant, but the highest number of leaves reached on the provision of water treatment at 75% fc (K_2).

The recommended dosage of fertilizer of Balitro has more leaves compared to the others. Large number of leaves due to the recommended fertilizer dose of Balittro was believed to be the doses as required by patchouli. This recommended doseo of Balitro has been tested to different types of soil and various patchouli production centers in Indonesia. Besides, this dose is the optimal and balanced dose for the development and growth of patchouli (Mawardi & Dzajuli, 2006).

Plant Height (PH)

Analysis of variance showed that the provision of water at field capacity, varieties and fertilizers do not provide a real difference on plant height at 120 dap. The highest plant as a result of concecutive treatment was achieved at K_2 (75% fc), Tapaktuan variety (V_2) and fertilizers P_2. Although statistically not significant, plant height was predicted to be caused by nutrient uptake by the roots due to the availability of sufficient water in the soil, resulting in the increase of plant height. Plants will easily absorb nutrients when water is sufficient in the soil. This is consistent with Mukhlis (2013), that the uptake of nutrients by plants is influenced by the availability of nutrients and water in the soil. Plants absorb the nutrients dissolved in soil water through the roots. Water plays an important role in the process of absorption of nutrients, the water can play a role in dissolving nutrients and transport it into the plant tissue.

Number of Branches (NB)

Analysis of variance showed that there are visible differences in number of branches as a result of the treatment dose of fertilizer at the age of 120 dap. Number of higest branches at the age of 120 dap was achieved at P_2 which is significantly different with the dose of P_3. There were no significant differences in water treatment at field capacity (K) and the treatment of varieties (V). Low number of patchouli branches at the P_3 dose was expected because the dose applied was not optimal for patchouli. According to Sugiarti *et al.* (2004) to obtain optimum plant growth, fertilizers must be administered in an amount

corresponding to the needs of the plant. Fertilizer administered was predicted to exceed the nutrient needs of patchouli.

Tabel 1.The number of leaves (NL), Plant Height (PH), Number of Branches (NB), Root Length (RL), Wet Weight of The Plant (WWP) Patchouli at the age of 120 days after planting (dap) due to the treatment of the provision of water at field capacity varieties and fertilizers.

Treatment /Parameter	NL	PH	NB	RL	WWP
Water field capacity					
K_1	45.12 a	41.71 a	8.44 a	22.01 a	23.52 a
K_2	45.62 a	42.48 a	8.30 a	26.43 a	21.93 a
K_3	37.81 a	38.33 a	7.62 a	19.82 a	16.09 b
K_4	39.56 a	39.63 a	8.97 a	27.24 a	15.25 b
BNT 0,05	14.24	6.04	1.86	10.68	5.49
Varieties					
V_1	41.61 a	37.62 a	7.69 a	24.96 a	18.24 b
V_2	43.87 a	47.22 a	9.15 a	21.96 a	24.08 a
V_3	40.59 a	36.77 a	8.15 a	24.71 a	15.27 c
BNT 0,05	9.03	2.35	1.62	7.37	1.42
Dose fertilizer					
P_1	48.58 a	42.22 a	8.82 a	23.92 a	21.39 a
P_2	42.97 a	42.54 a	8.88 a	24.85 a	19.05 ab
P_3	34.52 b	36.87 a	7.29 b	22.87 a	17.14 b
BNT 0,05	8.05	4.00	1.42	7.98	2.45

Note: The numbers followed by the same letters in the same column are not significantly different according to LSD test 0.05 level.

Root Length (RL)

Analysis of variance showed no significant differences in patchouli root length due to the provision of water treatment at field capacity, varieties and fertilizer at the age of 120 dap. Although it does not have significant differences due to treatment, but the highest root length is achieved at the level of 25% fc (27, 24) on the provision of water at field capacity, varieties of Lhokseumawe (24.96) and fertilizers P_2 (24.85).

Root length at 25% moisture content level was allegedly due to drought at the top soil, the plants extend their roots to find water at the bottom part of polybag which is still damp. It is as expressed by Djazuli (2010) that patchouli was able to search the water by extending its roots into the bottom soil of the pot for more moist. Similarly, as was expressed by Dubrovsky dan Gomez-Lomeli (2003), that the extension of roots in drought conditions with the formation of deep roots and many branches. From the data shown at the above, Lhokseumawe varieties have more long roots than others due to the provision of water treatment at field capacity. The recommended dose of fertilizer of Balittro was an optimal and balanced fertilizer for patchouli.

Wet Weight of the Plant (WWP)

Analysis of variance showed that there were significant differences on the wet weight of patchouli plant canopy due to the provision of water treatment at field capacity. The highest canopy wet weight was achieved at the level of K_1 (100% fc) followed by K_2 (75% fc) are significantly different from K_3 (50% fc) and K_4 (25% fc). Tapaktuan variety (V_2) has the highest canopy weight and highly significant compared with other varieties. Balittro fertilizer recommendation (P_1) provides the highest canopy wet weight and highly significant at a dose of P_3.

Low water supply treatment caused lower wet weight of plant canopy, as was the case in the K_3 and K_4. Plants slow organ growth and development as mechanism to face drought stress. Therefore, the wet weight of patchouli plant canopy to the scenes has a lower weight plants than plants with enough water. Tapaktuan varieties have a high canopy wet weight because it can adapt to a variety of stress conditions given. The study produced similar results to the study conducted by Djazuli (2010) who found that Tapaktuan varieties show best resistance level of all types of patchouli in Aceh. The amount of the plant canopy wet weight gained due to the dose of fertilizer P_1 indicates that the dose is adequate to support optimum plant growth (Prawoto & Sholeh, 2006).

Conclusion

The provision of water at field capacity has significant effect on the wet weight of patchouli plant canopy. Water provision at field capacity was found in the K_1. Best response of patchouli vegetative growth to drought stress obtained at Tapaktuan varieties that showed the highest plant canopy fresh weight compared to other varieties. Balittro recommended dose of fertilizer showed significant effect on the number of leaves and wet weight of the plant canopy. The provision of water for patchouli plant growth should be given to soil moisture content between 75% fc to 100% fc, using Tapaktuan variety with the Balittro recommended dose of fertilizer.

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Induction Of Genetic Variability In Kipas Putih Soybean With Gamma Ray Irradiation (M1 Generation)

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Abtract

This reasearch was done to study the effect of gamma ray on various characters of Kipas Putih soybean, including its height, number of pods per plant, number of seeds per plant, seed weight per plant, days to first flower and days to harvest. In this study, Kipas Putih Soybean *(Glycine max* L.) variety was treated with gamma ray with doses of 100 Gy, 200 Gy and 300 Gy. M1 generation showed that all the characters treated with gamma ray decreased, but days to first flower and days to harvest increased compared to non-irradiation Kipas Putih (as a control). This results indicated that different doses of gamma ray irradiation can be effectively used to create the genetic variability of plants.

Keyword: gamma irradiation, kipas putih soybean, M1 generation

Introduction

Soybean is an important crop in Indonesia. It is a protein-rich nutrient that plays an important role in improving people's nutrition. Soybean demand will continue to increase along with the growth of population and the needs of soybean as raw materials for the food, such as tofu, tempeh, soy sauce, soy milk, tauco and various snack products.

The increase in soybean demand is not in line with the increase in the production. According to BPS (2012), soybean production in 2012 was estimated at 779.74 thousand tons of dry beans or decreased by 71.55 thousand tons (8,40%) compared to 2011. Therefore, the increase in production of soybean is a must. Various attempts can be made, such as by using high yielding varieties. The development of varieties can be done through breeding programs.

Genetic variability of population is the basis of plant breeding programs. Extensive genetic variabily can lead to the success of genetic improvement through selection of plant breeding. Mutation breeding is one of the most effective technologies in increasing the diversity of plant characters which in turn can produce

new varieties. Manjaya and Nandawar (1997) stated that mutation breeding is a way to increase the genetic variability of plant characters, both in quantitative and in qualitative manners. The important benefit of mutation breeding is that mutants with certain characters can be created without changing the essential character of the existing variety. Therefore, the mutants can be easily cultivated as a normal type.

Mutation breeding of crop cultivation has been used for self-pollinated crop with limited genetic variability. Up to now, a lot of researchers have developed plants by mutation breeding techniques for sesame (Sharma, 1993), cowpea (Dhanavel et al., 2008), black gram (Thilagavathi and Mullainathan, 2009) and soybean (Padmavathi et al., 1992 and Pavadai et al., 2010). A lot of soybean mutant lines have been identified by using mutation breeding programs based on morphological characteristics (Rahman et. al., 1994; Hanafiah et. al. 2010).

Doses of gamma ray is the most important thing in inducing genetic variability which in turn can generate positive mutants. Previous studies on soybean showed that at a dose of 200 Gy of gamma ray can effectively generate genetic diversity of plants (Mudibu et. al. 2012). Hanafiah et. al. (2010) also reported that this dose resulted higher genetic diversity than other irradiation doses and the control. Many studies showed that treatment with higher doses of gamma ray were inhibitory, whereas lower exposures were sometimes stimulatory. Gamma ray produces radicals that can damage and affect plant morphology, anatomy, biochemistry, and physiology depending on the irradiation level.

This research was conducted to study the effect of gamma ray on induction of genetic variability in M1 generation of Kipas Putih soybean. Kipas Putih is a local Aceh soybean variety becoming nationally leading soybean. Kipas Putih has a robust appearance, somewhat resistant to rust disease and well-adapted to the local climate. Unfortunately, for the farmers, this variety is not a favorite one due to its low production and long harvesting time span. According to Balitkabi (2009), Kipas Puth productivity is 1.69 tons/hectare and days of harvesting is 85-90 day. Induction of mutations by gamma ray irradiation on this variety is expected to result in genetic changes that could produce quality crops. The crops are more early maturing and high yielding.

Materials and Methods

Kipas Putih soybean seeds were irradiated by gamma ray irradiation undertaken by Indonesia's National Atomic Energy Agency (BATAN), located at Pasar Jumat, Jakarta. Meanwhile, field research was cunducted at Reuleut Timu, North Aceh. This reasearch took place from April to Agustus 2015. Kipas Putih soybean seeds were irradiated with gamma ray with doses of 0, 100, 200, and 300 Gray derived from cobalt-60 using 4000 A chamber. Each treatment were irradiated 200 seeds. Weeds that grew in the planting area was cleaned, then 4 plot with 9 m x 3 m was made. Tillage was done manually, two weeks before planting.

Irradiated soybean seeds were planted in the field immediately. A total of 200 seeds (M1) in each treatment dose were planted one seed per hole with plant spacing of 40 x 20 cm. Fertilization was done according to the recommendation of Indonesia's Soil Research Institute (Balittan) consisting of 50 kg

Urea / ha, 200 kg SP-36/ha and 100 kg KCl/ha. Fertilizer application SP-36 and KCl performed 2 weeks before planting, while urea is done at the time of planting.

Watering was done in the morning or afternoon in accordance with the conditions of the field. In case of rain, the plants were not watered. The weed control was done manually by pulling weeds in the plot in accordance with the conditions of the field. The observation was made as to plant height, number of pods, number of seeds, seed weight, days to first flower and days to harvest.

Results and Discussion

Soyben M1 generation resulted from the study had low percentage of germination and low percentage of survival plants compared to the control because of the increase of the irradiation dose. At a dose of 300 Gy, the germination percentage was 78%, but the percentage of survival plants only 15% (Table 1). At 200 and 300 Gy, most of plants were only able to germinate up to cotyledon leaves, but there was no growth occurs at a later stage. One month after planting, many plants in this population died (Figure 1). The same result had also been reported by some other research on rice (Ramesh et al., 2002), cowpea (Gnanamurthy et al., 2012) and soybean (Pavadai et al., 2010). The study of the effect of gamma irradiation in bhendi conducted by Jagajanantham et al. (2012) showed that there had been the decrease of the germination percentage and the number of survival plans compared to the control when treated with gamma irradiation.

Table 1. The percentage of germination and the percentage of survival plants due to gamma ray irradiation.

Doses (Gray)	% Germination	% Survival
0	85,5	87,5
100	60	70
200	67	50
300	78	15

In this study, there were many morphological variations especially leaf abnormalities, which were indicators of the effectiveness of mutagens treatment. In different treatment, there were morfological variations such as unifoliate, bifoliate, quadrifoliate, pentafoliate and fused leafs. There were founded chimera leaf, albino plants and undeveloped flower rasim plants. In M1 generation, the mutation of flower colour was not found.

In general, the appearance of the irradiated plants was very bad. The M1 generation was the one that suffered from direct damage as a result of gamma ray irradiation. This is consistent with what Van Harten (1998) stated, that is M1 generation is the population experiencing a direct physiological effect of gamma ray irradiation which produces free radical electrons that cause damage to cells.

Figure 1. The comparison of the growth of Kipas Putih soybean between 0 Gray (the control) and 300 Gray at one mounth after planting

Gamma ray irradiation treatment significantly reduced plant height (Table 2). Based on the results of the t test, there were distinct differences in plant height with the control plants (0 Gy) of 100 Gy, 0 Gy to 200 Gy and 0 Gy to 300 Gy. The tallest crops were in the control of 86.3 cm, followed by 100 Gy (79.1 cm) and 200 Gy (51.7 cm) respectively. The shortest plants was the irradiation treatment with a dose of 300 Gy and plant height of only 40.1 cm. Pepol and Pepo (1989) also showed that in general the treatment of mutagens causes plant height reduction compared to the control.

Table 2. The effect of gamma irradiation on agronomic characters in Kipas Putih soybean.

No.	Characters	Irradiation doses			
		0 Gy	100 Gy	200 Gy	300 Gy
1.	Plant height	86,3±14,3	79,1**±15,7	51,7**±13,4	40,1**±13,4
2.	Number of pods	213,7±77,0	174** ±69,2	63,8**±75,1	20**±42,5
3.	Number of seeds	364±29	266**±15	80,4**±9,5	19,9**±14
4.	Seed weight per plant	41,5±14,1	30,4**±12,7	10**±11,7	2,70**±5,95
5.	Days to first flower	41,10±1,37	43,23**±2,25	54,42**±6,64	58,33**±5,80
6.	Days to harvest	89,52±1,51	97,05**±4,04	120,96**±8,06	131,22**±6,67

Note: ** = Significantly different with the control population (0 Gy) at level 1% by t test.

The result of t test indicated that the average character of number of pods, number of seeds and seed weight per plant also showed a highly significant difference between the control and the treatment of various doses of irradiation. The number of Kipas Putih pods without irradiation (the control) were 213 per plant, which was highly significant compared to 174 pods (100 Gy), 63.8 pods (200 Gy) and 20 pods (300 Gy). The largest number of seeds per plant was in the control, that was 364 seeds per plant. This difference was highly significant compared to all doses of the irradiation treatment with the number of seeds per plant as many as 266, 80.4 and 19.9 respectively. Similarly, the character of seeds weight per plant of the control had the highest weight of seeds per plant that was 41.5 g/plant. Meanwhile, the plant population treated with irradiation doses had seeds weight of 30.4 g, 10 g and 2,7 g/plant respectively. This is consistent with research conducted by Girija and Danavel (2013) on cowpea plants which

concluded that all quantitative characters proportionally decreased with the increasing doses of gamma ray irradiation. A decrease in the number of pods, number of seeds per plant and seed weight on irradiation treatment because of the inhibition of enzyme activity, changes of enzyme activity and toxycity of mutagens. This causes disruption of the physiology and biochemistry of the development of the plant as reported by Laric (1975) in Girija and Danavel (2013).

In M1 generation, all quantitative characters decreased but days to first flower and days to harvest increased in plants treated with mutagen compared to the control. T-test of the character of days to first flower and days to harvest showed that there were distinct differences between the control plants and plants treated with the irradiation dose. The irradiation dose caused flowering and harvesting became longer. Table 2 shows that the control plants started flowering on 40.1 days after planting, while the irradiation dose flowered on 43.23 days (100 Gy), 54.42 days (200 Gy) and 58.33 days (300 Gy). The longest days to first flower was a dose of 300 Gy, which was late 18,23 days compared to the control. Days to harvest of the irradiation treatment was also very different from the control plants. Days to harvest became longer in line with the increase of irradiation doses. The control plants harvested on 89.52 days, while the irradiation treatment harvested on 97.05 days (100 Gy), 120.96 days (200 Gy) and 131.22 days (300 Gy). The delay of harvesting was in a dose of 300 Gy in which plants became late 41.7 days compared to the control. This is consistent with the results of Danavel Girija's research (2013), that was the gamma ray slowered cowpea where flowering was late 1-4 days compared to a dose of 40 kR. The shortest age of days to first flower was found in the control (34.78 days), while the longest were at the highest irradiation with a dose of 40 kR (49.32 days). Similar results were also recorded in soybean by Pavadai and Dhanavel (2005).

Jagajanantham et. al., (2012) noted that the biological effect of gamma ray was determined by the interaction among atoms or molecules in the cell. These radicals could damage or modify the important components of plant cells, and changed morphology, anatomy, biochemistry and physiology of plants depending on the radiation dose (Ashraf et al., 2003). The irradiation of seeds with high doses of gamma ray disturbs the synthesis of protein, hormone balance, leaf gas exchange, water exchange and enzyme activity (Toker et al., 2005). Girija and Danavel (2013) also stated the ability of mutagens to enter the cells of living organisms for interacting with the DNA produces toxic that associate with their mutagenic properties. Thus, mutagens can cause physiological damages mainly showed by growth retardation and death in M1 generation.

Conclusions

All quantitative traits observed in M1 generation decreased in line with the increasing doses of gamma ray irradiation, but the character of first days to flower and days to harvest increased compared to the control plants.

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Profile of Attachment Styles to the Father among Early Adolescents in SMPN 19 Percontohan Banda Aceh Based on Adult Attachment Scale

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Abstract

Changing of paradigm emphasizes that in addition to be a main breadwinner in the family; the father also has an important role to play in the formation of adolescent behavior (Lindsay, 2007). Shade, Kools, Weiss, and Pinderhughes (2011) found that men and women who had good social relationships (marital quality and ties outside the family, such as friendship), have been experiencing more warm from father in childhood. Attachment styles to the father was assessed using the newly developed Adult Attachment Scale (AAS). Results calculation obtained that the average score for close attachment to the father was 20.89 (SD = 3.58), the average score for dependent attachment to the father was 19.73 (SD = 3.66), and the average score for anxiety attachment to the father was 19.88 (SD = 4.20). Thus, from these results the seventh grade students of SMPN 19 Percontohan Banda Aceh had close attachment to the father.

Keywords: attachment styles to the father, early adolescent, adult attachment scale

Introduction

Changing of paradigm emphasizes that in addition to be a main breadwinner in the family; the father also has an important role to play in the formation of adolescent behavior (Lindsay, 2007). In a patriarchal culture, a father has a more dominant role than a mother (James, 2010). A father is a head of the family, who must be responsible to his wife, children, family, and society (Bretherton, 2010). Thus, the relationships between father and children have to be maintained, so the children will be able to become more mature (Kenyon &Koerner, 2008). Although the attachment relationship between the father and the adolescent becomes more limited in communication and emotional quality over time, the adolescent continues to view his or her father as an important attachment figure (Paterson, Field & Pryor, 1994).

Shade, Kools, Weiss, and Pinderhughes (2011) found that men and women who had good social relationships (marital quality and ties outside the family, such as friendship), have been experiencing

more warmth from father in childhood. Besides that, a recent study conducted by Fosco (2012) indicated that parental monitoring and father-adolescent connection were associated with reductions in problem behavior over time. This showed that the role of the father was very important for adolescent behavior development (Sipsma, Biello, Cole-Lewis, & Kershaw, 2010). Hence, it can help adolescents to build positive social relationships with effective problem-solving and competent coping skills (Habib et al., 2010).

Attachment given by the father to the son since he was a baby, will give a feeling of comfort and love until he becomes an adult (Sullivan, 1999). A father is the greatest asset in educating the emotions of early adolescent males by giving full attention to them (Mazlish, 1975). The father also provides positive benefits for the adolescent son, such as in the development of self-control, the ability to delay the desire, and to help the adolescent in social adjustment (Flouri& Buchanan, 2003).

Daughter-to-father attachment has been shown to be significantly related to a daughter's ability to regulate emotions (Pearce, 2009). Kenny and Gallagher (2002) also said that paternal attachment is associated positively and significantly with traditional feminine traits of expressivity. Expressivity may be linked with emotion regulation, in that females who are expressive may be able to better articulate their emotions, as compared to those females who may be more withdrawn (Vignoli, Croity-Belz, Chapeland, de Fillipis, & Garcia 2005). In addition, paternal involvement may be a protective factor against psychological maladjustment with adolescents in families that are not intact and against psychological distress, especially for women (Flouri& Buchanan, 2003).

The objective of this study was to see the profile of attachment styles to the father among early adolescents SMPN 19 Percontohan Banda Aceh based on Adult Attachment Scale.

Materials and Method

The approach used was a quantitative method. This is because a quantitative approach has many advantages for this particular study, such as providing systematic process to obtain quantifiable information and presenting in numerical form. In addition, quantitative approach also uses a statistical method that emphasizes the analysis of the numerical data (numbers).

Firstly, all participants needed to fill the informed consent and demographic sheet.Then, next pages were followed by items from Adult Attachment Scale and participants might give their answer without passes. The researcher waited until all completed, this was conducted to minimize the loss of the sample. Once all the scales had been completed they were collected and researcher would check all of the answers. If items passed were found, so the researcher would ask the respondent to fill it. Moreover, a souvenir "keychain" was also provided for students who wanted to be a participant in this study. Samples were taken using random sampling with proportionate stratified random sampling technique.

The number of samples taken was stratified because the population was also stratified, based on the classes that consist of VII-1, VII-2, VII-3, and VII-4. Population in this study was seventh grade students of SMPN19 PercontohanBanda Aceh that met the established criteria, specifically at least 12 years old and still had a father. So, the number of samples taken were 81 students with 30 males and 51 females.

The method used in this study was a survey method which took samples from a certain population and used questionnaires as the main data collection tool (Singarimbun& Effendi, 1989). The primary data obtained from the respondents were through a questionnaire given.

Instruments

Demographic Information

A brief demographic questionnaire was used to obtain background characteristics of the participants. Items in this questionnaire would request information on gender, age, and number of siblings.

Adult Attachment Scale

Attachment styles to the father were determined by three patterns of attachment styles based on Adult Attachment Scale (AAS, Collins & Read, 1990). Collins and Read developed AAS to measure the dimensions which are believed to represent attachment styles. The 18-items of AAS, developed with a sample of undergraduate students, measures attachment style dimensions including comfort with closeness and intimacy (close subscale), comfort with depending on others (dependent subscale), and worry about being rejected or unloved (anxiety subscale). Each subscale will be described into six items.

The 18-items contain 3 main parts which can be calculated separately. The first part measures close attachment (1, 6, 8, 12, 13, and 17), such as (1) “I find it relatively to get close to father”. A higher score indicates greater feelings of comfort withcloseness and intimacy. Secondly, measures dependent attachment (2, 5, 7, 14, 16, and 18), such as (2) “I find it difficult to allow myself to depend on father”. A higher score indicates more comfort with depending onothers and a belief that others will be available when needed. The last part measures anxiety attachment (3, 4, 9, 10, 11, and 15), such as (3) “I often worry that father doesn’t really love me”. A higher score indicates greater worry about being rejectedor unloved.

Items of AAS are also divided into 2 styles; consisting favorable items and unfavorable items. Favorable items are statements which showed positive attitude towards the object, otherwise unfavorable items are statements which showed negative attitude towards the object (Arikunto, 2000). Items which have a favorable style are item numbers 1, 3, 4, 5, 6, 9, 10, 11, 12, 14, and 15. Otherwise, items which have unfavorable style are item numbers 2, 7, 8, 13, 16, 17, and 18.

The original scale had 5-point likert types, but researcher modified into a 4-point likert types, with deleting neutral as the third point, in order to avoid central tendency. So, respondents were asked to choose one of 4 alternative options from Strongly Misappropriate (SM), Misappropriate (M), Appropriate (A), and Strongly Appropriate (SA). For the favorable items (+), Strongly Appropriate (SA) got a score of 4, Appropriate (A) got a score of 3, Misappropriate (M) got a score of 2, and Strongly Misappropriate (SM) got a score of 1. On the other hand, for the unfavorable items (-), Strongly Appropriate (SA) got a score of 1, Appropriate (A) got a score of 2, Misappropriate (M) got a score of 3, and Strongly Misappropriate (SM) got a score of 4.

Nancy L. Collins and Stephen J. Read, two authors who developed AAS had demonstrated good psychometricproperties for reliability and validity of AAS. Collins and Read (1990) reported Cronbach

Alpha's coefficients of .69 for Close, .75 for Depend,and .72 for Anxiety. In addition, the latest study conducted by Akhtar (2012) among adolescents in Pakistan found that the value of Cronbach Alpha for AAS ranged from .72 to .80. From this result, AAS was decided to be used for measuring attachment styles to the father among early adolescences in seventh grade classes of SMPN 19 Percontohan Banda Aceh.

Results and Discussion

For determining the types of attachment styles to the father among early adolescents at seventh grade classes of SMPN 19 Percontohan Banda Aceh, the researcher did a descriptive analysis by using the computer software, IBM SPSS Statistics version 20.0 for Windows. Previously, the statistical mean for each dimension of attachment styles to the father in AAS was completed. Furthermore, the dimension which showed the highest point reflected the attachment style to the father owned by each participant. Below is the table which shows the types of attachment styles to the father.

Table 1. *Typesof Attachment Styles to the Father among Early Adolescents*

Attachment Style	*M (SD)*	
Close Attachment	20.89	(3.58)
Dependent Attachment	19.73	(3.66)
Anxiety Attachment	19.88	(4.20)

The types of attachment styles to the father among early adolescents are more clearly seen in the following graph.

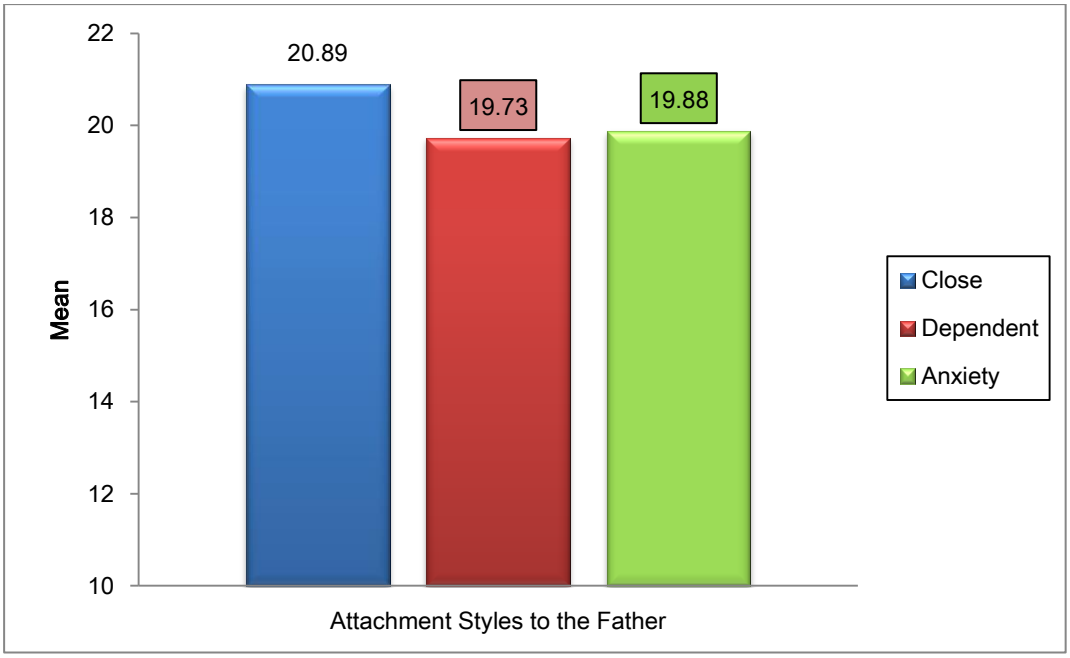

Figure1. Types of Attachment Styles to the Father among Early Adolescents

Based on the table and graph shown above, the average score for close attachment to the father was 20.89 (*SD* = 3.58), the average score for dependent attachment to the father was 19.73 (*SD* = 3.66), and the average score for anxiety attachment to the father was 19.88 (*SD* = 4.20). Thus, from these results the seventh grade students of SMPN 19 Percontohan Banda Aceh had close attachment to the father.

Adult Attachment Scale (AAS) was used to examine the attachment styles to the father among early adolescents. Results calculated from AAS obtained that types of attachment styles to the father in early adolescents at seventh grade classes of SMPN 19 Percontohan Banda Aceh were spread among close attachment to the father, dependent attachment to the father, and anxiety attachment to the father.

The spread types of attachment styles to the father can be understood because of the varying characteristics of the participants, such as order of birth. These findings are similar to the opinion stated by McGuirk and Pettijohn (2008) that only child participants would be the likely to report secure attachment, then the oldest child participants, the youngest child participants, and the middle child participants would be the most likely to report insecure attachment. Only children who have their parents' undivided attention and oldest children also experience this undivided attention until a second child is born, which may lead to increased security and attachment. The later born children are the babies of the family and may receive attention from all family members and therefore develop stronger attachments than the middle children. The middle child is stereotypically always the child in the most competition for attention with older and younger siblings. This competition for attention may lead to an uncertainty about parental relationship quality and a more insecure form of attachment.

The results showed the majority of early adolescents at seventh grade classes of SMPN 19 Percontohan Banda Aceh had close attachment style to the father. It could be said most of early adolescents had close and secure relationships with their father. These findings were in line with Doyle, Lawford, and Markiewicz(2009) who is opinion stated early adolescents still show high level attachment security with parents, although they started developing attachment with other persons, such as friends. In addition, Santrock (2011) explained that when entering adolescence, forms of attachment have changed from tangible (physical) to an emotional bond. So, it could be said that although early adolescents showed attachment with somebody else, they still build a good emotional relationship with parents.

In addition, close attachment to the father owned by seventh grade students of SMPN 19 Percontohan Banda Aceh could also be understood as a cultural and gender paradigm in Banda Aceh city which had undergone many changes after the Tsunami disaster. Before the Tsunami, the mother was a major role in educating and raising children. However, now the father has started interfering in the development and continuity of the children's education because, his wife is busy working. This is according to research conducted by Lisna, Evi, Agussabti, and Safrida (2011) who stated that the father had taken the role of the mother due to the mother taking part in improving the economy of the family. So, he started to expand secure attachments with his children by contributing of adolescent personality development.

Ainsworth (1968) defined close attachment as an attachment style characterized by children who feel comfortable with the parents, who are not completely dependent on their parents, have fun relationships

with the parents, and carry a sense of confidence. As a result, the father was viewed as a warm and loving figure that becomes a source of support for adolescents. Adolescents with close attachment become visibly upset when their father is away, and feel happy when their father returns. When they feel frightened, they will seek comfort from their father. A father who gives close attachment always engages with their adolescents during activities together.

Based on AAS, adolescents with close attachment to the father had several characteristics, including find it relatively easy to get close to the father, do not worry if the father try to get closer, feel comfortable being close to the father, feel comfortable developing close relationships with the father, feel comfortable when the father gets too emotionally close, and encourages them to be more emotionally secure than they feel comfortable with the father.

Conclusions

The first limitations of this study was that the results could not be generalized to a broader scope, because the study only conducted on students at SMPN 19Percontohan Banda Aceh. The following was the method used to collect data. If qualitative method was used with performing interviews and observation, perhaps the data would be more detail and comprehensive.

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Anatomy Accessory Glands Of Male Reproductive Of Javan Pangolin (*Manis javanica*)

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Abstract

This study aimed to learn the morphology accessory glands of male reproductive of pangolin by macroanatomy. Male reproductive organs of a pangolin were used in this study. Morphometric observations included measurements of length, diameter/width of the accesoriae gland were analyzed descriptively. Results of microscopic observation showed that the vesicularis glands had a pair laid at the base of the ampulla dexter and sinister that led to the urethra in the form of an enlarged conical with the width at the caudal and protruding toward ventrad, with the average length and thickness is 1.07 cm and 0.41 cm. There was *prostata* when the conical structure met both, observed enlargement of the base of the urethra were also prominent in the direction ventrad. The length and thickness of the *prostata* pangolin was 1.17 cm and 0.54 cm. In macroanatomy gland bulbourethralis not visible because it was covered by muscles and glands in the radix penis is attached to the *anales gland*. Accessory gland of the male reproductive pangolin consists vesikularis glands, prostate and bulbourethralis glands (Cowper's) play an important role in the reproduction process that is vesicularis and prostate gland as a producer of seminal plasma, whereas bulbourethralis glands act as a producer of seminal plasma as well as rinse of urethra channel.

Keywords: pangolin (M. javanica), accessories gland, vesikularis glands, prostate and bulbourethralis glands

Introduction

Pangolin is a unique and interesting mammal. The uniqueness among other body surface is covered by scales that hard as reptiles do not have teeth (toothless), the protrude length tongue and roll of the body when threatened (Breen, 2012), as well as having pyloric teeth in the pyloric stomach (Nisa 'et al. 2010). In addition olfactory abilities pangolin better than the vision capabilities (Robinson 2005). The main meal of the pangolin are ants (Ordo Hymenoptera) and termites (Ordo Isoptera) (Lekagul and McNeely 1977).

Pangolin is one of the animals that have been given special attention by CITES since 1985. This is because the rampant illegal trade in pangolins, due to increased market demand, especially from China. Most people, especially the Chinese, have the belief that pangolin scales efficacious as an antiseptic, anti-inflammatory and can cure some diseases such as scabies and rheumatism (Nowak 1997), while the heart, intestines and head anteaters used to cure asthma and heart (Akpona *et al*. 2008). This led to poaching of the animals is increasing, thus allegedly wild population declined drastically. Indonesia has imposed a zero quota for pangolin since 2000, but since that time the illegal trade continues to increase from year to year. Pangolin overcome the decline in nature, should be anticipated by performing captivity in an attempt to maintain the populations threatened with extinction. Information on the status of wildlife reproductive biology is very important for the implementation of the ex situ conservation activities (Sita and Aunurohi 2013). One aspect of reproductive biology of wild animals is knowledge of the anatomy and physiology of the reproductive organs of both male and female. Male reproductive organs of mammals consists of a pair of testis (plural: testes), ductus epididymidis, ductus deferens, penis and accessory glands.

Accessory glands in males include vesikularis gland, prostate gland and ampulla bulbourethralis (Colville and Bassert 2002). Secreta gland accessories along with secreta of testis and ductus epididymidis, plays an important role in maintaining sperm motility and metabolic activity (Pineda 2003). The existence of accessory glands are species specific. Not all species have four organs such accessories, as well as the morphology of the gland that is also different (Chugtai et al. 2005; Thomson and Marker 2006).

Until now, data on information morphological characteristics of the male pangolin reproductive accessories glands macroscopicly is still very limited. Data obtained from this study is new information in reproductive biology, particularly on the morphological characteristics of the male reproductive accessory glands on pangolin. In addition the information can become the basis of data and information that is important in the effort to support ex situ conservation through captive breeding activity.

Materials and Methods

This study used the male reproductive accessories glands of pangolin (M. javanica). Microscopic observation made to the in situ position, shape and size of the male reproductive accessories glands of pangolin that vesicularis gland and prostate bulbourethralis gland. Measurement of the length, diameter/width and thickness is done by using a caliper in cm units. All observations are documented using a digital camera Canon EOS 400D. Results were analyzed descriptively and presented in the form of tables and figures.

Results and Discussion

Accessory gland consists of vesikularis gland, prostate and bulbourethralis glands (Cowper's) play an important role in the reproductive process. Accessory gland secretions produce seminal plasma with the largest volume (60-90%) of the total volume of plasma (Aughey and Frye 2001). The growth of the gland and accessory gland secretion activity is influenced by testosterone (Adebayo et al. 2009). Accessory glands are not all there is on any male animals, sometimes one gland is not owned or even owned, but

not overly developed (Colville and Bassert 2002). Morphometry reproductive organs of male pangolin accessory glands after fixation is presented in Table 1.

Table 1. Morphometry reproductive organs of male pangolin accessory glands

Accessory glands of male pangolin reproductive organs			
Morphometry	***Glandula vesikularis***	***Prostata***	***Bulbourethralis****
length (cm)	1.07	1.17	-
Width (cm)	0.41	0.54	-

* *Glandula bulbourethralis* (tidak tampak secara makroskopis) Bulbourethralis gland (not visible macroscopically)

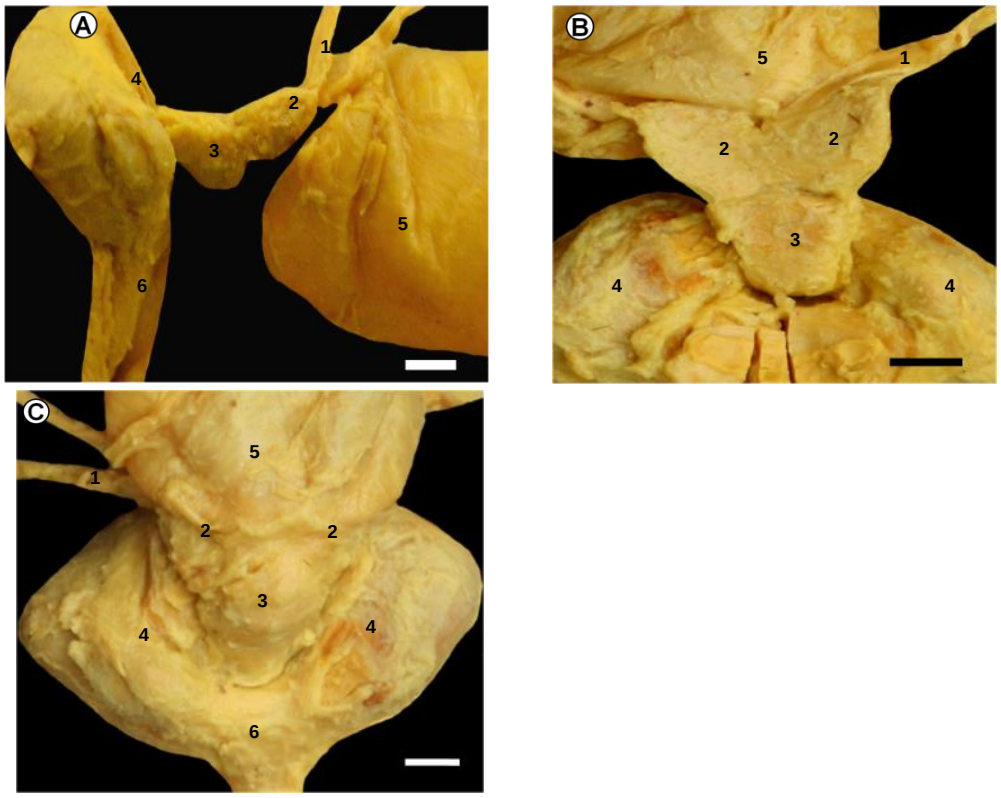

Figure 1. Microanatomy of the male pangolin reproductive accessories glands. *lateral* (A), *dorsal* (B) and *ventral* (C). *ductus deferens* (1), *glandula vesicularis* (2), *prostata* (3), *glandulae anales* (4), *vesica urinaria* (5), *Penis* (6). Bar: A-C=0.5 cm

Vesicularis gland located at the base there is a pair dexter and sinister ampulla which empties into the urethra will be enlarged conical with the wide side in the caudal and protruding toward ventrad (Figure 1). The average length and thickness of the pangolin glands vesicularis is 1.07 cm and 0.41 cm (Table 1).

Vesicularis gland duct enters the urethra in the same area as the ductus deferens. Vesicularis gland found in domestic animals except dogs and cats (Colville and Bassert 2002). The size of sheep vesikularis gland was 0.4 cm long, 0.2 cm wide, 0.15 cm high and weighs 5 g (Toelihere 1981). On deer, gland vesicularis length of ± 1.800 cm thick and weighs ± 0573 cm ± 0.029 g (Najamudin 2010). The Timor deer vesicularis gland length of ± 4,536 cm (Nalley 2006). Results of this secretions gland containing hexoses, fructose and citric acid with a high concentration which would then be secreted into the seminal coliculus (Hafez 1987). In humans, vesicularis gland plays a role in the formation of seminal plasma coagulation, modification of sperm functions (motility, capacitation) and immunosuppression, as well as reabsorbing liquids or solutes and damaged spermatozoa (Aumüller and Riva 1992). The results of ejaculation using electricity ejaculator show that in the seminal plasma squirrels are granules cartload vesicularis gland in addition to sperm cells (Berdford 1997).

At Pangolin are enlargement of the ductus deferens called ampulla as in most animals, ductus deferens will be enlarged before joining the urethra. Ampulla is an enlargement at the base of the ductus deferens, which is well developed in horses, cattle, sheep, little developed in dogs, but no in pigs. Long ampulla in sheep is ± 7.0 cm (Toelihere 1981), Timor deer ± 7253 cm (Nalley 2006) and deer ± 1,733 cm (Najamudin 2010). Ampulla contains glands which empties into the ductus deferens and helped produce seminal plasma (Frandson et al. 2009). The results of ampulla secretion containing fructose and citric acid, although this more substantia produced by vesicularis glands (Hafez, 1987).

There is prostate contained met in the conical structure both, observed enlargement of the base of the urethra were also prominent in the direction ventrad (Figure 1). The length and thickness of the prostate pangolin is 1.17 cm and 0.54 cm (Table 1). Prostate pangolin formed prostate corpus while pars disseminated not found. The prostate is a unpaired gland and surrounds the urethra in the pelvis area. The prostate can be found as corpus prostate and pars disseminated. Corpus prostate is a compact body that is located on the dorsal urethra, while pars disseminated spread inside the walls of the urethra. In dogs and cats, prostate corpus large, globular-shaped and surrounds the entire wall of the urethra (the dog) or most of the walls of the urethra (the cat). Horses only have prostate corpus is large and consists of two lateral lobes connected by isthmus. Cattle and deer Timor has a corpus of disseminated prostate and pars, while the goats and sheep, only had pars disseminated (Getty 1975; King 1993; Nalley 2006). Prostate in deer has a length of ± 1,733 cm thick and weighs ± 0.653 cm ± 0.43 g (Najamudin 2010), while the Timor deer have prostate corpus with a length of ± 2.061 cm (Nalley 2006).

In microanatomy bulbourethralis gland not visible because it was covered by penis radix muscles and glands in the is attached to the anales gland. Bulbourethralis gland known as Cowper's glands, are a pair of glands located in the dorsal urethra of arcus ischiadicus in cranial and caudal glands other accessories. Bulbourethralis gland is found in all animals, except dogs, medium-sized in horses and ruminants, as well as large pigs (Dyce et al. 2002). This gland is covered by a thick capsule that helped shape septum glands and contains many smooth muscle to help remove the secreta. Bulbourethralis gland in sheep length ± 0.15 cm, width ± 0.1 cm, height ± 0.1 cm and a weight of ± 3 g (Toelihere 1981), while the deer has a length of ± 0826 cm, thickness ± 0.547 cm and a weight of ± 0.86 g (Najamudin

2010). Bulbourethralis gland plays a role as a producer of plasma cement and as a rinse urethra channel. Functionally vesicularis glands and prostate play a greater role in the reproductive aspects as seminal plasma source, while the bulbourethralis gland double role as a producer of seminal plasma and as a rinsing urethra channel (Desiani et al. 2000).

Conclusions

Accessories glands on pangolins consist of a pair of vesicularis gland and prostate gland as well as single bulbourethralis. There are a pair of vesicularis glands located at the base of the ampulla dexter and sinister. There is prostate contained in the conical structure both, observed enlargement of the base of the urethra were also prominent in the direction ventrad. In microanatomy bulbourethralis gland not visible because it was covered by penis radix muscles and glands is attached to the anales gland. Pangolin male reproductive accessories gland play an important role in the reproduction process that is vesicularis gland and prostate as a producer of plasma seminal, whereas bulbourethralis glands act as a producer of plasma seminal as well as rinse urethra channel.

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Antibacterial Effects of Phisyc Nut (*Jatropha Curcas. Linn*) Latex against *Aeromonas Hydrophilla* Infection in Tilapia (*Oreochromis Niloticus*)

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Abstract

This study aim was to determine the effectiveness of phisyc nut latex in various doses to inhibit *Aeromonas* hydrophilla infection in tilapia. Four concentration of phisyc nut latex at 0,01 ppm, 0,02 ppm, 0,03 ppm and control without the addition of the latex were given to the tilapia fry with soaking it in the water for fifteen minutes and maintained for 7 days before being infected by *Aeromonas hydrophilla*. As much as 10 ^{8} CFU/ml bacterial concentration added to a litre of soaking water to get the infected fish. Physical and behavioural signs, weight and length average, survival rate and prevalence were observed among the infected tilapia. Physical and behavioural signs shows that tilapia soaking in 0,03 ppm latex have the same signs with the healthy tilapia when infected by *Aeromonas hydrophilla*. There were significant differences amongst survival rate and prevalence ($P< 0.05$) and no significant differences amongst average weight and length of all experimental and control group ($P> 0.05$).

Key words: phisyc nut latex, aeromonas hydrophilla, antibacterial activity, tilapia.

Introduction

Tilapia (Oreochromis niloticus) is the most valuable and becoming the fastest growing species inside the industry of aquaculture in Bireuen. The farming of this species has risks according to the diseases that could a significant impact on commercial production through induced stress on fish, loss of growth and production, death of stock and high costs of treatments. The common disease of tilapia farming incidence is caused by bacteria and known as *Aeromonas hydrophilla* that can cause motile Aeromonas septicemia (MAS). In general, infected fish will exhibit the red patches, especially in the chest, abdomen and base of the fin and some other body parts. Deeply, the fins become ragged edges, damaged and finally it's difficult to swim.

Aeromonas disease control is very important in tilapia farming. Since the use of antibiotics and other chemotherapeutics has several shortcomings including the risk of resistant pathogens, the problem of

drug residue in treated fish, and the impact on environmental pollution, natural products has been considered as an alternative to control bacterial infections in aquaculture.

Phisyc nut (Jatropha curcas L.) is a plant that are reported to have antimicrobial activity against several pathogenic bacteria and have been used as traditional medicines for the treatment of human diseases (Arun, et.al, 2012; Narayani, et.al, 2012; Nuria, et.al, 2009). The latex of this plant also reported have antimicrobial activity against some pathogen bacteria. This plant is growth widely and easy to find in the yard of Bireuen people because of its valuable purpose and has a chance as a therapeutics agent in tilapia farming. Therefore, this study is aims to determine the effectiveness of phisyc nut latex in various doses to inhibit *Aeromonas hydrophilla* infection in tilapia farming.

Materials and Methods

Preparation of Phisyc Nut Latex. Latex from the plants collected as liquid exudates from the cut stalk of young stem and stored in coloured sterile bottles and refrigerate until used.

Bacterial strains and culture conditions. The A. hydrophila used in this study was obtained from Parasites and Fish Disease Laboratory of Bogor Agricultural University. A. hydrophila was grown in Tripticase Soy Broth (TSB) at 30 ^{o}C for 24 hours until used (Nuria, et.al, 2009).

Fish Preparation. Live tilapia of mixed sexes were obtained from the Freshwater Aquatic Breeding Center, Batee Iliek, Bireuen, Aceh Provinces. All fish were healthy and acclimated under wet laboratory conditions for three days and randomly distributed at a stocking density of 10 fish per aquarium. Each aquarium filled with 20 l of water. The initial average fish weight was 12±1g/fish and fed on commercial diets twice a day during acclimatitation.

Prevention with Submersion of Fish in Phisyc Nut Latex. As much as 50 ml, 100 ml and 250 ml dilute in 5 l of water to got 0.01 ppm (A), 0.02 ppm (B) and 0.03 ppm (C) concentration of phisyc nut latex. Fish which was prepared, devided in to four equal groups and was submersed in various doses of phisyc nut latex dilution for fifteen minutes. One group (D) was used as a control without the addition of phisyc nut latex. After fifteen minutes, fish was collected and returned to the aquarium for maintained during 7 days and recorded all physical and behavioural signs that are changed.

Challenge Test Tilapia that has been maintained for 7 days after submersion using phisyc nut latex, furthermore tested to *Aeromonas hidrophyla* that has been cultured on TSB media for 24 hours by soaking it in infected water, made from the dilution of 10 ^{8} CFU/ml bacterial concentration in a litre of water. After thyrty minutes, fish was collected and returned to the aquarium for maintained during 20 days and recorded all physical and behavioural signs that are changed. During maintained, fish was fed on commercial diets three times a day a la adlibitum.

Parameter Observation All physical and behavioural signs were recorded during submersion, challenge test and maintaining. Growth performance and survival rate are calculated at the end of this experiment using the formula of Suyanto (2005). The prevalence of Aeromonas hydrophila on tilapia is calculated

according to Ramadan *et.al.,* (2012). Water quality parameters, include the temperature, oxygen dissolved and acidity was recorded each day during this experiment.

Statistical Analysis One-way ANOVA was used to evaluate the effect of Tilapia submersion in phisyc nut latex against Aeromonas hydrophila on growth performance, survival rate and the prevalence of Aeromonas hydrophila on tilapia. The comparison of mean values was carried out by least significant difference test to determine differences between treatments at probability level ($P < 0.05$).

Results and Discussion

Physical and Behavioural Signs The characteristics of tilapia during submersion in phisyc nut latex within fifteen minutes have showed the same physical and behavioural signs with the healthy fish. During the challenge test, the group of treatment C showed a good physical and behavioural signs compared to the other groups of treatment. The change of physical and behavioural signs were obviously seen during maintaining, especially in first until third day except in the group of treatment C. A good physical and behavioural signs increaseas in line with the increase of the phisyc nut latex concentration (Table 1).

Table 1. Physical and Behavioural Signs of tilapia during submersion, challenge test and maintaining.

Treatment	Observed Signs	Submersion in Phisyc Nut Latex (15 minutes)	Challenge tests (soaking in dilution of aeromonas hydrophilla for 30 minutes	Maintaining for 20 days
A				
	Physical Signs			
	• Color	Do not change	Not change	Redness, pale
	• Bleeding	Nothing	Not occur	Wounds, bleeding,
	• Wound	None	Not occur	broken, redness
	• Tail Fin	Intact	Intact, Not change	Redness, torn
	• Dorsal Fin	Intact	Intact	
	Behavioural signs			
	• Movement	Vigorously,	Slowly, standing in the	Slowly, gasping in the
	• Swim	Occasionally rise to	corner of the aquarium	corner of the aquarium
	• Feeding Response	the surface of water	Swim	Swim
	• Residual feed			Loss of appetite in first until third day.
				Lots of residual feed in first until third day.
B				
	Physical Signs			
	• Color	Do not change	Not change	pale
	• Bleeding	Nothing	Not occur	
	• Wound	None	Not occur	torn, redness
	• Tail Fin	Intact	Intact, Not change	
	• Dorsal Fin	Intact	Intact	intact
	Behavioural signs			
	• Movement	Vigorously,	Slowly	Slowly
	• Swim	Occasionally come	occasionally come up to	occasionally come up to

	• Feeding Response • Residual feed	up to the surface of water	the surface of water	the surface of water Loss of appetite in first day Lots of residual feed in first day, no residual feed in the next day.
C				
	Physical Signs			
	• Color	Do not change	Not change	Not change
	• Bleeding	Nothing	Not occur	
	• Wound	None	Not occur	Intact
	• Tail Fin	Whole / fused	Intact, Not change	
	• Dorsal Fin	Whole / fused	Intact	
				Intact
	Behavioural signs			
	• Movement • Swim • Feeding Response • Residual feed	Vigorously, Fish occasionally come up to the surface of water	Vigorously Occasionally come up to the surface of water	Vigorously occasionally come up to the surface of water High response to the feed No residual feed.
D				
	Physical Signs			
	• Color	Usual	Pale	Redness, pale
	• Bleeding	Usual	Not occur	
	• Wound	none	Not occur	Broken off, sores, redness.
	• Tail Fin	Usual	Intact, Not change	
	• Dorsal Fin	Usual	Intact	Redness, torn
	Behavioural signs			
	• Movement • Swim • Feeding Response • Residual feed	Usual Usual	Slowly, gasping in the bottom and the edges of aquarium Swim to the surface and bottom of water	Slowly, gasping in the bottom and the edges of aquarium Swim to the surface and bottom of water Loss of appetite in first until fourth day. Lots of residual feed in first until fourth day.

Growth Performance, Survival Rate and The Prevalence Initial weights, end weights and weight gain observed are not significantly different for all groups, while survival rate and prevalence are significantly different in the group of treatment C (Table 2). Antimicrobial compounds contained in phisyc nut latex effectively inhibit bacterial growth (Arun, et.al, 2012; Hambali, 2006; Narayani, et.al, 2012; Nuria, et.al, 2009) include Aeromonas hydrophilla in this study.

Table 2. Average Body Weights Gain of Tilapia among Research

Group of Treatment	Initial weights (g)	End weights (g)	Weight gain (g)	Survival rate (%)	Prevalence (%)
A	12.81 ± 0.05[a]	25.46 ± 0.78[a]	12.65 ± 0.74[a]	53,3 ± 11.55[a]	46,67 ± 11.54[a]
B	12.85 ± 0.03[a]	26.43 ± 1.22[a]	13.58 ± 1.19[a]	60 ± 20[a]	40 ± 20 [a]
C	12.82 ± 0.03[a]	25.53 ± 0.55[a]	12.71 ± 0.57[a]	93,3 ± 11.54[b]	6,67 ± 11.54[b]
D	12.76 ± 0.09[a]	25.05 ± 0.30[a]	12.29 ± 0.32[a]	46,67 ± 23.09[a]	53,33 ± 23.09 [a]

Means in same column sharing the same superscript letter are not significantly different ($P < 0.05$)

Water quality parameters During the experiment, water quality parameters were recorded and shown as average as follows:

Table 3. Value of Water Quality

Group of Treatment	Temperature	OD	pH	Keterangan
A	29 ^{o}C	4 ppm	7	Good
B	27 ^{o}C	5,1 ppm	7,4	Good
C	29 ^{o}C	4,9 ppm	6,8	Good
D	30 ^{o}C	4,7 ppm	6,7	Good

Based on Table 3 above, the results of water quality parameters measurements during the maintenance of tilapia in this study has shown suitability according to living media of tilapia with a temperature range of 27-29 ° C, acidity range of 6.7 to 7.4 and oxygen dissolved range of 4 to 5.1 ppm. Tilapia grow normally in the temperature range of 14 -30 ^{o}C and can spawn at 22-37 ^{o}C and oxygen dissolved content ranges between 4-5 ppm (Effendi, 2004). The optimal pH range for the cultivation of tilapia was between 7-8 (Fujaya, 2004).

Conclusions

The results presented here indicate the potential of using the readily available phisyc nut latex as an environmental friendly therapeutics agents for preventing Aeromonas hydrophila attack in tilapia farming. The concentration of phisyc nut latex at 0.03 ppm was effective to be used according to this study and would make it practical for the farmers to use a locally occurring herb as a replacement for antibiotics.

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Effects of Plant Growth Regulator of Applications Technique and Age Transplanting Seedlings TSS (True Shallot Seeds) on the Growth and Yield of Shallot (Allium Ascaloicum L.)

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Abstract

This research is aimed to the aplication techniques of PGR and age transplanting seedlings of TSS on growth and yield of shallot seed origin. The research was carried out in September 2013 through January 2014 in the Geulanggang Gampong Kota Juang district Bireuen Regency. The research methode used was implemented randomized block design factorial consisting of 2 factors with 3 replications. The first factor is the technique of application of PGR (Z) by using a combination of auxin and cytokinin which consists of 4 levels namely: without the application of PGR, Soaking the seeds TSS for 30 minutes in a solution of PGR, spraying the plants with a solution of PGR and soaking seeds and spraying the plants with a solution of PGR. The second factor is the age transplanting seedlings of TSS (T) consisting of 4 levels, namely age transplanting 3, 4, 5 and 6 weeks after sowing. The results showed that the application technique of PGR does not significantly cause the increase in the growth of the plant but significantly gives effect on the increase in the number of roots at harvest, stover dry weight, number of bulbs and harvest age. Techniques of seed soaking for 30 minutes in a solution of PGR (Z1) gives higher yields than the treatment by the application techniques of seed soaking in plain water (Z0). Treatment of seedlings when transplanting gives very significant effect on the plant growth and increase crop yields except for bulb diameter and number of bulbs. The interaction between treatment by the application techniques of PGR and age transplanting seedlings of TSS can speed up harvesting. Best interactions at harvest time after the planting seedlings were transferred was found in all treatment techniques with the application of growth regulators to the seedlings aged 4, 5 and 6 weeks after sowing. The best interaction of harvesting after sowing the sedes was found in the seeds soaked in water treatment and in the solution of growth regulators at the ages of 3 and 4 weeks after sowing.

Keywords: Plant Growth Regulator, Seedlings Transplanting, True Shallots Seeds

Introduction

The shallot (*Allium ascalonicum* L.) is an important horticultural commodities are good for farmers, communities, and countries. In the 1970s to 1980s commodity shallot is golden commodity for farmers. However, in the era of the 1990s until now its role has declined. This is because the decline in the bulbs at the farm level.

Planting shallots from seed is very potential to be developed at this time because it has a good prospect. Compared with the planting of bulbs, planting the seed has advantages such as lower production costs in both the supply of planting material and transport, greater potential is 32 ton/ha while the bulbs only reach 18-20 ton/ha, free of bulbs-borne diseases and handling more efficient (Permadi, 1993; Putrasamedja, 1995; Sumarni *et al*., 2001). However nurseries using seeds require additional time for seeding and harvesting longer (Liferdi, 2013) between 4-6 weeks (Sopha, 2010). After going through the nursery, planting the seeds of TSS must be moved in order to be strong and tough seeds and number of seeds is more efficient than direct planting (Rosliani *et al*., 2002).

Besides, after the nursery requires the right time for transplanting seedlings to the field. But not yet known when the time is right transplanting, transplanting so that time is not too fast and not too late. One strategy to increase plant growth is the application of PGR. PGR combination of auxin and cytokinin with the same concentration can stimulate the roots, leaves and buds. But not yet known how the proper application technique so that the growth of the roots and leaves are perfect and transplanting time can be accelerated and increased growth and shallot production. This research is aimed to the aplication techniques of PGR and age transplanting seedlings TSS on growth and yield of shallot seed origin.

Materials and Methods

The research was carried out in September 2013 to January 2014 in the Geulanggang Gampong Kota Juang Sub district Bireuen District. The materials used are shallot seeds from seeds of varieties TUK TUK, NAA, BAP, manure, Urea, TSP, and KCl. The tools used are the nursery trays, plastic transparent, analytical scales and measuring devices.

This research uses a randomized factorial design consisting of two factors : the technique of application of PGR (Z) and the age of transplanting seedlings TSS (T) each with 16 treatments with three replications.

Z0: Soaking the seeds in water (control)
Z1: Soaking the seeds in a solution of PGR (NAA 50 ppm + BAP 50 ppm)
Z2: Spraying plants with a solution of PGR solution (NAA 50 ppm + BAP 50 ppm)
Z3: Soaking the seeds in a solution of PGR and spraying the plants with a solution of PGR
T1: Transplanting seedlings age of 3 weeks after sowing
T2: Transplanting seedlings age of 4 weeks after sowing
T3: Transplanting seedlings age of 5 weeks after sowing
T4: Transplanting seedlings age 6 weeks after sowing

Results and Discussion

The percentage of germination

Observational data on the percentage of germination of seeds showed that soaking seeds TSS in a solution of PGR and in water significantly different. The average percentage of germination by Soaking the seeds in water (Z0) and soakingthe seeds in a solution of PGR (Z1) are listed in Table 1.

Table 1. The average percentage of germination (%) by immersion in water treatment (Z0) and immersion in a solution of PGR (Z1)

Threatment	Percentage of germination (%)			
	1st week	2nd week	3rd week	4th week
Z0 (Soaking the seeds in water)	85.83	84.83	84.17	85.33
Z1(Soaking the seeds in a solution of PGR)	86.67*	86.83*	86.67*	86.83*

Note * : higher seed germination

Table 1 shows the percentage of germination of shallot seeds due to the soaking treatment in a solution of PGR (Z1) is higher than the soaking the seeds in water (Z0). This is due to a combination of growth regulator auxin and cytokinin can increase seed germination. In accordance with the opinion of Salisbury and Ross (1995) which states that the other functions of cytokinin and auxin are affecting root growth and differentiation; encourage cell division and growth in general, to encourage germination and delay aging. According to Hassani *et al*., (2009), Subbiah and Reddy (2010), cytokinin (BAP, BA and kinetin) also play a role in stimulating the germination of seeds of plants which are applied directly to the seed.

Height of plant

Observational data of average height of shallot at planting, aged 15, 30 and 45 days after transplanting indicates that application techniques PGR effect no significant effect on plant height at planting, aged 15, 30 45 days after transplanting while age seedlings when transplanting very significant effect on plant height at planting, aged 15, 30 and 45 days after transplanting and there is no real interaction. The average height of shallot crop due to the influence of PGR treatments and seedlings when transplanting are listed in Table 2. All treatment techniques PGR applications can not be increased plant height. This may be due to the concentration of PGR use is still very low so it can not improve the growth of plant height. According Rosliani *et al*., (2005) that the spraying of plant growth regulators on shallot crop is less effective than by immersion, it is suspected because of the morphology of shallot plants are leafy erect and slippery contains cuticle layer thick, so the solution PGR were sprayed not into the plant tissue.

Table 2 also shows that the age of transplanting seedlings (T) very significant effect on plant height. The highest high shallot crop at planting, aged 15 and 30 days after transplanting found in treatment and followed by T3 and T2 and the lowest plant height was found in T1. But at age 45 days after transplanting

plants found in the highest and lowest T3 remains at T1. It is suspected seedlings 6 weeks after sowing at age 45 days after transplanting period of vegetative growth has stopped or has entered the stage of generative growth. In accordance with the opinion of Gardner *et al*., (1985) stated that the vegetative growth in annual crops is generally terminated by generative growth.

Number of Leaves

Observational data the average number of leaves of shallot plants showed that the technique PGR applications affect not significantly affect the number of leaves at the time of planting, aged 15, 30 and 45 days after transplanting while the seedlings when transplanting very significant effect on the number of leaves at the time of transplanting, age 15, 30 and 45 days after transplanting and there is no real interaction.

Table 2 shows that the number of leaves of shallot crop at planting, aged 15, 30 and 45 days after transplanting due to the influence of PGR application techniques treatment effect is not real. These results indicate that at the time of planting leaf number is still strongly influenced by genetic factors of the shallot varieties. Seed soaking treatment still can not change the nature and character of the grain so that no real effect on the number of leaves.

Treatment seedlings when transplanting (T) very significant effect on the number of leaves. The number of leaves shallot plants most at planting, aged 15 and 30 days after transplanting found in treatment T4 and T2 and is followed by the high and lows of plants found in T1. But at age 45 days after transplanting highest number of leaves found in T3 and the lowest fixed at T1. It is suspected the increasing age of the plant then also increase the number of leaves, but when they entered the stage of generative growth, the vegetative growth will stop (Gardner *et al.,* 1991).

Number of Roots

Observational data indicate that the application technique PGR (Z) effect no significant effect on the amount of plant roots at planting time and very significant effect on the number of roots at harvest, while the seedlings when transplanting (T) very significant effect on the number of roots when moving planting and at harvest time but there is no real interaction. The number of the most red onion plant roots at harvest due to the effect of treatment techniques PGR applications found on treatment followed by Z3 and Z1, Z2 and Z0. This shows that the treatment of soaking and spraying with a solution of PGR can increase the number of roots of plants at harvest.

Table 2 also shows that the number of plant roots shallot most during transplanting and harvesting encountered in the treatment of seedlings 6 weeks after sowing (T4) and followed by T3 (seedling age 5 weeks after sowing) and T2 (seedlings 4 weeks after sowing) and the number of roots lowest found in T1 (seedlings 3 weeks after sowing). This indicates that at the age of 6 weeks after sowing seedling root number formed more numerous than the seedlings 5, 4 and 3 MSS. In accordance with the opinion of Thangaraj and O'Toole (1985) states that the transfer of seedlings to the field should be adjusted to the level of development of the roots, so that when transplanting not damage the root, if root is damaged then to the early growth of seedlings require healing time when maximum tillering occurs up to the age limit of

49-50 days after seedling and root development will generally be halted at the age of 42 days after sowing.

Number of Chlorophyll Leaf

Observational data indicate that the PGR application techniques are not real effect on the amount of chlorophyll of leaves, but the real effect due to the treatment of age transplanting seedlings and there is no real interaction (Table 2). In Table 3 it can be seen that there is no difference to the amount of chlorophyll of leaves due to treatment of growth regulator application techniques. This is presumably due to the observation of the amount of leaf chlorophyll days after transplanting done at age 50, while it is known that more leaf chlorophyll found in plants that have not entered the generative growth or leaf chlorophyll untapped by plants in photosynthesis process for the formation of tubers. This is in accordance with the opinion of Biber (2007) which states that the age and stage of physiological leaf of a plant is the factor that determines the content of chlorophyll.

Table 2 shows that the highest amount of chlorophyll treatment due to age transplanting seedlings (T) found in treatment T2, T3 and T4 and the lowest was found in T1. This indicates that the weeks after sowing seedling age 4 when measured chlorophyll has reached the maximum amount, but at the age of 5 weeks after sowing and transplanting seedlings at the age of 6 weeks after sowing chlorophyll number decreases. This is because the amount of chlorophyll in the age above 78 days from sowing the seeds have started to be used in the process of photosynthesis to tuber formation. While at T1, the amount of chlorophyll leaves are still small. Setiari and Yulita (2009) states that based on the age factor of the plant, it can be said that the older the age of the plant will produce higher chlorophyll content. High or low amount of chlorophyll of leaves can be caused by several factors such as the age of the plant, the age of leaves, leaf morphology and genetic factors.

Diameter Bulbs

Observational data as a result of treatment techniques PGR applications and seedlings when transplanting no real effect on the diameter of the bulbs and there is no interaction. The results in Table 3 show that the diameter of the bulbs as a result of the treatment effect of PGR application techniques are not real. In contrast to the opinion of Smith and Palmer (1970) in Nurmayulis (2005) which states that cytokinins contained in the solution of growth regulators can spur growth by way of inhibiting the activity tuber starch hydrolysis and otherwise stimulate the activity of the starch. Seedlings when transplanting are also influential not evident to the diameter of the bulbs.

Number of Bulbs

Observational data due PGR application technique significantly affect the number of bulbs and the effect was not significant on the number of bulbs due to treatment when transplanting seedlings and there is no interaction between the two treatments. Results from Table 2 it can be seen that the PGR application technique significantly affect the number of bulbs. The number of tubers are highest due to treatment techniques PGR applications obtained in the treatment of immersion in a solution of PGR (Z1) followed by the influence of spraying with a solution of PGR (Z2), and treatment of soaking and spraying with a

solution of PGR (Z3) and the number of tubers were the least common in treatment without the application of PGR (Z0). This shows that by using growth regulators with different application techniques will increase the number of onion bulbs from seeds. While the treatment effect of age moved seed TSS no significant effect on the number of tubers. This shows that the onion seedlings from seeds aged 3, 4, 5 or 6 weeks after sowing when transferred to the field will produce a number of tubers were no different.

Table 2. The average plant height, number of leaves, number of roots, the amount of chlorophyll of leaves, bulbs diameter and the number of bulbs due to treatment PGR applications techniques (Z) and seedlings when transplanting (T)

Application techniques PGR	Plant height (cm)				Number of leaves (blade)			
	currently Planting	15 DAT	30 DAT	45 DAT	currently Planting	15 DAT	30 DAT	45 DAT
Z0	22.76	22.75	26.26	30.24	3.66	4.53	6.67	9.59
Z1	25.31	24.44	31.27	33.84	3.69	4.24	6.59	10.44
Z2	22.82	22.09	23.66	32.67	3.74	4.08	6.71	10.04
Z3	23.77	23.86	24.83	30.56	3.75	4.25	7.17	9.69
Planting seedlings Move	Plant height (cm)				Number of leaves (blade)			
	currently Planting	15 DAT	30 DAT	45 DAT	currently Planting	15 DAT	30 DAT	45 DAT
T1	13.39c	15.05d	24.49c	36.2b	2.80 c	3.03 c	4.82 c	7. 36 c
T2	22.94b	22.60c	37.14b	48.66a	3.27 c	4.03 b	6.66 b	10.02 b
T3	26.50b	25.67b	42.38ab	54.03a	4.09 b	4.64 b	7.27 b	11.54 a
T4	31.83a	29.82a	46.29a	52.16a	4.70 a	5.41 a	8.38 a	10.85ab

Application techniques PGR	Amount of Roots (pieces)		Amount of chlorophyll (unit)	Bulbs diameter (cm)	Amount of Bulbs (bulb)
	currently Planting	when Harvest			
Z0	9.41	31.00 b	74.965	4.23	1.00 c
Z1	9.54	31.85 b	75.826	4.32	1.98 a
Z2	9.63	31.24 b	81.495	4.22	1.66ab
Z3	9.91	40.19 a	83.497	4.02	1.51 b
Planting seedlings Move	Amount of Roots (pieces)		Amount of chlorophyll (unit)	Bulbs diameter (cm)	Amount of Bulbs (bulb)
	currently Planting	when Harvest			
T1	6.52 d	24.90 c	60.967 b	4.2	1.75
T2	9.29 c	32.08 b	93.707 a	3.99	1.55
T3	10.82 b	37.26 a	82.797ab	4.31	1.61
T4	11.86 a	40.03 a	78.313ab	4.3	1.73
Application techniques PGR	Weight of Wet Stover (gram)			Weight of Wet Stover ((gram)	
	Per sample plant		Per Plot	Per sample plant	Per Plot

Z0	47.45	2182.1	33.6	1438 b
Z1	50.32	2717.2	39.81	2051 a
Z2	41.35	2281	33.49	1669ab
Z3	44.77	2123	33.98	1538ab

Planting	Weight of Dry Stover (gram)		Weight of Dry Stover (gram)	
seedlings Move	Per sample plant	Per Plot	Per Sample plant	Per Plot
T1	38.85	1286.8 b	34.34	1023 b
T2	49.93	2384.3 a	37.32	1698 a
T3	47.87	2637.9 a	33.99	1830 a
T4	48.85	2994.3 a	35.24	2147 a

Note: Numeral are followed by the same letter in the same row and column are not significantly different at the level P≤0.05 (Tukey test) DAT : Days After Transplanting

Weight of Wet Stover

Observation of the weight of stover wet per plant samples and per plot indicates that application techniques PGR effect is not real, while the seedlings when transplanting influential not evident to the weight of stover wet per plant samples and a very significant effect on weight stover wet per plot but no influence interaction between the two treatment factors. The results in Table 4 show that the weight of the wet stover onion bulbs per plot which is the highest result of treatment when transplanting seedlings obtained in the treatment T4, followed by T3, T2 and T1 lowest in. While the T1 results are very low due at harvest many rotten tubers caused by very high rainfall two weeks before harvest.

The high weight of wet stover at T4 and not significantly different from T3 and T2 due at the time of transplanting, the plant has been sufficiently able to withstand environmental conditions tuber crop so that growth becomes stunted. In accordance with the opinion of Gardner *et al*., (1991) that with good vegetative growth the generative growth will also be better. Bagheri *et al.,* (2011) and Ginigaddara and Ranamukhaarachchi (2011) adds that when the seedlings are transplanted at the appropriate time and the appropriate age, growth will also run normally so that the outcome will be better.

Weight of Dry Stover

Observational data on average weight of dry stover samples per plant and per plot shows that the PGR application techniques are not real effect on the weight of dry stover per plant samples and significantly affect the weight of dry stover per plot. While the seedlings when transplanting no real effect on the weight of dry stover per plant samples and a very significant effect on the weight of dry stover per plot and the lack of interaction between the two factors influence the treatment.

The data results in Table 2 show that the weight of dry stover highest per plot due to treatment techniques PGR applications contained in the application technique followed by Z1 and Z2 and Z3 and the lowest was found in Z0. This suggests that the effect of all treatments either by immersion, spraying or by both greatly affect the weight of dry stover. Along with the increase in the number of leaves, number

of roots and the amount of chlorophyll it will also increase the weight of dry stover. Greater photosynthetic production such as leaves and roots subsequently generate greater production of dry matter (Sitompul and Guritno, 1995).

The results in Table 2 also shows that the weight of stover dried shallot bulbs highest due to treatment of seedlings when transplanting (T) contained in seedling age 6 days after sowing.

(T4) followed by T3, T2 and the lowest at the seedling age 3 weeks after sowing (T1) , The low weight of the dry stover at T1 also caused a lot of dead plants per unit area of the plot. This is apparently due to the age of 3 weeks after sowing seeds, seedlings have not been able to adapt to environmental and physiological growth has not been perfect. In accordance with the opinion of Splittstoesser (1990) states that the maintenance of seedlings is done to enhance the physiological processes which at this point can save a plant carbohydrate and producing cuticle so that the plant can root formation and survive in unfavorable environmental conditions. With good vegetative growth the generative growth will also be better (Gardner *et al.,* 1991).

Harvest (Day)

Harvest After Seed Moved to Field

There is a real interaction to harvesting due to treatment techniques and the application of growth regulator seedlings when transplanting. In Table 5 shows that the harvesting of the fastest after the seedlings was moved planting due to the interaction that is very real among the engineering application of plant growth regulators (Z) and seedlings when transplanting (T) found in the treatment Z0T2, Z0T3, Z0T4, Z1T2, Z1T3, Z1T4, Z2T3, Z2T4, Z3T3, Z3T4 ie at the age of 75 days after transplanting and found the longest harvest age at treatment Z2T1 and Z3T1 ie 84 days after transplanting. This suggests that the harvesting is influenced by PGR application technique and the age of transplanting seedlings TSS.

In the opinion of Sembiring *et al*., (2002) which states that one of the benefits of young seedlings compared with the old seeds in terms of adaptation to extreme environments grow. This is clearly seen in onion crop from seeds aged 3 weeks after sowing when transferred to field many who suffered death, but seedlings are longer than 3 weeks after sowing harvest can be accelerated. Younger seedlings will have better adaptability although the beginning of growth seen slow growth, but it can ultimately change after the plant actually being able to adjust to the growing environment.

Harvest from seed sowing (Days After Sowing)

There is a real interaction to harvesting due to treatment techniques and the application of plant growth regulators when transplanting seedlings (Table 3). Harvesting the fastest due to the influence of the interaction between the two treatment factors encountered in treatment combinations Z0T1, Z0T2, Z1T1) and Z1T2. And harvesting the longest seen in Z0T4 treatment, soaking the seeds in a solution of PGR, Z1T4, Z2T4 and treatment Z3T4. It can be said that the faster sowing then the sooner it can be harvested and the younger seedlings at planting moved the faster the crop can be harvested.

Tablel 3. The average age of the seed is planted and harvested after seed sowing since due to the influence of interaction between PGR application techniques and seedlings when transplanting

Harvest After Seed Moved to Field					Harvest from seed sowing				
Treatment	T1	T2	T3	T4	Treatment	T1	T2	T3	T4
Z0	82 a	75 b	75 b	75 b	Z0	103 c	103 c	110 b	117 a
Z1	82 a	75 b	75 b	75 b	Z1	103 c	103 c	110 b	117 a
Z2	84 a	77 b	75 b	75 b	Z2	105 c	105 c	110 b	117 a
Z3	84 a	77 b	75 b	75 b	Z3	105 c	105 c	110 b	117 a

Vavrina (1998) states that transplanting earlier will accelerate the adaptation of plants to the environment so that plant growth is not hampered and can produce vegetative better, and if transplanting late so the plant does not have enough time to finish the growth of vegetative so the plant is more rapid aging and quickly entered the generative stage. This indicates that the shallot crop will be faster harvest if planted with seedlings that early (seedling age 3 weeks after sowing) compared with planted late (seedlings 6 weeks after sowing), provided that environmental conditions can be maintained properly in accordance with the needs of seedlings to be planted.

Conclusion

Application techniques best growth regulator to the increased weight of dry stover per plot is technique of soaking the seeds for 30 minutes in a solution of growth regulators which provide results of dry stover 42.63% and the number of tubers 98% more than the application technique of soaking the seeds in water usual.

Age transplanting seedlings TSS can increase the growth and yield of onion bulbs except for the diameter and the number of tubers. Age transplanting seedlings right TSS is at the age of 6 weeks after sowing seeds that can increase plant height up to 30 days after transplanting 88.99% and the number of leaves until the age of 45 days after transplanting 56.79%, and the weight of the wet stover weight of dry stover result is also higher 132.69% and 109.87% compared to the age of 3 weeks after sowing seeds.

Combination treatment between PGR application technique and the age of transplanting seedlings TSS (True Shallot Seeds) can only affect harvesting. Harvesting faster after the seedlings was moved planting seen in all treatment PGR applications techniques with seedlings age 4, 5 and 6 weeks after sowing and harvesting faster after seed sowing seen in all treatment PGR applications techniques at seedling age 3 and 4 weeks after sowing.

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Effect of Application Potassium Sulfate (K_2SO_4) on Plant Height and Yield of Chili (*Capsicum annuum* L.) Variety TM 999

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Abstract

A field experiment was conducted to study the effect of different concentrations of Potassium sulfate (0, 1.5, 3.0 and 4.5 g/L in several applications namely 6, 9 and 12 times) appplied to the variety of chili called TM 999 on the plant height and yield. A plot of 50 X 12 meters was divided into 30 subplots of 280 cm x 120 cm, and the experiment was done in three replicates using the split plot design, with the main plot for chili varieties and chilli with Potassium sulfate concentration in the sub plots. Result showed that the chilli with increase in the concentration of Potassium Sulfate, had a steady increase in plant height and yield as compared to the untreated plants. Of the chilli plants treated with Potassium Sulfate concentration showed that those in K1, K2, K3 and K4 significantly increased in plant height compared to those in K5, K6, K7, K8 and K9, but those in K3, K4, K5 and K6 did not increase in plant height significantly compared among themselves. Following the treatment with higher concentration of Potassium Sulfate showed positive correlation with the better yield as shown in K9. As compared in yield to those chilli plants with concentration, it was found that those with all treatments were significantly different from those plants in Ko. Therefore, K1 and K2 as different as K3, K4, K5, K6, K7, K8 and K9, while K5, K6, K7, K8 was not different among them, and the same with K8 with K9. On the other hand, application Potassium Sulfate with the higher concentration can increase plant height and yield in chilli variety TM 999 with the better concentration at K9 (4.5 g/L with 12 times application).

Key words: Potassium Sulfate, Plant Height, Yield, Chilli, Variety TM 999

Introduction

Chilli (Capsicum annum) is quite important horticultural crops in Indonesia because it is one type of fruit and vegetables that have the potential to be developed. Chilies found in almost tropical countries are consumed in fresh and dry (Sarker, and Fazlur, 2003).The chili of demand in each year increases with the amount of inhabitants, and restaurants. The amount of demand to make chili soaring prices on the

market, this is because the production of chili insufficient of market demand and cheating traders who hoard and raise the market price of chili.

Availability of chilli in the market can be caused by low production and harvested area. Central Board of Statistics (2013) states chilli harvested area in Indonesia amounted to 233 904 ha with a production of 1,378,727 tons and a productivity of 5.89 tons / ha. Productivity is still far from the potential productivity of chili produced in various studies. In addition the Ministry of Agriculture (2009) suggested that the resulting production also can not meet the needs of consumption reached 2.77 kg / capita / year. For North Sumatra, red chilli plant area recorded a significant decline until June 2015. That is approximately 14 percent, from 6437 hectares (ha) in 2014, became 5,513 ha in 2015 (Department of Agriculture of North Sumatera, 2015).

The main function of potassium (K) is to assist the formation of protein and karbohidrat. Potassium also plays a role in strengthening the body so that the leaves of plants, flowers, and fruits are not easily fall out. Can not be overlooked is that potassium also is a source of strength for the plant in the face of drought and disease (Lingga and Marsono, 2004).

The purpose of this study was to determine the effect on the growth K_2SO_4, amount of fruit/plant and yield chili.

Materials and Methods

This study was carried out in field trials in Jalan Tuar UMSU, Medan District Amplas with altitude of ± 27 meters above sea level. This study will be conducted in July until the month of November 2014. The material used in this study are: chili seeds, cow manure, calcium sulphate, silver black plastic mulch, polybag, bamboo, fungicides and insecticides. The tools used in this study are: hoes, machetes, yells, handsprayer, scales, sample plots boards, meter, calculator and stationery.

This study was conducted using a non factorial randomized design were studied, namely: The concentration and application K_2SO_4 used is level of treatment that is 10: 0; 1.5; 3; 4.5 g / l of water with the application 6, 9 and 12 doses as long as cropping. The treatment is obtained 10 plots where each treatment was repeated three (3) times in order to obtain 30 (tiga puluh) units each experimental unit consists of eight (8) plants so that the total population of this plant is 240 plants. At each study unit 3 (three) plant as a sample.

Implementation of the study. Land used is measured by a land area of 50 x 12 m. Nurseries and nursery implemented simultaneously in polybags measuring 8x12 cm and placed on seedbed keseluruannya building covered with gauze. The upper part was given or sago palm leaves to protect plants from excessive sunlight, exposure to rainwater .Areal seedbed sprayed with insecticides and fungicides, before planted, chili seeds soaked first in hot water (50^0C) as long as 1 (one) hour to eliminate pests and attached to the disease and accelerate the germination of seeds. Making the research plots done after land processing. Research plot size is 280 cm long and 120 cm wide with a number of plots 30 plots / replay. Number of replicates as much as 3, the distance between replications of 100 cm and 50 cm

distance between the plot. Planting hole made by punching holes in the plastic mulch using tin cans of milk infused with charcoal that had been burned with a spacing of 70 cm x 50 cm. After the 18-day-old seedlings, seedlings ready to be planted in soil. Seedlings are planted has been selected by the main criteria is the uniformity of both high growth and the number of leaves. The move was made in the afternoon starting at 15:00 pm to avoid evaporation is high.

The parameters observed in this study, namely, plant height (cm), and the amount of fruit / plant and fruit weight / plot.

Results and Discussion

The average of plant height, fruits/plant, fruit weight/plot on the chili of varieties TM 999 by treatment with potassium Sulfate Applications (K_2SO_4) contained in Table.

Table 1. The average plant height, the fruit/plant and fruit weight / plot on the chili of varieties TM 999 by treatment with Applications potassium Sulfate (K_2SO_4)

Treatment	Plant Height (cm)	Fruit / Plant (unit)	Weight of fruit / plots (Kg)
K0	68.96 e	15.33 f	0.56 e
K1	74.33 c	46 e	0.95 f
K2	82.44 c	47 e	1.47 d
K3	91.77 cb	73 d	1.77 d
K4	93.78 cb	90.33 c	3.16 c
K5	100ab	98.66 c	3.42 c
K6	101.78 ab	145 b	3.61 c
K7	107.33 a	145.66 b	5.26 a
K8	110.78 a	151.33 ab	4.68 b
K9	111.33 a	167 a	4.15 b
Average	94.25	97.93	2711

Notes: figure followed by the same letter in the same column no real effect on DMRT the 0.05 level.

Differences in plant height response of varieties TM 999 with dosage and application K_2SO_4 treatment highest concentration of 4.5 g/l and Applications giving 12 times, but statistically there is no difference between the frequency of 6 x, 9 x and 12 x at a concentration of 4.5 g/l.

These results indicate that for the varieties TM 999 are more responsive to the concentration of K_2SO_4, in general an increase in plant height with increasing dose and application so that the highest plant height is generally found in K9 treatment with a height of 111.33 cm. High gain a better chili on K9 compared with eight treatment concentration and other K_2SO_4 frequencies thought to be caused by the plants get enough K. Potassium is a nutrient that is needed number three plants after N and P. The specialty of this nutrient compared to N and P are plant rarely show symptoms of deficiency or eksesis. As we know that

protein synthesis in plants urgently need potassium. Proteins are the basic ingredients of the formation of new cells, so that plants possess enough material for its growth (Marschner, 1995).

Accretion better high than of varieties TM 999 in allegedly caused this variety is a hybrid superior properties, TM 999 is a hybrid which is intended to seek high yielding breeds, quality and resistance to pests and diseases (Sudjoko and Sunaryono, 1995). Meanwhile, according to Justice (1988), that the period of plant growth and development is a unity that is not fixed but can be influenced by factors in the body of plants that genetic factors (genes) and environmental factors.

The parameter amount fruit/plant, treatment dosages K_2SO_4 4.5 g/l (K9) gives the amount fruit/plant that is 167 unit showed the most significant difference with K0, whereas the lowest in treatment K0 is 15,33 unit, different shows unreal with K1, K2, K3, K4, K5, K6, K7 and K8.. K_2SO_4 fertilizer application 4.5 g / liter (K9) produces amount of red fruit / plant produced most.

This is due to absorption elements Potassium and Sulfur can improve the formation of carbohydrates during photosynthesis, because the element of K enhances the absorption of CO2 associated with the opening leaf stomata to close the carbohydrate further after entering the reproductive phase of plant stored in the fruit (Harjadi, 1991). Thus improve nutrient uptake K can increase the amount of fruit.

Analysis of variance in the treatment dose and application of K_2SO_4 (K) significantly affect amount fruit at harvest 1, 2, 3, 4 and 5. In the first harvest treatment dose of 4.5 g / liter and a frequency of 12 times that began 14 days after moving planting (K9) the real produce amount fruit with the highest average (24.33 fruit) but not significant to the treatment (K5 and K7) were significantly different with treatment (K0, K1, K2, K3, K4), which was not significantly different with treatment (K8).

The weight of fruit/plot on the treatment dose and application K_2SO_4 4.5 g / liter (7) gives the weight of the fruit / plot heaviest ie 5.26 kg showed significantly different with K0, whereas the lowest in treatment K0 is 0.56 kg, showed no significant with K1, K2, K3, K4, K5, K6 and K8, K9.

Varieties TM 999 generating the highest/plot fruit weight. This shows the response of plants to K_2SO_4 fertilizer affecting the weight of the fruit / plot. The adaptability of plants, visible when the plant responds to nutrients available indicated by low production of the control plants.

Provision of fertilizer K_2SO_4 (K7) is able to increase the weight of the fruit / plot, this is because the availability of nutrients for plants which nutrients potassium and sulfur, where the nutrient is essential nutrients that plants need in large numbers, so that with the fertilization K_2SO_4 able to increase the weight of the fruit / plot, according to the Suprapto (1993). Fertilization plays an important role in increasing the production of red chilli, because fertilizers contain nutrients that are relatively high.

Without fertilizer K_2SO_4 (K0) produced the lowest number of fruits, this is due to the red chili plants rely solely on available nutrients from the soil, so that the formation of the fruit is not good. Plants that lack of N, P and K results in the form of fruit will slump (Sumardi and Suriatna, 1993).

Conclusions

Dose and application of K_2SO_4 on giving 4.5 g / liter, 12 x frequencies during the growing season can increase plant height, the amount of fruit/plant and the weight of the fruit/plots.

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The Impact of Population and Environment Pollution

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Abstract

Starting from the human existences on the earth and how human interact with their environment. Decline in environmental quality are increasingly disturbing because society has lead to take the lives of innocent human beings so that more children die. Some research on air pollution with all the risks have been published, including the risk of blood cancer. However, rarely realized who knows how many thousands of citizens who die each year from respiratory infections, asthma, and lung cancer as a result of the air pollution. It is estimated that in the next ten years an increasing number of patients with lung disease and respiratory tract. Not only acute respiratory infections which now ranks first in the disease pattern in many areas in Indonesia, but also the increasing number of people with asthma and lung cancer. In the big cities, the contribution of motor vehicle exhaust gas as a source of air pollution reaches 60-70%. While the contribution of flue gas from industrial chimneys is only about 10-15%, the remainder coming from other combustion sources, for example from households, waste burning, forest fires, etc. Actually many air pollutants that need to watch, but the World Health Organization (WHO) defined several types of air pollutants that are considered pollutant harmful to human health, animals, and easily destroyed property is particulates containing particles and soot, hydrocarbons, sulfur dioxide, and nitrogen oxides. Everything is emitted by motor vehicles. WHO estimates that 70% of urban dwellers in the world ever breathe dirty air as a result of motor vehicle emissions, the remaining 10% while breathe air that is marginal. While, adults who are at high risk, such as pregnant women, the elderly, and people who have a history of lung disease and chronic respiratory tract.

Key words: quality environtment, population, pollution, disease

Introduction

Rapid population growth caused by the birth rate (birthrate) high and is followed by the decrease in the death rate (mortality). Throughout the business world mortality reduction was more successful than the efforts of the declining birth rate. Especially the developing countries rose from one percent to two

percent in a year. Western Europe, a decrease in mortality occurs slowly and increases the life standards and industrialization are factors that can accelerate the decline in birth rate, since children are no longer considered profitable in economic terms.

According to Warren S Thompson and David T Lewis (1965) Population growth in some countries can be caused by migration or migration. Population movement can be caused by problems with the economy, politics, and religion. The movement of people from one country to another is called migration International.

Air pollution is the presence of one or more physical substance, chemical, or biological weapons in the atmosphere in an amount which can endanger the health of humans, animals, and plants, disrupting the aesthetics and comfort, or property damage. Air pollution can be caused by natural sources and human activities. Some definitions of physical disturbances such as noise pollution, heat, radiation or light pollution is regarded as air pollution. The nature of the air resulting in impacts of air pollution can be directly and locally, regionally, and globally.

In general, the definition of air pollution is the difference in the actual air composition with normal air conditions where the actual air composition does not support human life. Material or substance itself may take the form of air pollution gases and particles. Many factors can cause air pollution, including pollution generated by natural sources and by human activities or a combination of both. Air pollution can lead to air pollution impact is direct and local, regional, and global or indirectly for a long time.

Materials and Methods

In this paper, the researcher uses descriptive method is a method that gives theoretical explanations about the Effects of Population growth and air pollution on the environment. This study uses descriptive method with qualitative and quantitative approaches. The intent of this study to provide explanations and descriptions based on data and information about the density of population and its impact on the environmental carrying capacity of an area. Descriptive method is defined as the troubleshooting procedures by describing the state of the subject and / or object of research that is based on facts and expresses business relationship with another; this was done to determine the condition of the population as a whole biophysical environment due to the activity of the community.

Discussion

Influence of air pollution on the quality of the environment and human health as well as the latest technology to reduce them. The more rapid economic progress will encourage the increasing need for transport, on the other side of the natural environment that supports the livelihood of people increasingly threatened the quality, the negative effects of air pollution to human life increasingly growing. For that brief article is presented as a starting material for the step create a healthy and comfortable environment. Air pollution is the entry, or the mixing of hazardous elements into the atmosphere which can result in environmental damage, interference on human health in general and the quality of the environment.

Air pollution can occur everywhere, for example in the home, school and office. Contamination is often called indoor pollution (indoor pollution). While the pollution outside (outdoor pollution) comes from vehicle emissions, industrial, marine, and natural processes of living creatures. Sources of air pollutants can be classified into stationary sources and mobile sources. Stationary source consists of power generation, industry and households. BPS data from 1999, in some provinces, especially in big cities such as Medan, Surabaya and Jakarta, motor vehicle emissions constitute the largest contribution to the concentration of NO_2 and CO in air of more than 50%. A decrease in air quality continues to occur during the last few years shows us that the importance of intensified efforts this emission reduction. Either through outreach to the community or to conduct research for the implementation of emission reduction technologies. In general, there are two sources of air pollution, the pollution due to natural sources (natural sources), such as volcanic eruptions, and which originate from human activities (anthropogenic sources), as derived from transportation, factory emissions, and others. In the world, known as 6 types of contaminants primary air originating from human activities (anthropogenic sources), namely Carbon monoxide (CO), sulfur oxide (SOx), nitrogen oxides (NOx), particulate matter, hydrocarbons (HC) and oxides photochemical, In Indonesia, approximately 70% of air pollution caused by motor vehicle emissions. Motor vehicles emit harmful substances that can cause negative impacts, either to human health or to the environment, such as lead / lead (Pb), suspended particulate matter (SPM), nitrogen oxides (NOx), hydrocarbons (HC), carbon monoxide (CO), and oxides of photochemistry (Ox). Motor vehicles accounted for almost 100% lead, 13-44% of suspended particulate matter (SPM), 71-89% hydrocarbons, NOx 34-73%, and almost all of the carbon monoxide (CO) into the air in Jakarta. The main source of burning of household waste was 41% of the dust source in Jakarta. The industrial sector is the main source of sulfur dioxide. Dense in places in Jakarta could lead concentrations 100 times the limit.

Sources of air pollution many factors can cause air pollution, including pollution generated by natural sources and by human activities or a combination of both. Air pollution can lead to air pollution impact is direct and local, regional, and global or indirectly for a long time. Polluter of air pollutants can be divided into primary and secondary pollutants. The primary pollutant is a pollutant substances arising directly from the source of air pollution. Carbon monoxide is an example of a primary air pollutant because it is the result of arson. Secondary pollutant is a substance pollutant formed from the reaction of primary pollutants in the atmosphere. The formation of ozone in photochemical smog is an example of the secondary air pollution. The atmosphere is a complex system, dynamic and fragile. This recent growth will concern the effects of air pollution emissions in a global context and its relation to global warming, climate change and ozone depletion in the stratosphere has been increasing.

Impact of Air Pollution

1. Health effects of pollutant substances contained in the air can enter the body through respiration system. Away penetration of contaminants into the body depends on the type of pollutant. Large-sized particulates can be retained in the upper respiratory tract, whereas small sized particulates and gases can reach the lungs. From the lungs, pollutants are absorbed by the circulatory system

and spread throughout the body. The health impacts of the most common is the ARI (acute respiratory infection), including, asthma, bronchitis, and other respiratory disorders. Some contaminants classified as toxic and carcinogenic.

2. Impact on plant

   Plants growing in areas with high air pollution levels can be stunted and vulnerable to disease, such as choruses, necrosis, and black spots. Particulate deposited on plant surfaces may impede the process of photosynthesis

Conclusion

1. Impact of Air Pollution for the survival of living things on earth: The health impacts of the most common is the ARI (acute respiratory infection), including, asthma, bronchitis, and other respiratory disorders. Some contaminants classified as toxic and carcinogenic.
2. Impact on plant: Plants growing in areas with high air pollution levels can be stunted and vulnerable to disease, such as chlorosis, necrosis, and black spots. Particulate deposited on plant surfaces may impede the process of photosynthesis.
3. Damage to the ozone layer: Ozone layer in the stratosphere (20-35 km altitude) is a natural protective filter function of the earth from the sun's ultraviolet B radiation. The formation and decomposition of ozone molecules (O3) occurs naturally in the stratosphere. Emissions of CFCs reach the stratosphere is very stable and causes the rate of decomposition of ozone molecules faster than formation, thus forming the holes in the ozone layer.
4. Damage to the ozone layer caused UV-B rays are not filtered and can cause skin cancer as well as diseases in plants.

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Education and Work Related to Breastfeeding Mothers 0-6 Months Simultaneously with Food Supplement

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Abstract

WHO and UNICEF as well as the Ministry of Health through the Minister of Health Decree No. 450 / Men.Kes / SK / IV / 2004 dated April 7, 2004 have set the recommendation of exclusive breastfeeding for 6 months. Scope of exclusive breastfeeding in Indonesia in 2012 amounted to 48.6% and in 2013 amounted to 54.3%. In the province of Aceh in 2013 the percentage of exclusive breastfeeding is 48.8%. The purpose of research is to determine the relationship of education and employment of mothers towards breastfeeding 0-6 months along with additional food in the village Monjambee and Blang Dalam district Jeumpa District, Bireuen Regency. The research designed was observational retrospective cohort study approach. The sample of the research was 52 people. The sampling is total sampling technique and instrument used was interview. The result of the respondents who dominate the secondary education was 42.3%. Employment status the majority of respondents are in the category of not working 77%. Breastfeeding 0-6 months along with additional food was categorized as 'yes' majority of 79%. The result showed that there was a relationship between the level of education of mothers towards breastfeeding 0-6 months along and additional food with a p-value of 0.017, and no relation to the employment status of breastfeeding 0-6 months along with additional food with a p-value of 0.005. Suggestion: It was expected that the respondents provide their babies with exclusive breastfeeding up to 6 months without giving any extra food.

Key words: education, employment, breastfeeding 0-6 months and Supplementary feeding

Background

Breast milk is the first food, the main and best for babies up to six months old. Breast milk contains a variety of nutrients needed in the process of growth and development of babies, most of the growth and development of the baby is determined by exclusive breastfeeding. Exclusive breastfeeding is breastfeeding without food or drink other additives in infants aged zero to six months. Other food or drink intended for example such as formula milk, orange juice, honey, tea water, or solid foods such as

banana, papaya, milk porridge, biscuits, rice porridge and teams. Even water was not given in this stage of exclusive breastfeeding (Roesli, 2005).

WHO (World Health Organization) and UNICEF (United Nations Children and Education Fund) and the Ministry of Health of the Republic of Indonesia through the Minister of Health Decree No. 450 / Men.Kes / SK / IV / 2004 dated April 7, 2004 has set the recommendation of exclusive breastfeeding for 6 months. In these recommendations explained that the benefits of breastfeeding will increase the IQ (Intelligence Quetiont) and the health of the baby, if the baby is only fed breast milk alone for the first 6 months of life without concurrent with extra food (WHO, 2015).

Maternal education was also expected to affect the knowledge and opportunity to provide exclusive breastfeeding mother. Low levels of maternal education resulted in a lack of knowledge of mothers in dealing with problems, especially in exclusive breastfeeding. The knowledge obtained through formal and informal education. While mothers have higher levels of education, generally open to accept the changes or new things to the maintenance of health (Depkes RI, 2004). Education will also make a person compelled to wonder, looking for experience so that the information received will be knowledge (Azrul, 2005).

Preliminary survey conducted by researchers at the village Monjambee and Blang Dalam Sub District Jeumpa in Bireuen District through interviews in ten mothers who have babies over 6-24 months, there is only one person who exclusively breastfed, nine breastfed along with supplementary feeding in infants before the age of 6 months. Therefore, the authors feel the need and interest to do research with the title "mother's education and employment relationship to breastfeeding 0-6 months along with additional food in the village of Blang Dalam and Monjambee Sub District Jeumpa in Bireuen District".

Materials and Methods

This was an observational study design that researchers are trying to find the relationship between variables is to conduct an analysis of the data collected. The approach used is a retrospective cohort study that is already experiencing the effects of the research group, then traced, so actually the same as the cohort study but data were taken retrospectively as has happened in the past (Santosa, 2008).

The data used came from interviews at the respondents containing about whether the respondent breastfed along with additional food when the baby aged less than 6 months. With only see two characteristics of respondents, level of education and employment status.

The research instrument used in this study is a form interviews that the author made themself guided by the conceptual framework and review of the literature and then researchers met directly mothers sampled to conduct interviews with respondents in the village Monjambee and Blang Dalam Sub District Jeumpa in Bireuen District.

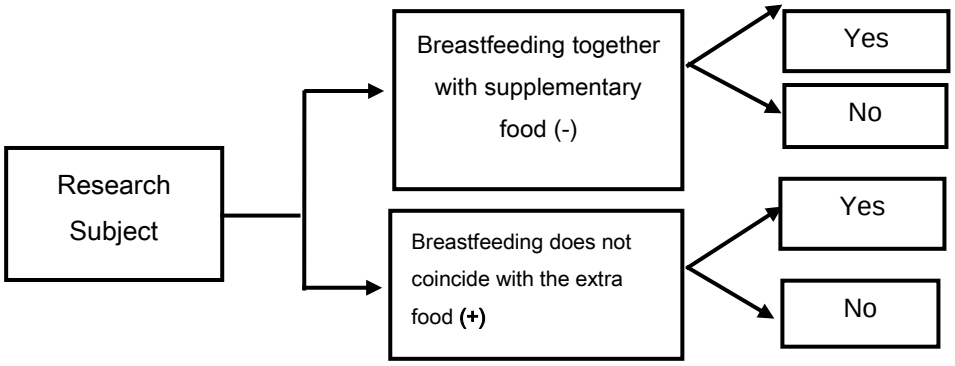

Figure 1. Schematic retrospective cohort study design (Santosa, 2008)

The data obtained and analyzed by the resolution of the data in accordance with the existing criteria. Analysis of the data for this study using computerized. Measures data analyze are:

1. Univariate Analysis

   This analysis is done on each of the variables of the research results. In general, this analyzed only produce distribution and presentation of each variable. This analysis uses the formula (Machfoedz, 2010), following:

   $P = \frac{f}{N} \times 100\ \%$

   Description:

   P : percentage
   f : frequency
   N : the population being sampled

2. Bivariate Analysis

   This analysis was conducted to test the hypothesis by determining the relationship between the two variables studied in order to answer the purpose of research, statistical test by using Chi-Square test using SPSS version 16 is:

   $= \sum \frac{(O-E)^2}{E}$

   Description:

   x2 : Chi Square test
   O : The value observed in the form of samples
   E : The expected value of a sample

As for the terms used are Ho: acceptable if the results of statistical tests x2 count <x2 table or p> 0.05, Ho is rejected if the results of statistical tests count ≥ x2 x2 statistical tables or p ≤ 0.05, the level of confidence (confiedencel level) 95 % and the degrees of freedom (degree of freedom): (b-1) (k-1) (Machfoedz, 2012).

Description:

B : Number of lines

k : Number of columns

Results and Discussions

Overview Location Research

1. Village Monjambee
    a. Geographical Data

Monjambee village is a village located in the Sub District Jeumpa Bireuen district with an area of 78 hectares. The boundaries of the Village area Monjambee namely:

1) East with Laksamana Village / Batee Timoh / Blang Bladeh
2) The western side is bordered by the village of Blang Dalam
3) North side is bordered with Strait Malacca Beach
4) South side is bordered with the village of Blang Dalam / Batee Timoh

    b. Demographic Data

Monjambee total population in the village is 940 people, men and women numbered 474 466 inhabitants souls of 249 families were there. While there are three sub village, consist of Dusun Awe, Bayu and Dusun Baro.

2. Blang Dalam Village
    a. Geographical Data

Blang Dalam village is a village located in the sub district Jeumpa Bireuen district with an area of 63 hectares. The boundaries of the village of Blang Dalam, namely:

1) East with the Village Monjambee
2) The western side adjacent to the Village Kuala Jeumpa
3) North side with Strait of Malacca
4) The Southern borders on the road Medan-Banda Aceh

    b. Demographic Data

    The total population in Blang Dalam Village are 801 peoples, 392 men and 409 women peoples, which consist of 187 families. While the village is composed of three sub village namely Dusun Tengku Jeumpa, Teungku Langkabee and Teungku Lampuuk.

Based on primary data collection has been done on the 15th until May 28th, 2015 in the village of Blang Dalam and Monjambee the Sub District Jeumpa in Bireuen District on the relationship of education and employment of mothers towards breastfeeding 0-6 months along with additional food, the obtained results of the analysis as follows:

1. Univariate Analysis

Table 1. Distribution of the frequency of respondents' level of education in the village of Blang Dalam and Monjambee sub district Jeumpa Bireuen district.

No.	Level of Education	Frequency	Percentage (%)
1	Basic	21	40,4
2	Intermediate	22	42,3
3	High	9	17,3
	Total	52	100

(Source: Primary Data 2015)

Base on table 1 above, the education level of respondents who dominate the secondary level, as many as 22 respondents (42.3%).

Table 2. Distribution of the frequency of employment status of respondents in the village of Blang In Dalam and Monjambee sub district Jeumpa Bireuen district.

No	Employment status	Frequency	Percentage (%)
1	Work	12	23
2	Jobless	40	77
	Total	52	100

(Source: Primary Data 2015)

Based on table 2 above, it can be seen that the employment status of the majority of respondents in the category do not work as many as 40 respondents (77%).

Table 3. Distribution of the frequency of breastfeeding 0-6 months along with additional food in the village Monjambee and Blang Dalam Sub District Jeumpa in Bireuen District

No.	Breastfeeding 0-6 months along with additional food	Frequency	Percentage %
1.	Yes	41	79
2.	No	11	21
	Total	52	100

(Source: Primary Data 2015)

According to the table 4.6 above, it can be seen that breastfeeding 0-6 months along with the majority of food additives in the category yes, as many as 41 respondents (79%).

2. Bivariate Analysis

a. Relationship education level of mothers towards breastfeeding 0-6 months along with additional food

Table 4. Relation to the educational level of breastfeeding 0-6 months along with additional food in the village Monjambee and Blang Dalam at sub district Jeumpa Bireuen District.

No	Level of Education	Breastfeeding 0-6 months along with additional food		Total	%)	X² Count	*P-Value*
		Yes	No				
1.	Basic	19	2	21	00,4		
2.	Intermediate	18	4	22	42,3	8,206	0,017
3.	High	4	5	9	17,3		
Total				52		100	

Source: Primary Data (2015)

According to the Table 4 above, shows that out of 52 respondents, the results of chi-square statistical test at α = 0.05% was obtained p-value 0.017 and the chi-square df = 2 (5.991) got x2 count 8.206> 5.991 x2 table, so it can be concluded there is a correlation between the level of education on breastfeeding 0-6 months along with additional food.

b. Relationship status against breastfeeding mothers work 0-6 months along with additional food

Table 5. Relationship employment status of mothers towards breastfeeding 0-6 months along with additional food in the village Monjambee and Blang Dalam in sub district Jeumpa Bireuen district.

No.	Employment status	Breastfeeding 0-6 months along with additional food		Total	(%)	X² Count	*P-Value*
		Ya	Tidak				
1.	Work	6	6	12	23	7,783	0,005
2.	Job less	35	5	40	77		
	Total	41	11	52	100		

Source: Primary Data (2015)

According to the table above, shows that out of 52 respondents, the results of chi-square statistical test at α = 0.05% was obtained p-value of 0.005 and the chi-square df = 1 (3,841) got x2 count 7.783> 3.841 x2 table, so it can be concluded there is a correlation between maternal employment status against breastfeeding 0-6 months along with additional food.

Based on the results of research on the relationship of mother's education and work towards breastfeeding 0-6 months along with additional food in the village of Blang Monjambee and Blang Dalam sub disrict Jeumpa Bireuen district 2015, the researchers decipher the discussion as follows:

1. **Relationship between the education level of mothers towards breastfeeding 0-6 months along with additional food**

From the results of statistical calculations using chi-square test, found no relationship between maternal education level with breastfeeding 0-6 months along with additional food in the village Monjambee and Blang Dalam Sub Distric Jeumpa in Bireuen District. The level of education will affect a person's level of knowledge on certain things. The higher level of formal education obtained the higher the person's knowledge including knowledge of exclusive breastfeeding owned (Tarmudji, 2003). Education about breastfeeding is a process of change of personality, attitudes and understanding about breastfeeding so as to create cultural patterns in breastfeeding exclusively without any additional food. Guided by the goal of education is estimated that increasing education achieved most of the population, the more help ease the coaching of the importance of exclusive breastfeeding in infants.

Arifin (2002) in his research indicates that the lack of education and lack of information are also factors that influence the failure of exclusive breastfeeding. From the results of research conducted by Arifin supports the results of a study conducted by researchers.

But in other ways, for mothers who have higher education, they tend to not give exclusive breastfeeding her baby, it is not because they do not know about the importance of exclusive breastfeeding, but an opportunity for them to be home with the baby less because they work in outside the home, so it was forced upon the mother was not home, food additives such as formula milk, bananas, porridge team etc is given to babies and at the time was still given breast milk home from work. This is why mothers who have higher education breastfed infants 0-6 months along with additional food.

2. **Relationship employment status of mothers towards breastfeeding 0-6 months along with additional food**

From the results of statistical calculations using chi-square test, found no association between employment status of the mother against breastfeeding 0-6 months along with additional food in the village Monjambee and Blang Dalam Sub Distict Jeumpa in Bireuen District.The results showed that most respondents were not working tend not exclusively breastfed. This is evidenced from the 40 respondents who do not work, only 5 respondents who exclusively breastfed. While 35 respondents are not exclusively breastfeed.

At the time of interview respondents who do not work, some of them say do not give exclusive breastfeeding due to not knowing about the importance of exclusive breastfeeding, but it is also caused by other things such babies cry and fuss, mother worried about the milk does not meet the needs of infants and there are also mother that her milk is not smooth, and thus forced extra food is given. The type of food additives that are often given that formula, mashed banana with rice and porridge team.

For working mothers, the actual work is not a reason to stop exclusive breastfeeding until 6 months. With the maternity leave for 3 months can help mothers to breastfeed exclusively, coupled with the right knowledge about breastfeeding, support work environments that provide special facilities for breastfeeding or commonly known as corner lactation. A working mother can continue to provide breast milk exclusively by way of milking her milk before she worked. Because breast milk can be stored for a 24-hours hold in a thermos of ice were given ice cubes, hold for 6-8 hours in the air and in the refrigerator for 48 hours and 3 months to 6 months under refrigeration (Roesli, 2007).

Results of research conducted by Dearden et al, (2002) whos found that the risk of not breast feeding exclusively was 14 times greater for women who return to work than those who do not. The mothers who started work often began to stop breastfeeding because they have to part with her baby. The actual mothers can continue to breastfeed exclusively in the first 6 months and continued breastfeeding until at least 2 years in a way express the milk.

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Relationship Diet and Revenue Children With Nutritional Status

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Abstract

State of the nutritional status of childrens needs special attention, especially by mothers. The age of the children is a time of rapid growth process that require nutrients more with the quality and quantity of food was good and sufficient. Based on reports from Puskesmas Montasik known that from the existing 1,385 infants, toddlers turned out to 1,001 (83.6%) fall into the category of good nutrition, 163 infants (13.6%) fall into the category of malnutrition and 14 children (1.2%) suffer from malnutrition. This study aims to determine the relationship of diet and income of the nutritional status of children in Aceh Besar district Puskesmas Montasik 2014. This research is descriptive analytic with cross sectional approach conducted on June 15 to 18, 2014. The population in this study are all mothers who have children (aged 1-5 years) who totaled 49 people. Sampling using lameshow formula, with a sample of 49 people. Data were analyzed using univariate and bivariate analysis with chi-square method. Data was collected by distributing questionnaires and then performed statistical tests chi square test using the program SPSS 15. The results showed that statistical tests, showed no association with dietary nutritional status of children with a P value of 0.001 and no revenue relationship with nutritional status of children with a P value of 0.003. Conclusions And Suggestions: of all the variables under study it can be concluded that there is a relationship between the nutritional status of children with diet and income. Expected to head the leadership Montasik health centers to educate more people about the improvement of nutritional status, especially families who have children, so the health status in the community for the better

Key words: Nutritional status of children under five, Diet, Revenue

Introduction

Nutrition is one of the important factors that determine the level of health and well-being. Nutrition someone say well if there is a balance and harmony between the physical and mental development of the person. There is a strong link between nutritional status and food consumption. Optimal nutritional status level will be achieved when optimal nutritional needs are met. Most people of the world are malnourished,

the prevalence is only estimated the magnitude of it, but they actually represent 1/8 parts of the population and are found mainly in Asia and Africa. Malnutrition group are infants, toddlers, pregnant women and nursing mothers (Paath, 2010).

Family eating patterns determine the nutritional status and development of children under five, when the food consumed each day is not enough to contain substances of high nutritional value and are not enough to meet the body's needs. Lack of knowledge of nutrition and health of the parents, especially the mother is one of the causes of malnutrition in children under five. Rural food is heavily influenced by the state of income and culture. There are restrictions on children such as children eat small fish is not given because it can lead to intestinal worms, nuts are also not given because it can cause abdominal pain or bloating (Mardiana, 2010).

Family income can affect a person's need for determining the ability of families to obtain food, because subsistence depends on family income. Family income affect the provision of food, both quantity and quality. Families with low economic status ability to influence family food consumption is closely linked to the nutritional status of the family (Stoppart, 2009).

Widya Karya National Food and Nutrition, has revealed that Indonesia experienced a double nutritional problems, namely the problem of malnutrition and over nutrition. Using grouping prevalence of malnutrition by WHO, Indonesia in 2012 classified as a country with high malnutrition due to 5,119,935, or by 28.47% of 17,983,244 children in Indonesia happening malnutrition and malnutrition. This figure continues to increase in 2005-2006 (Supariasa, 2012).

According to Minister of Health, Riskesdas 2013 shows nationally has decreased the prevalence of malnutrition (W / A) in children under five from 18.4% in 2011 to 17.9% in 2012. The decline also occurred in the prevalence of malnutrition is of 5.4% in 2011 to 4.9% in 2012. There is a decline in the prevalence of malnutrition is still 13.0%. The decrease mainly occurred in the prevalence of short toddlers, namely from 18.0% in 2011 to 17.1% in 2012. The prevalence of very short children is only slightly decreased from 18.8% in 2011 to 18.5% in 2012. The decrease also occurred in the prevalence of underweight children, which is very thin toddlers prevalence decreased from 13.6% in 2011 to 13.3% in 2012 (Riskesdas, 2013).

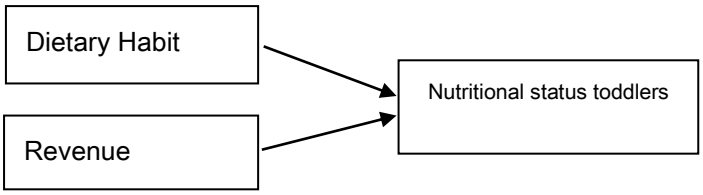
Based on data from the Aceh Provincial Health Office show that the nutritional status of infants in 2013 there were 470.901 inhabitants toddler, was 7.1% of children under five suffer from malnutrition, 16.6% children under five suffer from malnutrition, good nutrition 72.1% and 4.2% others suffer from nutrition (Aceh Provincial Health Office, 2013).

Data obtained based on reports from health Montasik known that from the existing 1,385 infants, toddlers turned out to 1,001 (83.6%) fall into the category of good nutrition, 163 infants (13.6%) fall into the category of malnutrition and 14 toddlers (1, 2%) suffer from malnutrition (PHC Montasik, 2013).

This research conducted to find out how the relationship between diet and the income and nutritional status in terms of: 1) relationship diet and nutritional status of children; and b) revenue relationship with nutritional status of children.

Framework

Researchers try to describe the framework according to Supariasa. (2012) family diet largely determines the nutritional status and development of children under five, when the food consumed each day is not enough to contain substances of high nutritional value and are not enough to meet the body's needs. According Suhardjo (2009) greatly affect family income family nutrition. The higher the family income, the better nutrition so that families can cause a risk of underweight children under five can be seen in the following framework:



Hypothesis

1. There is a relationship diet and nutritional status of children
2. There is a relationship of income to the nutritional status of children

Materials and Methods

This research is a survey research descriptive analytic with cross sectional approach of data collection is done at the same time. Research was conducted in Puskesmas Montasik Aceh Besar District 2014

The population in this study are all mothers who have children (aged 1-5 years) in Puskesmas Montasik Aceh Besar district. The sampling technique used purposive sampling method in which sampling deliberate in accordance with the requirements of sample is required.

Univariate analysis was conducted to determine the frequency distribution and percentage of each variable, then the data is displayed in tabular and narrative. Bivariate analysis to determine the relationship of each independent variable on the dependent variable using chi-square test. With a limit of significance ($\alpha = 0.05$) or confiden level (CL) = 95% is processed by computer using SPSS.

Results and Discussions

Eating Relationship With The Toddler Nutritional Status

Results of statistical analysis using chi square test showed a non-significant relationship with P value (> 0.005) 0.001. This means that the research hypothesis which states that there is a relationship between diet and nutritional status of children is proven or acceptable

The results showed that the diet is not good there are 6 people (20.7%) good nutritional status, and 23 persons (79.3%) less nutritional status. Results of statistical analysis using chi square test showed a significant relationship in which the p-value 0.001 (p <0.05), there is a relationship between diet and nutritional status of children, where the lack of good diet, the children under five are at risk of malnutrition. This proves the hypothesis in this study received.

This study was conducted in accordance Mardiana (2010) showed that a diet associated with infant nutritional status (p-value 0.027). Family eating patterns determine the nutritional status and development of children under five, when the food consumed each day is not enough to contain substances of high nutritional value and is not sufficient to meet the needs of the body, causing the food consumed does not support children to grow and develop optimally.

Table 1. Eating relationship with Nutritional Status

No	Dietary habit	Toddler Nutritional Status				Total		P value
		Good nutrition		malnutrition		f	%	
		f	%	f	%			
1	Good	16	80	4	20	20	100%	
2	Less	6	20.7	23	79.3	29	100%	0.001
	Amount	22	44.9	27	55.1	49	100%	

Table 2. Revenue relationship with the Toddler Nutritional Status

No	Revenue	Toddler Nutritional Status				Total		P value
		Good Nutrition		Malnutrition		f	%	
		F	%	f	%			
1	Height	15	78,9	4	21,1	19	100%	
2	Low	7	23,3	23	76,7	30	100%	0,003
	Jumlah	22	44,9	27	55,1	49	100%	

Results of statistical analysis using chi square test showed a non-significant relationship with P value (> 0.005) 0.003. This means that the research hypothesis which states that there is a relationship between income with infant nutritional status is proven or acceptable.

According to the assumptions in this study infants with a poor diet will be more at risk of experiencing malnutrition, while the toddler with a good diet, nutrition will be more easily fulfilled so that the better

nutritional status. For children who do not like to consume rice milk can be given in order to meet their nutritional needs. To improve the family diet, then the family must often replace food menu is different every day so that the toddler diet for the better due to the intake of nutrients obtained by toddlers become more optimal.

Revenue relationship with the Toddler Nutritional Status

The results showed that low-income families in the existing category 7 (23.3%) the nutritional status of children under five is good, and 23 persons (76.7%) less nutritional status. Results of statistical analysis using chi square test showed p-value 0.003 ($p < 0.05$), there is a correlation between revenue by nutritional status of children, where the lower the family income nutrition so that families will be less risk of causing children to experience malnutrition. This proves the hypothesis in this study received.

This research was conducted by the appropriate Maslihatun (2011) shows that the income related to the nutritional status of children (p-value 0.031). Family income affect family nutrition. The higher the family income, the better family nutrition, but more the lack of nutrition, the family income families increasingly less so as to risk causing infant malnutrition.

According to the assumptions in this study are low-income families would be at greater risk of causing children to experience malnutrition, while families with high incomes, would more easily meet the nutritional needs of children so that children become better nutrition. To get good nutrition, families with low income can take advantage of the home page to grow vegetables without the need for high cost, in addition, to meet the nutritional needs of the family can be done by raising livestock and poultry such as chickens and ducks which can be exploited meat and eggs, cow and goat milk and meat can be utilized so that the nutritional needs can be met with a good family.

Conclusion

Based on the above discussion it can be concluded that:

1. There is a relationship between diet and nutritional status of children
2. There is a relationship between revenue by nutritional status of children

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Factors That Influence the Mother Post Sectio Caesaria Failure in Providing Early Initiation of Breastfeeding in Dr.Tengku Mansyur Tanjungbalai Hospital

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IKM STIKES Helvetia Medan

Abstract

Based on the data obtained from the Health Department Cape Town hall in 2013, early coverage of early initiation of breastfeeding (IMD) in Tanjungbalai was 11.23%, while the target in PROPENAS coverage and national strategy program increased coverage breast milk (PP-ASI) was equal to 80%. The purpose of this study was to determine the factors that influence the failure of the mother post section Caesarea in providing early initiation of breastfeeding. The research designed was analytic survey with cross sectional designed. The research was conducted at Tengku Mansyur Tanjungbalai Public Hospital. The data were analyzed by univariate, bivariate analysis using the chi-square test. The result showed that maternal knowledge associated significantly with the implementation of early initiation of breastfeeding in newborn infants (p=0,000 <0,05). Family supported mothers significantly associated with the implementation of early initiation of breastfeeding in newborn infants (p=0,000 <0,05). Support health personnel in mothers significantly associated with the implementation of early breastfeeding initiation in newborn at Tengku Mansyur Tanjungbalai Public Hospital in 2015 (p=0,000 <0,05).

Key words: influence, the mother post section caesarian, breastfeeding

Introduction

Based on a survey of the world health organization (WHO) of more than 3,000 post-natal morhers in some countries.showed that mothers who initiate early breastfeeding or breast-feeding for at least one hour after the baby was born only about 38.33% (Indramukti, 2013).early initiation of breastfeeding (early initiation) or the beginning of early breastfeeding is the process of feeding babies immediately after birth.where the baby was left looking for her own nipples (not offered to the nipple). IMD is the process of letting the baby with her own instinct can breastfeed immediately within the first hour after birth. Along with skin contact between baby with the mother's skin.

Around the world, every year, about for million of the 136 milllion babies under the age of 28 days dies.acts of early initiation of breastfeeding within the first hour is expected to save no less than one million babies (Said, 2009). Researchers from the UK that conduct research involving 10.947 infants in Ghana. If the baby is given the opportunity to suckle within the first hour with left skin to skin contact mothers (at least for an hour), then 22% of the life of an infant under 28 days can be saved (Roesli, 2013).

Based on medical research (riskesdas) 2013. Shows that the percentage action process began to receive less than one hour (early breastfeeding initiation).in children aged 0-23 months in indonesia in 2013 amounted to 34.5%. Percentage action process started to get between 1-6 hours of 35,2%. Percentage action process started to get between 7-23 hours of 3.7%.while the percentage action process began to get between 24-47 hours of 13.0% and the percentage gets action process started more than 47 hours by 13.7%. Percentage action process began to receicve less than one hour (early breastfeeding initiation) highest in West Nusa Tenggara at 52.9% followed by oleg south Sulawesi amounted to 44.9%, and West Sumatera at 44.2%.while the lowest percentage of early breastfeeding initiation are in the province of West Papua by 21.7% followed by Riau province by 22.1% and then riau island by 22.7% (Kemenkes RI, 2014).

Indonesian health profile data also shows in the province of North Sumatera started to breastfeeding infants percentage of less than 1 hour the first (early breastfeeding initiation) in children aged 0-23 months in 2013 is 22.9%. Much lower in comparison with the achievements of the national level is by 34.5% (Kemenkes RI, 2014). Data health depertement cape town hall in 2013. The scope of the implementation of the IMD coverage which is target ed in the national development program increased coverage breast milk (PP-ASI) is by 80%. It indicates a state of considerable concern, so it needs a serious effort towards that and be immediately toward the success of the program that can increase exclusive breastfeeding (Dinkes Tanjungbalai, 2014).

Hospitals (general hospital) dr.tengku mansyur cape town hall is the only real government-owned hospitals in cape town hall should at this hospital has done the provisions set out in government regulations regarding health services that should be applied in hospitals related to the implementation of the IMD number coverage in 2014 IMD implementation at district general hospital dr.tengku mansyur cape town hall of 18.2%which is still far from the standards that have been set by the hospital 70% (dr.Tengku Mansyur General Hospital, 2015).

Preliminary studies the researchs did in district general hospitals dr.tengku mansyur cape town hall that number of women giving birth in 2014 as many as 642 people. The number of mother who gave birth to normal as many as 85 people, while the maternity section caesarea as many as 557 people, or an average of 46 people after month. The high number of cases of labor section caesarea in district general hospital dr. Tengku Mansyur because mothers delivered in a hospital generally experience delivery complications, whereas a normal pregnant women in the maternity midwife or obstetrician.based on data

from the general hospital dr.tengku mansyur tanjungbalai. Tengku mansyur cape town hall that of 457 maternal section caesarea, who are willing to do IMD only 83 118.2%5).

The research was conducted to determine the factors that influence the failure of the mother post section caesarea in providing early initiation of breastfeeding early breastfeeding in hospitals dr.Tengku Mansyur Tanjungbalai.

Materials and Methods

This research is analytic survey with cross sectional design,aims to determine the factors that influence factor mother post sectio caesarea failure to provide early breastfeedig initition.research carriedout in district general hospital dr.tengku mansyurcape town hall porters in september 2015. Based on dat characteristics of the respondents that of46 respondents surveyed mostly age 20-36 years is 30 people (65,2%) a small part aged <20 years (13.0%). Most respondent are housewives that 33 (71,7%) the majority of respondent worked as a trade in which 3 (6.5%) .most respondents in parity multiparas that 26 (56.5%), a small portion of respondents parity grandemultipara namely 9 (19.6%).

Based on the survey results revaledthat most respondents are knowledge about as many as 30 people (65.2%), good knowledge that a small proportion of 16 (34.8%). The majority of respondents said that family suupport him 16 (34.8%). Most respondents said family support of health professionals in the development of IMD less catagory is 28 people (60.9%), a small portion of the respondents said the support of health workers is 18 people (39.1%). Most do not implement early breastfeeding initiation in the birth of a new baby is 46 people (70.8%), while crrrying out early breastfeeding initiation in the birth of a new baby is 19 people (29.2%).

Results and Discussion

Relationship With The Mother's Knowledge Of Early Initiation Of Breast Feeding In New Borns

Table1. the table cross-cprrelation with the mother's knowledge of early initiation of breastfeeding the newborn in dr. Tengku Mansyur Tanjungbalai.

knowledge	Giving IMD in newborns				score	p	
	yes		no				
	f	%	f	%	f	%	
good	10	21.8	6	13.0	16	34.8	
less	3	6.5	27	58.7	30	65.2	0.000
score	13	28.3	33	71.7	46	100	

Based on the above table shows that of the 16 respondets who are knowledge bot largely implement early initiation breastfeeding in newborns is 0 people (21.8%) of the 30 respondent who are knowledge about largely implement initiation breastfeeding premature newborns are 27 people (58.7%). Bivariate test result using a chi-square inicates that th value of 0.000 <0.05 means that a significant relationship

with the mother's knowledge initiation Early initiation of breastfeeding in infants born in hospitals dr. Tengku Mansyur Tanjungbalai.

Relationships Family Support In Women With Early Breastfeeding Initiation In Newborns

Table 2. Table cross ties of family support in women with early breastfeeding initiation in newborns in hospitals dr. Tengku Mansyur Tanjungbalai

Knowledge	Giving IMD in newborns				score		p
	yes		no				
	f	%	f	%	f	%	
good	10	21.8	6	13.0	16	34.8	
less	3	6.5	27	58.7	30	65.2	0.005
score	13	28.3	33	71.7	46	100	

Based on the above table shows that of the 16 respondents stated that most of the good family support early breastfeeding initiation implement in newborns is 9 (19.6%). of the 30 respondents who have less family support largely carry out iisiasi early breastfeeding in newborns is 26 people (56.5%).bivariate test results using a chi-square indicates that the p value of 0.000> 0.05 means that there is a significant relations with the family support early breast feeding initiation in newborns in hospitals dr.tengku mansyur Tanjungbalai.

Relationship Support Health Workers In Women With Early Breastfeeding Initiation In Newborns

Table 3. Table cross ties of family support in women with early breastfeeding initiation in newborns in hospitals dr.tengku mansyur Tanjungbalai 2015

Knowledge	Giving IMD in newborns				score		p
	yes		no				
	f	%	f	%	f	%	
good	10	21.8	6	13	16	34.8	
less	3	6.5	27	58.7	30	65.2	0.000
score	13	28.3	33	71.7	46	100	

Based on the above table shows that of the 18 respondents who expressed the support of good health during pregnancy largely implement early breastfeeding initiation in newborns that 12 (26.1%) of the 28 respondents who lack the support of the majority of health workers do not carry out early breastfeeding initiation in newborn are 27 people (57.7%). Bivariate test results using a chi-square indicates that the p value of 0.000 <0.05 means that a significant relationship with the health personnel support early breastfeeding initiation in newborns in hospitals dr. Tengku Mansyur Tanjungbalai 2015.

Based on research results knowledge of the relationship with the mother post sectio caesarea early breastfeeding initiation in newborns shows that there is a significant relationship with the mother's

knowledge of early initiation of breastfeeding in newborns in hospitals doctors tengku mansyur Tanjungbalai in 2015 (p = 0.000 <0.05).

The results of this study are consistent with research conducted by Wahyuningsih (2009) in BPS Benis Jayanto Klaten get the result that there is a significant relationship between the knowledge of maternal neighbor initiation of early breastfeeding by implementing initiation early breastfeeding with p = 0.009 (p <0, 05).

Knowledge of the human senses, or the results of the object for know someone senses that has, by itself when sensing is approximately equal to generate knowledge strongly influenced by the identity of the object of attention and perception. Knowledge of the human senses, or the results of the object for know someone senses that has, by itself when sensing is approximately equal to generate knowledge strongly influenced by the identity of the object of attention and perception. Based on the results of research on the family support relationship mother post sectio caesarea with early breastfeeding initiation in newborns shows that there is a significant relationship family support in newborns in hospitals dr.tengku mansyur Tanjungbalai 2015 (p = 0.005 <0.05).

The results of this study are consistent with research conducted by Lumula (2011) in the working area of the district was Tilamuta health centers in Gorontalo get the result that the contribution of family support for the implementation of the IMD assessed melali test phi = 0.0550, or 55.0% as well as multivariate test using logistic regression showed the value of p = 0.00. The influence of family support esar OR = 6.783 means that women who get family support 6.8 times larger can perform IMD compared with mothers who did not get the support of his family.

Assumptions according to the researchers, the results of this research shows that most mother post sectio caesarea (65.2%) lack of support from the family in the provision of early breastfeeding initiation. this is caused by a lack of family also know and understand the importance of early breastfeeding initiation. Only 34.8% of respondents who support the bathtub of the family in the provision of early breastfeeding initiation to the new baby is born.

Relationship Support Health Personnel In The Mother Post Sectio Caesarea With Early Breastfeeding To Newborns

Based on research results sectio caesarea support relationships with early breastfeeding initiation in infants born meunjukan smell that there is a significant relationship with the mother's health workers on early breastfeeding initiation in newborns in rsuddr. Tengku mansyur tanjungbalai 2015 (p = 0.000 <0.05).

The results of this study are consistent with research Hidayati (2012) which examines maternity patients who are in hospital maternity hospital maternity Brada heroine cities kndari get results that support health personnel associated with the implementation of the IMD (p = 0.010 <0.05) of 37 respondents who carry out nisiasi early breastfeeding as much as 62.2% received support from health workers and who has not received the support of 37.8% of health workers.

According to the researchers, based on the results of this study that most mothers say lack of support from health professionals during pregnancy on breastfeeding initiation dii so maternal tidakmemberikan early initiation of breastfeeding her baby. Only 39.1% of respondents who expressed the support that states get good support from health personnel. The success or failure of early initiation of breastfeeding in the maternity highly dependent on the support of health workers first they who will assist in the birth mothers to initiate early breastfeeding.

Conclusion

1. The mother's knowledge significantly associated with the implementation of early breastfeeding initiation in newborns in hospitals dr.Tengku Mansyur Tanjungbalai.
2. The maternal family support significantly associated with the implementation of early breastfeeding initiation in newborns in hospitals dr.Tengku Mansyur Tanjungbalai.
3. The support of maternal health at significantly associated with early breastfeeding initiation in newborns in hospitals dr.Tengku Mansyur Tanjungbalai.

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Immunization and Environment Related Events with ARI (Acute Respiratory Infection) in Children Health

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Abstract

ARI (Acute Respiratory Infection) is an acute inflammation of the upper and lower respiratory tract. The respiratory disease on infants at Peukan Bada Public Health Center posed the first rank among the 10 most prominent diseases. The finding revealed that respiratory disease inflicted 111 toddlers at Peukan Bada Public Health Center in 2014. This study aims to determine immunization relationship with the environment of Genesis ISPA on the toddlers at Peukan Bada Public Health Center, Aceh Besar District. The research designed was a descriptive analytic cross sectional study that was conducted on 18 to 22 June 2014 at Peukan Bada Public Health Center, Aceh Besar. The sample of the research was 43 children by using purposive sampling of Lameshow formula. The data analysis used was univariate and bivariate analysis with chi-square method. The result showed that there was a relationship between immunization and ARI on infants with a p-value = 0.009 (p <0.05). And there was a relationship between the environment and the incidence of acute respiratory infection in infants where the obtained value was p-value = 0.021 (p <0.05). There was a relationship between immunization and ARI on infants and there is a neighborhood relationship with ARI in infants. It is expected that the Director of Peukan Bada Public Health Center should provide counsling for mothers about immunizations and the environment in order to reduce the spread of acute respiratory infection on infants.

Keywords: ARI, infant, mother, counseling

Introduction

ARI (Acute Respiratory Infection) is an acute inflammation of the upper and lower respiratory tract caused by infection with microorganisms or bacteria, viruses, and rickets, without or with inflammation of the lung parenchyma. ISPA causal factors include environmental factors, nutritional status, low birth weight (low birth weight), and immunization status (Alsagaf, 2009).

Immunization status is a risk factor of ARI. Immunization showed consistency in giving effect to the ARI. Based on research Nasution, et al (2009) in Jakarta that infants who do not receive immunizations

according to age at risk for respiratory infection and there is a significant relationship between immunization with the incidence of acute respiratory infection in young children, which was obtained p-value = 0.045.

WHO (2010) states that the ISPA is one of the leading causes of death in children under 5 years but diagnosis is difficult to enforce. The World Health Organization estimates the incidence of ARI in developing countries with the incidence of acute respiratory infection in infants above 40 per 1,000 live births is 15% -20% per annum on the 13 million children under five in the world the toddler age group. In 2000, 1.9 million (95%) children - children around the world die from ARI, 70% from Africa and Southeast Asia.

According to the Ministry of Health (2012), from the Health Research report (RISKESDAS) in 2007, the prevalence of ARI in Indonesia approximately 25.5% with the highest prevalence occurs in infants two years (> 35%), with pneumonia morbidity in infants 2,2 % and in infants 3%, while 23.8% mortality in infants and toddlers 15.5%. The number of infants who suffer from respiratory infection in Indonesia in 2012 was 416 cases a day.

Indonesia as a developing country, faces many public health problems. Infectious diseases and malnutrition still including the cause of death of children under five, so that in 2004 the infant mortality rate (IMR) is still high at 52 per 1,000 live births. The Directorate General of Communicable Disease Control and Environmental Health (PPM & PL) of the Ministry of Health of the Republic of Indonesia (2004) states that the ARI is a leading cause of infant mortality and under five in Indonesia. Most of these deaths are caused by ARI bottom (Gulo, 2009).

The incidence of ARI in West Java province reached 24.73%. Number of patients with acute respiratory infection in infants 3 years in West Java in 2012 is estimated at 20 687 cases. According to the head of the District Health Office Wasdal Bandung, Bandung regency were the highest for prevalence of ARI. It is estimated that the toddler suffered ARI cases in Bandung regency toddlers as much as 320 thousand of the total population of 3.2 million people each year.

According to Dinkes the Provincial Health Office Bandung (2013) In 2010, Bandung regency health office received reports of case finding Ispa of PHC as many as 21 929 cases with two deaths. In 2011, a total of 22,371 cases with two deaths, in 2012 as many as 183 640 cases and in 2013 as many as 144 366 cases. While based on data from the Aceh Provincial Health Office in 2012, estimates of pneumonia in infants amounted to 52 928 and the discovery of pneumonia by 2,395 or 4.5% (Profile Aceh Provincial Health Office, 2012).

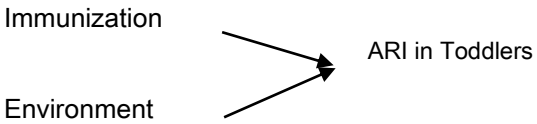
The incidence of respiratory disease in infants in Puskesmas Peukan Bada ranked first among the 10 most prominent disease. Findings cases of respiratory disease in infants in 2014 in PHC Peukan Bada reach 111 children suffering from ARI, toddlers aged 1-5 years.

From the data obtained from 16 people toddler who suffered ARI in Puskesmas Peukan Bada, as many as 10 people toddler due to a dirty environment or bad and 6 Toddlers because of incomplete immunization status.

This research was conducted to determine the relationship Immunization and Environment with Genesis ARI In Toddlers in terms of: a) Immunization relationship with Genesis ARI In Toddlers; b) To determine the relationship Environment With Genesis ARI In Toddlers.

Framework

Researchers try to describe the framework according to the Ministry of Defense (2015) ISPA disease which is the second highest cause of death is closely related to sanitary housing conditions unhealthy. According to research Nasution, et al (2009) in Jakarta that infants who do not receive immunizations according to age at risk of suffering from respiratory infection can be seen in the following framework:



Hypothesis

1. There is a relationship Immunization With Genesis ARI In Toddlers
2. There is a relationship Environment With Genesis ARI In Toddlers.

Materials and Methods

This research uses descriptive analytic methods to the design approach used was cross sectional study of data collection is done simultaneously. This study was conducted in Puskesmas Peukan Peukan Bada Bada subdistrict of Aceh Besar District in 2014.

The population in this study were all in the Work Area Toddler Pukesmas Peukan Bada. Furthermore, samples in this study conducted by purposive sampling the number of samples to be taken is 43 people.

Univariate analysis was conducted to determine the frequency distribution and percentage of each variable, then the data is displayed in tabular and narrative.

Bivariate analysis to determine the relationship of each independent variable on the dependent variable using chi-square test. With a limit of significance (α = 0.05) or confiden level (CL) = 95% is processed by computer using SPSS.

Results and Discussions

Results of statistical analysis using chi square test showed a non-significant relationship with P value (> 0.005) 0.009. This means that the research hypothesis which states that there is a relationship between immunization with ARI in infants, where more and more children who do not perform complete

immunization, the more the incidence of acute respiratory infection in infants. This suggests the hypothesis in this study received.

Table 1. Immunization relationship with Genesis ARI In Toddlers

No	Immunization	ARI In Toddlers				Total		P *Value*
		YES		NO				
		f	%	F	%	f	%	
1	Complete	5	33.3	10	66.7	15	100	0.009
2	Incomplete	22	78.6	6	21.4	28	100	
	Total	27	62.8	16	37.2	43	100	

The results showed that incomplete immunization (78.6%) who experienced ARI and (21.4%) who did not suffer from ARI whereas given full immunization (66.7%) who did not suffer from ARI and (33.3%) were ARI experience. Results of statistical test by using Chi-square test p value-value = 0.009 (p <0.05).

Based on research Nasution, et al (2009) in Jakarta that infants who do not receive immunizations according to age at risk for respiratory infection and there is a significant relationship between immunization with the incidence of acute respiratory infection in young children, which was obtained p-value = 0.045.

As well as events in the village of Lam Rukam in April 2014, who did not want to immunize all newborns because of the issue, whereas all immunization vaccines that contain no lard. On the issue, health officials have provided the correct information about immunization vaccines containing the pork oil, but people still believe that all vaccines contain lard. Mother did not know that with complete immunization can give more immunity against children, which can reduce the risk of occurrence of various diseases, one of which ARI.

Assuming the researchers in this study is that many mothers who reasoned that do not immunize their children for fear of her fever, so no appetite, injection site will be swollen, the child cranky, fearful that his son was paralyzed after injecting and there is also the issue stating that the vaccine contained in the oil-containing immunization of pigs, so this is a dilemma in society.

Table 2. Environment relationship with Genesis ARI In Toddlers

No	Environment	ARI In Toddlers				Total		P *Value*
		Yes		No				
		f	%	f	%	f	%	
1	Good	1	16.7	5	83.3	6	100	0.021
2	Bad	26	70.3	11	29.7	37	100	
	Total	27	62.8	16	37.2	43	100	

Results of statistical analysis using chi square test showed a non-significant relationship with P value (> 0.005) 0.021. This means that the research hypothesis which states that there is a relationship between the environment and the incidence of acute respiratory infection in young children, where the worse the environment, the more the incidence of acute respiratory infection in infants. This suggests the hypothesis in this study received.

The results showed that it was in a bad neighborhood there (70.3%) who experienced ARI and there (29.7%) who did not suffer from respiratory infection and there were 6 children who were in a good environment (83.3%) who did not experience ISPA and (16.7%) who experienced ARI. Results of statistical analysis using chi square test shows the relationship P value = (<0.005) 0.021.

According to the Ministry Kesahatan RI (2001), environmental factors may be risk factors for respiratory infection. Cigarette smoke and smoke of burning fuel to cook with high concentrations can damage lung defense mechanisms that will facilitate the emergence of ARI.

Results of epidemiological studies showed that house or shelter poor or slum and a sudden increase in cases of air pollution will increase morbidity and mortality due to respiratory disease that occurs Influenza, measles, and whooping cough (pertussis) (Chandra, 2006).

The assumption of this research is the mother who still lack awareness of environmental cleanliness. Mothers and family members are not concerned about the bad environment, such as: there are people who smoke in the house, around the house a lot of garbage, trash in fuel and drinking water daily is not in the cook (who use well water especially in the dry season) can increase the risk because ARI ARI can be caused by bacteria, and many more causes.

Conclusión

Based on the above discussion it can be concluded that:

1. Expected for other researchers to conduct further research using a sample and can add knowledge and experience of researchers in conducting research so as to obtain results more meaningful relationship immunization and the environment that affect the incidence of acute respiratory infection in infants.
2. It is expected to head the health center Peukan Bada to cooperate with health workers to provide counseling to mothers about immunizations and the environment in order to reduce the incidence of acute respiratory infection in infants.

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The Effect Husband Roles in Labor at BPS Martini Lhoksukon North Aceh District

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Abstract

The role of the husband to accompany their wives during the birthing process is an act or behavior that must be taken by the husbands when their wives are giving births. The purpose of this study was to determine the factors that influence of husband's participation in accompanying their wives during the labor. This research used descriptive analytic method, which was carried out in August through October 2013 with the population being all the husbands whose wives were giving births at BPS Martini Lhoksukon, totaling 30 respondents as sample. Results of a survey conducted in BPS Martini Lhoksukon, with 6 maternal cases, 2 mothers were accompanied by her husbands during the birthing process. A total of 4 people who are not accompanied by their mothers during childbirths, the husbands said, their really wanted to be accompanied by their husbands during the birthing process. Furthermore, it was found that as many as 46.7% of the husbands did not participate in accompanying their wives during the labor. It was also found that there was the influence of age and work factors of the husband's participation in accompanying their wives during the labor and there is no influence of education, economic, and social factors on participation of the husbands during the labor of their wives where p-value was >α. It is expected that husbands' participation in accompanying their wives during the labor can improve and the husbands should not neglect their responsibilities for their wives.

Key words: Maternal, labor, husband, participation

Introduction

WHO (World Health Organization) suggests that as many as 12 of the 23 states, the husband of much-needed presence in the hospital in assisting the birth process. Husband's participation in reproductive health is very low. And can be seen from the high maternal mortality rate (MMR) in Indonesia is 390 per 100,000 live births is the highest in the ASEAN (Association of South East Asian Nation) (Anonymous, 2002). Husband mentoring influence on maternal psychological, with the presence of people nearby will provide a sense of comfort during childbirth so that mother's anxiety would be reduced (Depkes RI, 2007).

Midwifery care given to mothers maternity aims to seek survival and achieve a high level of health for mothers and their babies with attention to the care of maternal affection. Dear mother care principles include respect for the culture, beliefs and desires of the mother. One of the basic principles of the care of maternal affection is included husband and family during labor and childbirth (Depkes, 2007).

The results of a preliminary survey in BPS Martini Lhoksukon Aceh Utara District, more than 6 maternal, accompanied by the husband during childbirth. A total of four mothers were not accompanied her husband during childbirth say that he really wanted was accompanied by her husband during childbirth so that he feels the attention, confidence deeper through the process of childbirth and she was able to share a sense they experienced during the delivery takes and feel the support of loved ones. Base on the background, researchers interested in conducting research on the factors that influence participation in the labor husband in BPS Martini Lhoksukon Aceh Utara district.

Materials and Methods

This research uses descriptive analytical method to determine the factors that influence participation in the labor husband in BPS Martini Lhoksukon Aceh Utara district in 2013. In this study, the population is all the husbands of women giving birth in BPS Martini Lhoksukon in Aceh Utara District in 2013. Criteria sample is husband of maternal, literate, and willing to become respondents. Sampling technique in this research is Accidental sampling is the technique of determining the sample by coincidence, namely: anyone who by chance met the researchers can be used as a sample, if in the view of those who happen to be found it suitable as a source of research and the minimum number of samples is 30 people.

Results and Discussion

Based on the research that has been conducted on October 2013 that the sample is husband of maternity as many as 30 people with aspects that are carefully Factors Affecting Participation in Labor husband BPS Martini Lhoksukon In Aceh Utara district in 2013.

a. Participation of husband

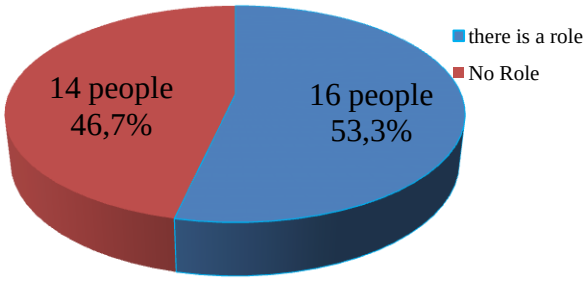

Figure 1. Frequency Distribution Participation in Labor in the BPS husband Martini Lhoksukon Aceh Utara District; Source: Primary Data (processed 2013)

Husband's participation in the labor largely instrumental in the category is 16 peoples (53.3%). Based on the assumption husband researchers who participate in labor more than that does not play a role, because many husbands who care about the state of his wife during childbirth. This is consistent with the

theory that the presence of the role of the husband from the beginning of pregnancy until delivery will reduce the fear of the mother and to facilitate the delivery process, the success of a mother during the pregnancy until the birth process can be seen from how much attention and support given to pregnant women in order to reduce anxiety, fear, and also can reduce pain during labor (Suwarni, 2005). Husband and wife were present in addition will have a special meaning. The wife will be confident in the face of labor. Husband and wife were present in addition to having a specific meaning (Suwarni, 2005).

b. Age

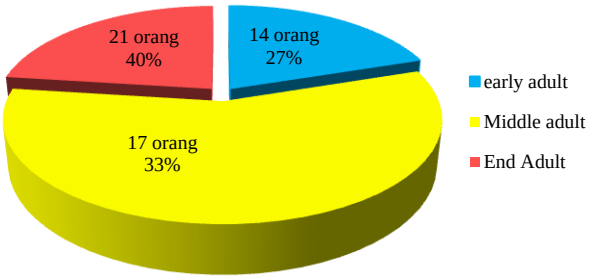

Figure 2. Frequency Distribution of Age Factor in BPS Martini Lhoksukon Labor in Aceh Utara District

Husband who did not participate in labor with adult middle age category (31-35 years) 13 (43.3%) people. This means that there is influence between the factors of age with the participation of the husband in childbirth where pvalue (0.001) <α (0.05). Age is a determinant factor that is very important when associated with participation in the labor husband. At the time of research got a husband who his young age between 20-25 years of very little role in childbirth.

c. Work

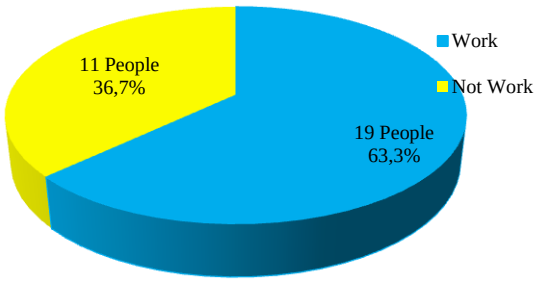

Figure 3. Frequency Distribution factor in the Labor Employment in BPS Martini Lhoksukon Aceh Utara District

From the figure 3 above it can be seen that the work of husband who participated in Childbirth mostly in the category Working with 19 people (63.3%). Based on the assumption researchers husband's work was very influential on delivery, but the facts that occurred on the field a lot of husbands who do not have jobs actually participate in the birth of his wife, Although the theory says, a husband who works will be more easily exposed to various sources of information so as to have a better knowledge and wider than the husband who does not work (Notoatmodjo, 2007).

d. Education

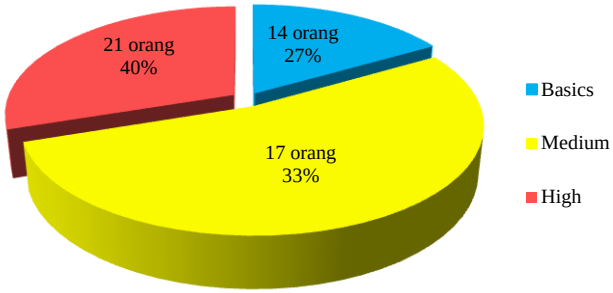

Figure 4. Frequency distribution factor in Labor Education in BPS Martini Lhoksukon Aceh Utara District Source

From the above data it can be seen that most of the education husband who participate in Labor in the category medium education is 16 people (53.3%). Most husbands who do not participate in labor with as many as 10 Secondary education (33.3%) people. This means there is no influence between education factors against the participation of the husband in childbirth. Assuming researchers based on research that has been do, there is still a highly educated husband actually not much role in childbirth. Although the theory says a person's education level greatly affect a husband's level of knowledge about the role of the husband as a labor companion. The higher the education a person, then that person will be exposed to various sources of information so that the person will have more knowledge when compared with those whose education level is low (Notoatmodjo, 2007).

e. Economy

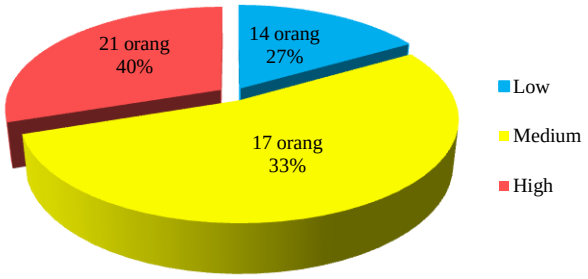

Figure 5. Frequency Distribution of Economic Factors in BPS Martini Lhoksukon Labor in Aceh Utara District

From the above data it can be seen that the Economic husband who participated in Childbirth mostly in the category of medium economy is 16 people (53 %). According to the assumption researcher fact the field proves there is still a husband who feels burdened because of the economic burden, his mind grow at the current old age, usually aged husband who are old can enjoy a life of results diusahanya for the young, while the husband the young want to enjoy her youth or pursuing a career, in addition to the economic situation affect the process of mentoring husband when his wife gave birth to a husband, a

husband who has a well-established socio-economic level would be more likely to pay attention and to accompany his wife during childbirth.

f. Social

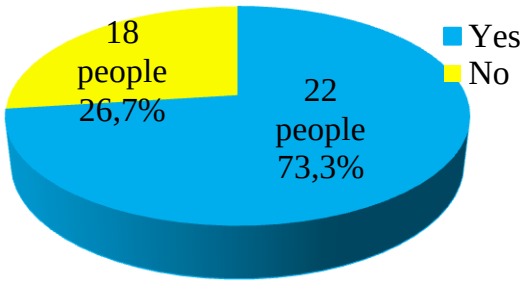

Figure 6. Frequency distribution in the Delivery of Social Factors in BPS Martini Lhoksukon Aceh Utara District

From the table above it can be seen that the social role of the husband who participated in Childbirth mostly in the category Yes is 22 (73.3%). Based on the assumption of a husband's social support researchers in labor are still very little, husband and wife found more convenient if accompanied by a mother or sister. It is indeed in line with the theory Salmah (2003) which says that social support is the presence, willingness, awareness of people who are reliable, appreciate and love us. Rice (2008) defines social support as the assistance provided by partner (husband / wife).

Conclusion

Based on data collection on Factors Affecting well as the role of the husband in Childbirth conducted in 30 respondents in BPS Martini Lhoksukon Aceh Utara district, it can be concluded that:

1. There is the influence of the age factor and the role of the husband in childbirth where pvalue (0.001) <α (0.05).
2. There is the influence of factors of work with the participation of the husband in childbirth where pvalue (0,000) <α (0.05).
3. There is no influence between the factors of education with the participation of the husband in childbirth where pvalue (0,050)> α (0,05).
4. There is no influence of economic factors with the participation of the husband in childbirth where pvalue (0,072)> α (0,05).
5. No influence of social factors with the participation of the husband in childbirth where pvalue (0.151)> α (0,05).

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Contribution of Arms and Muscle Strength Flexibility Speed of Distance Rowing K-1 200 Meter on Rower City Banda Aceh

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Abstract

Rowing is a water sport that uses a paddle and takes place in the river, lake and sea. One of the factors that can affect the speed of rowing is the arm muscle strength and good flexibility. The physical element of the arm muscle strength is needed in rowing so that it produces advancing movement of the boats, while flexibility can help increase the range of frequencies of paddling which can help produce necessary speed so that the athletes can paddle properly. The aim of the study is to determine the contribution of the arm muscle strength and flexibility on paddling speed k-1 200 meters on the rower Banda Aceh in 2013. The population of this study was all the rowers of Banda Aceh. The sample of the research was fifteen rowers. The data collection techniques: (1) Test the pull-up (2) the sit and reach test, and (3) Test speed paddle k-1 200 meters. Data processing was performed by using a formula of simple correlation analysis and multiple correlations. The results obtained as follows: (1) There is a significant correlation between the strength of the arm with a speed paddle (r = 0.58). (2) There is a significant relationship between flexibility with speed paddle 2013 by (r = 0.52), and (3) there is a significant contribution of the arm muscle strength and flexibility together to paddle speed of (Ry.x1x2 = 0, 60). Then from the data analysis, it can be concluded that the arm muscle strength and flexibility contributes significantly to the speed of paddling.

Key words: arm muscle strength, flexibility, and rowing.

Introduction

Sports development now looks so soaring, one is rowing with the development of other fields. Sport is one of the means that can be the name of the nation and also the proud parents as well as themselves. Improved performance in sports these days tend to be more oriented to the application process to achieve peak performance, as well as the work done by the coach or manager in designing an exercise program that is appropriate and systematic. To achieve these objectives it should be noted that some of the principal factors include physical, technical, tactical, and psychological. This is in accordance with the

opinion of Harsono (1988) that the main goals and objectives of the exercise is uantuk help athletes improve their skills and accomplishments as much as possible. To reach it, there are four aspects that must be considered and optimally trained by athletes, namely (a) physical exercise (b) technical training (c) tactics (d) mental and psychological training.

These factors largely determine the physical condition of the improvement in the ability of a sport, because this factor is one factor that plays an important perana to support other factors. By having a good physical condition will contribute greatly to achieving the maximum performance. The physical elements in question, as proposed by Moeloek (1983: 2) as follows: Endurance, Speed, Strength, Agility, smearing, Accuracy, Balance, Explosive Power, coordination, and reaction.

But keep in mind that the strength of the capital base needs to be improved to reach speeds in the paddle and reached the finish immediately, in order to achieve maximum performance throughout kompenen physical conditions need to be developed within the athlete, because one component with the other components are intimately interconnected. As we know, every sport has different characteristics in the activity and duration of the activity is performed. However, other elements of physical condition also should not be overlooked. At the rowing sport, especially in sprint kayak paddle number elements required physical condition is, strength, speed, and flexibility as well as the reaction speed at the start. The physical condition of the element should be trained in every effort in obtaining kecepadan effective paddling.

Rowing is a water sport that uses a paddle and take place on the river, lake and sea. Rowing also is an old sport at the Olympics. (Http: //www.T-moreonline.320.htm). In rowing need to be mastered several paddling techniques such as balance and pedaling technique. It is very important to be mastered in order to run the boat with ease. In addition, untukk achievement of an achievement in the sport of rowing, it is necessary to have a good physical condition as well. Physical component that is required in the sport rowing. Harsono (1988: 204) explains that: "The physical components are in need in paddle sports, among others; muscular strength, muscular endurance, flexibility, agility, and power".

A unique part in the sport of rowing that produced the large muscles of the back muscles, shoulder and arm muscles. Muscles - Strong muscles or power is very important as penyongkong appearance. Role of the arm muscle strength is very meaningful during a tug of course supported by the rotation of the waist, footrests consistently. Muscle explosive power at the time of entry into the water dayungan must be strong and fast in order to maintain it until the finish. With good physical state of the course will affect every job performance or achievements.

In addition to the strength of the arm muscles are other aspects that can also support the rowing technique, namely flexibility, we are usually referring to the space joints of the body. Lentuk least one determined by the narrowness of the space wide joints, elastic flexibility is also determined by whether or not the muscles, tendons, and ligaments around the joints (Harsono: 1988). Thus flexible person is a person who has a wide space in the joints and muscles have elastic.

From the description above explains that in paddle sports waist flexibility is very important contributions to engineering, particularly for kayak rowers, including round the waist yanag assist pedaling frequency for faster, helping add to the range when paddling. In a simple understanding of the power and flexibility made a significant contribution to the rowing speed.

Rower Banda Aceh has been accomplished at the local level as Porprov Porda or even national level as pre-PON and PON. Rower is is a well-trained athlete and financed each month. They follow a systematic and sustained program means athletes are doing the exercises, the loads are arranged as detailed as possible given good physical exercise, techniques, tactics, and mental or psychological. Athletes are handled by coach lokan and often addressed national coach from outside this area in order to see and monitor whether rowing in Aceh has made progress in the past few years, as well as a motivation for athletes rowing Aceh to train harder and conscientious -sungguh order to achieve a maximum performance, but the picture still requires scientific proof entitled "Contribution Arm Muscle Strength and flexibility on paddling Speed K-1200 M in Rowing Athletes of Banda Aceh in 2013"

Materials and Methods

In accordance with the problems posed, in a study there are various types of research. The research studied by the researchers in this study belong to the descriptive study with correlation or a description of the capabilities of the individual. Because in this study describes a person's ability to be examined at that time. At this descriptive study, the researchers tried to describe the research activities conducted on a specific object in a clear and systematic". Based on the above variables, this research included in the research descriptive correlational, meaning that the research aims to discover whether there is any relationship between one variable with another variable.

Results and Discussion

Results of a series of field research conducted in Banda Aceh Rowing athletes in 2013, the research data obtained in the form of test data arm muscle strength, flexibility and speed paddle K-1 200 meters at the Rowing Athletes of Banda Aceh Year 2013. The data was tabulated into a table and the results are as follows.

Calculating Average

In calculating the average first find the total number perindividu the initial value of some variable. After the initial value can be the total number of multiple variables, the value that will be entered into a search formula on average. Based on the elaboration of the data in the table above, the next step is to calculate basic statistics, namely:

Calculating Average Test Scores Arm Muscle Strength

$(X2)^{-}$ = $(\Sigma X1) / n$

= 183/15

= 12.2

Calculating Average Test Scores flexibility

X2 = ΣX2 / n

= 353/15

= 23.53

Table 1. Summary of Results of Measurement Arm Muscle Strength (X1), flexibility (X2) and Speed Measurement Rowing K-1200-m in Rowing Athletes of Banda Aceh in 2013.

No	Name	Strengh arm muscle (X_1)	Fleksibelity (X_2)	Rowing Speed (Y)
1	**2**	**3**	**4**	**5**
1	Araiko Rahmat	15	25	44,00
2	Hasbuna Rawe	15	30	49,00
3	Mahdi	14	38	66,00
4	Amanda Syukriadi	14	29	69,00
5	Maskur	13	24	53,00
6	Mirawati	12	21	68,00
7	Zaina	12	29	70,00
8	Zuraidha	12	28	66,00
9	Faradilla	12	19	57,00
10	Jimmy Kurniawan	12	15	56,00
11	Siti Hawa	11	21	59,00
12	Sahlan	10	24	51,00
13	Sakdiah	10	17	66,00
14	Novi Lidya Isdarianti	10	16	69,00
15	Sarifah	9	17	68,00
Number		**183**	**353**	**911**

Calculating Score Average Speed Test Rowing

X = ΣY / n

= 911/15

= 61

Calculation Value T-Score

Based on analysis of the average and standard deviations above, the next step is to change the raw scores arm muscle strength (X1), flexibility (X2) and speed paddle (Y) into a T-score using the formula:

TScore = ((X-X)) / SD x10 + 50

Description:

X = the raw score

X = average of the raw scores

SD = standard deviation (standard deviation)

The T-score calculation details can be found in the annex and recapitulation raw score and T-score can be seen in the following table.

Table 2. Summary of the results of the calculation of the T-score arm muscle strength (X1), flexibility (X2) and the T-score calculation speed paddle (Y) on the rower Banda Aceh in 2013. No Arm Muscle Strength (X1) flexibility (X2) Rowing Speed (Y)

No	Arm Muscle Strength (X_1)		flexibility (X_2)		Rowing Speed (Y)	
	Skor Mentah	T-score	Skor Mentah	T-score	Skor Mentah	T-score
1	2	3	4	5	6	7
1	15	38,24	25	39,86	44,00	35,96
2	15	64,97	30	52,28	49,00	58,19
3	14	48,93	38	36,75	66,00	44,15
4	14	59,63	29	50,73	69,00	40,64
5	13	48,93	24	42,97	53,00	45,32
6	12	38,24	21	38,31	68,00	59,36
7	12	38,24	29	50,73	70,00	38,30
8	12	32,89	28	39,86	66,00	30,12
9	12	43,58	19	46,07	57,00	47,66
10	12	64,97	15	60,05	56,00	55,85
11	11	54,28	21	46,07	59,00	58,19
12	10	59,63	24	72,47	51,00	55,85
13	10	59,63	17	58,49	66,00	59,36
14	10	48,93	16	58,49	69,00	60,53
15	9	48,93	17	56,94	68,00	55,85
	183	**750,00**	**353**	**750,08**	**911**	**745,32**

Results table above explained that T-score arm muscle strength (X1) is 750.00, the T-score flexibility (X2) is a T-score of 750.08 and speed paddle (Y) is 745.32.

Correlation Value Calculation

Purposes of calculating the correlation value is to determine whether there is a correlation between the arm muscle strength, flexibility speed paddle to paddle Athlete Banda Aceh in 2013. To find this

correlation value calculation, it is necessary helper table to facilitate the search. The auxiliary table is shown in the table below.

Table 3. Table Helper for Correlation Analysis in Athletes paddle Banda Aceh in 2013

No	X_1	X_2	Y	X_1^2	X_2^2	Y^2	$X_1.X_2$	$X_1.Y$	X2.Y
1	38,24	39,86	35,96	1461,94	1588,84	1293,47	1542,07	1375,13	1433,57
2	64,97	52,28	58,19	4221,52	2733,47	3385,74	3396,97	3780,61	3042,18
3	48,93	36,75	44,15	2394,19	1350,90	1949,40	1798,42	2160,38	1622,79
4	59,63	50,73	40,64	3555,22	2573,51	2054,05	3024,80	2423,38	2061,83
5	48,93	42,97	45,32	2394,19	1846,06	3523,22	2102,34	2217,61	1947,28
6	38,24	38,31	59,36	1461,94	1467,46	1467,20	1464,70	2269,52	2273,80
7	38,24	50,73	38,30	1461,94	2573,51	907,03	1939,67	1464,57	1943,16
8	32,89	39,86	30,12	1081,60	1588,84	2271,55	1310,91	990,48	1200,47
9	43,58	46,07	47,66	1899,47	2122,58	3118,99	2007,93	2077,20	2195,80
10	64,97	60,05	55,85	4221,52	3605,59	3385,74	3901,42	3628,62	3353,48
11	54,28	46,07	58,19	2946,11	2122,58	3385,74	2500,67	3158,29	2680,76
12	59,63	72,47	55,85	3555,22	5251,75	3118,99	4321,01	3329,97	4047,24
13	59,63	58,49	59,36	3555,22	3421,52	3523,22	3487,73	3539,18	3472,00
14	48,93	58,49	60,53	2394,19	3421,52	3663,43	2862,13	2961,58	3540,41
15	48,93	56,94	55,85	2394,19	3242,28	3118,99	2786,15	2732,67	3180,04
Number	**750**	**750**	**745**	**38998**	**38910**	**38433**	**38429**	**38109**	**37995**

Looking for calculating the correlation value by means enter the results of the correlation between variables by using the formula:

$$rx_1y = \frac{n\sum X_1.y-(\sum X_2)(\sum y)}{\sqrt{\{n\sum {X_1}^2-(X_1)^2\}\{n\sum y^2-(y)^2\}}}$$

$$= \frac{15.38109-(750)(745)}{\sqrt{\{15.38998-(750)^2\}\{15.38433-(745)^2\}}}$$

$$= \frac{571635-558750}{\sqrt{584970)-(562500).(576495)-(555025)}}$$
$$= \frac{12885}{\sqrt{(22470).(21470)}}$$
$$= \frac{12885}{\sqrt{482430900}}$$
$$= \frac{12885}{21964,31}$$
$$= 0,58$$

The results of the above analysis, showed that the correlation coefficient (r) between the muscle strength of the arm (X1), with a speed paddle (Y) in athletes Banda Aceh in 2013 (rx1y) or rhitung 0,58, while rtabel 0.53, then Ho is rejected, thus it can be concluded that there is a significant correlation between muscle strength with a speed paddle arm K-1 200 meters in athletes Rowing Banda Aceh in 2013.

$$rx_2y = \frac{n\sum X_1.y-(\sum X_2)(\sum y)}{\sqrt{\{n\sum {X_1}^2-(X_1)^2\}\{n\sum y^2-(y)^2\}}}$$
$$= \frac{15.37995-(750)(745)}{\sqrt{\{15.38910-(750)^2\}\{15.38433-(745)^2\}}}$$
$$= \frac{569925-558750}{\sqrt{(583650)-(562500).(576495)-(555025)}}$$
$$= \frac{11175}{\sqrt{(21150).(21470)}}$$
$$= \frac{11175}{\sqrt{454090500}}$$
$$= \frac{11175}{2130,399}$$
$$= 0.52$$

The results of the above analysis, showed that the correlation coefficient (r) between flexibility (X2), with a speed paddle (Y) in athletes Banda Aceh in 2013 (rx2y) or rhitung amounted to 0.52, while rtabel 0.553, then Ho is rejected, thus it can be concluded that there is a significant relationship between flexibility with speed paddle K-1 200 meters in athletes Rowing Banda Aceh in 2013.

$$r\ x_1X_2 = \frac{n\sum X_1.X_2-(\sum X_1)(\sum X_2)}{\sqrt{\{n\sum {X_1}^2-(X_1)^2\}\{n\sum X_1)^2-(\sum X_2)^2\}}}$$
$$= \frac{15.38429-(750)(750)}{\sqrt{\{15.38998-(750)^2\}\{15.38910-(750)^2\}}}$$
$$= \frac{576435-562500}{\sqrt{(584970)-(562500).(583650)-(562500)}}$$
$$= \frac{13993}{\sqrt{(22470).(21150)}}$$
$$= \frac{13993}{\sqrt{475240500}}$$
$$= \frac{13993}{21800,01}$$
$$= 0.64$$

The results of the above analysis, showed that the correlation coefficient (r) between the muscle strength of the arm (X1) with power flexibility (X2) on the rower Banda Aceh in 2013 (rX1X2) 0.64, or 0.64 rhitung while r tabel 0.553, then Ho is rejected, thus it can be concluded that there is a significant contribution between the arm muscle strength and flexibility with a paddle speed of K-1 200 meters in athletes Banda Aceh in 2013.

Analysis of correlation coefficient dual conducted to determine are whether or not the contribution of muscle power arm (X1) and flexibility (X2) to speed paddle k-1 200 meters in athletes city of Banda Aceh in 2013 (Y), then r obtained from the analysis coefficients the correlation between the above variables.

Calculating double correlation with input means dai result of correlation between variables by using the formula:

$$R_{y.\ x1x2} = \sqrt{\frac{r^2x_1y + r^2x_2y - 2(rx_1y).(rx_2y).(x_1.x_2)}{1 - r^2x_1x_2}}$$

$$= \frac{\sqrt{(0.58)^2 + (0,52) - 2(0.58x0,52x0,64)}}{1-(0,64)^2}$$

$$= \frac{\sqrt{(0,33+0,27) - (0,67)}}{0,59}$$

$$= \frac{\sqrt{0,6 - 0,386048}}{0,5904}$$

$$= \frac{\sqrt{0.2139}}{0,5904}$$

$$= \sqrt{0,36}$$

$$= 0,60$$

Results of the analysis of the above data shows that the correlation coefficient (r) arm muscle strength (X1) and flexibility (X2) to speed paddle k-1 200 meters in athletes Banda Aceh in 2013 (Y) is equal to 0.60, or rhitung amounted to 0.60 while rtabel 0.553, then Ho is rejected, thus it can be concluded that there is a significant contribution between the arm muscle strength and flexibility to speed paddle K-1 200 meters in athletes Banda Aceh in 2013.

Hypothesis Testing

After may result from the correlation value calculation, then proceed with the search for hypothesis testing. The purpose of hypothesis testing is to get Thitung, and after can result Thitung, then compared with Ttabel, thus determining whether the research is significant or not significant.

$$F = \frac{R^2/K}{(1-R^2)/(N-K-1)}$$

$$= \frac{(0,60^2/2)}{(1-(0,60)^2)/(15-2-1)}$$

$$= \frac{0.36/2}{(1-0.36)/12}$$

$$= \frac{0.18}{0.64/12}$$

$$= \frac{0.18}{0,053}$$

$$= 3,75$$

The calculation above, the value Fb (Fhitung) = 3.75 while the value of Ft (F table) at the significant level of 0.05% by dk (nk-1) is equal to 3.60 means that the value of Fb = 3.75> value Ft = 3,60 The description shows that the hypothesis that the writer formulated as follows: "There is a significant contribution between the arm muscle strength and flexibility with a paddle speed of K-1 200 meters in athletes Banda Aceh in 2013".

Based on the results of research and test data processing arm muscle strength and flexibility to speed paddle K-1 200 meters in which athletes Banda Aceh in 2013. The third hypothesis results show that there is a significant contribution between the arm muscle strength and flexibility to speed paddle K-1 200 meters (r = 0.64), the value of Fh (Fhitung) = 3.75 while the value of Ft (F table) at a significant level 0.05% by dk (nk-1) is equal to 3.60 atrtinya value Fb = 3.75> Ft value = 3.60.

This research was conducted only limited proof of theories have been advanced sports experts, however, this study is expected to be an input means for the development of science in general and more specifically to the development of sport science in order to improve the achievement of sport, in particular branch rowing.

The results showed that there is a significant relationship to the measured variable or highly significant at 95% confidence level. Similarly with the relationship or correlation between the arm muscle strength and flexibility to speed paddle K-1 200 meters in athletes Rowing Banda Aceh in 2013. There is a meaningful contribution between the measured variable is caused by the need for physical components of certain sports, strength of arm muscles and flexibility is necessary for athletes and sports people in general, where the strength arm muscles and flexibility that will either greatly affect the speed paddle denan In other words an athlete rowing very requires an element of the arm muscle strength and flexibility to be able to increase the speed of rowing.

Conclusion

There is a significant correlation between muscle strength with a speed paddle arm K-1 200 meters (r account = 0.58), t count is greater than r tabel, or 0.58> 0.553.

There is a significant relationship between flexibility with speed paddle K-1 200 meters (rhitung = 0.52), rhitung greater than rtabel, or 0.52> 0.553, then Ho is rejected, it means there is a significant relationship between flexibility with paddle speed K-1 200 meters.

There is a significant contribution between the arm muscle strength and flexibility to speed paddle K-1 200 meters (Ry.x1x2 = 0.64), the value of Fh (F account) = 3.75 while the value of Ft (F table) at the significance level of 0.05 % by dk (nk-1) is equal to 3.60 atrtinya value Fb = 3.75> Ft value = 3.60. The description then shows that there is a significant contribution between the arm muscle strength and flexibility to speed paddle K-1 200 meters.

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Correlation of Physical Freshness With Learning Achievement Junior High School in Aceh Besar

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Abstract

In taking each lesson the student is in desperate need of fresh physical, because with fresh physical condition the achievement of learning would be maximum. So it is regarded as very influential in the learning achievement of each student. This study aimed to determine the correlation of physical fitness to the learning achievement in SMP Aceh Besar district. The samples were students of SMP Negeri Aceh Besar regency taken by using proportional random sampling. The instruments used in this study were: (1) Test of Indonesian Physical Freshness After 13-15 years, which includes 5 test items: run 50 meters, hanging body lift and bend your elbows, baring sit, jump up, run in 1000 and 800 meters, (2) The learning achievement of students, drawn from student grades. Data were analyzed by using statistical correlation techniques. Based on the results of data analysis it can be concluded that there is a significant correlation between physical fitness and learning achievement in Junior High School physical Aceh Besar regency, as shown by a correlation coefficient of r = 0:47, physical fitness contributes by 22:09% on the learning achievement of Physical Education.

Keywords: Physical Freshness and Physical Education Learning Achievement

Introduction

Educational success at every level of education is usually called the learning achievement. Winkel (1983: 42) to give an understanding of the learning achievement is "proof of the success of efforts to achieve human in studying a discipline" based on the understanding that it is understood that learning achievement is the level of capability that is owned protégé in receiving, processing and assessing information obtained from school through a learning process that is symbolized by the grades given by the teacher.

Physical health problems is very influential in the learning achievement of each subject followed by learners in the learning process at school. Learning achievement of a learner can be influenced by many factors both within and outside the students' self-learners. According to Winkel (1983), the factors that affect the learning achievement:

1. Internal factors, namely: Factor Bodily (physiological), which includes, among other factors: the state of freshness of the body, vision, hearing, body structure and so on. Psychological factors, which include psychological factors, among others: Intelektul (level of intelligence, ability to learn, and how to learn) and Non-Property (learning motivation, attitudes, feelings, interests, psychological conditions, and conditions due to circumstances sosioculture).
2. External factors, namely: Factor setting school learning (curriculum, school discipline, teacher, learning, and grouping students). School social factors (social system, the social status of students, and the interaction of teachers and students). And situational factors (political, economic, time and place or climate).

Educational institutions that run education consists of several levels, among others: SD / MI, SMP / MTS, SMA / equal and Universities. Period SMP / MTs students studying a wide range of educational science, among others: physical education and health science, mathematics, Indonesian, English, the arts, science, social studies, religion and others. To follow each lesson and get good results every learner in carrying out routine that is teaching and learning, requires physically fit and fresh.

At the level of SMP / MTs or so-called adolescence learners has grown and developed very rapidly. At this time learners need a motion that is sufficient to support the physical growth, in addition learners also need attention and positive support from its environment to control its development stage. One of the lessons are very supportive in the stage of growth and development of learners is Jasman and health education lessons. In following the lessons of physical education and health of students in dire need of a fresh physical to afford to do any movement that will be taught.

Everybody needs a fresh physical, bodily fresh help everyone working on activities of daily living, the higher the level of freshness, it is increasingly easy to carry out routine activities. This includes also the activity of learners in the learning process at school educational institutions. Poor health, physical development is slow, causing a low level of mental ability, so it will affect the outcome of the learning process. Logically we can understand that with a good physical fitness, it can affect the achievement of learners. The discussion made the authors are interested to learn and conduct research, then put it in the form of scientific work "Correlation of Physical Freshness with Junior Achievement in in Aceh Besar district".

Materials and Methods

Surakhmad (1982: 139) says "descriptive study focused on solving the problems that exist at the present time". While the approach used to answer the problem is the correlation approach. Arikunto (1991: 27) argues that "in a correlational study, researchers chose individuals who have a variation in terms of the

investigation, all the group members were chosen as research subjects were measured on the types of variables were investigated, then calculated to be known correlation". Based on the above opinion, this research included into descriptive correlational, meaning that this study aims to find whether there is any relationship between the variables with other variables. The design of this study is to measure the level of physical fitness is associated with academic achievement in grades obtained by students NegeriAceh Large Junior High School. In this design, the steps are the physical fitness test (X). Furthermore, the data retrieval math grades in one semester (Y), so that data can be correlated with the variable X variable Y.

Results and Discussion

Based on the calculation of the data, the results of the analysis produces a value r xy = 0:47. The results are set as the count r (rh) to test the hypotheses that have been formulated in Chapter I. Hypothesis testing can be done by comparing the value of the count r r contained in the table.Results of the data analysis of the correlation of physical fitness to the learning achievement among students of SMPN Aceh Besar (r xy) r values obtained count of 0:47, while r table value at 5% error level is 0367. meaning the value of count r = 0:47> r table = 0367, can thus conclude that the hypothesis proposed in the chapter I "There is a significant relationship between physical fitness and academic achievement in SMP Aceh Besar" unsubstantiated

To test the hypothesis that has been formulated, it can be reached by testing t-test. In this case one way to prove the truth or the position of an hypothesis of the study can be performed using the t test formula proposed by irianto (1988: 746), the t-test can be calculated as follows:

The above calculation results obtained by value t count = 4.69, while the value t table at the level of 5% error is 2.04, meaning that the value of t = 4.69> t table = 2.04. This is in accordance with the opinion of Ispardjadi (1988: 112) which states that "Where the value t count on gains equal to or greater than the value of t contained in the table, then the t value obtained was significant". Based on these descriptions, it can be the authors conclude that the writer formulated the hypothesis that can be accepted as true.

Based on the results of research and data processing correlation test of physical fitness to the learning achievement of learners SMP Aceh Besar consisting of two test items have obtained the results as shown in hypothesis testing. Hypothesis testing results indicate that physical fitness (X) gives a significant relationship to physical education learning achievement (Y), where the test results obtained value of r = 0:47. Thus physical fitness to give a donation of 0.472 x 100% = 22.09% on student achievement SMP Aceh Besar. Hypothesis of calculation obtained by value th (t-test) = 4.69 while the value tt (t-table) at the significant level of 5% was 2.04, meaning that the value of t = 4.69> t table = 2.04. Physical fitness then give a significant relationship to student achievement SMP Aceh Besar. Thus it is possible that physical fitness can also provide a significant relationship to other learning achievements. Seyokyanya this study could be continued by other researchers with samples and a wider scope as well.

This research was conducted for proving the theories that have been advanced sports experts, however this research in general is expected to be an input means for the development of science and in particular

as a reference in order to achieve student achievement that is optimal in the district of Aceh Besar and expected to be a reference to the Office of policies related agencies in Aceh Besar district.

Conclusion

Based on the results of research, discussion and analysis of the data from the correlation of physical fitness and academic achievement in SMP Aceh Besar district, it can be concluded that: There is a positive and significant correlation between physical fitness to the development of the learning achievement of other education generally in the Junior High School in Aceh Besar District , it is shown by the correlation coefficient of r = 0.47, physical fitness contribute at 22:09% against other learning achievement.

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Ethnobotany Medicinal Plant by Society at Mamplam Village Aceh as Alternatives Medicinal Synthetic Chemical

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Abstract

This research was conducted under the title "Ethnobotany Medicinal Plants by the Community of Mamplam Village Aceh Besar as Synthetic Chemical Medicinal Alternatives." This study aims to determine Ethnobotany Medicinal Plants by the community of Mamplam Village Aceh Besar as Alternative Chemical Medicine. The method used was descriptive method with the research location being the entire yard and garden located in the Village Mamplam, Leupueng Aceh Besar regency. Collecting data done by observation and interviews. The results obtained from 14 species of plants found in the township, 9 species were found growing in many areas of the people's houses while 5 more species grown in the people's gardens, were useful as medicine. Parts of the plants used were the roots, stems, leaves, fruits, herbs, rhizomes, seeds, latex and leather.

Keywords: Ethnobotany, Medicinal plants, Alternatives

Introduction

Indonesia is a country the center of biodiversity, especially plants. This is because Indonesia has a tropical climate, where the rainfall evenly distributed throughout the year and abundant sunshine all times. These conditions create an ideal habitat for various species life of plant. In terms of diversity of plants, in Indonesia is estimated there are about 25,000 species of plants. Half of this amount is estimated have the potential to utilized and provide added value for society (Hayne, 2007).

This is because the effects of relative natural medicines not as hard as the effects of chemical medicine so that the human body is relatively easier to accept _ from plants as compared to chemical medicine ". (Duryatmo, 2003).

According Mursito (2007) and Luke (1997) The use of medicinal plants can be either the whole of this part of the plant or just some parts like leaves, fruits, seeds, roots, bark, stems, and rhizomes. In fact it can be used either in fresh or dried state. Plants are the raw materials natural medicines. There is a kind of plants that only one to be used as medicine, but many are also used together with other herbs to be used.

The tendency of use traditional medicine increasingly is based on the following reasons:

1. traditional ingredients are easily available around us, can be grown for family supply. How to plant relatively easier and does not require a large yard.
2. Side effects caused by traditional medicine is very small compared to modern medical drugs. The reason is very natural raw materials or non-chemical
3. Processing potion is not complicated, so it can be made in your own kitchen without the need for specialized equipment and large cost.
4. The price natural medicines of factory currently more relative expensive, so people start looking for a cheap alternative and accessible, but not inferior to natural medicines manufactured (Editor Agromedia, 2003)

According to Winarno (2007) "These trends are also based as a medicinal plant is constructive, ie to develop and strengthen the organs and systems in the body that are resistant to disease and able to cope with diseases that have invaded. Medicinal plants have been shown to have an effect farmatokologis emperis particular so as to strengthen the body and combat disease. Therefore, medicinal plants have been used traditionally for centuries as an effective medicines".

The use of plants as traditional medicine is growing in line with development research conducted by experts on the benefits of herbs for traditional medicine. Selection of use plants as medicine is also an alternative for society beside of medical treatment (Resi, 2014)".

Meanwhile, according to Mursito (2007) stated that, "The use of medicinal plants as an ingredient to treat the disease can be an alternative that relative cheap compared with buying chemical medicine. Most side effects are relative small, although the efficacy of nature can not continue felt as well as medicines derived from synthetic chemicals".

Knowledge of medicinal plants and ways of use was better known with certainly. Because abuse improper it would also be bad for health. This is due to the hazardous substances in plants that formed are secondary metabolic compounds. According to (Djauhariya, 2004) "secondary metabolic compounds is the physiological effects it could be healthy or cure the disease, and may also provide unwanted side effects for human body. Chemical compounds included in the secondary metabolic are alkaloids, flavonoids, terpenoids, kuinan, and oil atsirin".

Materials and Methods

This study was conducted in Mamplam village Leupung, Aceh Besar district. The tools used in this study were books identification, stationery, and digital cameras. The population in this study are all kinds of medicinal plants found in the yard of a house community in the Deah Mamplam Village.furthermore, the sample in this study were each village located in the Deah Mamplam Gampong consisting of four villages that Mideun village, Ihok Baroe Village, Padang Rhoe village, and Deah baroeh village. Data collection was done by interview and observation. Data has been collected from this study were analyzed descriptively, that after data were collected and displayed in tabular form by a local name, scientific name, family, order / nation, used parts, and their role.

Results and Discussions

This section will describes the research data were discussed in accordance to the facts or reality. For more details of this study the Author will inform the things that are relevant to the discussion of research results.

Tabel 1. Variety of plants which nutritious medicine were found in research location

No	Variety names	Local name	Ordo	Family	Location			
					Vill 1	Vill2	Vill 3	Vill 4
1.	*Capsicum annum*	Red Chilli	Tubiflorae	Solonaceae	V	-	-	V
2.	*Capsicum fustesce*	Small chilli	Tubiflorae	Solonaceae	V	V	-	V
3.	*Momordica charanthia L.*	Pare	Cucurbitales	Cucurbitaceae	V	-	-	-
4.	*Morinda citrifolia L.*	Mengkudu	Rubiales	Rubiaceae	V	V	-	-
5.	*Cathanrathus roseus L.*	Tapak dara	Apocynales	Aocynaceae	-	V	V	V
6.	*Cucumis sativus*	Mentimun	Cucurbitales	Cucurbitaceae	V	-	-	V
7.	*Solanum lycopersicum*	Tomat	Tubiflorae	Solanaceae	V	V	-	-
8.	*Solanum melongena*	Terong	Tubiflorae	Solanaceae	V	-	-	V
9.	*Ipomea aquatica*	Kangkung	Tubiflorae	Convolvulaceae	-	-	-	V
10.	*Jasminum sambac*	Melati	Ligustrales	Oleaceae	V	V	-	V
11.	*Gardenia augusta*	Kaca piring	Rubiales	Rubiaceae	V	-	V	-
12.	*Lantana camara*	Tembelekan	Tubiflorae	Vebernaceae	V	-	-	-
13.	*Calostropis gigentea*	Widuri	Apocynales	Asclepiadaceae	V	V	-	-
14.	*Alstonia scholaris*	Pulai	Apocynales	Aocynaceae	V	V	-	-

Data source: Desa Mamplam Leupueng subdistrict - Aceh Besar District; Notes: V = yes, - = none

Based on Table 1 the kinds of plants which sub class of Sympetalae that nutritious medicine found in home yard consist of chilli (*Capsicum annum)*, cabe cayenne pepper(*Capsicum fustesce*), pare (*Momordica charanthia L.*), jasmine (*Jasminum sambac*), kaca piring (*Gardenia augusta*), tembelekan (*Lantana camara*), pulai (*Alstonia scholaris*), mengkudu (*Morinda citrifolia L.*) and tapak dara (*Cathanrathus roseus L*), eventhough the kinds were found in the garden kinds of tomato (*Solanum lycopersicum*), eggplan (*Solanum melongena*), widuri (*Calostropis gigentea*),kangkung (*Ipomea aquatica*), and cucumber (*Cucumis sativus*).

Plant parts used by the community as a medicine is in the form of roots, stems, leaves and fruit. In making potions from plants that some have used alone without being mixed with other plants, while the other or with spices such as kencur, turmeric, ginger, and turmeric. Alum, lime, honey, sugar cubes, and brown sugar also used as a drug mixture. Parts of plants, properties and methods of using the _ as presented in Table 2.

Tabel 2. Part of plants, efficacy and ways of useful as medicine

No	Scientific Name	The Species name	Part of used	Efficacy as a drug/medicine	Ways of using
1.	*Capsicum annum*	Chilli	Fruit and leaves	Usefulness can cure rheumatism, ulcers, toothache, influenza, and increases appetite.	Can be consumed in the daily diet mix and it could be 10 gr of chilli powder 1/2 cup brewed with hot water mixed with stirring until blended. The leaves can be crushed to threat hot.
2.	*Capsicum fustesce*	Cayenne pepper	fruit	Cure migrants, normalize the feet and hand were limp, cough with phlegm, and incrase appetite	Can consumed and mixed with daily food.
3.	*Momordica Charantia L.*	Pare	Fruit	Threat fever, abdominal pain, dysentri, eye inflammation, ulcers, intestinal worms, increased appetite, strengthens the	Fruit can be boiled and brewed for drinking or cooked as vegetables. While the leaves are dried in the sun to dry and then ground into a

				immune system for people with diabetes.	powder and smeared on the outside of the affected body part
4	*Morinda citrifolia L.*	Mengkudu	Roots, leaves, fruit, bark and flowers	Increase bone strength, cleans the blood, laxative urine, menstrual laxative, softening the skin, cough, anthelmintic, laxative, anti septic, and improve circulation and eliminate dandruff	Fruit can be consumed directly, while the leaves are crushed in the herb so it is
5.	*Cathanranthu roseus L.*	Tapak dara	All part of plants	As anti cancer, facilitate urination, treating high blood pressure, stop bledding, decrease body heat and menstruation laxative	The leaves boiled and drunk the water.
6.	*Curcumis sativus*	Cucumber	Leaves and fruit	Cure dyesentery, diarhea in children, high blood pressure, and inflammation of the skin fester	The fruit can consumed directly as vegetables and fruits, ,while the leaves can make juice with little sugar.
7.	*Solanum lycopersicum*	Tomato	All part of plants	Treating diabetes, bleeding gums, mouth ulcers, ulcers in the stomach, and skin swelling caused by poisoning. Tomato also contains vitamin A, B1, and C.	The fruit can be directly as a salad, and juices by using less sugar and cooked with vegetables. While the stems and leaves are boiled and then boiled water can be used to wash the affected part
8.	*Solanum*	Eggplant	All part of	Dysentery, cough,	The fruit can be

	melongena		plants	rheumatism and arthritis, chronic laryngitis, snake bite wound, swollen sores due to infections, allergies due weather	boiled with a little brown sugar and drink. Or can be boiled roots and enough sugar can be asyrup. while for external treatment whole plant eggplant boiled then boiled water is used to wash or washed away into the affected part.
9.	*Pomea aquatica*	Kangkung	Leaves and stems	Treat itching, calluses (thickening of the skin), swelling caused sting of centipede, nosebleeds, toothache, difficulty urinating, hemorrhoids, and bleeding in the urine and feces.	For treatment in kale can be boiled and added with sugar, salt and vinegar. As for the exterior treatment kale and mixtures of crushed and applied to the affected part
10	*Jasminum sambac*	Jasmine	Leaves and flowers	Treating eye pain, swelling due to bee stings, fever, headache, shortness of breath, and acne	Leaves and flowers can be crushed and placed on the affected body parts
11.	*Gardenia augusta*	Kaca piring	Roots, leaves, and flowers	Cure fever, difficulty urinating, vomiting and ulcers	Crushed and placed on the sick, for the treatment can be boiled and drunk
12.	*Lantana camara*	tembelekan	leaves	treating swelling	Crushed and placed on the affected part
13.	*Calastropis gigentea*	Biduri	leaves	Chronic ulcers heal poisonous snake bites, muscle pains, stomach feels full, and gonorrhea	Crushed and pinned to the wound or sore

14.	*Alstonia scholaris*	Pulai	bark	Treating high blood pressure, fever, flatulence and power adder	Bark is boiled and boiled water can be as herb

Based on Table 2 the types of plants used for outside treating of body generally mixed and made its way crushed, pulverized, or knead and then pasted and massaged the sore body parts. As for diseases inside of body generally mixed and made concoction by boiling it first, then boiled water drunk according required dose, but some can be consumed directly.

From the research conducted, people use the plant as a medicine to treat several diseases. In general, society use plant species from sub-class Sympetalea to treat diseases outside the body such as spinach, kaca piring, jasmine, tembelekan, Biduri, cayenne pepper, red pepper, and noni/mengkudu. In addition, society also using several kinds of plants Sympetalae to treat the disease inside body such as red pepper, cayenne pepper, cucumber, noni, pare, vinca, island, kaca piring, spinach and eggplant.

Conclusion

Based on the research conducted, it some concluded as follows:

1. There are 14 species of plants are used as medicine by the people at Deah Mamplam Gampong, Leupung-Aceh Besar District.
2. The types of plants found in the study site was Capsicum annum, Capsicum fustesce, Momordica charantia L., Morinda citrifolia L, Cathantathus roseus L., Cucumis sativus, lyopersicum Solanum, Solanum melongena, Ipomea aquatic, Jasminum sambac, Gardenia augusta, Lantana camara, Calostropis gigentea, and Astonia scholaris.
3. The plant used as medicine is the root, stem, leaves, flowers and fruit.

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Application of Optimal Coconut Water on Scallion Growth (*Allium fistulosum*)

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Abstract

Application of Optimal coconut water on plant scallion growth (*Allium fistulosum*). This research was conducted in the village of Krueng Siblah Peusangan Leundaneun District of Bireuen, from November to December 2014. The research aims to determine how the influence of the concentration of optimal coconut water on plant scallion growth. The experimental design used was a randomized block design (RAK) non factorial pattern consisting of one treatment factor with 3 replications, treatment factor consists of K0 (0 ml / l of water), K1 (150 ml / l of water), K2 (200 ml / l of water), K3 (250 ml / l of water), K4 (300 ml / 1air) and K5 (350 ml / 1 water). The parameters observed in this research is the leaf length and weight of tubers and leaves. The data observations which significant tested a further using Honestly Significant Difference (HSD 0.05). The research showed that the optimal coconuts water application real effect on the growth of leek leaf length and weight of leaves.

Keywords: Dose, Optimal Coconut Water, Plant Scallion

Introduction

Plant scallion (*Allium fistulosum* L) constitute types of vegetables from the group onions are widely used in cooking. In the art of Indonesian cooking, leeks can be found in martabak eggs, as part of a soup, or as a seasoning powder as in soup. Scallion can be used for facilitate digestion and eliminate the lender-of mucus in the throat (Rubatsky &Yamaguchi, 1998).

According Cahyono (2009), scallion including seasonal leaf vegetable crops (short-lived). These plants form clumps of with tall plant reaches 60 cm or more. Scallion always grow new tillers thus forming clump. In addition leek can also be used to as a vegetable that is very useful, because in the leaves of onion contains nutrients that are very useful for health, in the leaves of scallion contains a source of vitamin A, C, and E, carotene, xanthin and rich in antioxidants and minerals that are good for the body, apart from that scallion plant also can lower cholesterol, anti-cancer, anti-viral, anti-fungal, aid digestion the body and can lower high blood pressure.

Scallion production Aceh province in 2011 reached 2,600 tonnes with a planting area of 788 hectares with an average production 3.3 hectares/ton (BPS, 2012). While in district Bireuen scallion production in 2011 reached 491.92 tons with a planting area 67.38 hectares with an average yield of 7.3 tonnes/hectare (Distan, 2011). Meanwhile domestic demand for commodities scallion in 2011 reached 976 284 tonnes (MOA, 2011). Based on data from the Office Agriculture and Horticulture in Riau (2011) Export-import data analysis indicates that during the period 2005-2010 that Indonesia is a net importer (consignee) scallion, because the volume of exports for this commodity was consistently lower than the volume of imports. Based on data from FAO (2010), scallion producer countries in the world are China, India, USA and Pakistan.

Scallion crop development effort still needs to be improved in view of the need that continue increase. So that his need are met then should be offset by an increase in the amount of production by constantly and trying to improve cultivation system. One component of aquaculture is the use of growth regulators. Plant growth regulators are able to influence protein synthesis including chlorophyll, with increased chlorophyll is expected to increase fotosintat generated (Abidin, 2004). Fotosintat could generates energy for plant growth which will ultimately increase crop yields. To achieve high production, plants require replenishment of hormones produced by the plant itself or growth regulators derived from organic materials. Organic materials easily obtained from nature, one of which is coconut water.

Coconut water is an organic material that is useful for the plants bacause inside it contain vitamins, amino acids, nucleic acids of phosphorus, substances grow auxin and gibberellic acid that acts as a stimulant in the process of network development, accelerate metabolism and respiration, therefore coconut water can help the cell division process and cell differentiation thus can accelerate plant growth (Marsono, 2002). In general, coconut water contains 4.7 percent total solids, sugar 2.6 percent, 0.55 percent protein, 0.74 percent fat and 0.46 percent minerals.

Materials and Methods

This research was conducted in the Luengdaneun village of the sub district Peusangan Siblah Krueng districts Bireuen which lasts from November to December 2013. The material used in this study is the scallion seed, optimal coconut water, cow manure, urea, TSP and KCl. The tools used in this study is hoes, rakes, gembor, meter, handsprayer, scales, nameplate, digital cameras, potong- cutting tools and stationery.

The design used in this research is randomized design (RBD) non factorial consisting of 6 treatments that is : K0 = Without Giving Coconut Water Optimal (Control) K1 = Giving Coconut Water Optimal (150 ml / 1 ltr water) K2 = Giving Coconut Water Optimal (200 ml / 1 ltr water) K3 = Giving Coconut Water Optimal (250 ml / 1 ltr water) K4 = Giving Coconut Water Optimal (300 ml / 1 ltr water) K5 = Giving Coconut Water Optimal (350 ml / 1 ltr water) parameters observed among others : leaf length, number of leaves, the amount of Tillers, tuber weight and leaves, but published only the number of leaves and leaf weight

Results and Discussion

Observation of long leaf red onions at the age of 7, 14, and 21 Days After Planting (HST) shows the significant effect to the leaf long when compared with control plants. Average length of scallion after HSD test are presented in Table 1 below:

Table 1. Average the length scallion on Age 7, 14, and 21 Day After Planting (DAP)

Concentrations	Height of Plant (cm)		
	7 DAP	14 DAP	21 DAP
K_0 (0 cc/l air)	8.68[a]	13.1[a]	17.89[a]
K_1 (150 cc/l air)	20.55[b]	37.05[b]	41.66[b]
K_2 (200 cc/l air)	19.77[b]	34.77[b]	39.55[b]
K_3 (250 cc/l air)	19.44[b]	36.33[b]	41.38[b]
K_4(300 cc/l air)	21.38[b]	35.99[b]	40.22[b]
K_5 (350 cc/l air)	20.38[b]	37.94[b]	41.88[b]
HSD 0.05	**5.25**	**8.20**	**6.16**

Notes: Number followed by the same letters in the same column are not significantly different on level P ≤ 0.05 (HSD test).

Table 1 above shows that the provision of optimal coconut water significantly affect the length of the leaf at the age of 7, 14, and 21 HST when compared with the control, while between treatments the not significantly different. Long best leaf found in treatments K_5 and the lowest was found in treatment K_0. This is alleged to that optimal coconut water which given with concentration of 150 ml / liter until with water 350 ml / 1 liter did not show a reaction different. However, when compared with K0, coconut water can affect the length scallion, because in optimal coconut water contains nutrients, vitamins, amino acids, nucleic acids, phosphorus, growth regulator like the auxin and giberilin acid that can function in metabolism process and processes photosynthesis and also help the process of cell division and cell differentiation, thus accelerate in plant growth like the long of scallion (Marsono, 2002).

Irwanto (2001) argues that hormones contained in optimal coconut water can help stimulate the growth and development of plant tissues, like the auxin, giberilin and cytokines, apart from that can accelerate plant growth One of which is long the scallion and can also increase the amount of chlorophyll in the plant until the plant can be green and be able to increase photosynthesis.

Photosynthesis is a biochemical process do which plants to produce energy. Energy need plants to absorb carbon dioxide and water that would produce sugar and oxygen needed as an nutrition. The nutrients needed by plants to the growth and development of plants This is in accordance with the opinion of Gardner et al, (1991) that the nutrient or hormone be required for the synthesis of amino acids and proteins, especially at the growing point and the ends of the plant thus increasing plant growth like the cell division and cell elongation.

Bulbs Weights and Leaves

Average of weight of tuber and leaf showed that the concentration of optimal coconut water significantly affect the weight of the bulbs and leaves at 30 days after planting (at harvest). The average weight of tubers and leaves after HSD test are presented in Table 2 below:

Table 2. Average of weight of tuber and leaf Shallots at Age 30 Days After Planting (DAP)

Concentrations	Weight of Bulb (gr)
	30 DAP
K_0	17.85[a]
K_1	27.71[b]
K_2	40.94[c]
K_3	34.26[c]
K_4	37.10[c]
K_5	40.95[c]
HSD 0.05	7,02

Notes: Figures followed by the same letters in the same column are not significantly different on level P ≤ 0.05 (HSD test).

Table 2 above shows that the provision of optimal coconut water also significantly affect the tubers weight and leaves, statistically it appears that the tubers weight and leaves of tuber weight is highest in treatment K_3 and low in treatment K_0.

Results of the field is seen that the size of the leaves and tuber in treatment of K_3 is greater than the other treatments. This is alleged that in optimal coconut water the contain the Nitrogen element (N) which can help spur the growth of size of leaves and tubers scallion, according to (Untari, 2006) states that coconut water other than as a raw material for food and beverages also allows the can to be a nutrient for plants, because the content of coconut water there are some elements that plants need. The content of nutrients in coconut water is not just an element of the macro but also micro-elements, such as carbon element contained in coconut water in the form of a compound of simple carbohydrates such as glucose, sucrose, fructose. While elements contained in the nitrogen compounds such as amino acids alin, arginine, alanine, cysteine, and serine. According to a statement Gardner et al, (1991) stated that the accretion process of plant height occurs because of cell division, increase in cell number and enlargement cell size. Increase in plant height will also be increase plant fresh weight is also associated with plant height

Conclusion

Awarding of optimal coconut water significantly affect leaf length and weight of tubers and leaves, the best value found in treatment K_5 with a concentration of 350ml / l water

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Husband Support Relationship between Maternal Anxiety During Labor Stage I and II

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Abstract

The birthing process is a process of sacrifice that a mother has to bear in various ways; the sacrifice of pain, the sacrifice of emotion and energy. The delivery process is one factor that can lead to anxiety, because the childbirth is not always somatic. It can also be psychosomatic, because many things can affect the smoothness or delay in the delivery process. Support system given to the mother before delivery is very supportive in reducing the level of anxiety in the mother during the course of labor. Minimal or controlled anxiety can simplify and speed up delivery and can avoid complications in the childbirth. The delivery process is an experience that requires a lot of energy, emotional, and physical strengths. One of the factors that affects the physiology of the mother in childbirth is anxiety that could bring impact on the activity of the uterus which could lead to prolonged labor. Mother needs support from the husband by providing her a sense of security and comfort. The reduced maternal psychological stress and with the increase in the sense of wellbeing that the mother feels all can hasten or smoothen the physiological process of labor so that the child delivery becomes bearable by the mother.

Key words: Support System, Level Anxiety, Labor Process

Introduction

In 2008 there were 373 million people in Indonesia, pregnant women, and those with anxiety in the face of labor there are as many as 107 million people. Psychological aspects of the mother can be influenced by the support received in the environment in which labor, including of those who accompanied him. Mothers delivered must be accompanied by a person he believes and makes him feel comfortable, but not all hospitals permit husbands or other family members to accompany the mother in the delivery room (Primasnia, et.al, 2013).

Support system or support literally namely arms, support, help. The husband is the man who became the spouse of a wife or female. Support Childbirth husband in the presence of the husband to provide support is very important for the wife during the process of childbirth (Lamunde, 2009). WHO has recommended that women who give birth are allowed to have a labor companion she had wanted so that she feels

comfortable. Will however, this recommendation is not likely to be followed by developing countries, including Nepal. The presence of a companion in the delivery process provides clear benefits is positive and greater levels of self-control during labor in society in the world. However, there is no clear understanding of whether the husband's presence during childbirth in developing countries gave comfort to his wife in labor. This is because that the birthing process involves feelings and is a subjective experience, and influenced by cultural norms and practices of society in each country. In the younger women, who gave birth for the first time that they are greater perception of pain in labor and labor-related concerns. Recent research Meliti that support during labor in developing countries have shown that the presence of a professional doula, midwife and partner / husband during labor helps women reduce anxiety during labor (Sapkota, et.al, 2012).

Much evidence shows that a husband who involve themselves during pregnancy and childbirth have a positive impact which is useful for himself, his wife and child development. Research by Keirse et al (1983) proved that the positive impact of support is the support that is both physical and emotional. Such support includes several aspects such as rubbing her back, holding her hand, maintain eye contact, the mother accompanied by people who are friendly, and the mother did not undergo childbirth alone. Emotional support is emotional support, maintain a state of emotion, affection, or the expression shown in the form of love, trust, understanding, and openness and willingness husband in helping to address the problems faced by birth mothers. Mothers who received emotional support will feel cared for and protected by their partner. Attention on maternal making it feel not alone pass through the birth process. Klaus study in Guatemala showed mothers who were accompanied by a companion undergoing the process of running a shorter labor and the possibility of surgery is low. A review by Hodnett (1995) for all controlled trials in several countries conducted to assess the effects of continuous support in labor compared with the more common form of treatment in the hospital.

Results of this study indicate that the presence of support from people who are trained will reduce the duration of birth, reduces the tendency of the use of medicinal drugs of relieving labor pain, and reduced the incidence of operative vaginal births (Sari, 2010).

Methods

This study is a review of the literature (literature review) are trying to dig up more information on matters related to the husband's support system to maternal anxiety levels in the first stage of labor process and the second stage. Sources to conduct a review of this literature search included studies computerized database system (Pubmed, EBSCOhost, MIDWEFERI, and Google cendakia). Journals totaled 5 research journals. This study uses a scientific article writing bibliography vancouver.

Discussion

Support System

Support system or support literally namely arms, support, help. The husband is the man who became the spouse of a wife or female. Support Childbirth husband in the presence of the husband to provide support

is very important for the wife during the process of childbirth (Lamunde, 2009). Support system or other forms of support that can be given to the husband's mother in the first and second stage of labor, consist of: (a) Still entertain, give praise, encouragement and support mothers; (b) Guiding mother straining and breathing; (c) Help the mother relax during contractions with soothing words, giving sweep cool cloth on her forehead, neck, or shoulders, and a massage in the back to relieve pain. In addition to nipple stimulation performed by the mother or her partner; (d) Which makes comfortable touch like rubbing his back, holding hands, and massaged his mother's feet may increase the production of oxytocin and endogenous that strengthen the contractions became more frequent; (e) Prop waist mother when pushing, holding his hand, rubbing his forehead, wiping the face of a mother gently. Help mother back to its original position when the mother's position changes; (f) Sustainably shows the progress of labor, for example, when the baby's head began to emerge, telling the mother conditions; (g) Getting rid of the strands of hair on the face of the mother in the time between contractions, and warned to keep his chin pressed to the mother's chest while pushing follow the contraction and use respiratory muscles as well as the proper technique during straining. The more a husband who follows the guidance of antenatal and accompany his wife in the delivery room with the knowledge gained as a partner. They accompany his wife not only to watch but also to share experiences and provide support to his wife during labor. With the husband who accompanied his wife to provide support during labor, then the relationship between mother, father and their baby will be stronger (Sari, 2010).

Mechanism of anxiety in the first and second stage of labor is labor

Fear and anxiety can cause the release of stress hormones (catecholamines) in bulk (epinephrine and norepinephrine). Feeling tense during labor causes the muscles of the uterus wrinkled, while mom holding my breath it will hamper the delivery process, resulting in stress, both on maternal and fetus. But it also inhibits oxygen needed maternal and fetal. Stress hormones (catecholamines) triggered by the physical danger, fear, and anxiety. During labor, catecholamines circulating high levels of excess led to the shift of blood flow from the uterus to the placenta and other organs that are not essential for immediate rescue, to organs that are important in the reaction of "fight or escape", such as the heart, lungs, brain, and skeletal muscle. Decreased blood flow to the uterus and placenta uterine contractions can slow and reduce the supply of oxygen to the fetus. Picture of the performance of the limbic system, which is part of the human brain to process stress on humans. The limbic system is the part of the brain associated with emotion and instink. In hierarchical structure of the limbic system of the brain is in the middle, between the diencephalon (brainstem) to the cerebrum. The limbic system has the function of controlling emotions, instinctive behavior, drives, motivations, and feelings. Both cerebral cortex and the limbic system, both have access to the motor areas of the brain stem, allowing humans to learn to adapt and control perilak instinctive (Sari, 2010).

LeDoux and Niven explained in Bitstream (2011) in the first stage of labor, psychosocial reactions childbirth include feelings of anxiety, fear and increased pain sensitivity. These reactions are responded to as a stressor psychological and pathophysiological terlepaslah stress hormones and activation of the

sympathetic system, further cause reflex autonomous, consequently there was vasoconstriction systemic, which would give rise to a variety of clinical symptoms such as decreased muscle contractions womb / uterus, the rigidity of the skeletal muscles so that the delivery takes more old . Worried is everything that is bothering a person reaches the destination. Fear that eventually leads to anxiety this causes pain. In the delivery process of the cervix should be softened so that it can be stretched and open. Fundus becoming organ with great contraction able to push the fetus through the cervix and birth canal. The failure of the cervix and fundus caused by spasm of the muscles causes cervical tissue can not be opened, so that the delivery process to be slow.

Anxiety effects to the mother and fetus at delivery stage I and II.

Anxiety experienced by the longer maternity will increase along with the more frequent contraction appears that this situation will make mothers less labor kooperatif.Stress reflex causes an increase in maternal catecholamine levels far above the levels found in women who are not pregnant or pregnant women before delivery. Psychological stress and hypoxia associated with pain and anxiety increase the secretion of adrenaline. Increased secretion of adrenaline can cause excessive uterine contractions, causing vasoconstriction consequently decreased uterine blood flow. Resulting in hypoxia and fetal bradycardia that would eventually occur in fetal death and may inhibit contractions, thus slowing labor. Due to an increase in stress-related adrenaline mother at delivery, clear restrictions psychological stress and pain to the mother will give profit. Presence husband or partner is highly recommended to accompany the mother during labor because the direct approach can encourage communication between couples so as to address all concerns. But so far in the health services both in hospital or other place that assistance has not been implemented optimally husband. There are three roles performed by men during labor and delivery, ie the role as coach, teammates, and witnesses. A chaperone must be involved in the preparation of pre-natal and participate in the decision-making preparing a birth plan and possible changes to the plan if the situation changes. During labor, the companion may continue to accompany the mother, take a walk with him if he can run, especially at the beginning of labor, supported his decision about pain relief, and encourage any coping mechanisms he chose. Husband mentoring can cause emotions (happy) from the mother, who will be the impulse to the neurotransmitter to the limbic system and then forwarded to the amygdala to the hypothalamus resulting in stimulation of the ventromedial nucleus and the surrounding area, causing a feeling of calm and end the anxiety will decrease (Mukhoiratin and Khusniyah, 2014).

Effect of mentoring / support system to anxiety husband and mother in childbirth.

Continuous support given during birth mothers showed a shorter duration of the active phase and secondstage who labor, and reduce the rate of cesarean delivery. Studymay findings allow researchers to reduce the negative impact of labor and delivery in women, and therefore reduce the likelihood of a woman chooses an elective

Cesarean delivery in subsequent pregnancies as the results of previous negative experiences. As a result, it may convince health service managers to start practice continued support in Iran, and help to create a routine. Many midwives educated unemployed in Iran and would be practical to make this method of support is constantly available for delivery. This approach is less expensive than the cost of doing high number of cesarean delivery, and can help reduce maternal mortality and morbidity due to unnecessary caesarean section (Kashanian, et.al, 2010).

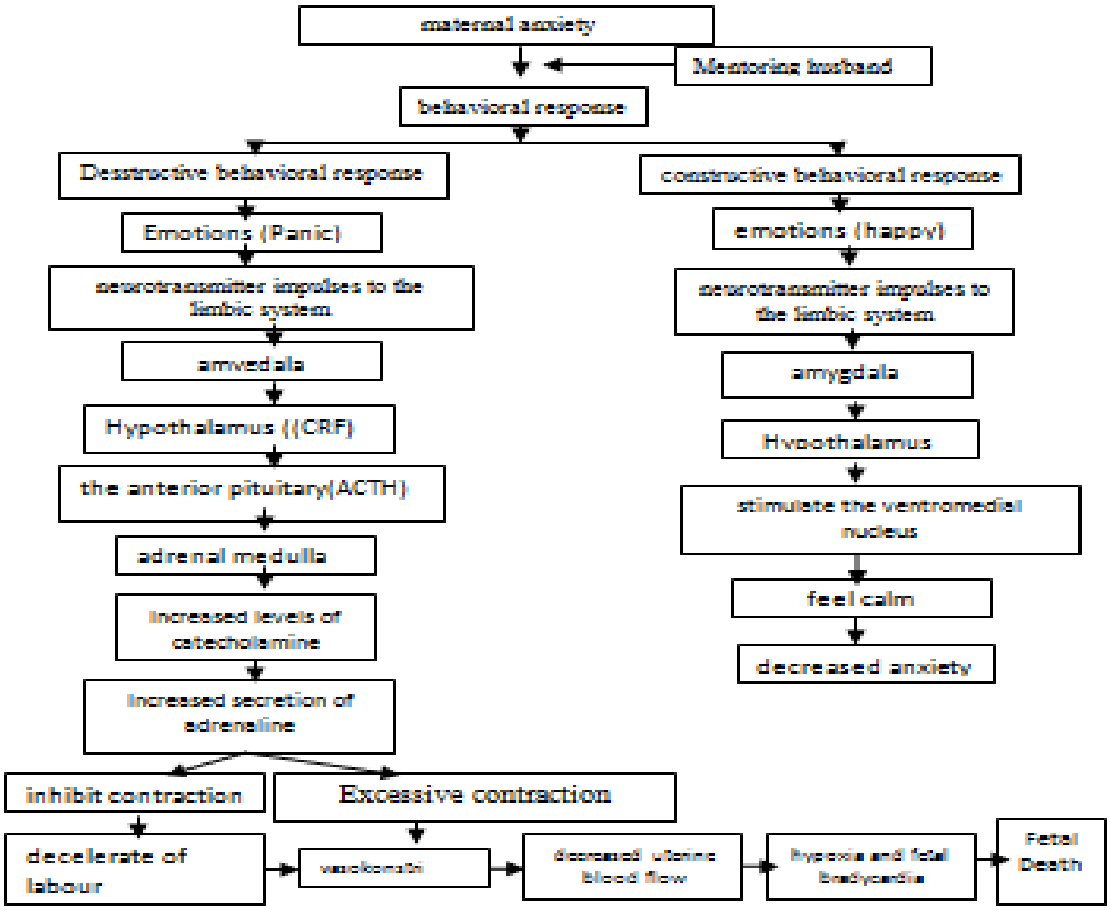

Figure 1. Mechanism Husband Mentoring Influence On Maternal Anxiety During Delivery

Scheme above shows the influence of mentoring / support system to anxiety mother's husband on the birth process that could end in the normal birth process as well as a positive impact on the welfare of the mother and fetus (Mukhoiratin and Khusniyah, 2014).

Conclusion

Several studies have been conducted both in Indonesia and in the world reveal that the support system provided to the mother before delivery is very supportive in reducing the level of anxiety in the mother in the course of labor. Lack of anxiety will simplify and speed up delivery and can avoid complications in

childbirth. The delivery process is an experience that requires a lot of energy, emotional, and physical. One of the factors that affect the physiology of the mother in childbirth is anxiety that affect the activity of the uterus and lead to prolonged labor. Mother's husband support is needed to provide a sense of security and comfort.

Proper handling to cope with anxiety during childbirth can be done by health personnel during patient examination pregnancy (Antenatal Care) to provide appropriate information about pregnancy, labor and childbirth so as to reduce the rate of maternal anxiety during childbirth.

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Factors Related To Consumption Of Calcium In Women 25-30 Years Olds To Prevent Osteoporosis

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Abstract

Calcium is the most abundant mineral in the body. Approximately 99% of the calcium found in hard tissue, namely bone and teeth, especially in the form of hydroxyapatite, only a small fraction present in plasma extravascular fluid. Calcium deficiency in infancy can cause bone growth to be less robust, easily bent and fragile. Based on preliminary data from a study in Ujong Batee national housing complex in March 2014 of the ten women aged 25-30 years old interviewed, there were four women whose knowledge about calcium deficiency in infancy was low, four women did not get the information about, and six women had low incomes. The objective was to determine the factors Associated with Calcium consumption in Women 25-30 Years old for Preventing Osteoporosis in Ujong Batee housings Aceh Besar regency. This study used a cross sectional analytic approach. The population in this study was women 25-30 years old who lived in Ujong Batee perumnas, with a sample of 69 women. Sampling was done by total sampling. Data processing was done using chi - square test statistic model. Data were collected through questionnaires distributed. Statistically the results showed that no significant association was found between the consumption of calcium in the prevention of osteoporosis in women 25-30 years old and their the knowledge of the value of the P-value = 0.033 (P <0.05), the level of information with the value of P-value = 0.088 (P> 0.05), family income with P-value = 0.466 (P> 0.05). There is relationship between the levels of knowledge of women with calcium consumption to the prevention of osteoporosis. And there is no relationship between the level of information and family income to the consumption of calcium.

Key words: Calcium, osteoporosis, consumption, women

Introduction

Calcium is the most abundant mineral in the body. Approximately 99% of the calcium found in hard tissue, namely bone and teeth, especially in the form of hydroxyapatite, only a small fraction present in plasma extravascular fluid (Almatsier, 2004). Most (99%) of calcium in the body are in hard tissue such as bones and teeth, and the rest spread in the body (Muchtadi, 2009). Calcium deficiency in infancy may

cause growth disorders. Bones less strong, easily bent and brittle. All adults, especially after the age of 50 years, the loss of calcium from bones. Bones become brittle and break easily. This is called osteoporosis which can be accelerated by the stress of everyday circumstances (Almatsier, 2004). WHO sets the average calcium intake recommended for childrens 4-9 years 550 mg / hr.

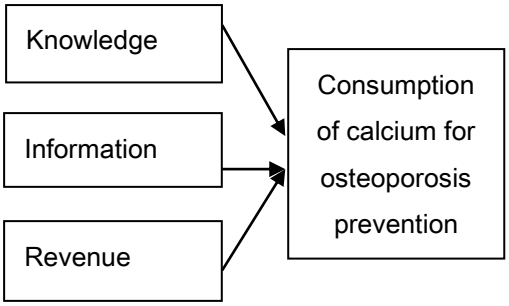
According Kartono and Soekatri in WNPG (2004) is generally known to the average consumption of calcium in Indonesia amounted to 254 mg / hr, which is 32% of the adequacy recommended by the WHO, in other words to be below average in Asian consumption. Calcium intake in the Asian community is still very low under the recommended sufficiency, namely 255-333 mg / hr in Malaysia. 498 mg / hr in Myanmar. 390 mg / day in the Philippines, 482 mg / hr in Singapore and 488 mg / hr in Vietnam (Florentino, 2005). Indonesia is much larger countries which peg the rate of 19.7 per cent of the entire population. Note several cities such as Jakarta, Surabaya, Semarang, Bandung and Medan has even reached 30 percent (higher than the percentage abroad) (Felecia 2009 and Hans, 2009).

The data obtained from the National Housing Ujung Batee in March 2014 of 10 women 25-30 years were interviewed, there are 4 people who are knowledgeable low, 4 people who did not get the information, 2 people with low incomes. And of the 10 people interviewed six people who know osteoporosis, among others: 3 to prevent and 3 do not take preventive Of the 10 people interviewed, none had osteoporosis. Among the first people who experience a fracture due to falls, 9 no fractures, and 6 people who have symptoms of Osteoporosis, 4 people do not experience symptoms of osteoporosis.

This research conducted to know the factors that are related to consumption of Calcium in Women 25-30 olds Years to Prevent Osteoporosis.

Framework

Researchers try to describe the framework according Sarwono (2009), Hartono (2000), and the UMP (2014), which need to be considered in the prevention of osteoporosis in women aged 25-30 olds years, are knowledge, information, and its income.



Materials and Methods

This research uses descriptive analytical method with cross sectional study design, namely variables - variables, including the risk factors and variables - variables include the effect, in observation while at the same time. This research was conducted at the national Housing Ujung Batee Neuheun village, Large Aceh district in 2014. The population in this study were women aged 25-30 years as many as 69 women

in the National Housing Ujung Batee Neuheun village in March - July 2014. Retrieval technique subjects in this study is total sampling criteria used were the exclusion criteria.

Results and Discussion

Table 1. Relationship Between Knowledge With Calcium Consumption Against Osteoporosis Prevention

No	Consumption of calcium	Knowledge						Amount		Statistic test	
		Good		Enough		Less					
		F	%	F	%	F	%	F	%	α	P-value
1	Enough	11	33.3	8	24.2	14	42.4	33	100		
2	Less	3	8.3	14	38.9	19	52.8	36	100	0.05	0.033
	Total	14	20.3	22	31.9	33	47.8	69	100		

Results of statistical analysis using chi square test showed the significant relationship where P value = (<0.005) 0.003. This means that the research hypothesis which states that there is a relationship between knowledge and consumption of calcium for osteoporosis prevention. The results showed that the percentage of women who are knowledgeable good (20.3%), knowledgeable enough (31.9%), while the less knowledgeable respondents (47.8). Results of statistical analysis using chi square test showed the significant relationship where P-value = 0.033 (P <0.05).

This study is consistent with research Akbar (2008), 56.2% of respondents who are knowledgeable high to prevent osteoporosis, and 34.7% of respondents who are knowledgeable lower not do prevention osteoporosis. Therefore, knowledge about good enough calcium may play a role as a factor support and reinforcement are important for good behavior regarding calcium intake in adolescents. According to the researchers the assumption that the level of knowledge is related to the level of consumption of calcium in women. Women who do not have knowledge, of course, the woman does not do the prevention of osteoporosis. Women who have a good knowledge and quite a lot more prevention than women who had less knowledge.

Table 2. Relationship Between Information With Calcium Consumption Against Osteoporosis Prevention

No	Consumption of Calcium	Informasition				Amount		Statistic test	
		Exist		No					
		F	%	F	%	F	%	α	P-value
1	Enough	16	48.5	17	51.5	33	100		
2	Less	10	27.8	26	72.2	36	100	0.05	0.088
	Total	26	37.7	43	62.3	69	100		

Results of statistical analysis using chi square test showed the significant relationship where P value = (<0.005) 0.088. This means that the research hypothesis which states that there is never an association

between calcium intake information for the prevention of osteoporosis.The results showed that the percentage of women who are there to get information (37.7%), while the uninformed (62.3%). Retrieved P-value = 0.088 (P> 0.05). According to the research Meilani (2007), 46.9% of respondents stated their research to get information about osteoporosis through electronic media and 37.5% through the media information. Researchers assume that the information does not relate to the consumption of calcium for osteoporosis prevention. Women who get information, but they are less concerned about the prevention. While women who did not get the information, even if they do not get the information, but a source of food that contains a lot of calcium often they consume.

Table 3. Relationship Between Income Level With Calcium Consumption Against Osteoporosis Prevention.

No	Consumption of Calcium	Revenue				Amount		Statistic test	
		Height		Low					
		F	%	F	%	F	%	α	P-value
1	Enough	14	42.4	19	57.6	33	100	0.05	0.466
2	Less	12	33.3	24	66.7	36	100		
	Total	26	37.7	43	62.3	69	100		

The results showed that the percentage of high-income women (37.7%). While low income (62.3%). Retrieved P-value = 0.466 (P> 0.05). According to the research Acta (2009), 54.2% of respondents whose income level is less, less to prevent osteoporosis, and 32.4% are low income levels do not do the prevention of osteoporosis. Due to less revenue, so it can not buy food products that contain calcium such as milk, and so forth. Researchers assume that the income not related to the prevention of osteoporosis women do. This is because, for the prevention, women should not consume the food was expensive, but it also can be obtained by eating foods such as anchovies, dried shrimp, tempeh, tofu, potatoes, and a source of other calcium-containing foods.

Conclusión

Based on the above discussion it can be concluded that:

1. There is a relationship between knowledge and consumption of calcium in the prevention of osteoporosis at the age of 25-30 years olds.
2. There is no relationship between calcium intake information in the prevention of osteoporosis at the age of 25-30 years olds.
3. There is no relationship between incomes with consumption of calcium in the prevention of osteoporosis at the age of 25-30 years olds.

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Relationship of Age and Obesity on Infertility Events in Women with Fertile Age

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Abstract

Infertility is the inability of a couple to have a child within one year after having sexual intercourse on a regular basis. Infertility is not an issue that can be life-threatening, but it can disrupt family life. WHO (2010) estimates that approximately 50-80 million couples who have infertility problems and annually appeared about 2 million new infertile couples in the world. The objective of this research is to determine the relationship of age and obesity with women Infertility at Puskesmas Peukan Bada working area Aceh Besar. This research was used a descriptive analytic with cross sectional approach. The population in this study are all WUS marriage. Taking samples with Stratified Random Sampling technique with formula of Slovin, with a sample of 100 people. Univariate analysis showed that WUS infertile as much as 29%, WUS that age are at risk as much as 23% and the WUS obese by 65%. Bivariate analysis results indicate that the age WUS risk of infertility as much as 52.2% and WUS obese infertile as much as 36.9%. There is a relationship between age and the incidence of infertility in WUS and there is a link between being overweight (obesity) and the incidence of infertility in WUS. There is a relationship of age to the incidence of infertility in WUS with p-value = 0.011 (p <0.05). And there is a relationship of overweight (obese) and the incidence of infertility in which the WUS obtained p-value = 0.032 (p <0.05). Expected to health care workers at the health center Peukan Bada to provide counseling to WUS about infertility in order to reduce the incidence of infertility in WUS.

Keywords: Infertility, age, overweight (obesity), WUS

Introduction

Infertility is a condition of pregnancy in couples who have intercourse without using contraception regularly within one year. Infertility occurs more than 20% of the population in Indonesia, and of these cases there were 40% female, 40% male and 20% in both of them and this caused the couple had no children. An estimated 85-90% of healthy couples will have fertilization in the first year (Depkes, 2010).

Based on WHO notes, in the world there are about 50-80 million couples have infertility problems and annually appeared about 2 million infertile couples (inability to contain or induce conception) new. There is a possibility that number will continue to rise. Based on the research of every 100 couples, in couples who already have children and they want the child back a quarter or 15% were below normal fertility (WHO, 2010).

In Indonesia, the incidence of infertile women at the age of 30-34 years is 15%, rising to 30% at age 35-39 years, and 55% at age 40-44 years. The survey results of pregnancy failure in a married couple for 12 months, 40% are caused infertility in men, 40% because of infertility in women, and 10% of men and women, 10% of unknown cause. Couples of reproductive age (EFA) suffering from infertility as many as 524 (5.1%) of 10205 EFA EFA (Syamsiah, 2010).

Puscheck (2011) states that the cause of the woman becomes infertile can also be caused by factors that increase the risk of that lifestyle uncontrolled applied. These factors are age, poor diet, exercise, overweight (obese) or malnutrition, sexually transmitted diseases, environment bad circumstances (air and water pollution), as well as health problems associated with hormonal changes.

Although infertility problems do not affect the day-to-day physical activity and life-threatening, for many couples this is a major impact on the lives of family. already psikokultural factors influencing attitudes pair on the issue, including efforts irrational to have children.

The data obtained from Puskesmas Peukan Bada, the number of people in Sub Peukan Bada amounted to 7,730 inhabitants of 18 villages. Data WUS (women of fertile age) who are married as many as 1,313 WUS, acceptors (Family Planning) is active as much as 908 people, WUS who experience menstrual disturbances as much as 8 people, and there are about 33 WUS who experience infertility. Based on the description above data, then on this study, researchers wanted to see how the relationship between age and overweight (obese) and the incidence of infertility in WUS in Puskesmas Peukan Bada, Big Aceh district 2015 ".

Materials and Methods

This study was conducted in Puskesmas Peukan Bada, Aceh Besar district on 15 to 26 June 2015. The study was conducted in 18 villages in the district Peukan Bada, the Village Lamteh, Lamlumpu, Kp. Baro, Lam-Manyang, Lam Awee, meunasah Tuha, Tutui Lam, Lam Teungoh, Guron Lam, Lam Badeuk, Lambaro Nijid, Pageu Lam, Lam Isek, Gurah, Lam Kemok, Rukam Lam, Lam Geue, and Pulo Bunta

This research uses analytical methods using cross sectional approach. In this study, researchers were look at the relationship of age and overweight (obese) and the incidence of infertility in WUS in Puskesmas Peukan Bada. The population in this study are all WUS married as many as 1,313 WUS. The sample is calculated using the formula Slovin (confidence level) of 90%, in order to get the total sample of 100 WUS. The samples in this study conducted by stratified random sampling.

Results and Discussion

WUS that infertility as much as 29%, while those not infertility as much as 71%. WUS is the age of majority is not at risk are 77 % and have the obesity condition are 65% (Table 1).

Tables 1. Frequency of Distribution Characteristics of Respondents on WUS (n = 100)

Characteristics	Frequency	(%)
infertility		
Yes	29	29
No	71	71
Age		
Risks	23	23
no risks	77	77
Obesity		
Yes	65	65
No	35	35

Age relationship with Genesis Infertility in WUS

The results showed that WUS age who are at risk as much as 52.2% of infertility. After statistical test by using Chi-Square p value = 0.011 (p <0.05), meaning there is a relationship between age and the incidence of infertility in WUS, which is at risk age> 35 years.

Peak fertility is 20-35 old years have a 95% chance of pregnancy. Currently, about 35-year-old woman to cause pregnancy percentage decreased to 90%, which means that age range at risk for infertility. Meanwhile, at the age of 40 years the chance of pregnancy decreased to 40%. Meanwhile, after approaching the age of 50 years, women only have a percentage chance of pregnancy by 10% (Depkes, 2004).

Results of this study, in line with research conducted by Sumarsih (2010) in Clinical infertility in Surabaya shows P value = 0.026 (p <0.05) to 94 couples who visit. The results showed an association between the ages of the respondents to the incidence of infertility. Factors such as age at risk of lowered fertility decreased ovarian conditions to release eggs, ovaries left out a little egg, and egg quality declines. It is also at risk for health problems that reduce fertility and miscarriage. Women aged 19-26 years had the possibility of pregnancy 2 times greater than in women aged between 35-39 years (Kusmiran, 2011).

Age can indeed be the largest contributor to the risk of various diseases, including infertility. However, research shows that there are 22.1% WUS with less than 35 years of age but experience infertility, it can

be caused by various factors such as lifestyle, frequency of sexual intercourse and other factors. Public response about women is the largest contributor to cases of infertility is not true. Factors abnormalities of the husband can also cause infertility. Moreover, when the couples are less aware about infertility.

Table 2. Relationship Age with Genesis Infertility in WUS (n = 100)

Age	Infertility on WUS				Total	P. *value*
	Yes		No			
	F	%	F	%		
Risks	12	52.2	11	47.8	23 (100)	0.011
Not Risks	17	22.1	60	77.9	77 (100)	
Amount	29	29	71	71	100 (100)	

Based on the table 2 can be explained that from 23 WUS that age who are at risk, as many as 52.2% had infertility. After statistical test by using Chi-Square p value = 0.011 (p <0.05), meaning there is a relationship between age and the incidence of infertility in WUS, which is at risk age> 35 years.

Relationship overweight (obese) with Genesis Infertility in WUS

Table 3 can be explained that that of 65 respondents were obese, as many as 36.9% of infertility, while 35 respondents were not obese as much as 14.3% of infertility. After statistical test by using Chi-Square p value = 0.032 (p <0.05), which means there is a link between being overweight (obesity) and the incidence of infertility in WUS.

Tables 3. Obesity relationship with Genesis Infertility in WUS (n = 100)

Obesity	Infertility On WUS				Total	P. *value*
	Yes		No			
	F	%	F	%		
Obesity	24	36.9	41	63.1	65 (100)	0.032
No Obesity	5	14.3	30	85.7	35 (100)	
Amount	29	29	71	71	100 (100)	

The results showed that there is a link between being overweight (obesity) and the incidence of infertility in WUS (p = 0.032). Manuaba (1999) explains that excessive fat content would lead to an increase in hormone production in both the ovaries and endrogen in adrenaline. Overweight condition related to the process of change androgen into estrogen. The hypothalamus stimulates increased secretion of LH hormones and occurring to hyperandrogenism.

Norman, et. al (2004) explains that many studies have shown that overweight and obesity can affect the reproductive function of women, this is a complication of the PCOS (Policystic ovary syndrome) in many infertile women. In addition, the distribution of body fat is also associated with a reduction or loss of fertility. Overweight and obesity can cause a lack of concentration of SHBG (Sex Hormone-Binding Globulin) and increased androgen, insulin and leptin secretion and insulin resistance, thus causing hiperinsulinaemia and hiperandrogenaemia.

WUS many are not aware of the relationship between obesity and infertility due to problems of obesity is common. Obesity occurs due to excessive intake of nutrients. Indeed nutrients needed by the body, but if the excess will lead to many diseases, one of which system disorders of women reproduction.

Obesity is common in housewives. Women who do not work and just doing homework are more likely to be obese. Eating culture in Aceh are high in carbohydrates can also affect the rise of obesity in women. Acehnese people make rice / rice as a main food, so they do not feel full or already finished eating when not eating rice, though previously they had to consume foods that also contain carbohydrates such as bread, noodles, and so forth. Therefore, obesity is becoming a regular thing and less attention especially among WUS married with the idea that they are married so it is not very important to maintain weight.

Conclusion

From the results of research and discussion that has been described above, it can be concluded that: there is a relationship between age and the incidence of infertility in which the obtained value WUS p value = 0.011 ($p < 0.05$); there is a link between being overweight (obesity) and the incidence of infertility in which the obtained value WUS p value = 0.032 ($p < 0.05$).

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POSTER

The Effect of Extraction and Drying Method to Protein Content of the Albumin Concentrate from *Channa striata*

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Abstract

Snakehead fish (*Channa striata*) is a type of carnivore fish living in fresh water and belogs to family of Channidaea. Protein and albumin content in the snakehead fish as reported is considered as high and thus, can provide health function to help in the treatment of wound healing patients, children with malnutrition and some other medical cases. Protein, as biomolecule, is very sensitive to the external condition and thus, requires adequate treatment during extraction and dying processes in order to get a biologically active albumin concentrate. In this work we varied the extraction and drying methods (temperature, maceration time, and steps of extraction and drying procesess) from sample of snakehead fish from Kalimantan. It was found that maceration temperature and drying methods gave significant effect to both yield and quality of albumin concentrate from the snakehead fish. Additionally we also analyzed one commercial snakehead fish albumin concentrate which was proven to have a significantly lower protein profile as well as poor solubility in aqueous solvents.

Key words: *albumin, snakehead fish, Channa striata*

Analysis The Potential Use Of Tempe As Preventive Agent For Coronary Heart Disease

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Abstract

Coronary heart disease is a disorder in one or more coronary arteries are thickening of the vessel wall with plaques that interfere with blood flow to the heart muscle which consequently can disrupt heart function. One of the major risk of coronary heart disease is dyslipidemia which led to the plaque in coronary arteries. Tempe has *Polyunsaturated fattyacid* (PUFA) such as oleic and linoleic acids as well as antioxidants such as isoflavones. This study aimed to analyze the potential of tempe as a preventive agent for coronary heart disease. Research studies using literature as an information sources. The results showed that the content of unsaturated fatty acids in tempe work effectively in lowering blood serum cholesterol. Tempe contains Isoflavones that can inhibit the absorption of cholesterol, either from diet or cholesterol that comes from the liver. This can increase the levels of high density lipoprotein (HDL) in the blood and can replace cholesterol. Based on the analysis the potential of tempe can be used as an agent for the prevention of coronary heart disease.

Keywords: Coronary heart disease, tempeh, cholesterol, antioxidants.

Introduction

Coronary Heart Disease is one of the causes of cardiovascular disease mortality. In 2005, in the United State of America, 56% of deaths caused by cardiovascular disease and dominated by Coronary Heart Disease (WHO, 2006). The report of Riskesdas in 2013 declared the prevalence of coronary heart disease were diagnosed 14.6% and age group highest in the age of 65-74 years is approximately 3.6% (Depkes RI, 2007). Coronary Heart Disease is a disorder of cardiac function due to the lack of blood supply to the heart muscle because constriction of coronary arteries (Alwi *et al.*, 2009). Problems arise

from the socio-economic and cultural in Indonesia that are very dense and encourage an increase in the risk of coronary heart disease primarily in terms of diet that causing dyslipidemia (Utari, 2010).

Tempe is one of the culinary properties in Indonesia. Tempe has a high nutrient content and antioxidant compounds that have a lot of benefits, such as to lower cholesterol levels, to lower blood pressure, anemia, anti-infective, anti-cancer, prevent osteoporosis and can prevent nutritional problems (Utari 2010; Widianarko, 2002). This article aims to analyze the potential effect of tempe as a preventive agent for coronary heart disease.

Objective

1. Analyzing the nutrients contained in tempe
2. Analyzing the potential use of tempe as a prevention agent for coronary heart disease.

Materials and Methods

Analysis is performed by collecting a review of literature to obtain information.

Results / Data

- Tempe contains active compounds include some fats, minerals either micro or macro, phyto protein, a natural dietary fiber, carbohydrates, isoflavones and a variety of vitamins.
- The fatty acids in tempe belonging to the group of polyunsaturated fatty acid (PUFA) which is an unsaturated fatty acid compound obtained from the fermentation process in tempe known as oleic and linoleic acid. Both of these acids work effectively in lowering blood serum cholesterol so that the negative impact of sterols can be resisted.
- Tempe also contain antioxidant compounds known as isoflavones that can increase HDL levels in the blood and can replace cholesterol. The fermentation process of soybean into tempe cause increasing of total isoflavones, it is estimated that tempe function as a functional foods, especially hipokolesterolemia effect and antioxidant effect much higher than soybeans (Utari 2010; Widianarko, 2002; Nangoi, 1994; Prabowo, 1994).

Discussion and Conclusions

- Tempe can lower cholesterol levels because it has polyunsaturated fatty acid (PUFA) and antioxidant such as isoflavones which is proved from several studies can lower blood cholesterol levels that can be used as an agent for the prevention of coronary heart disease.
- Nutrient content in tempe that can lower LDL levels and increase HDL levels so that can reduce the ratio of HDL / LDL. Polyunsaturated fatty acid (PUFA) contained in the fat in tempe can lower LDL by increasing the number of LDL receptors and decreases the secretion of VLDL from liver (Supriyanto, 2004; Hapsari, 2009).
- Isoflavones in tempe can increase levels of apolipoprotein A-1 and lower hepatic lipase enzyme thus increasing nascent HDL that will turn into HDL2 so that the amount of HDL cholesterol in the blood

increases. The existence of such a mechanism, the cholesterol absorbed by the intestine is also slightly so that the formation of chylomicrons and VLDL is also inhibited so that decrease the level of LDL and increase HDL so that reduce the ratio of HDL / LDL (Utari 2010; Widianarko, 2002; Nangoi, 1994; Prabowo, 1994).

- The potential of tempe is expected to be a prevention agent that is applicable in Indonesia needs to be supported to be socialized through proper processing, both the processing of soybeans into tempe, and processing of soybean into food so that nutrients and substances such as antioxidants in tempe derived levels of the maximum that can be increase the potential for health, especially for individuals who have a high risk of coronary heart disease or for patient with coronary heart disease.

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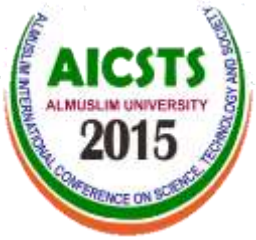
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