**ICHS**
JENDERAL SOEDIRMAN UNIVERSITY

PROCEEDING OF
2ND International Conference In Health Sciences

FROM LIVING WELL
TO AGING WELL:
A MULTIDISCIPLINARY APPROACH
Purwokerto, 4-5 November 2017

UNIVERSITY OF JENDERAL SOEDIRMAN
INDONESIA
2018

Proceeding of the 2ⁿᵈ
International Conference in Health Sciences (ICHS)

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Dean's Welcome Note

Dear all the conference participants,

Welcome to 2ⁿᵈ International Conference in Health Sciences 2017. In this very good occasion I would like to extend my warm greeting to you all, the speakers as well participants. It is a great honor for Faculty of Health Sciences to host this international conference. This becomes our positive contribution in facilitating the spread of research work from scientist and practitioner in health sciences. It is also our way to provide scientists and practitioners with an understanding of key issues in health and nursing, medical treatment and health technology, health policy and health services, health promotion as well as economic, social cultural and ethical aspect of health.

Knowledge and research will always walk side by side that we cannot gain new knowledge without conducting research. All those attempts act as a respond to the increase of health demand in our community. I hope in this conference which entitled *" From Living well to Aging Well : a multidisciplinary approach"*, we will obtain new knowledge about health sciences from many perspectives.

I do hope you enjoy your stay in Purwokerto and be able to see the beauty of this city. And most important, you can build a good networking with other participants which will be benefit for your field and research area.

Best Wishes,
Dr. Warsinah, M.Si., Apt

Conference Chair's Welcome Note

Dear Delegates,

On behalf of the organizing committee, we are pleased to welcome you to Purwokerto, Indonesia for the 2ⁿᵈ International Conference in Health Sciences (ICHS) 2017, held this year by Faculty of Health Sciences, University of Jenderal Soedirman. Theme of this event is *"From Living Well to Aging Well: a Multidisciplinary approach"*. We raise this special theme since the population ageing is a global issues which interesting for researchers, academic, policy makers, practitioners and governments. We want to have more people around the world are living longer healthier lives than our previous generations.

In this event, we are delighted to welcome this year's Plenary speakers : Representative of Ministry of Health Republic Indonesia, Prof.Dr. Gert Storm (Department of Pharmaceutical Sciences, Faculty of Science, Utrecht University), Prof. Jing-Jy Wang (Professor & Chair Department of Nursing, College of Medicine, National Cheng Kung University, Taiwan) and Chalermpol Chamchan, Ph.D. Assist. Prof. (IPRS Mahidol University, Thailand) and also Indonesian speakers.

We would also like to take this opportunity to thank the organising team for all their hard work to make this event run smoothly.
I know just how much time and effort goes into making such an event happen.

I hope all of us are going to enjoy this conference. Thank you for attending the meeting!

Kind regards,
Siwi Pramatama Mars Wijayanti, Ph.D

The 2nd International Conference in Health Sciences (ICHS)

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The Experience of Parents with Blind Children achievement in SLBN-A Bandung

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Abstract

Blind children are children with impairment of vision loss, both partial and total blindness. According to data collected from Ministry of Health of Indonesia (2014), West Java Province has highest ranked of visually blind children. There are about 975.550 children with partial blindness and 85.438 children with total blindness. Basically parenting system for blind child has no special system of parenting, it depends on the family background, education and age. The purpose of this research to find out more about the experience of parenting in parent for an achievement in SLBN-A Bandung city. The type of research used is descriptive qualitative with phenomenology method and the samples there are 5 parents of children who had been blind since birth. The techniques of selection is purposive sampling. Researcher use collecting data method by indepth interview. The research uses in-depth interviewing as the method of data collecting. The result showed that there are 6 theme that parenting is applied just like a normal children, learning techniques for blind children, development of blind children, the problems for parents to raise the blind children, how to motivate the blind children, and the hope of the parents for their children. Researcher suggestion is parents and teachers are able to add more information about parenting the blind children by attending some achievement that are held by organizations in order to make the blind children able to win achievement like normal children.

Keywords : Experience of parents, Blindness, Parenting, Achievement

Introduction

Parenting is very influential to the learning achievement of children. These achievements are very unique when we see that the person who won is a child who has limited one of them is blind. Interest and talents of blind children who have been seen from an early age continue to be developed and facilitated by the parents so that the child is able to excel like other normal children in accordance with the ability and their respective fields.

This is very interesting because the number of people with visual impairment in Indonesia put the highest number compared with other disabilities of 3,474 thousand people. Especially West Java Province is ranked highest with the number of people who have difficulty viewing as little as 975.550 thousand people and who experienced difficulty in severe vision as many as 85.438 thousand people [1,2]. If people with visual impairment can be empowered will be very extraordinary, one way empowerment that is with parenting that can be developed early as giving "Asah, Asih, Asuh" in children, guiding children at home and at school, nurturing with patience and affection and obey desire of the child with the supervision of parents [3].

Therefore, it is important for us to see how parenting patterns that can be applied so that can make the child can achieve and independently. Besides, researchers also conducted interviews on the SLB. From the SLB it is disclosed that there has been no research on parenting patterns of children with visual impairment who excel, but it would be very good if this research can be done so that all students blind at SLBN-A Bandung can perform.

Method

    Qualitiative phenomenology method was used in this study. The research was held in SLBN-A Bandung City. The informans involved in this research were five parents who have blind children with achievement in academic or non academic.

    The data were collected by using the method of indepth interviews with approximately 45-60 minutes and was recorded with a recording device.The interview was then transcribed verbatim and analyzed based on Collaizi approach to get the theme that specified 7 methodological steps: First step, read all protocols to acquire a feeling for them.Second step, review each protocol and extract significant statements.Third step, spell out the meaning of each significant statement. Fourth step, organize the formulated meanings into clusters of themes. Fifth step, integrate results into an exhaustive description of the phenomenon under study. Sixth step, formulate an exhaustive description of the phenomenon under study in as unequivocal a statement of identification as possible.The last step, ask participants about the findings thus far as a final validating step.

Results

    The research results reveal six themes 1) parenting patern of parents with blind childrens was same like a normal children. 2) Learning techniques for blind childrens 3) Development talents of the blind childrens 4) the problems for parents to raise the blind children, 5) how parents to motivate their children to develop their children's talents and 6) the hope of the parents for their children.

First theme: Parenting for blind childrens was same like a normal children

Based on the research showed that parenting for blind children was same like a normal children.

    "Parenting for my children same with people who are normal. So there is no difference" *(I 2)*

Informant 5 add that she caring for her children was like the others, there were no different.

    "So, Dila always treated like the other normal children. So I caring her like a normal children…"(I `5)

Second theme: Learning Techniques for Blind Children

    Based on the interviews, there are several ways to introduce the things to the blind children such as introducing things around the home and doing activities at home. Here are some informants statements about how to introduce things and activities at home by parents:

    "Well, I taught to Raka when doing activities at home I invite how to fold clothes like this, his hands like this, how to fold the clothes like this, this pile of clothes usually used at home, this pile of ordinary clothes to school. I taught h him to hold the ingredients, then to save the textbooks always say save all your stuff you've used at the usual place in use again "(Inf 3).

Informant 5 also said the same way as other informants to teach children how to know stuff.

    "First distinguish the color, then seen it and grope, I was told that is the hands, the entrance of the head. So, before he can't do it, I continue to teach until he can "(Inf 5).

Third Theme: The Development of Blind Children Talent

    Based on the interviews obtained the results that in knowing and developing the talents or potentials of blind children like parents were told by teachers, join the course, knowing by self and follow extracurricular according to his talent.

    a.   Knowing talent of blind children

        Two of five informants said that knowing their child's talent from teachers at school.

> *"After a few days enter here,buy this instrument, he began to like the instrument pianika. His teacher also said that Raka so quick to learn about music, if I told him one song he wrote immediately "(Inf 3).*

Informants 1, 2 and 5 have different opinions from previous informants, as seen from the habits of children. The following narrative:

> *"He is self-taught, so because he has a hidden talent, I ever want to enter him to modelling school but he doesn't want. So even he has some achievement, I mean I want to made him better if join the modeling school...."(Inf 5).*

b. Developing talent of blind children

Four informants told that they were developed the talents of children with joined the course and extraculicular in the school

> *"Well that's where I started tutoring, 30 juz already memorized. Then the music is also because he emm seen that there is potential so I entering the course of keyboard and drum "(Inf 1).*

Informants to 2 different from informants 1, 3, 4, 5 which states that how to develop the talent of his son by finding information about his son's talent, and also in tutoring, as follows:

> *"Well, I'am looking for information who can teach my child. Especially the first information that can teach children how to learn for children with visual impairment, patience search first information.... To dig it looking really understand with blind children so "(I 2).*

Fourth Theme: The Problems for Parents to Raise the Blind Children

Based on the interview results that the barriers experienced by parents such as feeling pity, not believe, impatient, poor mood and child pity. Informants 3 and 4 said the barriers experienced by informants were less patient in dealing with their children. Here's the story:

> *"The obstacle is on me. I am so difficult to cultivate that feeling (I 1)*
> *"The obstacles must be more patient yeah..but sometimes I can not be patients..."(I 3).*

Fifth Theme: How to motivate the talents of blind children

Based on interviews the way parents to motivate the talents of their children as always provide support to their children in accordance with his talents.

> *"Yes, I give the support. Try it first. If there's can't do is OK, but if he like so just keep it. Then I praised him. (I 4).*
> *"I'm support but with a note that he may have other achievements but the achievement of learning is number one, then I also ask to not follow the others" (I 5).*

The Sixth Theme: Hope of Parents

Based on the results of interviews there are various expectations of parents to their children such as achieving as much as possible, high school and able to independently.

Informant 1 said hope to his son that his son is able to be independent at his age and not dependent
on his parents

> *"Can be independent, someday may be able to support yourself, especially in his age that now I can not always be strong to ngejagain him. That first wrote can take care of himself "(I 1).*

Informants 2, 4 and 5 have the same hope in their children to be smarter, successful and achievers.

> *"The hope can still be successful, achieving more even more" (I 2).*

Discussion

Parenting for blind children was same like a normal children.

Based on the interview, parenting for blind children was same like a normal children. As the theory said that parenting for children with special needs not have a special one, but the parents give the parenting as a state of childrens ability [4].Every parents have a differents parenting based on the family background, education and old [3].

Based on the observation of the research, it was found that the parenting of each informant was same as a normal children, where the informants did not differentiate the pattern of parenting the blind children with normal children in general. But what distinguishes blind children with normal children is the attitude of parents or the way parents in educating children with visual impairment, where parents who have children with visual impairment should be more in explaining the conditions around his child's environment. Then, the informants more apply semi-authoritarian democracy parenting which in which each informant put freedom to his child in choosing the activities in the school desired by directly supervised by the parents.

Learning Techniques for Blind Children

Education of children with special needs such as visual impairment is not the same as educating normal children, because in addition to requiring a special approach also requires a special strategy [5]. Children with special needs need a special approach that can be used as a basis in an effort to educate them are: Principles of love such as not spoiling the child and provide tasks according to ability, motivation principles such as motivating their children to achieve they wants, principles such as introducing the introduction of bark brought forth the original fruit so as to know the form also taste, the principle of unified experience and the principle of learning while doing, which of each principle has a linkage in efforts to educate children with special needs [6,7].

The informant said that the parents ways to teaches the blind child is by distinguishing the items around it by using all the senses. This is in accordance with the revelation of [8] said some methods used to teach children with visual impairment is a concrete experience, blind children guided to explore through the sense of touch, smell, listener and taste. The full experience is that teachers and parents encourage children to engage all the senses in an integrated way in understanding a concept. Then learning while doing (learning by doing), the teacher and the parents involve the sense of touch to recognize the shape and size, surface properties and warmth. Furthermore, the sense of hearing to recognize sounds such as birds and even blind children can utilize the smell to recognize the distinctive smell of birds.

The Development of Blind Children Talent

Based on the researcher's observation, it was found that in obtaining experiences that can be understood by the blind children, the informants taught their children to learn all the objects around their house by using the sense of touch, taste, hearing and smell or explaining in detail an object that is not possible to be felt by the blind children with the goal of blind children can have a real and clear experience that is almost the same as any other normal child. Develop talents and interests of children, parents have a heavy duty and play a decisive role so that children learn or in the future can work in the field of interest and in accordance with the ability [9].

Seeing the informant's description above, the way informant knows and develops the talent / potential of the child is by being informed by his teacher and given informal education outside school (additional lessons outside school hours) and following special races visually impaired held in school and outside school. Developing the talent of children, so that can be

done is to enrich children with various experiences and deepen experience as more new things are seen and heard then the more interested the child to experience various experiences. Then parents' encouragement can extend a child's ability from one talent to another [10]. Then there is the means to express the talent. This also supported the theory by Familia [11] where to recognize the talents of children, parents provide activities that assure the child by taking into account the child's condition, the readiness of the child and avoiding the effort to encourage the child based solely on the influence of others. More and more children are given opportunities by parents in following various activities, making it easier for parents to know the talents and interests of children from an early age.

Based on the observation of the research, it was found out that the way to develop the talents of the blind children, the informants purposely include their children in every activity in school in academic and non-academic field, then the informants asked their children to choose any activity that their children liked , then the informants input the activity into the schedule of their daily activities. Then the informants also facilitated the activity by involving the children for tutoring outside school, following extraculative activities at school and following the competitions in the country and abroad.

Fourth Theme: The Problems for Parents to Raise the Blind Children

Seeing the narrative of informants above, barriers in the care of children with visual impairment is a very disturbing obstacles in child development and psychology of parents. This is in accordance with the study of Melati [12] that most parents who have children with visual impairment also have barriers in the care of their children such as depression, stress, disappointment, difficult to accept himself well, and sometimes be rude to his son when angry. This is also in line with some studies that say that mothers with blind children are experiencing stress, disappointment, feelings of guilt, shame and impatience in educating their children [13,14].

Based on the observation of the research found that the barriers often experienced by parents in the care of children with visual impairment is from itself, where some informants still can not accept their children born with visual impairments that cause psychological impacts such as stress, depression, feelings of shame and impatience in educating her child raises feelings of anger toward her child due to her slow child doing homework or other activities.

How to Motivate the Blind Children

Seeing the results of informants above, how to motivate children is to support the talents of children who have been seen early by showing his friends who excel or teachers who are also achievers so that children are motivated. This is supported by the theory that motivation is a psychological factor that greatly affect the effectiveness of children's learning where one solution that can be done to overcome the problems in children with visual impairment is to provide motivation gained from parents and teachers [15,16]. In general, blind children are given motivation in the form of encouragement so that they do not feel ashamed to learn, such as: observing the home study process, giving understanding that by learning the child's ideals can be achieved, giving gifts and punishments such as praise, buy a child something and take the kids on vacation.

This is in line with Resnawati research that how to motivate children to achieve one of them is the parents accompany the child while studying, parents can create a calm atmosphere while studying, parents provide solutions when having problems in learning, parents give direction and advice in learning and parents provide motivation while learning [17].

Based on the researchers' observation, it is found that the way the informants in motivating their children can be in various ways such as giving support to the children in

order to be able to excel in academic or non-academic and also give freedom in choosing what child likes so that the parent will easier in directing his child to what he likes. Then parents can also give rewards to their children for what they achieve so that children are motivated to achieve more achievements.

Hope of parents

Looking at the results of the above research, parents' expectations are very high on their children so directing their children to create their dreams become a reality. Some parents expect their children to perform like any other normal child and can go to a higher school. However, there are also parents hoping his son back like a normal child and can excel in his talent.

This is consistent with Lynkey & Joseph's [18] theory that individuals want to experience, gain, create or make their desires come true and move the individual's perception that he or she is capable of initiating and sustaining behaviors that lead to desired goals. Based on the researchers' observation, it is found that most informants expect their children to grow into self-reliant, able to go to higher education level and can continue to excel in academic and non-academic field, so that parents do not have to worry about their child's future and child's dependence on others when they live away from their parents.

Conclusion

The findings of investigation forward to some informants is that parenting for blind children was same like the normal childrens. There are many problems to raise the blind children. Parents have to knowing what's the talents of the children and motivate to get an achievements. Every parents have some hope for the children, they wants their children more independen and can facing the live by self.

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Self-Perception Identification of Students in Athlete High School Ragunan Jakarta

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Abstract

The purpose of this study is to identify self-perception of athlete students in Jakarta. This study uses 239 students of Ragunan Athlete High School Jakarta from adolescent age between 12-18 years old. Data collection in this study using questionnaire with likert scale. This study was adapted from Self-Perception scale which included eight special domain and one additional domain to measure global self-worth. The result of this study indicates that self-perception of Junior High School students are tend to social competence, physical appearance, and athletic competence. While self-perception of Senior High School tends to social competence, athletic competence, and close friendship.

Key Words: Self-Perception, Athlete Student

Introduction

Education is a systematic practiced by adults to develop the ability of student as optimal as possible. Ragunan Athlete High School is one of the school that provide the opportunity to development students' talent in sports. Various branches of sports has been developed in this school. Student receive cognitive development and also development of the talent sports. Graduate students from this school is becoming athletes in various branches sport such as: running athlete, football, basketball, swimming, silat, etc. Since they entered this school, they'd given the opportunity to develop their talents which based on their ability. Until now, the school has never been identify their student's self-perception. This research is very important to finds self-perception of the junior and senior high school student in Athletic High School Ragunan, Jakarta.

Theoretical Study
Self-Concept

Self-concept is the most famous theory about self. Self Concept is include all things (value, belief, attitude, and behavior) that we believe it existed within ourselves. Any kind of image about ourselves, which could bring up two possibilities of whether i am a good person or not a good person. Self-consept guide us behave and which the focuse we choose in life, self-concept at once become guideline for how we interact with others. Self concept is a set of all those components that resulting in how we perceive ouselves. Baron & Byrne (2003) suggested that personal self give a framework of thinking that determines how humans process information about themselves, including other things like inspiration, motivation, capacity, emotional condition. Other experts suggested that self-concept is all ideas, thoughts, and information that we have about who we are – what we are, what characteristics we have, how our current personality and how we are in the future. (Bordens & Horowitz,2002)

Self-concept is built through a series of interactions and experiences that we have been through during pur lives, one of which strongly shapes the self-concept is the socio-cultural pattern that exist within us. The concept if self is reflected from the answers about who we are

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and where we want to be. Often we use the terms self-concept and self-esteem in reverse, but these two constructs are different. Self-concept refers to the individual's perception of themselves that encompasses all of the things in his social sphere. While self-esteem refers to the overall assessment of their condition, whether the individual feels themselves happy and satisfied with themselves at this time (Harter, 1999).

As an illustration, if I perceive myself to be a good, religious, and intelligent person then it describes my self concept, whether it's similiar or not with my condition is referred to as self-esteem. Self-concept was first studied by psychologist Carl Rogers and Abraham Maslow, according to whom everyone would try to be the ideal self. The closer he is to his ideal condition the happier he is. Furthermore, Rogers proposes the concept of happiness derived from the discovery of this ideal self-concept with the Unconditional Positve Regard (UPR) or the condition in which the individual feels the situation is ideal and positive for him The UPR condition is an individual's psychological acceptance of the conditions he encounters either with regard to himself or others. These UPR's appear in general to family and friend ties where individuals consistently show affective attention to them regardless of whether or not their circumstances support or not support them. Departing from the concept of UPR, then Rogers put forward the importance of a psychologist or therapist who has an UPR against himself and his patient. Through this UPR, the concept of self is formed

Research from Benner & Mistry (2007) shows that individuals whose mothers and teachers have hope for a bright future for the individual show greater academic performance if compared to those who never get hopes for a bright future. Other studies also show parents who have positive expectations for their children tend to show the ability to reduce the negative effects of their social environment, while the opposite happens to parents who do not have positive expectations for their children. All of these studies show a significant relationship between parents' beliefs about their children and their beliefs about themselves.

Guimond, et al (2006) put forward the theory of self concept called Self Categorization Theory (SCT) which explains that self concept is built on two levels namely identity and social identity. This theory says that self-concept is formed on the individual's personal evaluation of themselves and how the individual accommodates the perception of others towards them. SCT explains in what situations a person will perceive themselves as part of a group, how they perceives themselves part of a group, and when they does not perceive themselves as part of a group.

Self Perception

Perception which directed to self is called self perception. In addition to the impact of pessimism or optimism, self-perception also establishes the individual status in the environment in which they joined; Feel low or feel high, so it can make someone feel over confidence or lack of confidence. Positive self-perception is necessary for the athlete, so they will not easy to experience internal conflicts or conflicts that come within himself.

For example an athlete depicts himself to be defeated in a match and will be agitated by the audience, such negative perceptions will suggest that he will lose before the match. It would be different to describe the match to be balanced and use the tactics and strategies that he prepared, he would be able to win the game. Athletes who have a positive self-perception can be improved further in order to have the ideal figure to be imitated. By having a role model or ideal figure that will imitate to spur himself to achieve an advantage. This is a positive motivation for achievement.

Self-assessment is a new approach to thinking and how to assess and evaluate people with different ages and areas. This difference begins with children especially when it comes to adolescence.

Self Perception Scale

The self-perception scale consists of eight separate domains separate from one domain of self-assessment as a whole. Here is an explanation of each of the nine domains:

a. Scholastic Competence

This competence is related to the child's cognitive as obtained in school. Therefore, these items are made to see if they can do schoolwork well, be able to find answers, be able to finish school quickly, and whether they feel that they are smart.

b. Social Competence

This subscale is related to the ability of children in social life and reflects in general the characteristics of self that determine success in the social field. Self-characteristics can affect their social competencies such as to know how to make friends like us, accept us, and make us popular and others.

c. Athletic Competence

Athletic competence refers to a person's ability to exercise well, including indoor and outdoor games and other sports skills

d. Physical Appearance

Physical appearance refers to the extent to which a person feels that they have a good physical, happy with their appearance, body, face, and hair, and other things.

e. Work Competence

Work competence refers to the extent to which a teenager feels that he or she has work skills, is prepared for part time work, and feels that they are doing a good job.

f. Romantic Appeal

Romantic appeal refers to the perception of teenagers that they attract someone who they likes romantically, dating with a dream partner, and feel happy when dating.

g. Behavioral Conduct

Behavior refers to the extent to which others like our behavior like doing the right thing, acting like everyone else does and avoiding problems.

h. Close Friendship

Close friendship refers to the ability to make friends into friends who can share personal thoughts and secrets.

i. Global Self-Worth

Global self-worth refers to how we value ourselves or self-esteem directly. Global self-worth is different from the assessment of ability, skill, or characteristic.

Study Method

This research method uses Research and Development (Borg and Gall, 1998). There are three stages: preliminary, development and implementation. Preliminary Stages: (1) preliminary study; development stage: (2) planning, (3) initial production, (4) initial test, (5) major product revision, (6) main field trial, (7) revision of operational product, (8) , (9) final product revision; Implementation Stage: (10) set the model.

Based on the research procedure of Borg and Gall, it was chosen with consideration of conformity with the developed material. The formulation of the procedure is as follows:

1. Model Design

In this research, the model design is as follows from preliminary study, product development and implementation.

2. Testing, Evaluation, dan Model Revision

At this stage, the first model was developed, (2) initial test, (3) major product revision, (4) main field trial, (5) revision of operational product, (6) operational field test, (7) Final product revision.

3. Model Implementation

At this stage tested the effectiveness of model and dissemination model

Variable use in this research is single variable, that is self perception identification at athelete high school student of Ragunan in Jakarta. The operational definition of self-perception is the image containing the judgment tends to be positive or negative, hateful or friendly, satisfied or dissatisfied, self-esteem higher than others, and so forth on oneself.

The population used in this study were students of the Athlete High School of Ragunan, Jakarta. The sample used in this study is saturated sample, that is all 239 students, consisting of teen age between 12-18 years old.

Result and Discussion
Self-Perception Identification

Identification of self perception of Athlete High School Ragunan student at Junior level can be seen in table 1, the following:

Tabel 1. Self-Perception Identification of Junior High School Student

Dimension	Total Score Self-Perception Junior High Student
Scholastic Competence	656
Social Competence	832
Athletic Competence	809
Physical Appearance	810
Romantic Appeal	669
Close Friendship	800
Global Self-Worth	833

Based on table 1, it is known that self-perception of students in Ragunan Athlete High School at junior level at first rank is Social Competence equal to 832, second is Physical Appearance equal to 810, third is Athletic Competence equal to 809, fourth is Nearness equal to 800, fifth is Romantic Drag of 669, the sixth is the Scholastic Competence of 656. While the Total Self Value is 833.

The top three sequences of Ragunan Athlete High School students' competence at junior level are in accordance with the athlete's characteristics,it's Social Competence, Physical Appearance, and Athletic Competency. If illustrated through the graph can be seen in Image 1, the following:
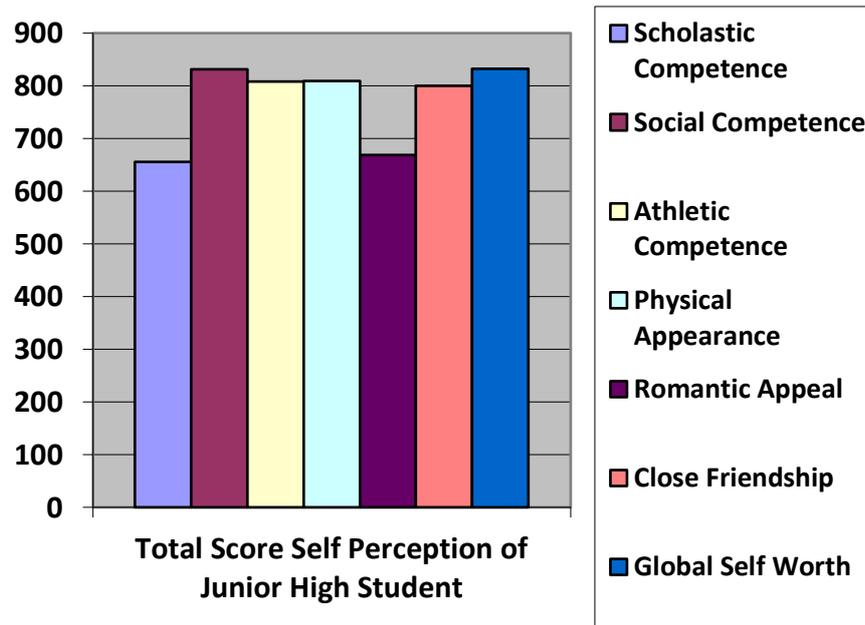
Image 1. Total Score Self Perception of Junior High Student

Identification of self perception of Athlete High School Ragunan student at Senior level can be seen in table 1, the following:

Tabel 2. Self Perception Identification of Senior High School Student

Dimention	Total Score Self-Perception Senior High Student
Scholastic Competence	2185
Social Competence	2683
Athletic Competence	2571
Physical Appearance	2431
Romantic Appeal	2304
Close Friendship	2547
Global Self-Worth	2631

Based on table 2, it is known that the self-perception of students in Athlete High School Ragunan at the senior level in the first rank is Social Competence of 2683, the second is Athletic Competence of 2571, the third is Close Friendship of 2547, the fourth is Physical Appearance of 2431, the fifth is Romantic Appeal of 2304, the sixth is Scholastic Competence of 2185. While the Global Self Worth is 2631.

The top three sequences of Athlete High School Ragunan students' competence at Senior level are Social Competence, Athletic Competence, and Close Friendship. This is slightly different from students at the junior level. Given at the senior high school level,

students spend more time socializing, increase close friends than sports. If illustrated by graphic can be seen in image 2, the following:
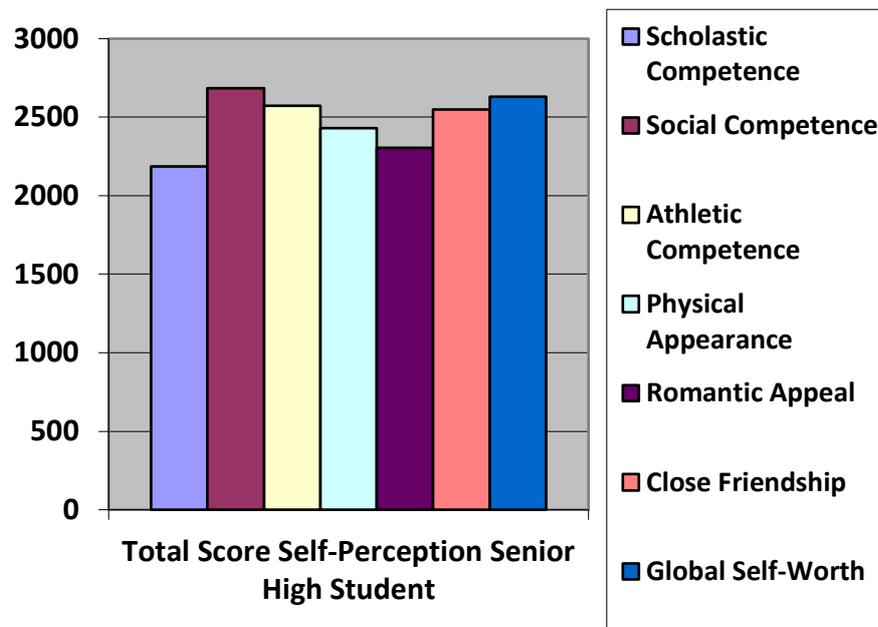
Image 2. Self-Perception Identification of Senior High School Student

Discussion

The results of self-perception identification of Ragunan Athlete High School students at the third highest level of junior high school students' competence are in accordance with the characteristics of athletes, Social Competence, Physical Appearance, and Athletic Competence. While the results of self-perception identification of Ragunan. Athlete High School students at the level of high school ranked third highest is Social Competence, Athletic Competence, and Close Companions. This is slightly different from students at the junior level. Given at the high school level, students spend more time socializing, adding close friends than sports.

Conclusion and Suggestion

Conclusion

Based on the results of research that has been done then it can be concluded Junior High School and Senior High School have different self-perception. Self-perception of Junior High School students are tend to social competence, physical appearance, and athletic competence. While self-perception of Senior High School tends to social competence, athletic competence, and close friendship.

Other than that, identifying self-perception is an important thing because students can understand how they perceived what's their interest and not their interest, so they can optimize their development and achievement in cognitive and sports.

Suggestion

Based on the results of research that has been done things to note include is: 1.Junior self-perception of students who have been in accordance with the characteristics of athletes

should be maintained until adulthood. So when High school perception itself is expected to be stronger to become a professional athlete.

To affect self-perception of high school students who focus more on social relationships and social rather than to the perception as an athlete. It must be searched for in order that in the exercises also pay attention to the social life side of this final teenager, so that does not happen boredom (fatigue) in living athlete profession.

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Measurement of Mental Health Literacy Among Insititut Ilmu Kesehatan Medika Persada Bali Student, A Multi Component Approach

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Abstract

The purpose of this study is to obtain a general and comprehensive picture of MHL level for students at IIK Bali which will be used as documentation and supporting evidence to develop the application for MHL interventions to students and young adults and in the future also for the development of information technology-based mental health counselling services for students of IIK Bali. The study design is a descriptive quantitative research with survey observation method. This study only measures the level of MHL in Bali IIK students, without analysis of causality or other relationships. It was found that, IIK Bali students have Knowledge-Oriented MHL level of 61.19%, Beliefs-Oriented MHL level 36.08% and Resource- Oriented MHL level 55.39% out of 102 respondents. The MHL level in IIK Bali students is still low on average, so there is a need for intervention to improve this MHL level. This research cannot be generalized, because the sample is small, it only involves students of class of 2016-2017 IIK Bali. Then, since this study is self-reporting, it is uncertain whether the study participants can recognize mental disorders others than themselves.

Keywords: *Measurement of Mental Health Literacy, Mental Health Literacy, Questionnaires, Surveys, Students, Young Adults*

Introduction

Mental health literacy (MHL) is first defined as knowledge and beliefs about mental disorders which support recognition, management process or prevention [1]. Then Kutcher et al [2], broadens the scope of the definition of MHL as an understanding of how to obtain and maintain a positive mental health condition; understanding of mental disorders and their care; as well as an understanding of how to reduce the stigma associated with mental disorders and encourage the effectiveness of self-help (help-seeking efficacy). MHL is an important factor in terms of multiple mental health care aspects, including help-seeking process, helping others with mental illness and also the stigma related to mental disorders itself [3,4]. Individuals with high levels of MHL will easily recognize mental disorders and identify the mental health care resources that needed to treat mental disorders while individuals with low MHL levels usually make early termination of his/her mental illness treatment process and tend to use ineffective and tend dangerous coping strategies in overcoming his soul turmoil (example: the abuse of drugs and alcohol). People with high levels of MHL and free from mental disorders can help to provide early intervention in people with mental illness before things going bad (homicide or suicide) [4].

Early intervention is very useful to improve the health services utilization and optimization or the treatment seeking process on mental disorders so that ultimately will

increase the mental disorders healing rate in patients concerned [5] as well as reducing and even preventing mental disorders co-morbidity (like suicide or homicide) [6,7]. Therefore, an effective way to improve MHL is needed in the communities around us in order to help improve understanding the mental disorders risks and to improve understanding of coping methods in people with mental disorders [6].

Research on MHL has gained tremendous attention in many countries [4]. The studies were conducted on various research subjects and approaches. The research from Furnham et al, Pinto-Foltz et al and Coles et al [5,8,9] conduct MHL measurements against students at several universities as well as young adults. As stated in [5,6,10], young adults are an important subject in the mental disorders treatment, since most mental disorders are detected and arise at age of young adults (between 12-24 years). In addition, young adults also can help their colleagues (other young adults) who have a mental disorder (as a peer group support). Peer group support will help the recovery process of people with mental disorders [11,12].

There are various methods of measuring MHL. The most common is case vignette [4], as in the research conducted by Deen and Bridges, Melas et al and Coles et al [9,13,14]. The case vignette method assessed the ability of study participants to identify mental disorders, study participants' beliefs in the need for professional help to overcome mental disorders and assess whether certain care and treatment methods can help them to overcome mental disorders. According to Gabriel and Violato [15], the case vignette method has limitations in terms of scope, so it is insufficient to summarize the extent of the MHL component (as described by Jorm [1,3]). In addition to case vignette, there are other approaches for measuring MHL values, such as survey questionnaires method [5] and multiple choice test methods [16]. However, all of the above methods have not resulted in consistent result of MHL measurement values.

Hyejin Jung et al [4] offers a new MHL measurement instrument in the form of surveys, which are claimed to be more comprehensive and also has a proven validity. Comprehensive, because this MHL measuring instrument based its items on the MHL component according to Jorm, resulting that this measuring instrument has a capability assessing MHL from multiple facets (multi component). In addition, this tool is claimed to be used to measure MHL in lay community people only (non health professionals) and only able to measure MHL at the general level. Just like other methods and measuring instrument, this method has several weaknesses. This is a self-report instrument so it cannot be separated from the social desirability bias, especially when measuring the beliefs level in mental illness. And also, this instrument only measure the participant literacy personally, so it is cannot guaranteed whether participants are also able to recognize mental disorders in others [4].

The Health Sciences Institutes of Medika Persada Bali (IIK Bali) as a health education institution has the vision to become a professional, supreme, cultured and competitive educational institution at national and international level. To realize this vision, one of IIK Bali's mission is to provide education that produces professional health workforces in their respective field. To produce professional health workforce, of course, IIK Bali needs adequate facilities and infrastructure to support the students learning activities. One of the facilities that have been prepared by IIK Bali is the formation of Guidance and Counseling team to serve the students psychological consultation needs who studied at IIK Bali. With this consultation service, IIK Bali students are expected can undergo a comfortable education process so that eventually will pass and succeed becoming a professional health workforce. MHL measurements on IIK Bali students, is expected to be the initial reference to know the psychological potential of IIK Bali students so that later will help the Guidance and Counseling team providing the best service for IIK Bali students.

Methods
Mental Health Literacy Measurement Instrument

The type and design of this research is descriptive quantitative research with survey observation method. This study only measures the level of MHL in IIK-Bali students, without seeking cause-effect relationships. Data collected through questionnaire of which is primary data i.e. data obtained directly at the first source. The questionnaire used is a questionnaire developed by Jung et al in [4] consisting of 26 items of questions with a response of a 5-point Likert scale.

Data Source and Sample
Sample

Selection of sample using purposive sampling technique that is sampling technique based on certain purpose and intention [17]. Inclusion criteria are all 2016/2017 students at IIK Bali, aged 18-24 years in February 2017. While the exclusion criteria are students IIK Bali aged over 24 years in February 2017.

Procedure

Data collection is conducted by spreading questionnaires directly to the students to be filled and then collected the results for analysis.

Data Analysis

The questionnaire used in this study consisted of 3 factor models that are translated into 26 items. The response format is Likert scale 5 points (strongly disagree, disagree, neutral, agree, strongly agree) with additional option 'I do not know'. For the purposes of data analysis, each response was grouped into 2 categories, for study participants who answered "strongly agree" and "agreed" were considered to have MHL that could potentially facilitate the use of mental health services (code 1) while study participants who answered "strongly disagree "," Disagree "," neutral "and" do not know "are considered not to have a good enough level of MHL. For the last 4 items that measure specific knowledge about mental health resources, it is categorized as "yes (code 1)" and "no (code 0)". The statistical analysis to be used is descriptive statistic method, among others, by calculating the frequency of distribution and percentage of each survey item and the MHL group (knowledge, belief and resource oriented MHL).

Research Subject Characteristic

Table 1. Characteristic of Research Subject

		Mean (M)		Range
1	Age (tahun)	18.91		
	Total	102		**18 -21**
		Frequency (n)	**%**	
	Gender			
	Male	34	33.33	
	Female	68	66.67	
	Total	102	100	
	Race			
	Balinese	96	94.12	
	Javanese	1	0.98	
	Without Explanation	2	1.96	
	Others	3	2.94	
	Total	102	100	
	Mental Health Treatment Exposure			
	Yes	32	31.37	

No	63	61.76	
Without Explanation	7	6.86	
Total	102	100	

Note. Mental health treatment exposure indicates a history of mental health treatment for self or family members

Results and Discussion

The MHL questionnaire items from Jung et al [4] are divided into 3 MHL groups, namely knowledge-oriented MHL, beliefs-oriented MHL and resource-oriented MHL. Each group, will be calculated the respondents' frequency who answered with code 1 (strongly agree, agree). Code 1 is a marker that respondents have a high MHL.

a. Knowledge-oriented MHL

Table 2. Knowledge-oriented MHL

	Question Item	Frequency* (n total=102)	%
	Counselling is a helpful treatment for depression.	91	89.22
	A person with schizophrenia may see things that are not really there	45	44.12
	Early diagnosis of a mental illness can improve chances of getting better	91	89.22
	Attending peer support groups helps recovery from mental illness	83	81.37
	Unexplained physical pain or fatigue can be a sign of depression	52	50.98
	Cognitive behavioural therapy can change the way a person thinks and reacts to stress.	61	59.80
	A person with bipolar disorder may show a dramatic change in mood.	59	57.84
	Taking prescribed medications for mental illness is effective	31	30.39
	When a person stops taking care of his or her appearance, it may be a sign of depression.	32	31.37
	Drinking alcohol makes symptoms of mental illness worse.	58	56.86
	A person with mental illness can receive treatment in a community setting.	62	60.78
	A person with anxiety disorders has excessive anxiousness or fear	84	82.35
	Mean	**62.42**	**61.19%**

Note:

a. * Frequency of response coded 1 (nominal data type)

b. Code 1: is a response that is categorized as having a high MHL

The data above tells that is 61.19% respondent have enough knowledge about mental health. It is said in [3,4] that the level of knowledge will greatly affect the rate of healing of mental illness. Individuals with high levels of MHL will easily recognize mental disorders and identify the mental health care resources that needed to treat mental disorders [3].

b. Beliefs-oriented MHL

Table 3. Beliefs-oriented MHL

Question Item	Frequency* (n total=102)	%
A highly religious/spiritual person does not develop mental illnesses.	35	34.31
Depression is a sign of personal weakness.	53	51.96
Mental illness is a short-term disorder	18	17.65
Recovery from mental illness is mostly dependent on chance or fate	17	16.67
A person with depression should not be asked if he or she has thoughts of suicide	51	50.00
Poor parenting causes schizophrenia	39	38.24
Mental illness will improve with time, even without treatment	24	23.53
Recovering from a mental illness is the same as being cured	53	51.96
A person can stop hoarding whenever he/she wants to	58	56.86
A person with depression will get better on his or her own without treatment.	20	19.61
Mean	**36.80**	**36.08**

Note:

a. * Frequency of response coded 1 (nominal data type)

b. Code 1: is a response that is categorized as having a high MHL

Based on the data above, only 36.08% of respondents have a high value of beliefs about mental health. Levels of beliefs are associated with causal attributes of mental disorders and may also affect the search process of mental health treatment services [18]. According to [19], low levels of beliefs contribute to the low success of mental disorder treatment among young adults.

Possible MHL interventions can be focused on improving the level of student beliefs through several methods, including inserting in the curriculum as in the study [14], which inserts knowledge of mental health in the secondary school curriculum in Sweden. Intervention through information technology especially internet media and certain software applications also seems promising. This is because young adults (students) are very active users of IT devices. One example of the application of information technology in the improvement of MHL is [20], where the authors create a website with e-learning base.

The result, there is an increase in aspects of knowledge and decreased mental health-related stigma in the users of this e-learning website. Increased knowledge and decreased stigma will lead to a positive prognosis in the treatment of mental disorders [3,4,20,21]. The level of MHL IIK Bali students, it is similar when compared with MHL from other countries. In Sweden, [14] perform measurements of MHL in young adults. The result turned out, young adults in Sweden, also has a low level of MHL, especially in terms of beliefs and stigma [14].

c. Resource-oriented MHL

Table 4. Resource-oriented MHL

Question Item	Frequency* (n total=102)	%
I know where to go to receive mental health services	68	66.67
I know how to get the number of a suicide prevention hotline.	38	37.25
I know where to get useful information about mental illness	62	60.78
I know how to contact a mental health clinic in my area.	52	56.86
Mean	**56.50**	**55.39**

Note:

a. * Frequency of response coded 1 (nominal data type)

b. Code 1: is a response that is categorized as having a high MHL

The data above tells that, 55.39 respondent have good knowledge about how to do self help and seek mental health knowledge resources. Good knowledge about how to do self help and seek mental health resources, is a good and positive predictors for recovery from mental health disorder [22] This research cannot be generalized, because the sample is small, it only involves regular students of class of 2016-2017 IIK Bali only. This study includes a response option "don't know." The rationale for adding "don't know" to the five-point Likert scale was to reduce bias from forcing study participants to answer items that they cannot respond to because of a lack of knowledge [23]. Then, since this study is self-reporting, it is not certain whether the study participants can recognize mental disorders in others other than themselves.

Conclusion
Based on the experience gained during this research process, the we conclude that MHL levels of IIK Bali students are on average still low (similar to experience [14] on young adult MHL in Sweden), so interventions are vital for increase this MHL. Moreover, most cases of mental health disorders begin in young adulthood [5,6,10].

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The Factors Influenced the Hand Hygiene of Health Care Provider at Inpatient Areas

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Abstract

Failure to perform good hand hygiene is considered as an major cause of HAIs. From the WHO data, compliance rate of nurses hand hygiene activity at the United States is about 50%, Australia 65% while in Indonesia 47%. This study aims to determine the factors that affect hand hygiene compliance. This research method is analytical descriptive with cross-sectional approach. The object of data collection is an health officer (consultant doctors, resident doctors and nurses) at PMN Hospital RS Cicendo Bandung as many as 61 samples. Sample selection using stratified sampling method with research instrument in the form of questionnaire and observation sheet about knowledge and attitude to hand hygiene adopted from WHO. The results of this study that obtained in the group of nurse were 63,16% doing imperfect hand hygiene and group of consultant consultant and doctor of resident respectively 47,06%. In terms of nurses knowledge about hand hygiene is 42.11%, consultant physician 52.94% and 48.00% resident doctors are included into either category. In terms of attitudes about the implementation of hand hygiene, the nurses group is 70.59% while physician consultants and resident doctors respectively 47.06% and 44.00% have a positive attitude. In terms of facilities is 89.47% nurses stated available, where as consultant physicians and resident doctors amounted to 82.35% and 84.00%. There was a significant relationship between hand hygiene with knowledge ($p = 0,02$) and hand hygiene facility ($p = 0,000$). From these findings the hospital needs to improve knowledge and positive attitude in terms of hand hygiene.

Keywords: Attitude, Hand Hygiene, Health Care, Knowledge

Introduction

Healthcare associated Infections (HAIs) has been an health problem worldwide. HAIs can cause serious illness, increase hospitalization day, reducing hospital image or health services, also may result in lawsuits [1]. The incidence of HAIs in the United States in 2011 was recorded at 721,800 incidents. While the British health agency noted that there are more than 4 million European citizens affected by HAIs and about 37,000 people died from the infection [2].

The role of all parties is certainly needed in overcoming this HAIs problem, including nurses, doctors and college students. Quality of service by health personnel can be measured by using clinical quality indicators, one of which is the implementation of care that ensures patient safety, one of which compliance with hand hygiene [3].

Failure to perform proper hand hygiene is regarded as the leading cause of nosocomial infections (HAIs) and the spread of multi-resistant microorganisms in health facilities and has been recognized as an important contributor to the outbreak [4].

Implementation of hand hygiene itself has not received serious attention in various hospitals in Indonesia, failure in the implementation of hand washing is triggered by the limitations of hand hygiene facilities, such as sinks, paper towels, hand dryers and antiseptic fluids. But when there are facilities, the next obstacle is the lack of awareness of health workers to perform hand hygiene procedures. It is a challenge for hospital infection control teams to promote hand hygiene programs. As per the WHO guidelines, the Ministry of Health establishes the principle of "six step" handwashing and "five moments" [1].

The level of nurse compliance in hand hygiene in the United States is about 50% and in Australia it is still around 65%. Nationally, hand hygiene compliance rate was 47% [5] while hand hygiene compliance rate at National Eye Center (NEC) of Cicendo Bandung Eye Hospital compliance of health officer was only about 70.35% in April 2017. [6]

The findings at Cicendo Eye Hospital in the implementation of hygiene compliance of health personnel hand were not maximized. Implementation figures of hand hygiene each month has not reached 100% of the target. Compliance rate of hand hygiene at consultant physician equal to 69,78% while resident doctor equal to 61,28% and nurse compliance rate in carrying out hand cleanliness equal to 79,99%. [6]

Methodology

The type of research used is quantitative research. The research design used is analytical descriptive research with cross-sectional approach. The population studied were nurses, specialist doctors and students who served in National Eye Center (NEC) of Cicendo Bandung Eye Hospital that as many as 155 health workers scattered in 4 inpatient rooms. The sample calculation using Slovin formula with standard error of 10% to get 61 sample consisting of 19 nurses, 25 doctor resident and 17 consultant doctors. Sampling technique using *stratified random sampling* method.

This study used a questionnaire from WHO [6] to determine the level of knowledge and attitudes of health officers on compliance of hand hygiene and observation sheet to assess the implementation of hand hygiene and hand hygiene facilities availability using the principles of 5 true and 6 moment. Analysis of univariate data will get the result of frequency distribution of knowledge, attitude and availability of handwashing facilities for health officer. Bivariate test is then done by connecting the three factors with the implementation of hand hygiene by using statistical test *Kolmogorov - Smirnov*.

Results

From Table 1 it is known that the highest knowledge percentage for good category is consultant physician (52,94%), for the highest enough category is nurse (57,89%) and for category less 0%. The percentage of positive attitude for the highest hand hiegine is nurse (70,59%) while the highest negative attitude percentage is resident doctor (56%). While the availability of facilities hiegine hand that argue not available complete the highest percentage is a consultant doctor (17.65%). While the opinion that facilities hiegiene hand available with the highest complete is nurse (89,47%).

Table 1. Frequency distribution of knowledge level, attitude and availability of hand hygiene hand hygiene facility for hand hygiene

Factors affecting hand hygiene	Category	Group					
		Nurse		Consultant Doctor		Residen Doctor	
		n	%	n	%	n	%
Knowledge	Less	0	0,00	0	0,00	0	0,00
	Enough	11	57,89	8	47,06	13	52,00
	Good	8	42,11	9	52,94	12	48,00
Attitude	Negative	7	36,84	9	52,94	14	56,00
	Positive	12	63,16	8	47,06	11	44,00
Hand hygiene facilities	Not available	2	10,53	3	17,65	4	16,00
	Available	17	89,47	14	82,35	21	84,00

Table 2   Relation of knowledge level, attitude and hand hygiene facility of health officer about hand hygiene with hand hygiene implementation at inpatient installation of Cicendo Eye Hospital

Factors affecting hand hygiene	Category	Hand Hygiene Execution						P value
		Not executing		Execute		Executing perfectly		
		n	%	n	%	n	%	
Knowledge	Less	0	0	10	16,40	0	0	
	Enough	0	0	22	36,06	19	31,14	0,02
	Good	0	0	0	0	10	16,40	
Attitude	Negative	8	13,12	18	29,50	4	6,56	1,000
	Positive	2	3,28	23	37,70	6	9,84	
Hand hygiene facilities	Not available	9	14,76	1	1,64	0	0	0,000
	Available	1	1,64	41	67,22	10	16,40	

From Table 2, it is known that there is a relationship between knowledge and hand hygiene facilities with hand hygiene practices with p-value values of 0.02 and 0.000. As for the attitude there is no relationship with the implementation of hand hygiene (p-value 1,000).

Discussion

4.1   Description of the level of knowledge about hand hygiene with hand hygiene excecution

From the research result, the level of knowledge of health officer shows that the highest level of knowledge of the consultant doctor is the knowledge with good category that is 52,94%, the resident doctor with the highest percentage is knowledge with enough category that is 52%. While the nurse with the highest percentage with sufficient category that is a number of 57,89%.

Education is an attempt to develop personality and abilities in and out of school and lasts a lifetime. Education affects the learning process, the higher a person's education the easier the person is to receive information [8]. With higher education then someone will tend to get information, either from other people or from mass media. The more information that attained, the more knowledge gained about health. [9]

4.2   Description of the attitude about hand hygiene with hand hygiene

The results showed that the attitude of the group of nurse respondents with the highest percentage was the positive attitude that is 70.59%, the highest percentage of the respondents were the negative attitude of 52.94%, and the respondent group with the highest percentage was negative attitude, 56 %. In general, the majority of consultant doctors and resident doctors show a negative attitude towards hand hygiene.

Specific beliefs and perceptions are found in a doctor who has an impact on the lack of adherence to best practice. While other health workers consider doctors as role models, doctors often do not see themselves as such. In addition, doctors appear to be more skeptical than other professionals about hand hygiene practices. [4]

The behavior of a person or society about health is determined by knowledge, attitudes, beliefs, traditions, etc. from the person or society concerned. In addition, the availability of facilities, attitudes, and behavior of health workers to health will also support and strengthen the formation of behavior. [8]
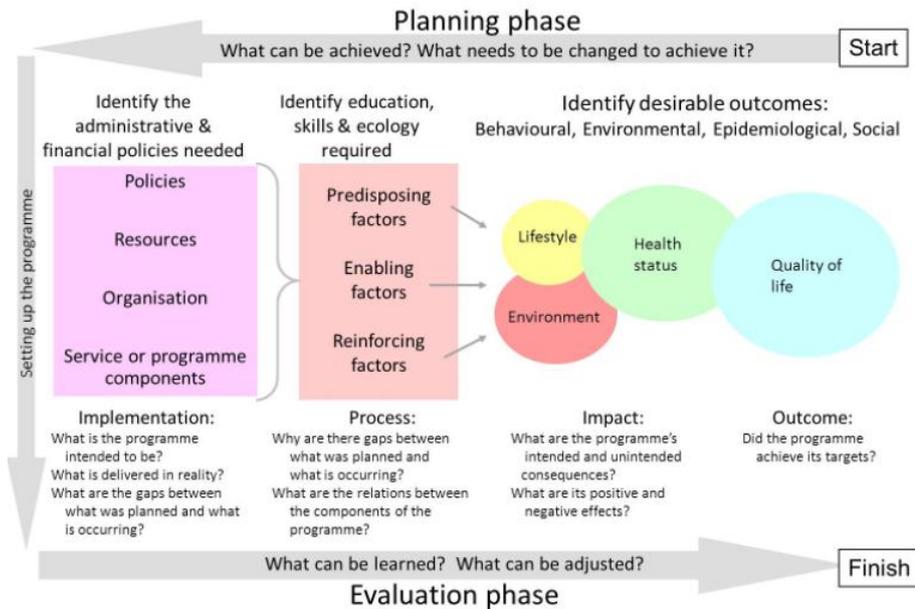
Picture 1 :The Factors tha Affects Human Behavior [10]

4.3 Description of supporting facilities for hand hygiene implementation

The results of this study indicate that each group of respondents has the availability of hand hygiene support facilities with each percentage of nurse respondents group of 89.47%, respondent group consultant doctor 82.35%, and respondent group of resident doctors amounted to 84%. Standard of hygiene facilities with water and soap is the available of sinks, soap, tissues, standard operational procedures on hand hygiene (posters). [11]

4.4 Relation of health personnel knowledge level about hand hygiene with hand hygiene implementation

The result of the research shows that there is a correlation between the level of knowledge with the implementation of hand hygiene on health officer with p value 0,02. The results of this study are in line with the Green Precede Model theory in Notoatmodjo [10] that a person's or society's behavior on health is determined by knowledge, attitudes, beliefs, traditions, etc. from the person or society concerned. The higher the level of a person's understanding of the instruction will be the more obedient someone runs the instruction. [12]

Based on the interview data to the respondents, it is known that for hand hygiene with 5 steps and 6 moments have been socialized by the quality team Hospital to every health worker. Ranging from the ways, impacts, benefits of handwashing for patients, patients' families and health workers. Each shift operands are also always reminded of hand hygiene so that the knowledge of health workers is good. Therefore the incidence of nosocomial infections can also be suppressed because all already understand the benefits of maintaining hand hygiene. [17] [18]

4.5 Relationship of health personnel attitude about hand hygiene with hand hygiene implementation

The results showed no relationship between attitude with the implementation of hand hygiene on health workers with p value 1.00. Attitude is a readiness or willingness to act and

not an exercise of a particular motive. Attitudes are not yet an action (open reaction) or activity, but are predisposing behaviors (actions), or closed reactions. [13] Attitudes are still a closed response to a stimulus, so sometimes the responses received do not match the activities performed by the respondents. [14]

4.6 Relation of hand hygiene facility availability with hand hygiene implementation

Result of research indicate there is relation between availability of hand hygiene facility with hand hygiene implementation to health officer with value p value 0,00. Availability of hand hygiene facilities will improve compliance in hand hygiene practices. Limited access to the sink affects the decrease of compliance in hand washing with water and soap. [15]

This is in line with the reality in the field. Health officials say that if the hygiene facilities are complete, then they will do hand washing. This is because health workers are aware that maintaining hand hygiene can protect them from transmission of infection. They want always available tissue or hand dryers. [16]

Conclusion

a. The level of knowledge of the majority nurses in the enough category amounted to 57.89%, consultant doctor with good category amounted to 52.94%, and resident doctors with enough category amounted to 52%.
b. The attitude of nurse with positive attitude category is 70,59%, majority consultant doctor with negative attitude is 52,94%, and doctor resident with negative attitude category that is 56%.
c. Hand hygiene facilities of each group said available with percentage of nurses 89.47%, consultant doctors amounted to 82.35%, and resident doctors amounted to 84%.
d. There is relationship between knowledge and implementation of hand hygiene on health officer with p value 0,02.
e. There is no correlation between attitude with hand hygiene to health officer with p value 1,000.
f. There is a relationship between the availability of facilities with the implementation of hand hygiene to health workers at Inpatient Installation at National Eye Center (NEC) of Cicendo Bandung Eye Hospital with p value 0,00.

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The Micro-Computed Tomography Study of Bone Loss in A Rat Chronic Periodontitis Model

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Abstract

Chronic periodontitis is characterized by bone loss. The bone destruction referred to the severity of the disease which would also determine whether the disease is reversible or irreversible. This analytic observational study was conducted to evaluate the bone loss in a rat chronic periodontitis model using the micro- computed tomography (micro-CT). In this study, the chronic periodontitis model was a rat induced by *Porphyromonas gingivalis,* where male rats were infected by live-*Porphyromonas gingivalis* at concentration of 2×10^9 cells/ml into subgingival sulcus area between the left first and second mandibular molar three times a week. After 2, 3 and 4 weeks, the rats were sacrificed and the micro-CT examination was conducted to demonstrate three dimensional morphology images of bone and to examine the bone destruction, including the alveolar bone height loss (AHL), bone volume density (BV/TV), trabecular thickness (Tb.Th), trabecular number (Tb.N) and trabecular separation (Tb.Sp). The results indicated that *Porphyromonas gingivalis* has induced bone destruction in chronic periodontitis. Three dimensional images from micro-CT scans showed that there was a reduced of alveolar bone height and decreased of bone volume and mineral density in the periodontitis groups compared with the control group. In conclusion, the micro-CT can provide precise images and quantitative measurements in periodontal bone loss of chronic periodontitis model.

Keywords: chronic periodontitis, micro-computed tomography, bone loss, bone volume, trabecular structure

Introduction

Chronic periodontitis, the most prevalent form of periodontitis, is a chronic infectious disease resulting in inflammation within the supporting tissues of the teeth, progressive attachment loss, and bone loss[1]. This disease is often silent, being present for decades before diagnosis and treatment. Chronic periodontitis affects most of the world's population which is more prevalent and occurred mostly in adult and became the second primary of oral disease after dental caries. Chronic periodontitis is a major public health because it can cause tooth

loss, masticatory dysfunction and poor nutritional status[2]. It was postulated that chronic periodontitis participated in the development or progression of systemic disease. There is evidence that periodontitis is associated with increased risk of cardiovascular disease, diabetes mellitus, respiratory disease, low birth weight and osteoporosis[3]. It has been reported that certain anaerobic Gram-negative microorganism from subgingival biota are aetiological factor of the chronic periodontitis. *Porphyromonas gingivalis* (*P. gingivalis*) has been identified as one of the major periodontal pathogens of chronic periodontitis. The virulence factors of these bacteria can contribute to extracellular matrix destruction and modulate inflammatory and immune responses resulting in deeper tissue destruction and bone resorption[4]

In the chronic periodontitis, changes that occur in bone were crucial, because the destruction of bone is responsible for tooth loss. The bone destruction referred to the severity of the disease which would define if the disease is reversible or irreversible. An understanding of bone destruction is essential for effective diagnosis and treatment of chronic periodontitis. Several methods are available to measure bone loss in periodontitis, including morphometric, radiologic and histologic techniques. However, these methods provide only linear or two dimensional (2D) information because they measure horizontal bone loss; they do not yield data about the three dimensional (3D) intrabony changes that occur during periodontal infection[5].

With the recent advancement in imaging instruments technology, micro-computed tomography (micro-CT) has been widely used to evaluate the morphology of porous materials such as bone. Micro- CT is an imaging technique that enables the non-destructive visualization and assessment of three- dimensional structural properties of objects at a micron scale. Three dimensional micro-CT scanning procedure have been proposed as an alternative approach to evaluate and quantify bone. micro-CT has become standard practice in rodent studies examining bone structure because of its power to visualize and quantify the three-dimensional structure of trabecular and cortical bone compartments[6]. This study was aimed to evaluate the microstructure and measure the bone loss quantitatively in a rat chronic periodontitis model using the micro-computed tomography (micro-CT).

Method
Chronic Periodontitis Model
Chronic periodontitis model was a Wistar-strain of *Rattus novergicus* induced by *Porphyromonas gingivalis*.Three-four-month-old male rats (*n* = 24), 200-250 g in weigh, were randomly divided into two equal groups, periodontitis and control group. The periodontitis group was injected by 0.05 ml live-*Porphyromonas gingivalis* ATCC 33277 (MediMark, France) at concentration of 2×10^9 cells/ml into subgingival sulcus area between the left first and second mandibular molar three times a week. The control group was injected by normal saline as periodontitis group protocol. Four rats in each group were sacrificed on 2, 3 and 4 weeks following injection. The mandibular specimens were harvested and fixed in normal buffer formalin. Ten specimens, 7 specimens from periodontitis group and 3 specimens from control group, were selected randomly for micro-CT examination. All procedure were performed under protocol approved by Committee Ethical of Faculty of Dentistry, Airlangga University (Ethical Clearance Certificate Number 017/HRECC.FODM/II/2017).
Micro-CT Analysis
Three-dimensional tomography analysis of the mandibular specimens were performed using Bruker SkyScan 1173 (Bruker micro-CT, Kontich-Belgium; installed in the Micro-CT Lab.

Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung). This device has a main feature of having an x-ray energy source ranges from 40 kV to 130 kV which is suitable for the study. The device generates 3-D digital image of a sample on the basis of x-ray attenuation. The device mainly consists of an x-ray source, a rotating object holder, and a flat panel detector. The scanning parameters for this study are listed in Table 1.

Table 1. Scanning parameters for the rat mandible.

Parameter	Value
energy [kV]	
65 current [µA]	
123 exposure time [ms]	
750 filter type	
- rotation step	
0.2 camera binning	
1×1	
dimension of projection image	2240×2240
raw image resolution [µm/pixel]	
12.11 frame averaging	
10	

A series of raw-projection images was generated from the scanning process in 16-bit TIFF format. Reconstruction of the projection images using NRecon software (based on the Feldkamp backprojection algorithm) was then performed to generate the 3D structural map of the sample as 8-bit bitmap format images. Some artefacts can be compensated prior to the reconstruction process to enhance the quality of the image. From the reconstruction process, a greyscale 3-D image is produced in the form of trans-axial 2-D images (sliced along the z axis, or x-y plane). Denser part of the sample can be identified as the bright regions, while lower density is indicated by darker areas.

The device comes with several software package. DataViewerallows for qualitative analyses to be done mainly by visual inspection of 2-D images in three possible slicing directions as well as ortho- slice. Basic image processing such as contrast and window-level adjustment, image rotation, color- coding, simple VOI selection can also be done using DataViewer. For the subsequent analysis, the scanned images of the rat mandible were rotated accordingly to obtain suitable 3-D positioning of the sub-volumes. The sub-volumes were generated by selecting the mesial aspect of first molar until distal aspect of second molar and below of root apex as the vertical borders of the Region of Interest (ROI).

Subsequent to generating the suitable sub-volumes, the tooth were removed from the reconstructed images after the image segmentation (thresholding). Image segmentation process produced binary (black and white) image of the sample where the structure is distinguished as solid and void only. After the binarizing process and tooth removal, the process is followed by shrink- wrapping the bone structure to obtain a more precise ROI.

Morphometric measurement of these sub-volumes were done afterwards. The measurements includes determining the alveolar bone height loss (AHL), bone volume density (BV/TV), trabecular thickness (Tb.Th), trabecular number (Tb.N) and trabecular separation (Tb.Sp). The alveolar bone height loss (AHL) was measured as the distance from alveolar bone crest to cemento-enamel junction (CEJ) along mesial, middle and distal root of first and second molar.

Result

Three dimensional images from micro-CT scans showed a decrease in alveolar bone height of the periodontitis groups compared with the control group, mostly in root of first molar. The largest decrease was in the periodontitis group 4 weeks which affected the root of both first and second molar (Figure 1). The periodontitis group 4 weeks also showed the highest value of AHL (Table 2).
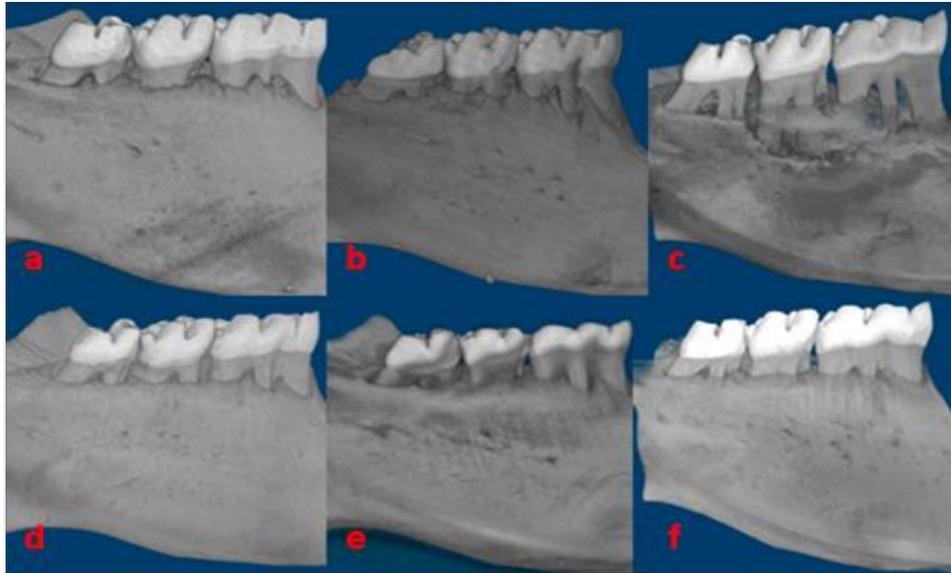
Figure 1. The micro-CT scan images of mandibular rat chronic periodontitis model (a) after injection *P. gingivalis* for 2 weeks, (b) after injection *P. gingivalis* for 3 weeks, (c) after injection *P. gingivalis* for 4 weeks, (d) control group 2 weeks (e) control group 3 weeks (f) control group 4 weeks.

Table 2. The Alveolar bone High Loss of Periodontitis Group

	First Molar			Second Molar		
	2 Weeks	3 Weeks	4 Weeks	2 Weeks	3 Weeks	4 Weeks
Mesial (mm)	1.365	1.317	1.684	0.501	0.714	0.696
Midline (mm)	1.055	1.344	1.339	0.515	0.485	0.587
Distal (mm)	0.6	0.828	0.885	0.566	0.477	0.528

The volumetric parameters for multiple bone loss of periodontitis and control group was performed in volume of interest described in Figure 2. The morphometric examined were bone volume density (BV/TV), trabecular thickness (Tb.Th), trabecular number (Tb.N) and trabecular separation (Tb.Sp) which presented in Table 3. Lower bone volume density (BV/TV) was found in periodontitis group 4 weeks compared with other periodontitis groups and control groups. The periodontitis group 4 weeks also showed lower value of Tb.Th and Tb.Sp but had higher value of Tb.N.

Table 3. The bone volume and mineral density of mandibular rat chronic periodontitis model

	2 Weeks		3 Weeks		4 Weeks	
	Control group (n=1)	Periodontitis group (n=2)	Control group (n=1)	Periodontitis group (n=2)	Control group (n=1)	Periodontitis group (n=3)
BV/TV (%)	64.506	65.668	66.168	71.655	73.490	56.775
Tb.Th (mm)	0.357	0.334	0.366	0.382	0.323	0.292
Tb.N (1/mm)	1.804	1.966	1.806	1.899	2.274	2.405
Tb.Sp (mm)	0.313	0.288	0.325	0.288	0.232	0.223
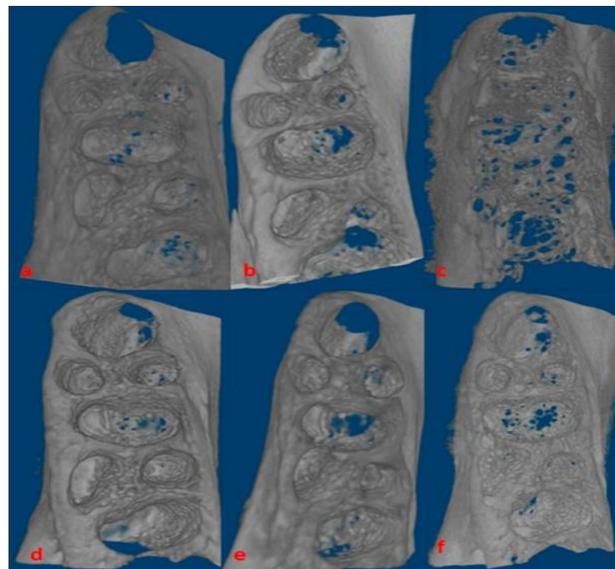
Figure 2. Bone microarchitecture of the volume of interest for morphometric parameter in mandibular rat chronic periodontitis model (a) after injection *P. gingivalis* for 2 weeks, (b) after injection *P. gingivalis* for 3 weeks, (c) after injection *P. gingivalis* for 4 weeks, (d) control group 2 weeks (e) control group 3 weeks (f) control group 4 weeks

Discussion

Chronic periodontitis was characterized by alveolar bone loss. An understanding of bone destruction is essential for effective diagnosis and treatment of chronic periodontitis. In this study, the micro-CT examination was conducted to demonstrate three dimensional morphology images of bone and to analyze the bone destruction in a rat chronic periodontitis model induced by P. gingivalis. Rats are often used in models of experimental periodontitis because the structure of the dental gingival area and periodontal anatomy in the molar region is quite similar to that observed in humans[7].The most commonly-used strains are Wistar or the Spraque-Dawley[8]. Different methods have been presented in the literature for rat periodontitis models, such as placement silk or ligature and inoculation or injection of periodontal pathogens or LPS[8,9]. In rats, periodontitis appears to be an infectious process. Inoculations or injections of various periodontal pathogens such as Porphyromonas gingivalis, Aggregatibacter actinomycetemcomitans or Fusobacterium nucleatum, can induce periodontal lesions. After infection, the destruction of the periodontal tissue occurs quite rapidly[8].

P. gingivalis is the mayor periodontal pathogens of chronic periodontitis. About 40–100% of adult periodontitis patients have been infected with these opportunistic bacteria. P. gingivalis has virulence factors that contribute to its survival in the oral environment, such as fimbriae, gingipains, lipopolysaccharides (LPS), capsule, and hemagglutinins[10]. These components of P. gingivalis can act upon osteoblasts to inhibit alveolar bone formation. P. gingivalis LPS, lipids, and metabolic products can inhibit the differentiation and osteogenesis of osteoblasts, and modulate RANKL (receptor activator of nuclear factor-kappaB ligand) and/or OPG (osteoprotegerin) expression in osteoblasts to stimulate osteoclastogenesis resulting in bone loss[11].

Our micro-CT study showed that there was a decrease in alveolar bone height of the periodontitis groups compared with the control group. From the images of micro-CT, the AHL is mostly seen in root of first molar (Figure 1).The result of this study similar to Han et al[12] and Zhang et al[13] study that found P. gingivalis infection result in increased bone resorption. In rat study, alveolar bone loss has been induced by the injection of P. gingivalis. There is clear evidence from the literature demonstrating horizontal bone loss in rats infected with Actinobacillus actinomycetemcomitans or P. gingivalis[7]. In many reports, alveolar bone loss can be detected as early as 2 weeks after the final oral challenge with bacteria or 3 weeks after initiating infection[9]. In this study, the mild AHL was showed in periodontitis group 2 weeks and more severe in group 3 weeks and group 4 weeks. The periodontitis group 4 weeks in this study showed the highest value of AHL which affected the root of both first and second molar (Table 1). In a research conducted by Han et al[12], total distance from cementoenamel junction to alveolar bone crest at day 7 and day 14 after P.gingivalis infection for 4 days did not differ from that untreated rats. However, a significant increase in total distance from cementoenamel junction to alveolar bone crest was observed on days 28. This increase is in parallel with the increased of sRANKL concentration in the gingiva of P. gingivalis- infected rat[12].

Our micro-CT study also demonstrates the decreased of bone volume and mineral density in periodontitis group. Lower bone volume density (BV/TV) was found in periodontitis group 4 weeks compared with other periodontitis groups and control groups. The periodontitis group 4 weeks also showed lower value of Tb.Th and Tb.Sp but had higher value of Tb.N. This study has shown that the bone loss in chronic periodontitis is not only the reduction of alveolar height, but also affect the bone density. This was paralel with a clinical study by Tonguc et al[13] that had found the mandibular bone mineral density of the subjects with periodontitis was significantly lower than that of the periodontally healthy subjects. Animal study conducted by Zhang et al[14] found that their micro-CT study had demonstrated significantly decreased residual alveolar bone volume and mineral density in the P. gingivalis-infected animals compared with the sham infected controls. There were significant negative correlations between the mandibular bone mineral density values and parameters related to the amount of periodontal destruction.

This study can determine the bone loss in chronic periodontitis by micro-CT examination, including the reducing bone height, alveolar bone volume and mineral density that cannot be determined by conventional radiographic examination. Dental radiographic examination can determine reducing bone height only as morphological alteration of the bone in two-dimensional (2D) images[5]. Alveolar bone, the supporting structure of tooth, is characterized by high porosity and heterogeneity, and the complexity of surrounding anatomical structures (i.e. tooth root, cementum, periodontal ligament) may cause difficulty in radiographic quantification. With the advancement of periodontal disease, alveolar bone

destruction takes place by degrading bone matrix to release the calcium minerals, and may significantly alter the mineral density of the bone15.

The micro-CT has become standard practice in rodent studies examining bone structure because of its power to visualize and quantify the three-dimensional structure of trabecular and cortical bone compartments[6]. Micro-CT can achieve more precise volumetric measurements in periodontal bone destruction than repair groups 16. Because of the limitation data used in this study, the value of bone volume and mineral density cannot be analyzed statistically. However, the decreased of bone volume and mineral density in periodontitis group can be showed in micro-CT images in Figure 2 that visualize the porosity of the bone. With that reason, the higher bone volume density (BV/TV) found in periodontitis group 3 weeks cannot be explained. A large sample will needed to explore the fact actually.

With a limitation of this study, we showed that the micro-CT can provide precise images and quantitative measurements in periodontal bone loss. The bone destruction in chronic periodontitis, not only the alveolar bone resorption but also the bone geometry, bone mineral density and porosity and profile of the trabecular structure, can be determined using the micro-CT in this study. The information of tissue-level mineralization can be advantageous for understanding the biomechanical properties, aethology and diagnosis of bone-associated disease and the therapeutic effect of ex vivo and in vivo[15]. This imaging technology has also become customary because of its increasing accessibility within the bone research community, allowing for the investigation of a wide range of interventions, including drugs, diet, exercise, mechanical loading or unloading, on bone structure and morphometry[6].

Conclusion

Reduced alveolar bone height and decreased of bone volume as well as mineral density in the chronic periodontitis induced by P.gingivalis were significantly observed using micro-CT scan method. The micro-CT can provide precise images and quantitative measurements in periodontal bone loss of chronic periodontitis model.

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Map of *Aedes aegypti* Vector Resistance in Central Java

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Abstract

Dengue Hemorrhagic Fever (DHF) is the most health problem in Indonesia. Vector control by using chemical insecticide (fogging) still used. Continuous and excessive use of insecticides causes *Ae.aegypti* to be resistant to certain insecticides. This study aimed to mapping resistance *Ae. aegypti* to insecticide that used in health program. Sample take in 13 District at 2013 and 2014.100 houses in 3 villages that endemic DHF at every district/city. Mosquitoes from vorious stage than rearing to get F1 and F2 to use in Succeptibility test for Malathion 0,8 %, Permethrin 0,25 %, Cypermethrin 0,05 % and biochemis test to measuring activity of enzym esterase. Result showed that House Index and Container Index in middle and high category for DHF risk transmission. *Ae.aegypti* resistance status in Central Java is almost all resistant to Malathion 0.8%, Permethrin 0.25% and Cypermethrin 0.05%, proved high esterase activity in *Ae.aegypti* mosquitoes. For vector control DHF needs to rotate and replace to no resistant insecticides.

*Keyword*s: *Aedes aegypti*, map resistance, Central Java

Introduction

Dengue Hemorrhagic Fever (DHF) is major public health problem in Central Java Province. Incidence Rate (IR)per 100.000 populations during last three years was reported as follows: 56,8 % in 2010, 15,3 % in 2011   and 19,29 % in 2012.[1] Vector control using insecticides is one effort to reduce dengue mortalitas and morbidity. Continuous use of insecticides for vector control and household necessary using synthetic pyrethroid to prevent mosquito bites can made effect to resistance dengue vector.[2]

Early detection of vector resistance to insecticides may be useful as program information for vector control and correct selection of insecticides in specific location.
Detection of vector resistance can be done in some methods ie: using standard methods of Word Health Organization (WHO) susceptibility test (impregnated paper), biochemical or enzymatic detection using microplate, and molecular detection.

Mode of the insecticide used in vector control is divided into 5 category, affecting the nervous system, inhibiting energy production, affecting the endocrine system, inhibiting cuticle production inhibiting water balance. How insecticides enter to the insect body (mode of entry) can be through the cuticula (contact poison), digestion (stomach poison) or respiratory (respiratory toxins). Nevertheless an insecticide can have one or more ways to enter the insect body.[2] Insecticides are often for dengue vector control ie: Organophospat group (Malathion 0.8%) and synthetic pyrethroid (Cypermethrin 0.05% and Permethrin 0.25%).

The results of the research can be guidance for stakeholder to determining the use of insecticide, rotating or substitute infer insecticide and determining insecticide group for dengue vector control. The objective of this study is mapping of *Ae.aegypti* resistance status to insecticide used at dengue endemic area in Central Java.

Methods

The study was conducted in 2013 and 2014, using cross sectional design. The unit of analysis is the individual vector of *Ae. aegypti* from the research location includes thirteen district / cities in Central Java, namely Purbalingga, Grobogan, Kendal, Purworejo, Kebumen, Pekalongan District, Demak, Wonosobo, Cilacap, Kudus, Klaten, Banjarnegara and Semarang City. *Ae.aegypti* mosquito samples were taken from 100 homes in each village (three villages in each district)., mosquitoes were rearing in P2B2 Banjarnegara laboratory until the first generation (F1) to (F2).

The susceptibility status of *Ae.aegypti* was determined based on criteria developed by WHO,[3] with classification: susceptible (deaths 98-100%), tolerance (deaths 80% -98% and resistance range (death <80%.) Determination of molecular resistance status on flickering with Highly Sensitive (SS) criteria, if Absorbance Value (AV) <0.700, moderate resistance (RS) $0.700 \leq AV \leq 0,900$ and high resistance (RR) AV> 0.900.[4].

Map making with Arc Gis program, topographic map obtained from the National Coordinating Agency for Surveys and Mapping (Bakosurtanal / Geospatial) with a scale of 1: 25.000.

Result

The spread of DHF in Central Java includes 25 districts (75%) as districts with more than 20/100,000 population, while other districts (25%) incidence rate (IR) less than 20 / 100.000 population. The survey results showed that the highest House Index (HI) in Grobogan District reached 66.67%, while the lowest HI was Demak District at 13.33%. The highest percentage of Container Index (CI) was also in Grobogan District of 52.17%, while the lowest CI was 10.83% in Semarang City. The result of calculation of HI and CI at the survey location shows that almost all of them are in the medium category for transmission risk of DHF, only Grobogan District is in high category risk (Table 1).

Table 1. Category of HI and CI Value at Survey Locations by Density Figure

Annotation	District code												
	BNA	WNSB	KBM	CLCP	KDS	DMK	PKL	KLT	PWJ	GBG	KDL	PBG	SMRG
HI	21,67	15,67	37,33	31,00	30,67	13,33	24,33	20,67	17,33	66,67	36,87	21,00	23,85
DF HI	4	3	5	5	5	3	4	4	3	8	5	4	4
CAT	SDG	SDG	SDG	SDG	SDG	SDG	SDG	SDG	SDG	TGG	SDG	SDG	SDG
CI	13,33	13,33	26,67	26,33	24,33	11,33	21,67	16,33	14,33	52,17	23,64	13,92	10,83
DF CI	3	3	4	4	4	3	4	3	3	7	4	3	3
CAT	Med	Med	Med	Med	Med	Med	Med	Med	Med	HIG	Med	Med	Med

Annotation : DF HI=Density Figure House Index, DF CI= Density Figure Container Index, CAT=Category, Med= Medium, HIG=High (category DF : 1 low, 2-5 medium, 6-9 high).[5]

Interviews with stake holders as follows; type of insecticides used in Central Java are the most common synthetic pyrethroid groups such as Lambdasihalothrin and Cypermethrin, some districts using Organophospat with active ingredients of malathion and Organochlorine with active ingredients Diazinon. The availability of insecticides for dengue vector control at the Provincial Health Office, however, in some districts there are those who purchase their own insecticides. Malathion used in several districts/cities in the last three years (2011,2012 and 2013).

Results of malathion 0,8 % succeptibility test showed: *Ae.aegypti* mosquito from thirteen districts in Central Java Province deaths less than 80% (resistant category). *Ae.aegypti* mosquito deaths for control after 24-hour holding at 0 %. Map of malathion 0,8 % resistance can be seen in Figure 2 as follows.
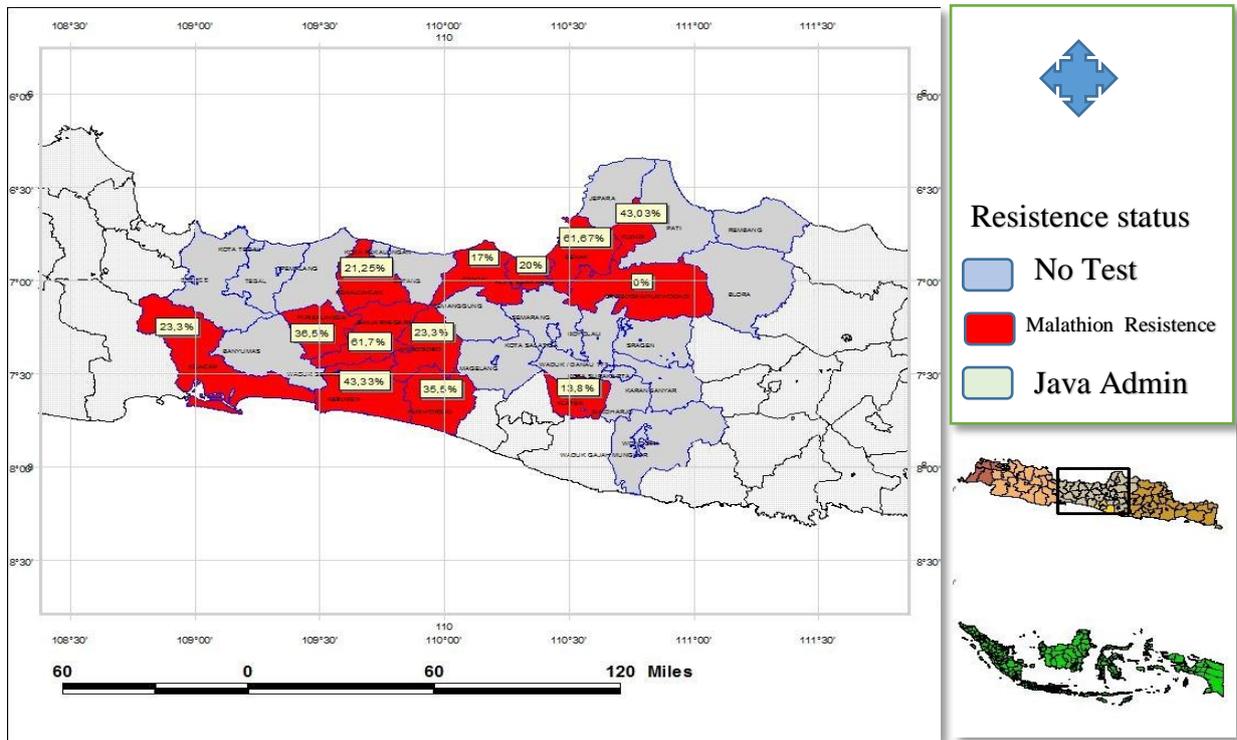
Figure 2. Map of *Ae.aegypti* Resistance to Malathion 0,8 %

Figure 2. shows that in 13 districts / city survey in Central Java have been resistant to malathion 0.8%. Cypermethrin 0.05% test using impregnated paper indicates that all districts survey sites have been resistant, and Permethrin 0.25% Test in four districts indicates have been resistant. The strongest resistance in Purbalingga District with an average 0 % mosquito deaths. *Ae.aegypti* mosquito control death of 0 %. Temperature room shows the range of 26 ° C-27.5 ° C., humidity shows a range between 65% -72% (Figure 3).

Kab	PWJ	KBM	PKL	DMK	WNS	CLP	KDS	KLT	BNA		GBG	KDL	PBG	SMG		Resist	Indikasi Resist	Renta n
	32.5	63.33	17.92	30.27	46.7	28	72.77	10	84.2		27	47	0	27		90	98	100
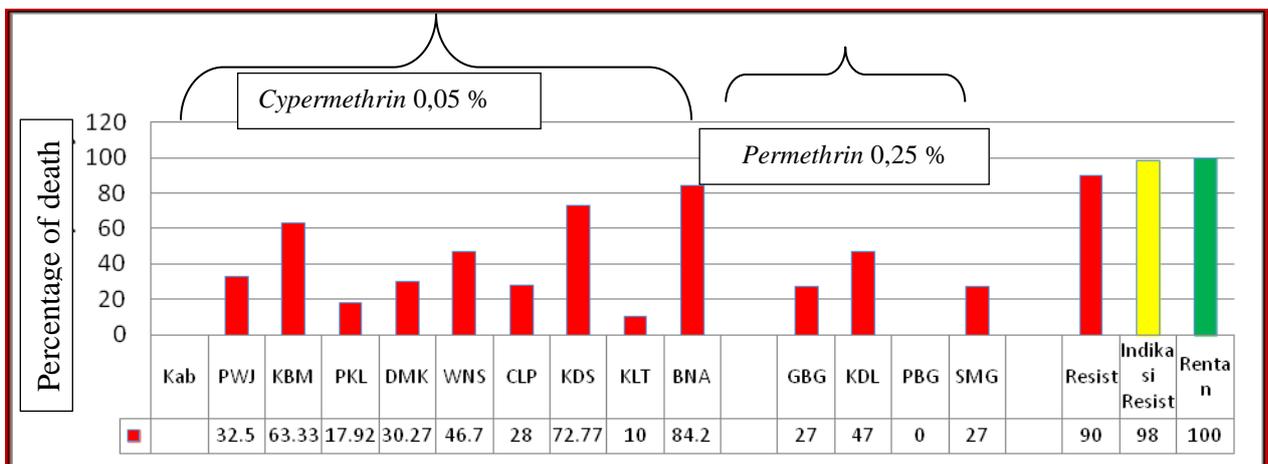
Figure 3. The average of *Ae.aegypti* mosquito death test for Cypermethrin 0.05% and Permethrin 0.25% in Central Java

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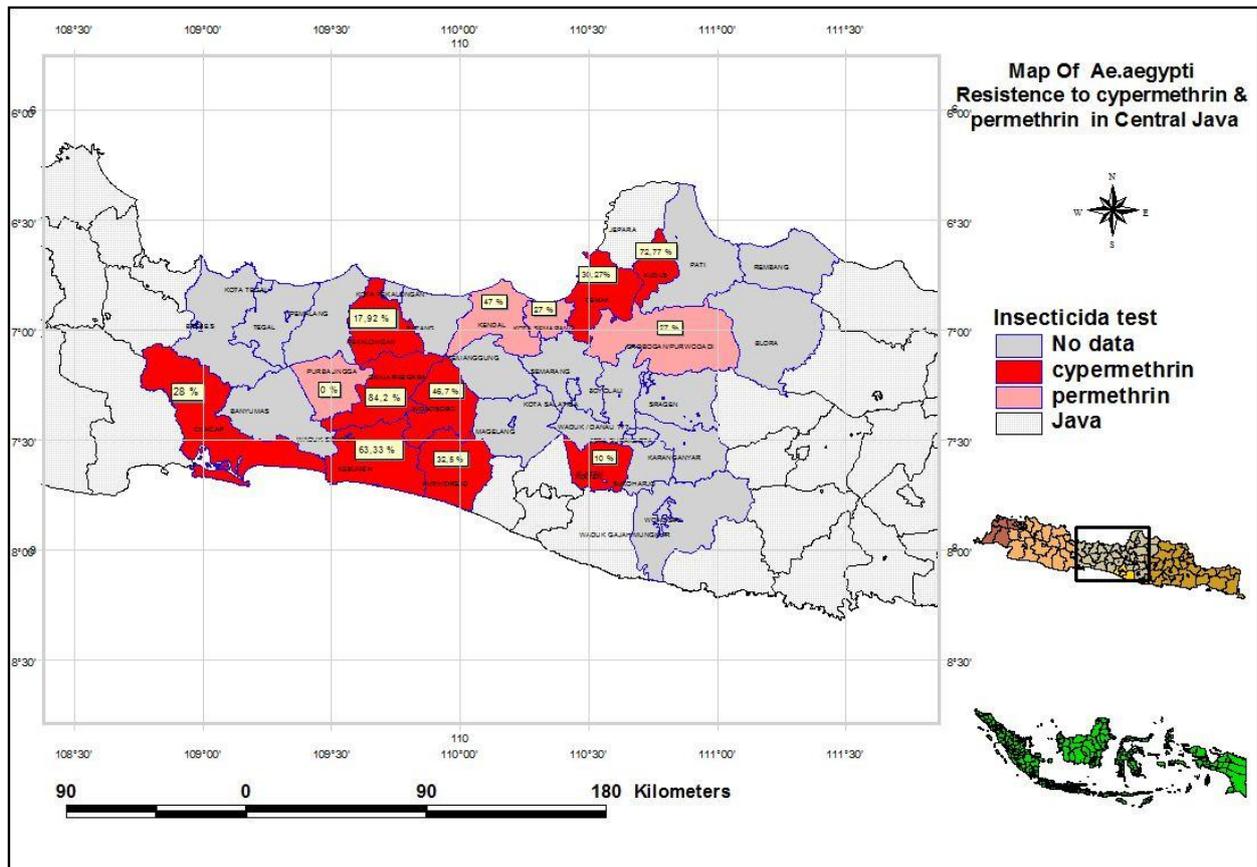
Figure 4. Map of *Ae.aegypti* Resistance to Cypermethrin 0.05% and Permethrin 0.25%

The results of *Ae.aegypti* resistance status by biochemical test method to organophosphate according to location of 2013 as follows: Semarang City, Kendal District and Purbalingga *Ae.aegypti* sample showed high resistant (100%), in Grobogan District 41.67% sensitive, 50% was moderate and 8.33% high resistant. *Ae.aegypti* samples from survey location in 2014 showed the percentage composition more susceptible. There are seven districts: Demak, Kebumen, Kudus, Pekalongan, Purworejo and Wonosobo with the percentage of test result indicated to be susceptible between 41,67-89,58%, the other three districts showed high resistance ie Banjarnegara, Cilacap and Klaten showed high resistance between 52.08 %-87.50%.

Discussion

The results of larva survey showed the highest House Index (HI) and Container Index (CI) in Grobogan District. The lowest HI in Demak District, and the lowest CI in Semarang City. When viewed from the Density Figure almost all survey sites are in the medium category, only Grobogan District is in the high category. All survey sites are dengue endemic areas, the results of mosquito larvae indicating medium and high category for the risk of dengue transmission then the area needs to be paid attention to efforts of community empowerment in eliminating mosquito breeding habitat.[5] Grobogan District is difficult water suplay especially in dry season, so to accommodate water suplay with some containers and rarely cleaned. Such conditions affect to the *Ae.aegypti* larvae breeding habit. Research conducted in endemic and sporadic areas in Grobogan District showed highest entomological parameter in both location. The House Index (HI) in Putat Village is 19.96%, Container Index (CI) 14,14% with Breteau Index (BI) 21,86 whereas Genuksuran Village which is dengue sporadic village HI value is 19,33% , CI value 13.27% and BI value is 26.99 %.[6]

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Insecticide is an integral part of the dengue vector control activity. In some endemic districts, insecticides are used selectively because limited budget from local government, but in some dengue endemic districts use excessive insecticides. Even in some district, NGOs do fogging using insecticides without coordinating with the local health office, without thinking about the risk and impact. Environment awareness should be owned by the community, because the dengue control is not only a health task but also in need of community participation. The lack of community participation in dengue control is evidenced by the discovery of mosquito larvae in the tubs, buckets, aquariums and dispensers in the house.

The most widely used insecticides type in Central Java are synthetic pyrethroid groups such as Lambdasihalothrin and Cypermethrin., some districts use Organoposphat group with active ingredients Malathion and Organochlorine group with active ingredients Diazinon. Study conducted by Widiarti et al (2010) in some areas in Central Java: Semarang, Magelang, Salatiga, Surakarta and Tegal, Blora, Jepara, and Yogyakarta Province: Yogyakarta, Sleman and Bantul showed *Ae. aegypti* resistant to malathion 0.8%, bendiocarb 0.1%, lambdasihalothrin 0,05%, permethrin 0,75%, deltamethrin 0,05% and etofenprox 0,5%. *Ae. aegypti* from some district sensitive to Cypermethrin 0.05% and Bendiocarb 0.1%.[7] Malathion 0,8 % has long been used (more than 10 years) for dengue vector control with fumigation/fogging, especially in outbreak areas. *Ae.aegypti* resistance to malathion has been reported in Malaysia by Hamdan, that after exposure of malathion, permethrin and temephos for 32 generations have occurred resistance.[8] *Ae.aegypti* resistant to malathion was found in study in French Guiana, percentage of deaths test mosquitoes ranged from 22-48%.[9] Research in Columbia also reported that *Ae.aegypti* has been resistant to malathion.[10]

In general, synthetic Pyrethroid group have long been used in Indonesia, ie for mosquito net, household insecticides, but the Cypermetrin group synthetic pyrethroid has been used for the dengue vector control with fogging method. A synthetic pyrethroid group has similiar metabolic and target site to the organochlorine group.[11] Research on Cayman Island shows *Ae. Aegypti* has been resistance to the pyrethroid group.[12] The emergence of resistance is rapidly related to the biological characteristics of vector species in each local population, type and level of excessive use of insecticides. increased esterase enzyme indicates a metabolic detoxification mechanism in the insect body.[13] This study shows that biochemical resistance test is not same as with succeptibility test method, it is possibility of other factors such as target site resistant or reduced penetration insecticide.[14] Not only in Indonesia, especially Central Java, *Ae.aegypti* and *Ae albopictus* resistent to pyrethroid occurs widely throughout the world.[15]

Conclusion

All dengue endemic districts in Central Java Province have been resistant to Malathion 0.8%, and almost all dengue endemic districts have been resistant to Cypermethrin 0.05% and Permethrin 0.25%, only one location in Banjarnegara District was classified as tolerant to Cypermethrin 0.05%. Evidence of resistance occurs ie increased activity of esterase enzymes in *Aedes aegypti* mosquito body.

Recomendation

Rotate the use of insecticides in the dengue vector control, especially insecticides resistant. The results of this study can be limitation of insecticide for vector control, counseling about the effect of excessive insecticide use that is insecticide resistance and mass mobilization with Mosquito breeding places Control is the main thing.

Acknowledment

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Dietary Flavonoid Intake Estimation of North Sulawesi Adults

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Abstract

We estimated intake of flavonoid and determined its differences and associations of characteristic. This study used secondary data from the Individual Food Consumption Survey 2014 of Indonesia with a cross-sectional design. Intake of food consumption data used food recall 1x24-h. Flavonoid content was obtained from the USDA database and related scientific journals. The subjects were health and more than 18 years old. Association of flavonoid intake and independent variable were analyzed by logistic regression. The number of subjects was 2022 subjects, including 1106 men and 1096 women of 46.66±14.54 years old. The median of total flavonoids intake was 9.45 mg/d (mean:17.16 mg/d). Total flavonoid intake was higher on women, live in urban area, more educated, worker, and high economic level. Total flavonoid intake was only inversely associated with food consumptions ($p<0.001$). Characteristics and food consumption may influence to flavonoid intake in North Sulawesi Adults.

*Keywords***:** *Adults, Flavonoid, Intake, North Sulawesi*

Introduction

Deaths due to non-communicable diseases (NCDs) in the world reached 38 million people each year and occurred before the age of 70 years. Indonesia, as lower middle-income country, had 71% of deaths from NCDs [1]. Mortality causes in Indonesia change along between 1995-2007, from communicable diseases become NCDs [2]. North Sulawesi was a province with the highest prevalence of hypertension and stroke in Indonesia [3]. Its prevalence of NCDs in 2013 were higher than 2007.

Epidemiologic studies presented that flavonoids have a protective effect against cancer and coronary heart diseases (CHDs) [4,5]. Flavonoids are a polyphenol that abundant in vegetables, fruits, tea, wine, legumes, and spices consumed by people [6]. Flavonoids have benefited as antioxidant, anti-inflammation, antibacterial, anti-thrombotic, and anti-carcinogenic [7]. Lower intake of vegetables in fruits would result lower intake of flavonoid as antioxidants. Low antioxidants could not neutralize free radical in the human body. Chun et al. showed that subject 51-70 years old with flavonoid intake 215.4 ±16.8 mg/d, had CRP-serum 5.34±0.25mg/L. It was lower than subject >70 years old who had flavonoid intake 150.0 ± 11.4 mg/d with CRP-serum 5.50±0.32 mg/L [8,9].

Some studies in Asian countries showed the various value of flavonoid intake. A study in japan showed that total flavonoid intake of women aged 29-78 y was 16.7 mg/d [10]. A recent

study in China, a case-control study, presented the median of the total flavonoid intake 64.92 mg/d (control group) and 51.13 mg/d (case group) [11]. In North Sulawesi, there has not been any study assessing the total flavonoid intake yet, especially using the representative data. Furthermore, we conducted to assess the estimate flavonoid intake and the sociodemographic factors that might influence flavonoid intake.

Materials and Methods

Study population. National Institute of Health Research and Development, Health Ministry of Indonesia conducted Individual Food Consumption Survey 2014 (Survei Konsumsi Makanan Indonesia/SKMI 2014). It was a cross-sectional study designed to obtain food sufficiency and mean of food consumption based on food items and food groups of Indonesian people [12]. Subjects in this study had through cleaning process by Data Management Laboratorium of National Institute of Health Research and Development, Indonesia Health Ministry. A total of 2202 subjects (1106 men, 1096 women) $\geq$19 y of age and who were in "healthy" state were included in this study [13]. The subjects were grouped by sociodemographic characters: gender, age (19-29;30-49;50-64;65-80; 80+ y), living area (rural; urban area), education (< high school; $\geq$ high school), worker (no-worker; worker), and economic level (low: 1st and 2nd quintile; high: 3rd-5th quintile).

Flavonoid database. We created food composition tables for 5 subclasses of flavonoid (anthocyanidins, flavan-3-ols, flavanones, flavones, flavonols, and isoflavone). We created new flavonoid database for Indonesian foods. The food items and food groups and their code were based on Food Items Code Guidance of SKMI 2014. We created the flavonoid database from USDA Database for the Flavonoid Contents of Selected Food 2015 Release 3.2, USDA Database for the Isoflavone Contents of Selected Food 2008 Release 2.0, and some related research [14,15]. Details of datasets used in this database were explained in our previous study. The database contains 1203 food items (13 food groups), as much as 654 food items contain flavonoids [13].

Estimation of individual flavonoid intake. Dietary flavonoid intake was estimated based on food recall 24-h of the SKMI 2014. The consumption data of SKMI 2014 has been already presented in weight (gram) of each food items. We got the consumption data for only selected food (contain flavonoid). The subject flavonoid intake was determined by multiplying the content of the flavonoid (mg/100 g food) by the daily consumption (g/d) of the selected food item. Total flavonoid intake for each food item was the sum of intake of 5 flavonoid subclasses. Individual total flavonoid intake was the sum of subject flavonoid intake from all food items. The steps of estimation in this study were adapted from Bhagwat et al. and Mc Collough et al. [6,16].

Statistical analyses. All of the numeric data in this study was not normally distributed, so we presented the total flavonoid intake and the food consumption in median (mean). The food consumption presented in 5 food groups because of the 1st-5th food groups of highest flavonoid content were legumes, vegetables, spices, beverages, and fruits [13]. The total flavonoid intake was divided into low level (0.00-9.44 mg/d) and high level (9.45-887.05 mg/d). To test for the differences total flavonoid intake based on sociodemographic characteristics, we used Mann-Whitney Test for 2 independent categories of variables and Kruskal-Walls Test post-hoc Mann-Whitney Test for $\geq$2 independent categories of variables. Multivariate analysis of this study used logistic regression. All analyses were conducted by using SPSS version 16.

Results and Discussion

The total flavonoid intake of North Sulawesi adults were median 9.45 mg/d and mean 17.16 mg/d. These intakes were lower than in Indonesia (median 25.02 mg/d), Bogor (mean: 145.52 mg/d), and Minangkabau (mean: 105.0 mg/d) [13,17,18]. It was also lower when compared with study in Japan that estimating flavonoid intake from the sum of 2 flavonoids subclasses (flavonols and flavones) with the mean of intake 16.7 mg/d [10].

Median and mean total flavonoid intakes for men were 8.73 and 16.62 mg/d (10th-90th percentile: 1.63-36.84 mg/d), and for women were 10.32 and 17.71 mg/d (10th-90th percentile: 1.63-36.84 mg/d) (Table 1). These result showed flavonoid intake data of North Sulawesi was positively skewed. It might be influenced by a large gap consumption of selected food. The total flavonoid intake was difference by gender, living area, education, worker status, economy level and food consumption. There was not difference between total flavonoid intake and age group. The subjects aged 65-80 years was the highest total flavonoid intake (median 10.09 mg/d) and the lowest was subject aged > 80 years. Subjects with higher total flavonoid intakes were more educated and in high economy level. High educated people have higher of nutrition and health aknowledgment [19]. The higher of 1 level economic level could increase 12.33 mg/d of flavonoid intake [8].

The food consumption was inversely associated with total flavonoid intake (*p*-value<0.001) (Table 1). This study showed that high consumed of food groups to provide flavonoid intake was came from vegetables, spices, and beverages. It was a difference with our previous study that conclude legumes was high consumed to provide flavonoid intake of Indonesian people [13]. That might be influenced by heterogenic of food pattern, culture, and sosiodemography of Indonesian people. As expected, legumes, vegetables, fruits, and spices consumption were more consumed by a high level of total flavonoid intake's subjects. The present study also showed that the consumption of flavonoid food source of North Sulawesi was still low than the others studies. The legumes, vegetables, fruits, and spices consumption of Bogor people were 81.6 g/d; 140.9 g/d; 106.1 g/d and 13,0 g/d [17]. Vegetables and fruits consumption of the subjects were still lower than Indonesian Dietary Guidelines (*Panduan Gizi Seimbang*). It suggests that Indonesia adults should consume 400-600 gram vegetables and fruits, which is 2/3 of vegetables (267-400 g/d) and 1/3 of fruits (133-200 g/d) [20].

Table 1: Characteristics of total flavonoid of adults in the SKMI 2014

	Subjects (n)	Total flavonoid intake [median (mean)][1]			*p*-value[2]
		All of subjects	Low Level	High Level	
Total subjects	2202	9.45 (17.16)	4.97 (4.76)	17.90 (29.56)	
Gender					
Men	1106	8.73 (16.62)	4.93 (4.70)	17.78 (30.10)	
Women	1096	10.32 (17.71)[a]	5.11 (4.83)	18.22 (29.09)	0.076
Age Group					
19-29 y	260	8.77 (20.31)	4.42 (4.56)	19.74 (38.12)	
30-49 y	1053	9.31 (16.56)	5.06 (4.78)	17.71 (28.59)	
50-64 y	620	9.75 (17.90)	5.16 (4.94)	17.89 (30.21)	
65-80 y	244	10.09 (14.92)	4.77 (4.50)	18.07 (24.20)	
>80 y	25	7.87 (13.62)	5.36 (4.60)	13.99 (25.09)	0.847
Living area					
Rural area	1400	9.37 (16.22)	5.12 (4.92)	17.65 (27.69)	
Urban area	802	9.60 (18.80)[a]	4.68 (4.48)	20.12 (32.77)	0.527
Education					
< High school	1380	9.21 (16.29)	5.12 (4.85)	17.46 (28.41)	
≥ High school	822	10.18 (18.63)[a]	4.73 (4.60)	19.26 (31.35)	0.246

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Worker status					
No-worker	830	9.43 (16.14)	4.81 (4.67)	17.78 (27.55)	
Worker	1372	9.47 (17.78) [a]	5.08 (4.82)	17.95 (30.78)	0.609
Economy Level					
Low economic level	862	8.74 (17.12)	5.08 (4.82)	18.01 (28.64)	
High economic level	1340	9.79 (17.19) [a]	4.81 (4.68)	17.78 (31.15)	0.491
Dietary intake (g/d)					
Legumes[3]		0.0 (8.3)	0.0 (0.9)	0.0 (15.7) [b]	0.000
Vegetables[3]		59.8 (75.0)	44.0 (54.7)	80.0 (95.4) [b]	0.000
Fruits[3]		0.0 (30.7)	0.0 (9.2)	0.0 (52.1) [b]	0.000
Spices[3]		10.5 (13.7)	7.0 (7.2)	18.2 (20.2) [b]	0.000
Beverages[3]		2.0 (10.0)	2.0 (7.6)	2.0 (12.4)	0.000

[1] in mg/d; [2] p-value for logistic regression (significant for p<0.05); [3] The data showed the amount (g/d) of related food groups consumption (not for flavonoid intake) ; [a] significant for Mann-Whitney test ($p<0.05$) by its sociodemographic; [b] significant for Mann-Whitney test ($p<0.05$) by level of flavonoid intake

The potential of flavonoid intake for preventing and reducing the risk of NCD was still controversial. Zamora-Ros et al. found that subject consumed vegetables 217.7 g/d and fruits 281.7 g/d had median of total flavonoid intake 199.6 mg/d (IQR: 128.9-298.4 mg/d). They potentially reduced 41% colorectal cancer of the subjects. This study used case-control design with total of subjects 825 (424 cases with incident colorectal cancer and 401 hospital-based controls) [21]. A 14 y of cohort study also provide the evidence of flavonoid in NCDs prevention, with 8% reduction risk of hypertension [22]. Inversely, meta-analysis studies showed that there was not significant association between total flavonoid intake with gastric cancer and breast cancer [23, 24]. Oxidative stress is a situation when there is a significant imbalance between free radicals and the antioxidant defense system. It will develope oxidative damage that occurs to DNA, proteins, lipids and small molecules in the living system, then damage body's tissue. At this point, flavonoids have beneficial effect as anti-oxidant, anti-inflammatory, and anti-cancer. Flavonoids are free-radical scavenger that neutralizes free-radical in the human body. In addition, flavonoids were found as a phytochemical that repairing DNA due to free radical, and inhibit cancer cell proliferation [25].

Even though this study has not been analyzing the correlation flavonoid intake and NCDs risk, because of lack of data, to our knowledge, this is the first study that estimates the flavonoid intake in a large North Sulawesi population assessing differences among gender, age groups, education and other characteristics. The real flavonoid intake of North Sulawesi adults may be higher than this estimation when the flavonoid intake from supplements, which are not included in the database. The estimation dietary intake of flavonoids in North Sulawesi has been very limited due to lack of data of flavonoids food content.

In summary, this study as the first step toward generating baseline data of dietary flavonoid intake in North Sulawesi, according to gender, age and some characteristics. These descriptive data provide a platform to further investigate the role of flavonoid, for either reducing or preventing NCDs's risks.

Acknowledgement

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Kinesthetic Perception, Physical Activity and On-Task Behavior in Thematic Learning

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Abstract

To investigate associations between kinesthetic perception, physical activity and on-task behavior in thematic learning, and evaluate how they correlate to academic performance in math reading and spelling. This study included 25 children (age: 6-7 years, 14 girls). Kinesthetic perception was evaluated in space-visuomotor task accuracy test (kinesthetic perception test and measurement). Level of physical activity was estimated from the daily activity during normal school activity using *pedometer* and both relation with On-task behavior in thematic learning was investigated with standard test of completion tasks and cognitive tests, in math, reading and spelling. Kinesthetic perception was associated with better performance in tests of completion tasks and academic performance ($P<0.003$), whereas physical activity was associated with better sustained completion tasks ($P<0.038$) and academic performance ($P<0.047$). Kinesthetic perception and physical activity were all associated with better performance in cognitive tests (math, reading and spelling). The results reveal that on the whole the academic performance was significantly correlated with three perceptual abilities – visual, auditory and kinesthetic. When considered separately, reading and spelling both were significantly associated not only with one another but also the three already mentioned perceptual areas. On the other hand, mathematic was found to be significantly correlated with only auditory and visual perception. The data demonstrate that kinesthetic perception and physical activity are positively correlated with on-task behavior in thematic learning and with academic performance in math and reading. Future interventions should investigate associations between kinesthetic perception, physical activity and on task behavior in academic performance to expound the causation of these associations.

Introduction

The association between kinesthetic perception, physical activity, and academic achievement has been studied in recent years. Some studies showing that active and fit children tend to perform cognitive test better than not active and lower fit children. Physical activity improves and contributes to quality of life, mental health, and the ability to accomplish physical task demands. Low level of physical activity can predispose children to obesity. National Association for Sport and Physical Education (NASPE) suggest that preschool student accumulate at least 120 min of physical activity per day.

Prior studies have found positive associations between kinesthetic perception and physical activity in academic performance, recent studies have also documented positive associations between physical activity and academic performance. Further, it emphasizes a potential positive role of physical activity in preschool children, children and preadolescence and suggests that motor skills development is positively related to learning process at school. Other studies on aerobic fitness in children found positive associations with performance in academic performance. The investigation to the associations between children perceptual abilities (visual perception, auditory perception, kinesthetic perception and tactile perception)

and the academic performance reveal that a significant percentage of the sample academic under-achievers scored low in the three perceptual channels – visual, auditory and kinesthetic. Bailey et.al (1995) reported that on an average one fourth of the children were poor in these perceptual areas. Tactile perception was the only area where only a few children faced problems.

We found no previously study focused on concurrent assessment of kinesthetic perception, physical activity and academic performance for cohort group children and it is the aim of this study to investigate the potential associations between kinesthetic perception and physical activity with academic performance in children.

Is it any relationship between kinesthetic perception and academic performance? The development of kinesthetic perception as separate from cognitive development, and the terminology itself clearly separates these functions. Kinesthetic perception, physical activity and cognitive may be fundamentally interrelated. Cognitive processes have functional implications that influence or be influenced by movements and engage the motor system and perceptual functions. Cognitive processes promote decision-making, motor control and motor skill learning process.

In recent studies have found positive relations between physical activity and academic performance in children. Ericsson & Karlsson (2014) reported positive effects of long-term motor skill training and physical activity; and positive relations between motor functions and academic performance and. We therefore investigate the interrelationship between kinesthetic perception, physical activity, on-task behavior and academic performance. Present study hypothesized that that there is positive relationship between physical activity and academic performance.
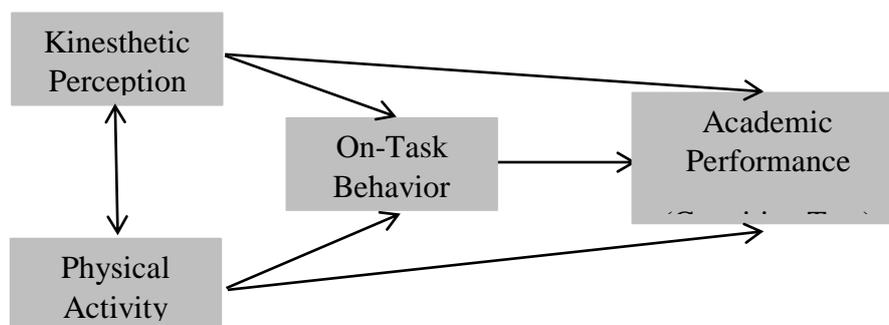
Fig. 1. Interrelationship between kinesthetic perception, physical activity, on-task behavior and academic performance.

McKee et al. (2005) reported a strong relationship between activity-rating scale and step count/3 min in 30 from preschool children (aged 3-4 years old) in normal school activity (1 hour nursery setting). Nevertheless, event it is still imprecise how daily activity relates to steps counts and how many steps equal to the daily activity recommendation for children (1 hour MVPA-Moderate to Vigorous Physical Activity-per day).

Methods

Sample involved 25 children in first grade, aged range 6-7 years from private school in East Jakarta. On two test days, the children participated in tests of kinesthetic perception. The 7 elements tests of kinesthetic perception consists of (1) Vertical Linear Space, (2) Lengthwise Balance, (3) Crosswise Balance, (4) Duplicate Basketball Free Throws, (5)

Pedestrial Kinesthesia of Vertical Linear Space (6) Gross Kinesthetic Movement (7) Walking on a Path.

Physical activity level were assessed using Omron Pedometer, model HJ325 Alvita Ultimate. All children were instructed to wear pedometer, a pedometer was fastened to waistband of their pants/skirts, on the left hip in-line with midpoint of left knee. Mean daily step counts were calculated for week school days.

Result

The average daily step count was 4,028 (range 2.685-5.570), no sex differences (t=0,47, see table 1)

Table 1 Daily Step Counts

	Total	Girls	Boys	*T*
Daily Step Counts (n-25)	4.028	3.986	4.753	0,47
Steps per minute	9,59	9,49	11,32	0,50

Reference

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Food Advertising on Adolescence: Brand Logo Recognition Related Food Preference and Food Behavior among Senior High School Teens in Yogyakarta

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Abstract

Food promotion by the food industry contributes greatly to the adolescent's nutritional status, because young adolescents are easily attracted to new things that affect food selection and food behaviors. Research on brand logo recognition as one of the causes of adolescent nutritional problems related to preference and behavior of adolescent meal in Indonesia is still rare. The research to determine the relationship of the brand logo on food preferences and food behavior of adolescent high school in Yogyakarta. The studied was observational with cross sectional design. The research sample will be 420 high school students Public and Private High School in the city of Yogyakarta. Data were analyzed by chi-square correlation. There is a significant relationship between brand logo recognition and adolescent's food preference (p = 001). There is a significant relationship between brand logo recognition and adolescent's food behavior (p = 0.002). Adolescents who have a high value in getting to know the brand logo have a high food preference also to food products that have a brand logo. Teenagers who have a high value in knowing the brand logo proved to often consume food that has a brand logo.

Keywords: brand logo recognition, food preferences and food behaviour

Introduction

Based on WHO data, the number of obese and obesity prevalence in America is increasing as much as 14,9% for obese and 16,9% (1) for obesity. In Indonesia, the prevalence of obese and obesity in teenager is as much as 5,7% and 1,6% (2). The prevalence of obese in Yogyakarta province is as much as 7,2% and 2,6% for obesity, with the highest prevalence reach at 12,9% for obese and 6,0% for obesity (3). One of the factors that cause the increasing of obese and obesity is the consumption of energy dense food which increases due to the good marketing strategy which conducted by selling the brand (4). *Brand* is the strategy used by the industry to promote their product, *brand* can be a logo which designed by a picture, letter, number or color which represent the product or service sold (5). *Brand logo* is one of the methods used to bring up the brand awareness toward a product (6).

A research in Chile shows that 60,4% respondents decide to buy a product based on the brand of the food product itself, then the rest is about the taste and price (7). A research related to the influence of brand logo is also conducted in United Kingdom, shows that children who exposed by advertising are more often having a direct impact toward eating preference and it also affected the eating behavior (8). The research in Palembang shows that 77,2% of children get the information about food product through electronic media since most of them (56,5%) watch the television more than 3 times in a day and the advertising the often see is snacks with low nutrition (9).

In Indonesia there has been no research examine the relation of brand logo (brand logo recognition) toward eating preference and behavior in high school teenager in Yogyakarta, whereas the inappropriate eating preference and behavior can result in nutritional and health problem. In addition, the current era and the development of social media that more advance can ease the food manufacturer to introduce their logo branding. Therefore the researcher wants to know the relation between the brand logo recognition toward eating preference and behavior of high school teenager in Yogyakarta.

Methods

This research is an observational research which use design cross sectional. Cross sectional research is a research that studies the relation between impact and risk factor observationally in a certain period (10). The location of research is in high schools in Yogyakarta and occurs for 3 months from March to June 2017. The amount of sample is 420 respondents, with cluster sampling technique as the method.

Result

The analysis result based on respondent characteristic shows that most of the respondent are men (57.86%), Catholic (41.67%), background education of the parents are D4/S1 for mother is as much as 44,76% and father is as much as 47.86%. Most of the occupation of respondent is entrepreneur for Father is as much as (42.14%) and for a housewife is as much as (44.29%). The average of respondents' allowance is considered low (79.29%). The average of respondents' residence in urban is 93.33%.

Table 1. Characteristic Respondent

Character	Total (n=420)	
	N	**%**
Gender		
Man	243	57,86
Women	177	42,14
Religion		
Catholic	175	41,67
Islam	137	32,62
Christian	101	24,05
Hindu	3	0,71
Buddha	4	0,95
Education Mother		
Never finished	2	0,49
Primary School	0	0
Junior High School	4	0,95
Senior High School	93	22,14
Diploma	77	18,33
Bachelor	188	44,76
Master/Doctor	56	13,33
Education Father		
Never finished	2	0,48
Primary School	1	0,24
Junior High School	2	0,48
Senior High School	71	16,95
Diploma	53	12,65
Bachelor	201	47,86
Master/Doctor	90	21,48
Mother's job		
Housewife	186	44,29
Entrepreuner	85	20,24

Private Employees	76	18,10
Government employees	48	11,43
Others	23	5,48
Employees of state-owned enterprises	2	0,48
Father's job		
Entrepreuner	177	42,14
Private Employees	137	32,62
Government employees	69	16,43
Others	23	5,48
Employees of state-owned enterprises	14	3,33
Pocket Money		
Low	333	79,29
High	87	20,71
Residence Location		
Urban	392	93,3
Rural	28	6,67

Table 2. frequency distribution analysis showed that respondents have high brand recognition ability (60,71%), high food preference (58,81%), and eating behavior (54,05%).

Table 2. Frequency Distribution Brand logo recognition, Food preference and Food Behavior

Variable	Total (n=420)	
	N	**%**
Brand logo recognition		
Low	165	39,29
High	255	60,71
Food preference		
Low	174	41,43
High	246	58,57
Food Behavior		
Often	227	54,05
Rarely	193	45,95

Table 3. and Table 4. shows that there is a significant relation between brand logo recognition with eating preference of teenager (p=0,001) and there is a significant relation between brand logo recognition with eating behavior of teenager (p=0,002).

Table 3. Relationship brand logo recognition to food preference of high school adolescents in the city of Yogyakarta

Brand Logo Recognition	Food Preference				Total		PR (CI 95%)	p-value
	Low		High					
	n	%	n	%	n	%		
Low	84	50,91	81	49,09	165	100	1,900	0,001
High	90	35,29	165	64,71	255	100		

Table 4. Relationship brand logo recognition to food behavior of high school adolescents in the city of Yogyakarta

Brand Logo Recognition	Food Behavior				Total		PR (CI 95%)	p-value
	Rarely		Often					
	n	%	n	%	n	%		
Low	91	44,51	73	55,49	164	100	1,370	0,002
High	102	39,84	154	60,16	256	100		

Discussion

There is a significant relation between brand logo recognition toward eating preference and behavior. This respond the hypothesis and theory used in this research, which said that brand is one of factors that determine the eating preference and behavior (11,12). The result of systematic review concludes that promotion conduct by food industry has a disadvantageous impact in children's eating preference and behavior (8). Previous research prove that children that often exposed by food and beverage advertising has a higher energy intake than the food and beverage advertised in television (262,7 ± 99,7 kkal), than children that are not exposed (233,7 ± 103,3 kkal), and choose the food which is advertised more (4,7 ± 1,7) than children who are not exposed (4,2 ± 1,7)[13]. Review stated that kids with obesity correctly recognize food advertising than kids with normal weight and this statement correlate positively to the amount of food consumed (11). A research done in *Center Calgary* and Canmore found that almost a half of kids are able to recognize McDonald's brand, 35% of them come to McDonald's for 1-3 times in a month or more and 63 % of them has the merchandise or toys from McDonald's in their home (14). So, the influence of brand logo which done by the food industry hugely contribute in bringing up the consumption preference toward the brand itself and it easily influence the behavior of consumer to choose and consume the product. The development of era and the advance of social media make it easier for food manufacturer to introduce their logo branding.

Conclusion and Suggestion

There is a significant relation between brand logo recognition toward eating preference in high school teenager in Yogyakarta. There is a significant relation between the brand logo recognition toward eating behavior in high school teenager in Yogyakarta. Based on the result of this research, an education and introduction related to brand logo recognition is needed. It is expected there will be a good cooperation between schools, local central health (PUSKESMAS) and public health office (Yogyakarta province) which is by monitoring and providing a counseling or seminar for high school teenager. An advance studies use a better research design is needed to be conducted to describe in detail causality related to eating preference or eating behavior of teenager.

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The Extract of Sargassum Sp. Increased the Expression of BMP-2 in Fractures of Tibia in Rattus norvegicus

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Abstract

Bone loss is induced due to decreased osteoblastic bone formation and increased osteoclastic bone resorption with various pathologic states. The*Sargassumhorneri* extract has been found to have an anabolic effect on bone calcification in rat femoral tissues both in vitro and in vivo.Here, we investigated the effect of extract *Sargassumsp*on the expression of BMP-2 in Tibia fracture in*Rattusnovergicus*. Male of *RattusNorvergicus* were divided into 5 group. The extract of Sargassumsp was administrated orally with different dose (50mg/kg, 100mg/kg, 150mg/kg) after tibia fracture to 5-week old for 7 weeks and 10 weeks. Negative control group (fracture (-), 0 mg / Kg Sargassumsp), positive control (fracture (+), 0 mg / Kg Sargassumsp), treatment 1 (fracture (+), 50 mg / Kg Sargassumsp), Treatment 2 (fracture (+), 100 mg / Kg Sargassum sp.), treatment 3 (fracture (+), 150 mg / Kg Sargassumsp). Extract Sargassumsp was increased the expression of BMP-2 in dose dependent significantly ($P<0.01$). Furthermore, extract of Sargassumsp also increased in the expression of BMP-2 between reparative phase and remodeling phase in RattusNovergicus ($p<0.01$). Extract *Sargassum sp*. has the effect stimulator of bone formation through increased the expression of BMP-2 in fractures of the tibia *Rattusnorvergicus.*

*Keywords***:** *Sargassumsp, BMP-2, Fracture Tibia*

Introduction

Sargassumhorneri has a stimulatory effect on bone composition [1]. Sargassum is part of a group of brown seaweed (phaeophyceae) from the largest family of sargassaceae. There are many sargassaceae in Indonesia, one of them is Sargassum sp. Sargassum has not been optimally utilized sargassum plants have many active ingredients that can be used in the health field.Sargassum active ingredients include alkaloids, triterpenoids, steroids, saponins, phenols, flavonoids and quinones. But not yet can explain about sargassumbergenus plants that have stimulatory effects on bone formation [2].

The bone healing process can take a long time. There are three phases of fracture healing process is the inflammatory phase, reparative phase and remodeling phase. The inflammatory phase begins several hours after the fracture and lasts up to 2 weeks. The reparative phase begins at week 2 and ends at week 4 [3].Total healing process of fractures can last 3-6 months [4]. Many molecules and cells are interconnected and work together in the healing process of bone. In the inflammatory phase of cytokine gathering process and some cells that play a role in healing, there are inflammatory cells that come simultaneously with platelets and some cytokines such as PDGF, FGF, BMPs, IGF and TGF. In the reparative phase, bone begins to form in the callus with an osteoblast

differentiation process. In the remodeling phase there is a primary bone shift with a secondary or mature bone marked by a process of osteoblast differentiation into osteocytes [4].

Research [5] showed that marine algae contain phytoestrogens. Phytoestrogens are estrogen-like compounds and in the [6] study showed that there was an increase in BMP-2 mRNA activity in mouse stem cells after phytoestrogen administration. The previous study in in-vitro experiment, showed that Sargassumhorneri dose 0, 5, 25, 50, 100 μg / ml increased the BMP-2[7]. Therefore, in this study we examined the effects of extract of Sargassumhorneri which is one of the sea algae has a stimulant effect on bone formation through the expression of BMP-2.

Materials and Methods
Animals and extract administration

*Rattusnovergicus*were purchased from Pharmacology of UniversitasAirlangga. All experimental procedures conformed to the guidelines for animal experimentation of Airlangga University. Ratusnovergicus were divided into 5 groups.The extract of sargasum is prepared with maceration methods using ethyl acetate solution and the filtrate from maceration is thickened using a rotary evaporator. The negative control group was the untreated group with a fracture and was given only 1% NaCMC solution per day. Positive control is group treated with fracture but given 1% NaCMC solution per day. The treatment group 1 was group treated with fracture with a dose of Sargassumsp 50 mg /Kg extract dissolved in 1% NaCMC per day. The second treatment group was a fractured group with a dose of Sargassumsp extract 100 mg / Kgbb dissolved in 1% NaCMC per day. Treatment group 3 was group treated with fracture with dose of Sargassumsp extract 150 mg / Kgbb dissolved in 1% NaCMC per day. To examine the differences of fracture we sacrifice the Rattusnovergicus at 14 days and 30 days.

Rat were given anesthesia using a combination of ketamine 100 mg / KgBB and xylazine 10 mg / KgBW with a ratio of 1: 0.5. After the animal is anesthetized, the animal is placed in the supine position, then the tibia bone is broken by bending methods using both thumbs on the medial side of the tibia [8]. Then immobilize tibia fracture using plaster plasterparis.

Histological and immunohistochemical analyses

Bone decalcification is the removal of calcium ions from the bone through histological process thereby making the bone flexible. Bone decalcification process using 10% EDTA solution for 30 days at room temperature. Every 3 days 10% EDTA solution is replaced after the process of bone decalsification, bone tissue is ready for the immunohistochemical process. Specimens resulting from the immunohistochemical process are used to view BMP-2 expression. BMP-2 expression is calculated in 10 fields of view with 400x magnification. The calculation results of BMP-2 expression were then analyzed using statistical analysis.

Statistical analysis

All results are expressed as mean ± SEM. Comparison of parameters between groups was performed withKruskal Wallis. Comparisons of dose-response curves were made by two-factor repeated-measures ANOVA, followed by Tukey's post hoc test for comparison between groups. A value of $P < 0.05$ was considered significant.

Result
The Sargasum.Sp increased the expression of BMP-2

The effects of extract Sargasum.Sp on fracture of Tibia increase the expression of BMP-2 in remodelling fase as shown in figure 1. As we can see increased of the BMP-2 was significant in dose dependent of extract Sargasum.SP. Kruskal Wallis statistical test is used to determine the differences between groups. Kruskal Wallis test results have Sig. (P-Value) of 0.001. The wallistcruciate test inter- preted that there was a significant difference from the five treatment groups to the expression in the reparative phase.The Independent Sample T-test was used to determine differences in the reparative and remodeling phases. The result of Independent Sample T-test test interpreted that BMP-2 in group K (+), P1, P2 and P3 there was significant difference P <0.05. Because of Sig. (P-Value) BMP-2 <0.05 then there is a real difference between the reparative phase and the remodeling phase. As for group K (-), Sig. (P-Value BMP-2> 0.05 there was no significant difference between the reparative phase and the remodeling phase In Figures 1 and 2 there was an increase in BMP-2 expression in the control group of the control group The highest mean BMP-2 expression was seen most height is in the treatment group P3 with a dose ofSargassum sp. of 150 mg / Kg.
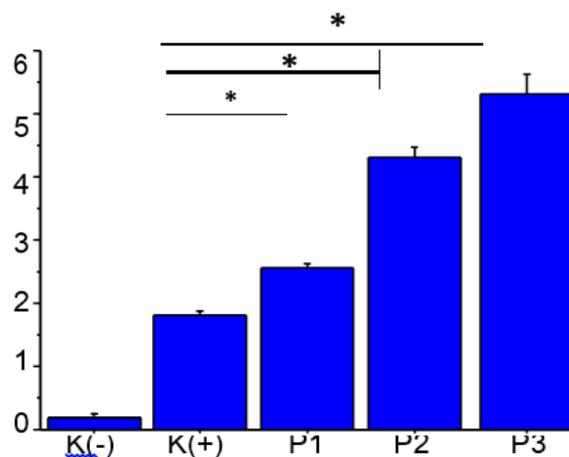
Figure 1: The expression of BMP-2 in histology of Tibial Bone (14 days)
Results of immunohistochemical analysis demonstrated that Sargassum sp. Significantly increased the expression of BMP-2 in dose dependency. (n=4, per group) *; P<0.01. All values are mean ± SEM.
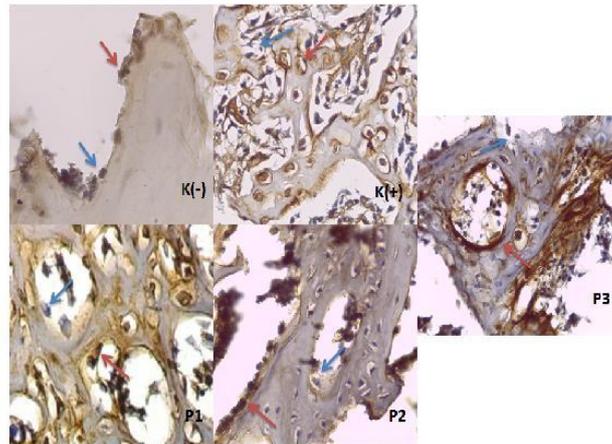
Figure 2: BMP-2 expression per field in the reparative phase. K (-). Negative control group, K (+). Positive control group, P1. Treatment Group 1, P2. Treatment Group 2, P3. Treatment group 3. The red arrows on each image shows BMP-2 expression was positive, while the blue arrow indicates Expression of BMP-2 negatives.
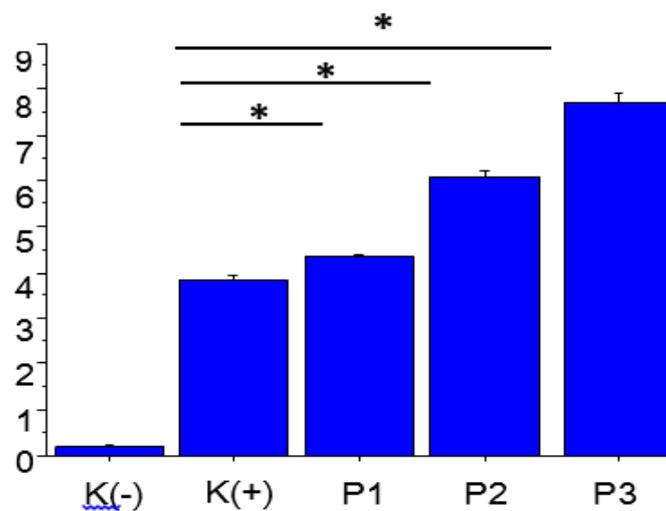
Figure 3: The expression of BMP-2 in histology of Tibial Bone (30 days)
Results of immunohistochemical analysis demonstrated that Sargassum sp. Significantly increased the expression of BMP-2 in dose dependency. (n=4, per group) *; P<0.01. All values are mean ± SEM.
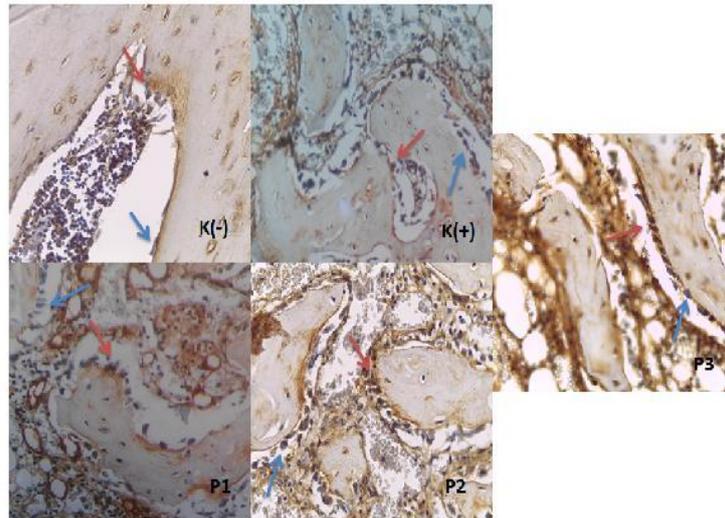
Figure 4: BMP-2 expression per field in the remodeling phase. K (-). Negative control group, K (+). Positive control group, P1. Treatment Group 1, P2. Treatment Group 2, P3. Treatment group 3. The red arrows on each image shows BMP-2 expression was positive, while the blue arrow indicates Expression of BMP-2 negative.

Discussion

The results of the statistical analysis interpreted that the five groups were significantly different in almost every treatment group terminated on the 14th day and 30th day. This significant difference means that the addition of the dosage of Sargassum sp. effect on BMP-2 expression.

Figure 1 and 3 shows that with increasing dosage of Sargassumsp given orally there is an increase in BMP-2 expression. Sargassumsp extract may contain phytoestrogen compounds. Sargassum extract enter orally and pass through the digestion, in the digestion of the partially absorbed flavonoid in the small intestine and partly in the large intestine. In the small intestine the active ingredient phytoestrogens in the form of isoflavone glycosides are degraded by enzin glucosidase into aglycone compounds such as genistein, daidzein and glycinein[9]. While in the colon, flavonoids are metabolized into phenolic acids by the microflora of the colon and then absorbed into the liver and circulatory system.

Phytoestrogens can bind to estrogen receptors and activate ERE (Estrogen Receptor Element) which then leads to activation of transcription factors that trigger gene expression and produce BMP-2 [6]. BMP-2 is a member of BMP. BMP is an important factor in the development of signals for the formation of osteoblast cell phenotype. BMP-2 is a growth factor that plays a role in the final stages of osteoblast differentiation and mineralization. BMP-2 is osteoconductive that stimulates bone formation through mesenchymal cell differentiation. When BMP-2 is low then osteoblast differentiation becomes inhibited, so that mature osteoblasts become low as well. Conversely, if BMP-2 production is high then mature osteoblasts are also high [10]. BMP-2 can maximally increase the proliferation of primary osteoblast cells [11].

The result of analysis and calculation of BMP-2 expression using Independent sample t-test showed that there was a real difference between 14 days (reparative phase) and 30 days (remodeling phase) in group K (+), P1, P2 and P3. (-), Sig. (P-Value) BMP-2> 0.05 then there is no real difference between the time of 14 days and 30 days.

The apparent differences in the reparative and remodeling phases showed significant differences in BMP-2 expression of the reparative phase and the remodeling phase of the process. In this study the average BMP-2 expression in the reparative phase was significantly lower in BMP-2 expression in the remodeling phase. This can happen because of it. On the 14th day the healing process of fracture is still in the reparative stage so that BMP-2 expression is not optimal yet.

According to [4], the healing process of fractures has several stages such as inflammatory stage, reparative stage and remodeling stage. The reparative phase begins on the 14th day. During this phase, the callus can have fibrous tissue, blood vessels, cartilage and bone (woven bone). The acidic pH of the acidic tissue will become neutral and close to alkaline pH to optimize the activity of the alkaline phosphatase (ALP) enzyme [3]. BMP-2 and BMP-4 on the 7th day until the 14th day post fracture were at the highest level of conditions at baseline in hypertrophic chondrocytes and osteoblasts [12].

In this study, BMP-2 expression in the reparative phase was lower when compared with BMP-2 phase remodeling expression. Figure 2 also shows at more remodeling stage. Two important things that occur in bone formation at the remodeling stage are intramembranous ossification and endochondral ossification [13]. BMP-2 and low-grade BMP-4 are commonly found in high-grade chronic mucrosal and chondrocytic hypertrophy, BMP-2 and BMP-4 often found in osteoblasts near endocondral ossification [3]. Nevertheless, BMP-2 expression of P2 group of reparative phase was higher when compared with control group (+) remodeling phase. This suggests that the excess Sargassumsp 100 mg / KgBB increases more rapidly than the group that is not given sargassum sp. Increased BMP-2 expression in this reparative phase can be a sign that Sargassumsp 100 mg / KgBB can increase bone formation.

Group K (-) according to statistical results showed no significant difference between the reparative phase and the remodeling phase. This is indeed the expression of BMP-2 is not so different. The expression of BMP-2 group K (-) which was not significantly different in group K (-) did not found fracture so there was no bone healing process.

Conclusion

BMP-2 expression increased with increasing dose of sargassumsp 50 mg / KgBB, 100 mg / KgBB and 150 mg / KgBB. The dose 100 mg / KgBB reparative group showed increased BMP-2 expression better than the control group (+) remodeling. So Sargassumsp can help speed bone formation through increased BMP-2 expression.

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The Development of PE Teacher's Performance Instruments for Junior High School

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Abstract
The objective of this research is to develop an instrument of physical education teacher's appraisal at Junior High School level. Performance measurements for subject teachers and physical education teachers are conducted by the school principal in the existing format of the Job Implementation Assessment List (DP3). Assessment in DP3 includes: loyalty, job performance, responsibility, obedience, honesty, cooperation, initiative and leadership. However, for the assessment of the performance of physical education teachers should be seen from how the teacher conveyed learning materials to students.

Performance assessment of physical education teachers is essential in creating quality physical education in schools. Currently the physical education teacher's performance appraisal is measured subjectively by the principal, whereas physical education teachers have different characteristics from subject teachers. This study aims to evaluate the performance instruments of physical education teachers, so that will be known needs in the performance of physical education teachers.

The method used in this research is by evaluation method which includes: content, input, process and product (CIPP) from Stufflebeam. The results of this study were measured by performance measurement instruments of physical education teachers covering aspects of personal skills, communication, organizational climate and teaching motivation.

Keywords: performance measurement, physical education teacher

Introduction

The performance of teachers is expected to boost quality and relevance to the world of education. Implementation on teacher performance in the field depends on many factors that influence it and the factors are interrelated. Factors such as the personal skills of the teacher in teaching the students and also the motivation that influence it in teaching. Teachers with personal skills should be able and knowledgeable about the teaching materials and can develop the teaching materials with good, logical, and systematic preparation of teaching. The development of teaching materials is intended for teachers to be accountable for what is done. Therefore, every teacher must be in conformity with the teacher professionalism standard that can be realized with the preparation of a mature teaching before implementing the lesson, whether written or unwritten preparation.

Teaching physical education, especially in schools is different from other lessons because it has its own characteristics, among others, in the learning process involves many activities of motion. Physical education is basically an education of physical activity that serves as a medium to achieve student development as a whole and an integral part of other subjects in school. An integral part in this regard is the effort to achieve the goal of national education that is comprehensive. How to organize physical education based on fundamental ethical values.

A physical education teacher has personal skills or not, can be known from two perspectives, the first, seen from his educational background. In accordance with Government Regulation No. 19 of 2005 (article 28) on National Education Standards. As an educator must have academic qualifications and competence as a learning agent, healthy physical and

spiritual, and have the ability to realize national education. The academic qualification in question is a verification with a recognized diploma and certification.

Second, Teachers' satisfaction on teaching materials, planning lessons, managing processes, managing students, performing guidance, assessing, and other tasks more fully in accordance with teacher competency standards. Physical education teachers must have a good standard of competence, ie teachers must have ten competency standards such as developing personality, mastering the educational base, mastering the lesson materials, preparing the teaching program, implementing the teaching program, assessing the outcomes and teaching-learning process, , organizing school administration, collaborating with peers and communities, organizing simple research for teaching purposes.

Teaching physical education, especially in schools is different from other lessons because it has its own characteristics, among others, in the learning process involves many activities of motion. Physical education is basically an education of physical activity that serves as a medium to achieve student development as a whole and an integral part of other subjects in school. An integral part of this is the effort to achieve a comprehensive national educational goal of learning that answers the question of how to organize physical education based on fundamental ethical values and basic motions.

During this assessment performance of physical education teachers by the leadership is the same as the assessment of subject education teachers. Performance appraisal of teachers by school principals so far only by using the Instrument of Vocabulary Assessment (DP3). In the DP3 instrument that contains the assessment of Loyalty, Job Performance, Responsibility, Obedience, Honesty, Cooperation, Initiatives and Leadership. While physical education teachers in addition to the instruments in DP3 should have another insrumen that supports the personal skills of the physical education teacher. Eventually the performance appraisal instrument for physical education teachers should be re-evaluated to meet appropriate performance assessments of physical education teachers. Thus, future expectations of performance appraisals for physical education teachers include assessment of the performance or demonstration of sports practice.

Based on the above explanation, the scope of the study in this study is limited to the performance problems of physical education teachers. The endogen variable consists of performance variable of physical education teacher, while the exogenous variable consists of organizational climate, interpersonal communication, personal skill, and teaching motivation.

Performance

Teacher performance has a broader meaning, not just the work, but includes how the work process takes place. Performance is the result of work that has a strong relationship with the goals of organizational strategy, customer satisfaction, and contribute to the economy (Armstrong and Barong). Thus, performance is about what is done and how to do it. (Wibowo, 2007 p.7)

The performance of teachers will be achieved well if there is a motivation in himself and from outside himself known as the factor of intrinsic motivation and extrinsic motivation factor. influenced by the level of education or teaching experience. The profession of physical education teachers is generally the same as other subject teachers. But in particular there are differences that principle and make its own characteristics. The fundamental difference is that the personalization skill of the education personnel becomes a major requirement in the teaching of physical education and sport. According to Pullias & Young, the roles of teachers are as educators, teachers, mentors, leaders, learning managers and as a model or role model for their students (kompasiana 2007).

Physical education teacher as a human figure who occupies a position and plays an important role in the education of the formation of sportsmanlike character, teamwork and

discipline. The educator or the physical education teacher is a skilled workforce in charge of planning and executing the learning process of sports and jetting, assessing the learning outcomes of sports, conducting coaching and sports training, and conducting research and community service.

Teacher performance is influenced by the factors that surround it and each individual is different from each other. Broadly speaking this performance difference is caused by two factors, namely: individual factors (intrinsic) and the situation and work environment (extrinsic). Individual factors determine how they can actualize themselves in the work environment and perform well, while the work situation factors affect how individuals can self-live according to their surroundings.

According to Gibson, et.al there are three sets of variables that affect work performance or performance, the first Individual variable consists of various abilities and skills both mental and physical abilities, backgrounds such as family, social level, payroll and demographics such as age, gender. Second, the organizational variable consisting of Resources, Leadership, Remuneration, Structure, Design work. Third, psychological variables, consisting of Perception, Attitude, Personality, Learning, Motivation (Simamora, 2000, p.415).

Based on the factors mentioned above, it can be said that the factors that affect a person's performance can come from within the individual itself such as motivation, skills and education. There are also factors from outside the individual such as work climate, salary levels and so forth.

Personal Skills

Personal skills or Personal Skill is a capability that someone has associated with his profession or his work. A primary ability for a teacher is his ability to interact well with students, peers, organizations, leaders and the community. Conditions for interaction are in addition to social contact and communication. Social contact in question is at the meeting of two or more people who react, while communication is the process of delivering messages provided by a communicator against the recipient of the message (communicant).

Communication by Bernard Berelson and Garry A. Stuer, in his work, "Human Behavior" cited by Onong Uchana Effendy (2006, p.48), defines communication as follows: Communication is the process of delivery. It is delivered information, ideas, emotions, skills and so on, while the way used in penyampainnya use symbols, words, pictures, numbers, graphs and others. Communication by Brent D. Ruben and Lea P. Stewart is: a process through individuals both in relationships, groups, organizations and societies that create and use information related to the environment and others. Richard West & Lyn H. Turner (2005: 5) defines communication as: the social process by which individuals use symbols to create and interpret meaning in their environment. So, it can be concluded that communication is a process of exchange information, ideas or ideas submitted either verbally or non verbally to achieve a goal.

Looking at the definition above, it can be seen that there are five key terms used in communication; first, the process by which communication is continuous, sustainable and endless. Communication is also dynamic, complex and ever-changing. Second, Social communication involves always two people or more who interact with various intentions, motivations and abilities. Thirdly, Symbols in this case symbols are arbitrary or refreshed labels of phenomena. Words are symbols for concepts and things. Labels can be ambiguous, can be both verbal and nonverbal and can occur in face to face communication and media communication. Fourth, meaning where this meaning is something that someone took from a message. In communication messages can have more than one meaning and even multiple layers of meaning. And the fifth Environment is the situation or context where

communication occurs. This category consists of several elements including time, place, period, history, relationships and cultural background communicators and communicants.

Therefore no human being will not be involved in communication, because communication is a basic human activity that is unavoidable in its activity. Basic human activity as a social creature requires another person to complete his life. Communication skills become an important element for someone who works as a teacher. Teachers who communicate effectively facilitate the delivery of messages or materials to be conveyed can be understood by students. So the communication skill is a skill that a person has to be an important variable in personal expression.

Personal skills that meet standardization and become a benchmark for a profession can be regarded as competence. It can also be said that competence is a combination of ability, knowledge, skills, interpersonal communication, attitudes, nature, understanding, appreciation, and hope underlying one's characteristic to perform work in performing tasks (Nurfuadi, 2012, p. The formulation of competency above contains three aspects (1) as a picture of substance / ideal material that should be mastered or required to be mastered by teachers in carrying out their work; (2) as a picture of real performance that looks quality of mindset, attitude and actions of someone in carrying out their work skillfully. A teacher may successfully master theoretically all aspects of the material the competence is taught and required; (3) as a result (output and outcome) of performance. A teacher's competence characterizes actions / behaviors and is adept at performing effective and efficient job duties. The result is a product of one's competence in performing his duties and work. So the other party can assess someone whether in carrying out their duties and work competent and professional or not.

Methods

The research design used the CIPP evaluation model initiated by Stufflebeam. In accordance with the theoretical studies that have been put forward, the CIPP model evaluates based on the component of context, input, process, and product evaluation. The research design illustrates the flow of evaluation implementation on each evaluation component and describes the evaluation process of each component. The research design is described in Figure 1.

Based on the design scheme in the picture above can be explained as follows:

a. At the context stage is intended to perform recording or identification of objective conditions of objective conformity, legal basis and needs analysis. From the results of the analysis can be obtained the information that became the basis for taking decisions follow-up program.

b. At the input stage is intended to identify the support of factors needed to improve the performance of physical education teachers. Data support on teacher's personal skills, adaptation to school orginsal climate and teaching motivation of physical education teachers. Further analysis of the assessment to support physical education teachers towards professional teachers so that can be used as a basis for decision making stage of performance appraisal performance.

c. At the stage of the process carried out the identification of the application of performance appraisal of physical education teachers. Stages of the process include program implementation and organizing. Furthermore, the conformity analysis of criteria and standards determined on the assessment of the existing physical education teacher performance. Based on this information a decision can be made about how far the implementation mechanism has been implemented.

d. In the product stage, identification of the achievement of assessment targets that have been set in the performance assessment standards of physical education teachers so that it can be

decided evaluation and decision making for success to become physical education teachers can be achieved.
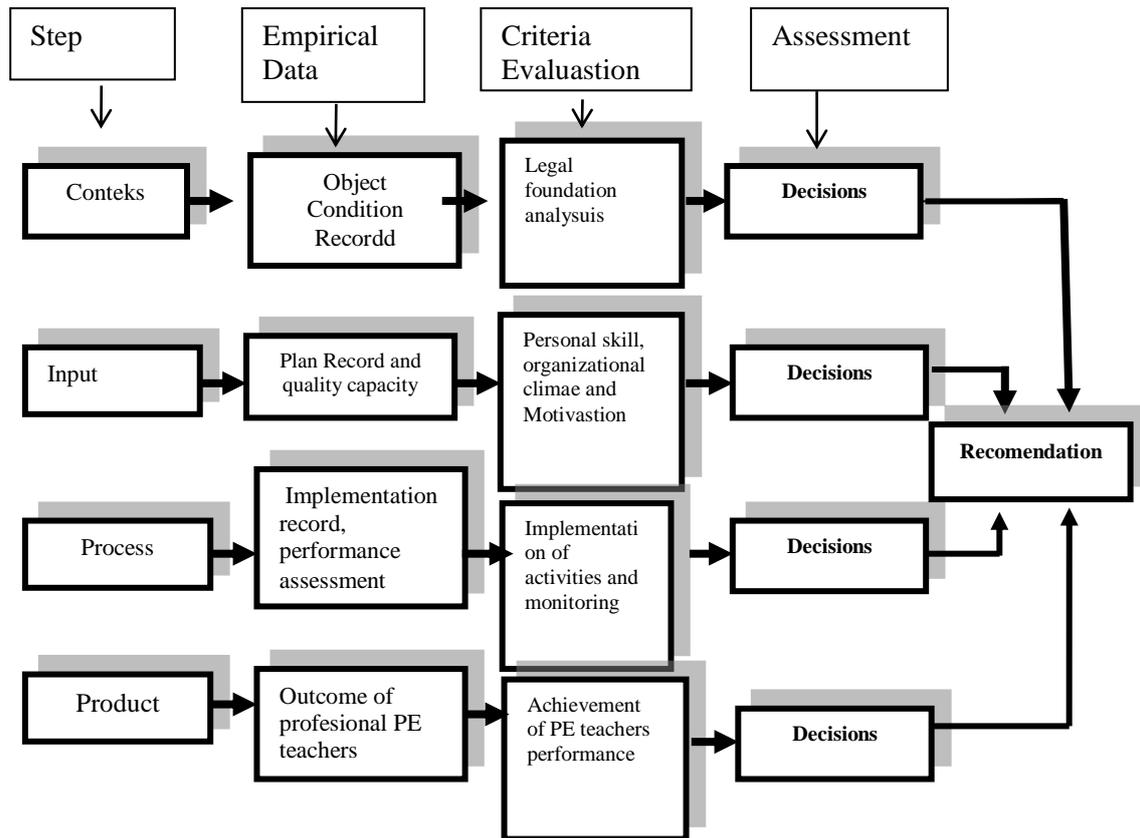
Figure 1 : Evaluation Design CIPP

Results

Furthermore, the results of questionnaires on these participants obtained the results that are very helpful for the development of performance penilaia physical education teachers, especially in junior high school. This is shown from the results of processed questionnaire data as follows: Questionnaire Results from Participants About Context and Input.

		Kontek			Input			
		Assessment Standard	PE teachers Information	Needs Analisys	Personal skill rate of PETeachers	Comunication	Organization climate support	Motivation
	Valid	63	21	126	168	252	105	21
	Missing	189	231	126	84	0	147	227
Mean		4,29	4,5	4,09	4,39	4,32	4,25	4,23
Median		4,00	5,0	4,00	4,00	4,00	4,00	4,00
Mode		4,00	5,0	4,00	5,00	4,00	4,00	4,00
Std. Deviation		,633	,68	,693	,638	,653	,555	,555
Variance		,401	,46	,480	,408	,428	,308	,308
Range		2,00	2,0	3,00	3,00	2,00	2,00	2,00
Minimum		3,00	3,0	2,00	2,00	3,00	3,00	3,00
Maximum		5,00	5,0	5,00	5,00	5,00	5,00	5,00
Sum		270,	95,	529,	738,	1090,	447,	95,

Based on the results of questionnaires from participants that occurred above shows very good results with a range of assessments that are not much different both in context and input. Most participants stated to involve psychomotori assessment or personal skills in performance appraisal of physical education teachers, as an effort to improve the quality and performance of physical education teachers in Junior High School. This can be seen from the average questionnaire 4,2- 4,5. Results of assessment of the assessment standard 270, Information on physical education teachers 95, and needs analysis 529. For input of personal skill level of teacher 738, communication 1090, support of organization 447, and motivation to teach 95. As for the implementation process and product can be seen in table below this:

Results of Questionnaires from Participants About Process and Products

	Process		Product
	Performance assessment activity	**Performance assessment activity control**	**Identify the performance appraisal design**
Valid	113	117	115
Missing	105	97	103
Mean	4,36	4,36	4,36
Median	4,00	4,00	4,00
Mode	4,00	4,00	4,00
Std. Deviation	,631	,651	,651
Variance	,412	,409	,398
Range	3,00	3,00	3,00
Minimum	2,00	3,00	3,00
Maximum	5,00	5,00	5,00
Sum	182	182	182

Based on the above questionnaire on the process and product in getting the results with an average value ranges between 4.36 and 4.38. for the process of conducting performance appraisal and supervising the implementation of teacher performance appraisal has the same value that is 182. The same value also for the product is the design of work appraisal of physical education teacher.

2. Evaluation

Evaluation of the policy in the performance assessment of physical education teachers, consisting of 4 evaluations, namely context (contexts), input (input), process (process) and results (product). Here are the evaluation results:

a. Context

Context evaluation in this case includes issues on performance appraisal standards of physical education teachers. Until now the performance assessment of physical education teachers using the standard dafatar assessment of the implementation of work (DP3). In addition to stanar DP3 performance assessment, evaluation is done by analyzing the needs of teachers for performance appraisal, especially teachers of physical education more precise. Finally the information from the concerned in this case the physical education teacher is also considered.

b. Input (Input)

The development of the instruments to be developed in this research includes the addition of personal skills variables ie communication skills with students, fellow teachers and also to the leadership. In addition to komusikasi in personal skills variables are also about the ability

of physical education teachers in demonstrating sports practices. The second input is the organization's climate interaction. A conducive school environment affects well the physical education learning process of physical education. The third input is the motivation to teach. Directly motivation to teach a very important influence in maintaining one's performance. Factors of intrinsic motivation and extrinsic motivation factors as intermediate variables in performance appraisal of physical education teachers

c. Process

Performance appraisal process includes two things that should not be separated, namely: the implementation of performance assessment of physical education teachers. Implementation of teacher assessments by principals so far only based on the existing format of DP3. Usually the reference is only based on the previous year's achievement. In this study the special performance appraisal instrument of physical education teachers will be slightly different from the classroom performance appraisal instrument. Supervision is a process activity in evaluation research. Supervision of performance appraisal activities for physical education teachers in Junior High Schools needs to be done. This supervision involves at least the members of the MGMP in the region. This needs to be done so that the assessment of teachers' physical education performance is more appropriate and objective.

d. Product

The expected result in this research is the creation of a performance appraisal model that is more in line with the performance of physical education teachers at the junior high school level. This study is an evaluation study of the current year that has a purpose to evaluate a policy in measuring the performance of a teacher, especially physical education teachers. Learning in physical education and sport not only involves the paedagogic and affective aspects only, but also must include in the learning of motion (psychomotor) is equally important. Therefore, performance appraisal should also include the psychomotor domain. In the performance assessment of teachers so far using the Job Implementation Assessment List (DP3). In DP3 the teacher's assessment is done by the principal covering the assessment component: Loyalty, Job Performance, Responsibility, Obedience, Honesty, Cooperation, Initiatives and Leadership.

Conclusion

This research which refers to result of research and discussion are as follows:

1. Model of professional teacher performance evaluation consists of three components, namely: a. professional teacher performance appraisal mechanism, b. criteria or indicators of professional teachers, and c. professional teacher performance instruments consisting of IPKG I, IPKG II, and the third supervisor and supervisor assessment instrument are teacher certification instruments.

2. The evaluation model of the performance of professional teachers developed is quite simple but able to improve the professionalism of teachers on an ongoing basis if the implementation in accordance with the provisions.

Suggestion

1. Physical education teachers should strive and be honest in gathering evidence of their performance. One example is by recording the learning process so that it can perform the evaluation of its teaching

2. The involvement of the MGMP of the region is more involved in the development of physical education teachers

3. District education offices should always supervise and supervise physical education teachers in conducting academic activities

4. The community should actively participate so that teachers are encouraged to collect evidence of their performance honestly.

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Continues Technical Guidance Based on Health Promotion Training Evaluation for Public Health Center Officer in West Java Province (Mixed Methods Research)

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Abstract

Health promotion support health goals through behavioral interventions. There are still many Public Health Center (PHC) officers do not have the competence and quality of conducting standardized health promotion. In 2015 there were 238 trainees from 10 districts in West Java. The purpose of study to know the change of participants knowledge according to education level and distric, the task implementation after training, the service coverage, identification of the continues technical guidance model based on training evaluation. Design mixed method - explanatory sequential. Quantitative data of all trainees with review of secondary data, qualitative data of four PHC through in-depth interviews. Statistical analysis for quantitative data, describing, clasyfing, connecting and concluing for qualitative data analysis. There was significant difference of participants knowledge before and after training in each district, but there was no significant difference between districts. There was significant differences of knowledge between bachelor and non-bachelor participants before and after training in two districts, but not significantly differences in 8 districts. Health promotion services management at PHC not yet optimal. Programme and sectoral coordination established through mini workshop, sub-district meetings, village community meetings. Policy support as advocacy results is largely unwritten. Partnership with private sector not all of them carry out. There was minimal activities documentation. Integration health promotion with other services has been established. Health promotion services coverages no significant difference before and after training. Direct technical guidance and indirect guidance through social media is possible a way of continuous health promotion technical guidance with collaboration professional organization.

Keywords: continues technical guidance, health promotion, public health center

Introduction

Year 2015 in West Java conducted training of 238 participants from 10 districts with high infant mortality rate. The training was carried out gradually in eight classes, conducted by health promotion section health office in West Java Province collaboration with health training unit West Java with a team of trainers who have been trained by the Indonesia Ministry of Health. The training evaluation shows participants assessment of facilitators and training facilities, no different between classes. There is a significant increase in trainee knowledge after training, with significant differences in knowledge increase among class participants. Using a score of 75 as the cut of point of the knowledge category is high and low, the effectiveness of training increases the participants knowledge into higher category is 44.49% or less effectively.[1]

This study continues the evaluation of training on participants knowledge differences before and after training based on the participants education level and district. Besides that evaluation of Health Promotion (HP) implementation after training at Public Health Center (PHC) and HP services coverages. The results as basis for the identification of continuous technical guidance.

Literature Review

Health Promotion at PHC refer to health promotion implementation guidance at Public Health Center is : *"Effort of Public Health Center to empower society to prevent disease and improve health every individual, family and environment independently and develop community health efforts"*.[2] Furthermore, in the Regulation of the Minister of Health Republic of Indonesia 75/2014 about PHC, health promotion services is one of the essential health services that must be implemented in PHC.[3]

Guidelines for the Implementation of Health Promotion (HP) at PHC also state that health promotion strategies can be implemented to be reinforced by appropriate methods and media and the availability of adequate resources. Management of health promotion should be done by the coordinator who has health promotion capacity in the field. The health promotion activities carried out within the PHC building or outside the PHC building for the community in the working area of PHC. Monitoring and evaluation of health promotion at PHC is done by determining the success indicators covering input indicators, processes, outputs and the impact of health promotion services. [2]

Health promotion training for PHC officers mentions that the training is a basic technical competence training on health promotion in improving the communities independence to live healthy. HP training for PHC officers is needed to improve basic competence and application of science and health promotion art for health promotion officer at PHC. It is expected that officers will be able to carry out advocacy, Information Education Communication (IEC), community empowerment, capacity building of HP resources, and to build partnership in order to create a healthy society that is independent and fair. [4]

The following chart of health promotion management at PHC. [4]
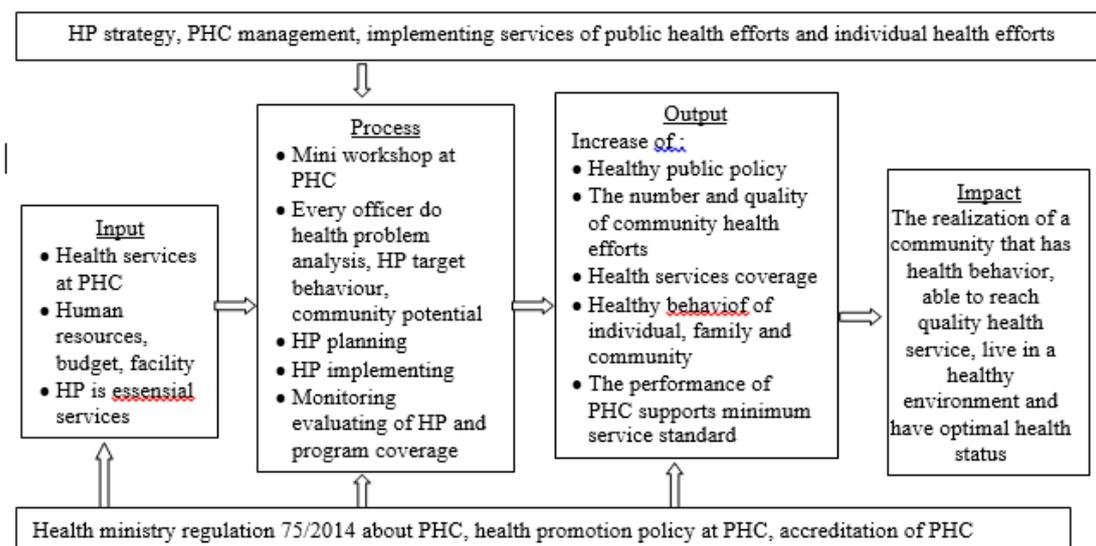
Fig. 1: Health Promotion Management at Public Health Center

After conducting the training, participants are expected to have competencies in 1) Health promotion planning at PHC, 2) Implementing of IEC in health sector 3) Implementing of community empowerment in health sector, 4) Implementing of advocacy in health sector 5) Implementing of health partnership 6) Developing messages and health promotion media 7) Implement of monitoring and assessment health promotion efforts 8) Implementing recording and reporting of health promotion efforts at PHC. [4]

Training for PHC officers in West Java Province was conducted for 70 hours lesson x 45 minutes, in November 2015 held at one of the hotels in Bandung. Evaluation of the

training is done by evaluating the learning with pre and post test form for the trainee with the aim to see the improvement of the participants knowledge after the training. Evaluation of the event is conducted to get input from the participants about the training that will be used for the completion of the next training. [1]

Kirkpatrick's model (Allan Bailey) mentions there are four stages of outcome evaluation: Level 1 Evaluation-Reaction, Level 2 Evaluation-Learning, Level 3 Evaluation-Behavior, Level 4 Evaluation-Results.[5] Continues technical guidance is a systematic guidance effort to improve and develop the knowledge, skill, and attitude of health personnel to always be able to run the profession with good aim to maintain and improve the professionalism of health workers (quality and ethics) in accordance with standards competence and ensure a quality health service.[6]

The legal basis for sustainable profession development is Article 5 Minister of Health Regulation 46/2013 about registration of health personnel. One of the efforts to develop sustainable profession is through inter-technical learning through training and technical guidance. In article 18 paragraph 3 of Law 36 Year 2014 mentions technical guidance is technical coaching profession to achieve professional standards or curriculum competency standards in the education process.[6] This study refers to the theory of training evaluation as the basis for the development of continuous technical guidance on health promotion for officers at PHC.
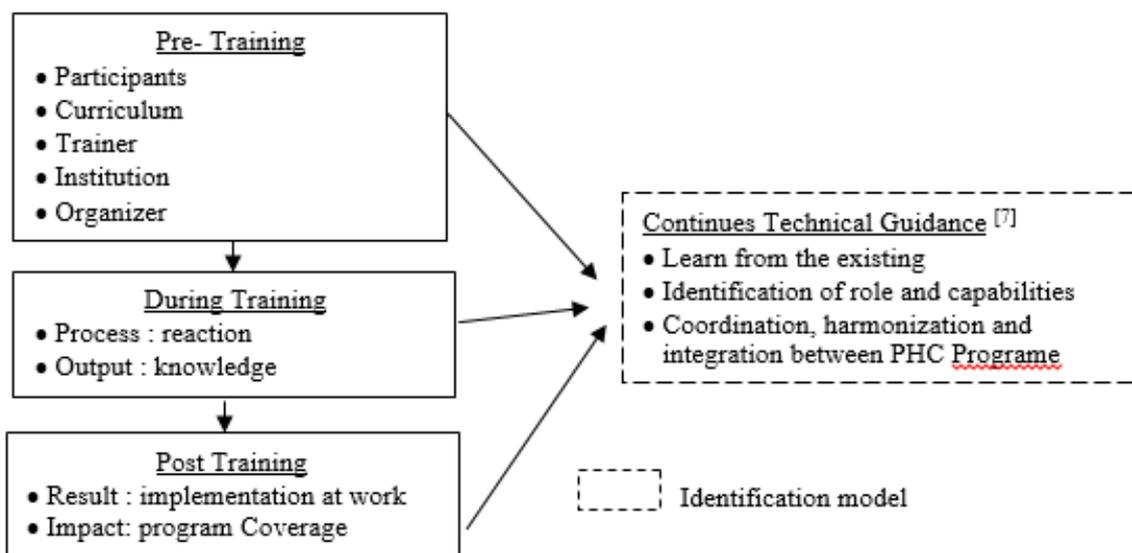
Chart 2. Training Evaluation Framework

Research Methods

The design of the research is mixed method – explanatory sequential, begins quantitative research design with pre-experiment one group pre-post test continued by qualitative research. Quantitative research population is all training participants who has the inclusion criteria, total sample. Quantitative data collection with secondary data analysis of participants knowledge from training documentation and HP programme coverage data from selected PHC. The qualitative data of HP implementation were obtained through in-depth interviews of HP officers and head of selected PHC. Quantitative analysis used with parametric or non parametric statistic test, according to data normality test result. Qualitative analysis is done by describing, clasyfing, connecting and concluding. The result of the

analysis becomes the material for identification of continues health promotion technical guidance model for officers in PHC.

Results and Discussion

The number of training participants who has the inclusion criteria are 233 people came from 10 districts. Participants with bachelor degree are 48.50% less than non-bachelor degree are 51.50%. Using a limit value of 75 (the criteria of complete learning) the knowledge level of participants listed in the table.

Table 1. The knowledge value at before and after training

Districts	High knowledge categories by districts (amount / %)		Average value by education level	
	Pre	Post	Pre	Post
Grt	4(17,40)	11(47,80)	56,00	74,59
Bdg	1 (4,20)	17(70,90)	52,44	80,00
Bgr	0 (0,00)	13(59,10)	51,69	76,00
Cjr	1 (4,50)	10(45,50)	53,00	70,25
Mjl	0 (0,00)	11(50,00)	41,67	74,33
Krw	0 (0,00)	7 (29,20)	38,55	68,00
Skbm	0 (0,00)	9 (37,50)	48,33	72,17
Tsk	0 (0,00)	13(50,00)	48,00	76,36
Crb	0 (0,00)	8 (36,40)	51,33	76,77
Ind	0 (0,00)	8 (33,30)	40,86	72,14
Total	6 (2,60)	107(45,90)	48,00	76,00

Based on the participants origin of the district, before the training there were 7 out of 10 districts (70% of districts) none (0%) participants belonging to the high knowledge category. After the training there was an increase in the number of participants belonging to the high knowledge category that is to be 107 people (45.90%), but there are still 126 participants (54.10%) who still in low knowledge category. Differences increase participants knowledge by district and education level before and after training, listed in the following table.

Table 2. Test different of knowledge changes by districts and education level

Districts	Different test by districts		Different test by education level	
	p value	Type of test	p value	Type of test
Grt	0,000	Wilcoxon test	0,217	t independen test
Bdg	0,000	Wilcoxon test	0,907	U man whitney test
Bgr	0,001	Wilcoxon test	0,512	U man whitney test
Cjr	0,000	t dependen test	0,274	t independen test
Mjl	0,000	Wilcoxon test	0,006	t independen test
Krw	0,000	Wilcoxon test	0,031	t independen test
Skbm	0,000	Wilcoxon test	0,362	t independen test
Tsk	0,000	t dependen test	0,587	t independen test
Crb	0,000	Wilcoxon test	0,963	t independen test
Ind	0,000	Wilcoxon test	0,406	t independen test

Different test between districts	0,656	Kruskal Wallis test	0,443	U man whitney test

There was no significant difference between the mean value of different knowledge before and after training inter-district (p 0.656). There were significant differences (p <0.05) of participants knowledge score before and after training in each district. The lowest knowledge change is 29.20% (Krw) and the highest is 66.70% (Bdg). The highest average difference of the highest knowledge score before and after the training of the bachelor participants is the participant from Krw as 32.73 and the lowest is the participant from Cjr district as 17.25. The average difference of the highest knowledge score before and after training of the non-bachelor participants is the participant from Bdg as 28,53 and the lowest is from Mjl as 15,20.

There was significant difference (p <0,05) mean of different knowledge score before and after training between bachelor and non-bachelor participants from Mjl and Krw. Conversely, there was no significant difference (p> 0,05) mean of different knowledge score before and after training between bachelor and non-bachelor participants from eight other districts. Overall there is no difference in knowledge change before and after training between bachelor and non bachelor participants (p 0,443).

Based on qualitative data, the planning, implementing, evaluation of HP services is not optimal yet. The coordination of inter program and inter sectoral is established through various meetings. HP promotion services integration with other services in PHC is established but not yet systematic. Implementation of Indonesia healthy with the family approach still during in the data collection stage of some families, interventions not yet optimal. There is no significant difference in health promotion coverage before and after training (p>0.05). The results are found in line with the results of previous research who suggested the health promotion planning process program has not been implemented in an integrated manner, the organizing and implementation of the HP has not been implemented maximally and the monitoring is only based on the results of clean and healthy behaviour survey when it should be monitoring and evaluation should be carried out covering all service components includes inputs, processes and outcomes. [8]

Direct HP technical guidance and indirect guidance through social media as a way of continues technical guidance for PHC officers. The model listed in the following chart.
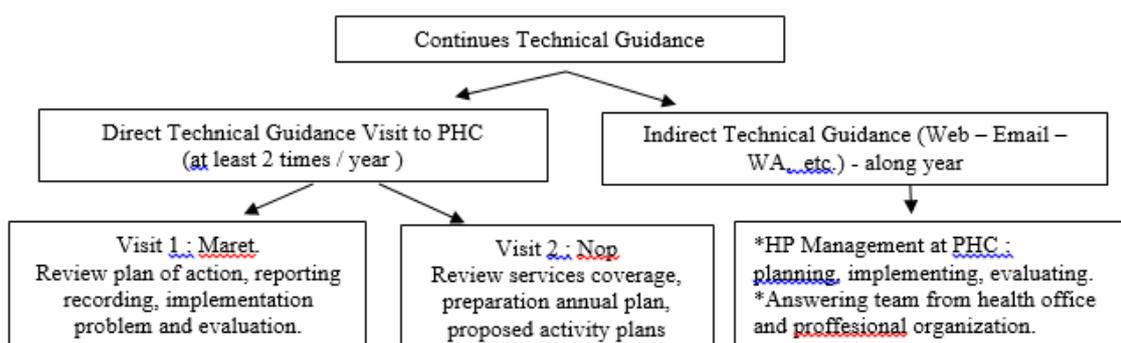
Chart 3. Model of Continues Technical HP Guidance for PHC Officers

Modules or guidelines should be developed for direct technical guidance by referring to the curriculum and training module and the health promotion implementation policy. This guideline is accompanied by a table or a checklist of technical guidance steps with items that must be checked in accordance with the guidance personel of Visit 1 and Visit 2 each year and the solutions provided by referring training modules or program policy documents. Indirect technical guidance can be developed with cooperation as professional organization and provincial / district health office and health training unit. Web or email preparation that is connected with the team of discussion / answer questions. This model is developed from the simplest through WA or email until the possible use the WEB model, etc.

Conclusion

There were significant differences (p <0.05) knowledge before and after training in each district, but no significant difference (p 0.656) knowledge before and after training inter-district. There were significant differences (p <0.05) of knowledge between bachelor and non-bachelor participants before and after training in two districts, but no significant difference (p≥0,05) in eight. Health promotion services management is not optimal yet. There is no significant difference in health promotion coverage before and after training. Direct health promotion technical guidance and indirect guidance through social media as a way of continues health promotion technical guidance for PHC officers.

Suggestions for health policy makers, health promotion stakeholders including health training unit, are expected the post training evaluation is carried out consistently in all training, so that the cost incurred more efficient. This prevents the wastedness of implementing cost-effective training, as well as the increasing competence of officers as well as the quality of HP promotion service at PHC. Continues technical guidance health promotion services at PHC in a sustainable manner directly by the HP Unit in health office of districts and province. Health Promotion Professional Organization (PPPKMI) with health promotion unit develop a model of guiding officers / members of professional organizations by utilizing information technology that can be accessed by PHC officers. Establish a team of consultants or an answering consultation team committed to answering incoming questions through developed social technology media. Health promotion program officers increased motivation to work better, to meet on-the-job performance standards and to improve personal self-competence. Health promotion officers develop a professional network to exchange experiences and knowledge in disseminating scientific health promotion.

Acknowledgments

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Description of Immunization Management Officer in Vaccine Management Support In Puskesmas in Brebes District

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Abstract

In the Decree of the Minister of Health on the National Immunisation Movement Acceleration Universal Child Immunization 2010–2014 (GAIN UCI 2010–2014) stated that the general problems of decline in immunization coverage and quality of service were caused by lack of quantity, quality and distribution of human resources. This study is a descriptive study with a quantitative approach. Subjects in this study were immunization officers at 25 puskesmas in Brebes District. Human resources criteria of the immunization program are seen from training participation, educational qualifications, duration of work as immunization officers and duplicate duties. The results of the study indicate that immunization officers in 25 health centers are only 84% with civil servant status, 20% have high school education, 64% have not participated in vaccine management training, 80% have multiple workload. While the average duration of work as an immunization officer is 10.9 years with a minimum period of work is 2 months and the maximum is 41 years. Immunization officers at 25 puskesmas in Brebes District are inadequate, less in terms of quantity and quality, most officers have multiple duties that impact on unimmunity of immunization performance in the immunization program.

Keywords: HR, immunization officers, vaccine

Introduction

Vaccines used in the immunization process, is a way to induce / boost a person's immunity actively against a disease, so that when someone exposed to the disease, he will not suffer from the disease. In order to achieve immunization objectives, safe injection practices should be undertaken, ie any vaccine injection action for immunization using standard immunization equipment, using vaccines that have been managed by trained cold chain officers and injectable syringes safely.[1] The cold chain vaccine process aims to maintain the potential and safety of the vaccine to achieve the effectiveness of the immunization program in preventing diseases that can be prevented by immunization.

One of the strategies in the immunization program is that immunization services are carried out by professional / trained personnel. Vaccine management requires a skilled executive, because it must apply five important things from the logistics management system.[2]

Minister of Health's Decree on the National Immunization Acceleration Movement of Universal Child Immunization 2010-2014 (GAIN UCI 2010-2014) states that in general the

problem of decreasing coverage and quality of immunization services is due to lack of quantity, quality and distribution of vaccine managers.[3] Immunization Implementers are officers or managers who have met the qualification standards as executing officers at all levels and have been trained in accordance with their duties.

In Minister of Health Decree No. 1611 of 2005 on Guidelines for Immunization Implementation, it is stipulated that the standard of personnel and training for Puskesmas levels consists of: 1) Immunization Officers, with qualified nurse or midwife who has been trained for immunization officers and is tasked with providing immunization and extension services. 2) Cold Chain Executives, with qualified minimum educated high school or vocational high school personnel who have attended cold chain training and are responsible for managing vaccines and maintaining refrigerators, recording refrigerator temperatures, recording vaccine entry and expenses, and taking vaccines in districts / cities as needed per month. 3) Immunization program managers, with qualified immunization officers, cold chain implementers or other officers who have taken training for immunization program managers and are tasked with making vaccine and other logistic planning, arranging immunization service schedules, checking immunization service records, creating and sending reports to districts / city, create and analyze PWS (Local Area Monitoring) monthly and plan follow-up.[1]

Another fact in the area, they found several weaknesses, including power distribution is uneven, field officers and private practice not all trained, motivated personnel is still low and the skills of computer operation is still lacking, especially at the district / city, while reporting and management of vaccine stocks already using the computerized system.[4] This directly or indirectly affects the immunization program, as training is an important asset for officers in running and managing immunization programs, particularly managing the vaccine chain.

The importance of vaccine management resources at the puskesmas level, the need for a study to look at the description of vaccine management resources in an area, so that it can be used as a consideration for the immunization program in the area in order to improve the quality of immunization services.

Method

This study is a descriptive study with a quantitative approach. Subjects in this study were immunization officers at 25 puskesmas in Brebes District. This research was conducted in Brebes District. The time of this research is conducted in March-April 2017. The target of this research is vaccine storage management system at puskesmas level in Brebes Regency.

The study population was all the immunization officers in 38 puskesmas, while the sample was in the study of all immunization officers in 25 pusesksmas, where the determination of puskesmas was done by random sampling. Human resources criteria of the immunization program are seen from training participation, educational qualifications, duration of work as immunization officers and duplicate duties.

Result

The results showed that the staffing status of immunization officers at the puskesmas level in Brebes was only 20% with the status of civil servants (PNS) and the education status was the majority of senior high school graduates or 64%. (table 1)

Table 1. Status of Immunization Officer Brebes

Immunization Officer	Prosentase (%)
The staffing status	
Civil servants	20
Honorary / Contract	80
Educational status	
Graduated from elementary school	
Graduated from junior high school	
Graduated from high school	64
Graduated Diploma / Bachelor Degree	

Table 2 shows the quality of immunization officers at the puseksmas level in Brebes District, only 36% of officers have been exposed to training, and only 20% of immunization officers in Brebes District have no duplicate work. While the average period of their work as an immunization officer is 10.9 years. (Table 3)

Table 2. Frequency Distribution of Immunization Officers in Brebes

Variable	Yes		No	
	f	**%**	**f**	**%**
Participation in training	9	36	16	64
Duplicate workload	20	80	5	20

Table 3. Descriptive Analysis of Immunization Officers Work Period in Brebes

Variable	n	max	min	average
Work Period (years)	25	41	0,16	10,9

Discussion

According to the Ministry of Health New Zealand in 2012, there are two important components of the vaccine cold chain management system: the regulating officers in the manufacture, storage and distribution as well as those working on health services. The second is the equipment used for the storage, transport and monitoring of the vaccine to the patient.[5]

The working period of immunization officers at puskesmas level in Brebes is 41 years old the shortest fund is only 2 months become immunization officer. The period of work is often associated with how long a person has worked so that work experience increases and skills in carrying out his work increases.[6] According to Hogberg in 2004, in which is contained in Kurnia in 2009, stated that the requirement of midwife-quality, among others, have experience and a minimum term of two years, following the training program in formal education for 6 months, and has a role as a teacher who annually teaches 12 students. In other words, when seen from the average tenure it can dikataan that immunization workers at the health center level in Brebes already qualified, but when viewed from the status of education and training, is still very limited so that they become a shortage of immunization workers at the health center level in Brebes.

According to the standards of health personnel, the immunization officer must have the qualifications attended the training. Midwives are often trained in skills and abilities according to their duties. One of the training also provided to the midwife is cold chain training. In Kepmenkes No 1161 / MENKES / SK / XI / 2005 mentioned that cold chain training is given to immunization program officers. Notoatmodjo in 1989, stated that training is one form of the educational process, through training it is expected that trainees can gain experience experiences that will eventually lead to changes in their practices. At some

institutions are often organized training with a view to provide additional knowledge and skills to employees or existing workforce in carrying out their duties or employment.

Immunization programs often have good resources for training staff or members.[7] This is also in line with the MOH RI in 2005 which mentions that technical training is provided to immunization officers at puskesmas, hospitals, and other service establishments as well as cold chain officers at all levels. It aims to improve the knowledge and skills of immunization officers.[8]

Socialization of Distribution and Storage of Vaccines Socialization is the provision of a source of knowledge that enables a person to act and behave as an effective member of society, which causes him to be effective, causing him to be aware of his social function so that he can be active in society.[9] Above understanding can be attributed to socialization distribution and storage of vaccines means immunization informing the officer that allow immunization workers act and behave according what has been socialized and as an active health workers.

This is in line with the Center for Disease Control and Prevention in 2012, which states that all staff who handle and administer the vaccine should know and understand about vaccine storage and handling policies and procedures or work steps for vaccine cold chain facilities. This applies not only to those who become cold chain officers, but also to anyone who delivers and accepts vaccine delivery and anyone who has access to the vaccine storage unit. Therefore, the dissemination of information is very important to the immunization officer or officer who has access to the vaccine storage unit.[10]

At the Puskesmas level, immunization program managers are assisted by cold chain operators and immunization officers. Immunization program managers at the puskesmas level may be appointed from immunization officers, cold chain operators or other officers who have been training for immunization program managers in charge of vaccine planning and other logistics, schedule immunization services, check records of immunization services, create and send reports to Kab / Kota, create and analyze monthly PWS and plan follow-up.

The quality of immunization program managers is seen from the level of formal education, received training and duration of work. The level of formal education and training is the prerequisite of the management officers based on Kepmenkes 1161 in 2005, while the length of work is seen to know the turn over of employees in each agency.

Number of duties of immunization officers at puskesmas other than as immunization officer. Bruce Aylward and Jennifer Linkins in the 2005 WHO bulletin suggested the recruitment of immunization volunteers to address the shortcomings of immunization practitioners especially in health services by simplifying tasks and clear operational guidelines.[11]

Immunization programs must be supported by technical personnel who have the capacity and competence in providing services, especially field service and support personnel such as wasor program and logistics managers. Scarcity of trained personnel in the field, especially in the eastern region of Indonesia due to the transfer of personnel, promotion and transfer of tasks/movements. In addition, other workloads due to immunization personnel also carry out duplicate duties both as treasurer of puskesmas as well as in charge of other programs. This needs attention with the provision of incentive systems. Incentive systems do not always have to be in the form of money, but communication and empathy and support can help increase the commitment of program personnel. High motivation is instrumental in the successful achievement of the immunization program.[12]

Research conducted by Kristini on Risk Factors of Poor Management of Vaccine Quality Management at Private Service Unit (Case Study in Semarang City) in 2008 showed that risk factors affecting the quality of vaccine management were unavailability of guidance, lack of knowledge of officers, refrigerator functions are not specific to vaccines,

thermometers are unavailable, how to carry the wrong vaccine and less staffing commitments. In this research there are 3 aspects of human resources which is a risk factor, namely the knowledge of the officers are lacking, the distribution of the wrong vaccine and the lack of officer commitment.[13]

Conclusion

Vaccine management personnel in 25 health centers in Brebes inadequate, lacking in terms of quantity and quality, most officers have a double duty that makes ketidakmaksimalan in the performance of the immunization program.

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Bottleneck Analysis from Selected Intervention Improving the Effectiveness of the First 1000 days of Life Movement in Semarang 2016

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Abstract

This study was conducted to analyze the existing bottleneck in several intervention strategies in supporting the First 1000 Days of Life program in Semarang city. This study was an analytical descriptive study with qualitative approach and conducted observations. The Bottle Neck identification was done by using Bottle Neck Analysis method from Tanahashi. The respondents were representatives from Health Department of Semarang City, executives of the First 1000 Days of Life (1000HPK) Program in Semarang city, including representative from the Ministry of Religious Affairs in Semarang city, Head of Community Health Center (Puskesmas) and Midwives working in Puskesmas area that had been selected as the study sample, representative of Education Department of Semarang city, and NGO (LSM). In determining the respondents, the researchers used purposive random sampling. There were still some obstacles in the intervention strategies of 1000HPK Program in Semarang which was assessed based on the Bottle Neck Analysis method from Tanahashi. The obstacles faced in each intervention were including the absence of tools, still limited to verbal, the lack of health workers, the availability of nursing kits, the number of midwives was still lacking, the area of public health center and the number of midwives, the availability of KIE props.

Keywords: Bottle Neck Analysis, First 1000 Days of Life

Introduction

Health is one of the elements of general welfare which needs to be realized in accordance with the ideals of Indonesian people through national development which is sustainable based on Pancasila and the 1945 Constitution.

Indonesia is one of the 17 countries of the 193 countries that have 3 high nutritional problems in toddlers. Indonesia ranks 64th out of the 65 countries. In addition, Indonesia is one of the 36 countries where 90% of the 175 million stunting toddlers live. Unicef (2008) noted that Indonesia ranks fifth for the highest stunting toddlers. Riskesdas 2010 showed that the prevalence of stunting toddlers on rich families is 26.9%, while for poor families it is nearly doubled, namely 47%. Along with this, the movement of health status improvement with a focus on the group of first 1,000 days of life on a global level (First 1000 Days of Life Movement or in Indonesia, 1000 HPK Movement) begins to be implemented in Indonesia.[1,2,3]

First 1000 Days of Life is the period since the child in the womb until the child is two years old. This phase is referred to as the Golden Period because in this period, the brain grows very rapidly. The disruption that occurs during this period, especially the lack of proper nutrition, will have an impact on the permanent and long-term survival and development of the child, and will be more difficult to be repaired after the child turns 2 years old.[4,5]

However, in the implementation, if it is seen by the objectives listed in Government Regulation No. 42 Year 2013 on "National Movement of Nutrition Improvement Acceleration in case of First Thousand Days of Life" (1000 HPK movement), there are still some obstacles.[6]

Therefore, a research is needed to analyze the Bottle Neck of several intervention strategies to support the optimization of the First 1000 Days of Life Program in Semarang city.

Method

The method used in this study was a qualitative approach to implement the Bottleneck analysis on some of the selected intervention in the Maternal and Child Health Program in order to improve the Effectiveness of the First 1000 Days of Life Movement in the city of Semarang.[7]

This research was conducted in the city of Semarang. The time of the course of this research was conducted in July-November 2016. The target of this research were the representative of Health Department of Semarang city, the executive of 1000 HPK program in the city, including the representative from the Ministry of Religious Affairs in the city of Semarang, the representative of Education Department of Semarang city, and NGO. The head of Puskesmas and Midwives working in Puskesmas area, which has been selected as the study sample. The Puskesmas sample selected by purposive sampling, which has inclusion criteria choosen by services (with care or non care service), location (urban or sub urban area) and maternal and child health program secondary data from Health Department of Semarang city.[7]

Result

1. The Bottle Neck Analysis of the Pre Marriage Health Counseling Program

These are the graphics that shown result pre marriage health counselling program bottleneck analysis in Puskesmas sample:
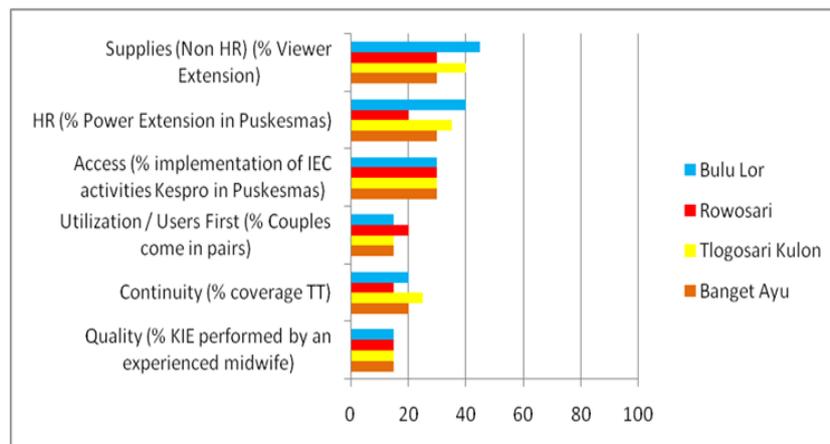
Fig. 1: Graph of Analysis Obstruction Pre Marriage Counseling Program Health

2. The Bottle Neck Analysis of the Antenatal Care Service (ANC) Program

These are the graphics that shown result ANC program bottleneck analysis in Puskesmas sample:
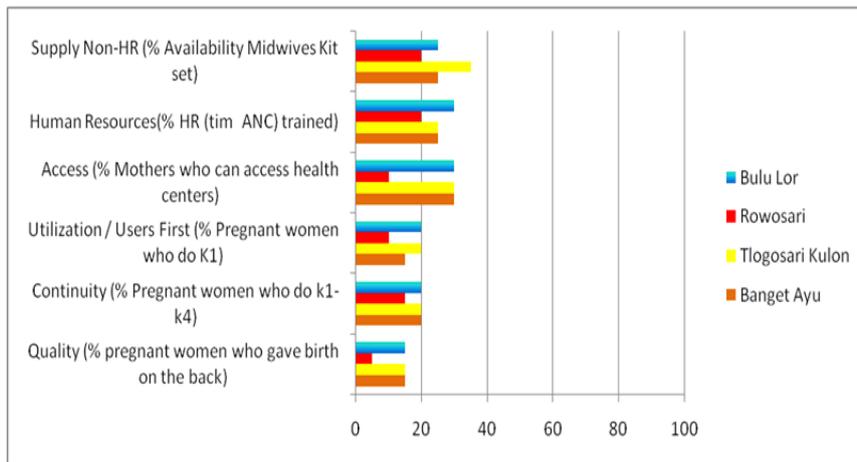
Fig. 2: Graph of the Bottle Neck Analysis of the Antenatal Care Service (ANC) program PHC

3. The Bottle Neck Analysis of the Postpartum Visit Program

These are the graphics that shown result Postpartum visit program bottleneck analysis in Puskesmas sample:
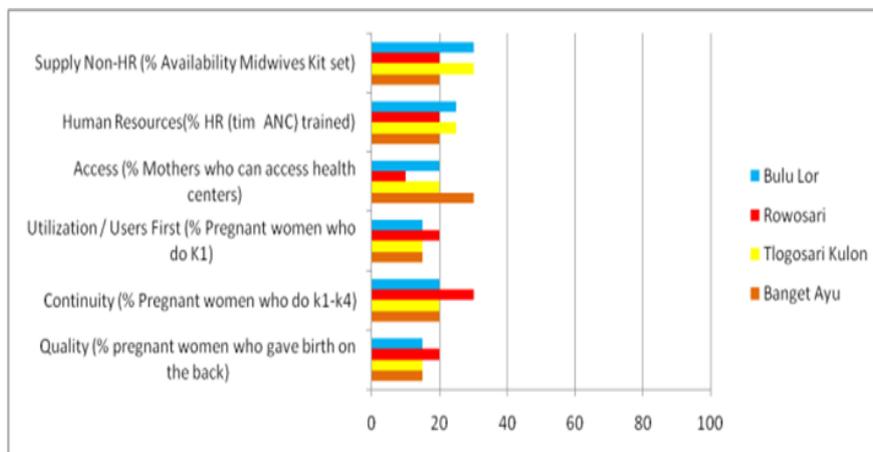
Fig. 3: Graph of the Bottle Neck Analysis of the Postpartum Visit Program PHC

4. The Bottle Neck Analysis of the Exclusive Breastfeeding Program

These are the graphics that shown result Exclusive breastfeeding program bottleneck analysis in Puskesmas sample :
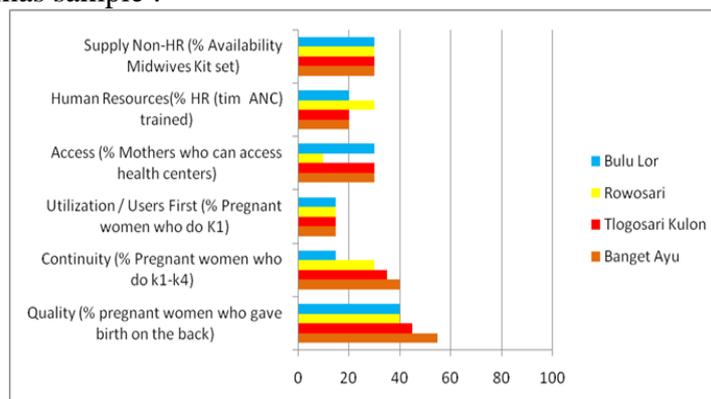
Fig. 4: Graph of the Bottle Neck Analysis of the Exclusive Breastfeeding Program PHC

Discussion

Intervention of Pre-Marriage KIE

Based on the study of four health centers as the sample, it is found that the obstructions with a greater coverage are non-HR supply and availability of HR, especially in Bulu Lor health center, as well as the access.

The obstruction of non-HR supply on KIE program is the absence of tools or devices/materials that should be given to couples who are getting married, this is the case in all of health centers. All this time, the KIE activities are usually given only when the couples getting married ask TT vaccinations verbally and it has not been allocated a special budget from the health centers and Semarang Health Department to provide the props.

Moreover, another problem is the unavailability of special funds to run the KIE activities outside the building that touches the fertile age group. So it will hamper the quality of the implementation of KIE program, because if the means of delivering information are not met, the information provided to the targets will not be maximal.

The number of midwives in the health centers surveyed is still deficient, since the activities are in the building and also outside the building. There are three health centers which still have a shortage of health workers; they are the Banget Ayu health center, Kulon Tlogosari health center, and Bulu Lor health center. As for Rowosari health center, the needs are felt sufficient since the Rowosari PHC is a health center whose working area is close to the educational environment. Because of that, its region is often used as a place to do a field study of educational institutions which is related to health, so that the health services are often assisted by students conducting the field study.

The problem of access obstruction is that the couples getting married have not been enough accessing the information that should be given, because of the limited information delivered by the health workers (in PHC performed by midwives).

According to research by Hasibuan (2016), about the implementation of disease control programs of dengue hemorrhagic fever (P2DBD) in Medan city, it shows that the availability of adequate resources (personnel, funds, and infrastructures) affects the successful implementation of the P2DBD program. This is also supported by the theory of implementation success stated by George Edward III and Van Meter and Van Horn, where the availability of resources will affect the success of implementation.[8]

Intervention of Antenatal Care Program (ANC)

It is found that the obstructions with a greater coverage are on the non-HR supply and availability of HR, as well as access to the services by the public. Tlogosari Kulon PHC has a high obstruction related to non-HR supplies (the availability of midwives KIT, medicines, etc.). This happens because there are obstacles in the provision of drugs, particularly the drugs for cases of pre-eclampsia and high blood pressure. That is because the health center still finds troubling with its e-catalog system. It is in line with respondents infrmation from other health centers, although it is not too much of a significant barrier to them.

Bulu Lor PHC has the highest obstruction related to human resources among the other health centers, as the civil servant midwives in the health center are only 2 people, 2 apprentice midwives who do not have a full duty in the health centers, and a midwife who has not been taking care of his license. While Banget Ayu PHC does have 5 Civil Servant midwives and 2 apprentice midwives, but still feeling the lack of human resources due to the larger working area and it is a basic emergency and hospitalization health center. For Tlogosari Kulon PHC, it has 5 Civil Servant midwives and 1 apprentice midwife, but still feeling less as a hospitalization Health Center with 2 supporting health centers. It is only Rowosari PHC stating that the human resources are now sufficient to run the Antenatal Care Program, it will be better if the number of HR is added.

Each PHC still has a fairly high obstruction related to the access problem to health services. This is due to the vast working area of PHC, while for Bulu Lor PHC, the low coverage of pregnant women who access the services at the health center because of the existing "elite" area who do not want to check the pregnancy at health centers and prefer to conduct the antenatal at the hospital or specialists doctors, however it cannot be ascertained whether the service provided is appropriate or not.

According to the study conducted by Pelupessy (2013), about the obstruction of the use of childbirth assurance service in Rijali PHC of Ambon city with qualitative research methods and phenomenological approach shows that the concept of obstruction in antenatal care (ANC), as pregnant mothers have a low knowledge and awareness for antenatal (K1) after the first trimester and the time of services at health centers which is limited (only twice a week). The concept of obstruction in childbirth assistance is the lack of information about the benefits of Childbirth Assurance so that the birth mothers do not take the advantages of the health facilities in hospitals and health centers.

Intervention of Postpartum Care Program

The obstructions that occur in this program intervention is almost identical to the obstructions of pre-marriage KIE and ANC programs, which are the non-HR supplies and the availability of HR, as well as the access to services by the public. It is only Tlogosari Kulon PHC who has a fairly high obstacle in the non-HR supplies in the program of postpartum visits. This happens because of the constraints in provision of drugs, particularly the drugs for cases of pre-eclampsia and high blood pressure. It is the same with the case in the obstruction of ANC care that it is because the health center still finds it difficult with the existing of e-catalog system.

Related to Postpartum Mothers who can access the services at health center, the one which has a fairly high issue or obstruction is Banget Ayu PHC. It is due to the large working area of Banget Ayu PHC, which is located on the border between Semarang city and Demak regency. Therefore, the traffic of residents that come in and go out of the area is often not recorded. There are many cases that the postpartum mothers move away before finishing the post-partum care for 42 days in the Banget Ayu PHC, and then do it in other places.

The research result above is also in line with what is said by Moore (2011), about the utilization of health services by pregnant women during childbirth in Nigeria, that among the factors of the distance from home to the health center, transportation, transportation costs, services in the health facilities, attitude of the officers and availability of the personnel providing the services, the factor that are very influential are the distance and cost (economy).[9]

Intervention of Exclusive Breastfeeding Program

All health centers have a fairly high obstruction in the non-HR supplies for Exclusive Breastfeeding program. It is due to the availability of props which has not been sufficient. There is no specific budget provided for the implementation of the exclusive breastfeeding program. Giving information about the exclusive breastfeeding when pregnant women do K4 is just appealing, as the appeal to read information about exclusive breastfeeding in the KIA book.

Full service coverage is a picture of the health service acceptance given to the public, after being given the first contact remaining continued in accordance with the rules and needs of the patient / people. Each PHC experiences obstacle related to the variable of full services for mothers to breastfeed exclusively. The monitoring of exclusive breastfeeding done by the health workers is only until the childbed or 3 months after the childbirth. After over 3 months, the active monitoring cannot be done to the breastfeeding mothers. The reason of mothers

who do not continue breastfeeding exclusively is that most of mothers also work in the formal and informal sectors. For the mothers who work in the formal sector find it difficult to exclusively breastfeed associated with the leave period which has expired so that the mothers have to work back, and the difficulty in milking. While the other reason is the lack of encouragement from the nearest family of mothers to breast feed exclusively.

The research result above is also in accordance with the words of Putri (2015), that breastfeeding (ASI) exclusively by women who are factory workers is less than housewives do. This research result is that exclusive breastfeeding by the factory worker mothers is less than the housewives.[10]

Conclusion

Several important conclusions that can be drawn from this study are:

1. The Bottle Neck in the phase before pregnancy of the selected intervention is KIE program on the couples that are getting married. The obstacles encountered in this intervention are the absence of tools, still limited to verbal, and the lack of health extension workers.
2. The Bottle Necks in the pregnancy phase of the selected intervention are the ANC service program, availability of midwife kits related to the drugs and the number of midwives which are still a shortage, especially in the care health centers that also has a health center network as a help.
3. The Bottle Necks in the phase after childbirth of the selected intervention are the postpartum visit program, the vast of health center area, and the number of midwives becomes the constraint in the implementation of postpartum visits to the childbirth mothers.
4. The Bottle Necks in the phases of children aged 0-23 months of selected intervention are the exclusive breastfeeding program, the availability of KIE props for the exclusive breastfeeding program is still inadequate, the continuity and quality aspects of the exclusive breastfeeding have not been achieved to the fullest.

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The Effect of Low Intensity Interval Swimming on Increasing of Motor Development and Cognitive Intelligence of Secondary School Swimmer

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Abstract

In this study, it was aimed to determine the effect of low intensity interval exercise of swimming on major physical, physiological as well as cognitive development in secondary school swimmer. Short-term memory plays a major role in all cognitive process affecting children intelligence and academic performance. Short-term memory is affected by many factors. One of them is physical exercise. Physical exercise can affect the function of cognitive process through mechanism of neurogenesis improvement, synapse plasticity, brain blood flow, angiogenesis, vascular growth, neurotransmitter and epigenetic. One of physical activity is aerobic exercise. Swimming is an aerobic water-based exercise which involves almost all the muscle of body, so it has benefit for health and keep body fit.. The method used in this study was an experimental research with *pre test - post test* group design. The subjects were 13 children listed as member in the Bina Taruna Pool Club in Purwokerto. The intervention is 5-weeks swimming with the frequency of 2-3 times per week. Each swimming session is 30 minutes, divided into 5 series. Each series consisted of 6 minutes swimming and 5 minutes of rest. Swimming will be carried out in moderate exercise zone (64-76% of maximum heart rate). Short-term memory was measured using the digit span and symbol coding before and after intervention. Paired T-test was used as the statistical test with significance value $p < 0,05$. There is an effect of swimming to short-term memory (auditory and visual) in children. P value = 0.006 for auditory short-term memory (digit span) and p value = 0.045 for visual short-term memory (symbol coding).There is an effect of swimming to short-term memory in children.

Keywords: swimming, intensity, short-term memory, children, digit span, symbol coding

Introduction

Short-term memory plays a major role in all cognitive process affecting children intelligence and academic performance. Short-term memory is affected by many factors. One of them is physical exercise. Physical exercise can affect the function of cognitive process through mechanism of neurogenesis improvement, synapse plasticity, brain blood flow, angiogenesis, vascular growth, neurotransmitter and epigenetic. One of physical activity is aerobic exercise. Swimming is an aerobic water-based exercise which involves almost all the muscle of body, so it has benefit for health and keep body fit. Research Ratey & Loehr (2011) said that physical activity is associated with increased brain function and cognition during childhood and young adulthood, said also that aerobic activity can improve cognitive function. The main purpose of aerobic exercise is to use as much oxygen as possible or multiply the amount of oxygen that can be processed by the body (Alex, et al., 2012). One study of physical activity using the respondent children under the age of 5 years. The study aims to explore the benefits of outdoor learning is to physical, emotional, social and intellectual. Results from these studies are statistically significant, where there is physical development, language and cognition among respondents (Jorgensen, 2012). Other studies on

the effect of exercise on short-term memory is done by previous researchers in adult women. The results showed an increase in short-term memory scores were significant compared with the scores before exercise. The conclusion of the study is that exercise can improve short-term memory in older women (Susanto, et al., 2010). However, no studies on the effect of swimming against short-term memory in children of school age. So researchers interested in studying the effect of physical exercise swimming against short-term memory in children.

Method

This experimental design was pre-post test group design. The subjects were all children who join Bina Taruna pool club in Purwokerto, Central Java which amount 13 children. Inclusion criteria were 1) children aged between 7-12 years old and they were at "Preparation" level in the pool club, 2) Respondent's parent fill out a letter of approval (informed consent) which state willing their child be a respondent for this research and verbal informed consent from respondent 3) In a good health condition measured from the PAR-Q questionnaire which there is no "Yes" in the questionnaire colom, 4) Respondent can understand numbers and letters. Smokers were excluded from this research. Respondent will be drop out when 1) resondent resigned as a respondent for some reason, 2) respondent who ever absent when swimming programe were on going, 3) respondent didn't do one from two test which would be given.

Subjects were swimming for 30 minutes which divided into five series of time. Each series consist of 6 minutes and 5 minutes break. Swimming were doing in moderate zone (64%-76% of maximum heart rate) and it was going along 5 weeks with a frequency of 2-3 times per week. Short term memory was measured using digit span test and symbol coding, and it took before and after 5 weeks swimming. We used paired T-test as a statistic test with significance $p < 0,05$. The proccess of taking data has been approved by ethics committee from medical faculty of Jenderal Soedirman University.

Result and Conclusion

This research was held at Bina Taruna swimming pool on 4th November 2015 until 5th December 2015 for 5 weeks. Respondent were children at Preparation level. Total of children in Preparation level were 21 children with 4 boys and 17 girls. Eight respondent didn't join one of the short term memory test, so we're not included them in this study. Respondent who joined the study until the end of session were 13 children.

Table 1. Distribution Table according by Respondent Gender and Nutritional Status

Classification	n (%)
Gender	
Boy	2 (15,38)
Girl	11 (84,62)
Status Gizi	
Normal	8 (61,54)
Fat	5 (38,46)

Univariate analysis used to determine the distribution, frequency and percentage of each subject. This analysis performed on each variable of the study results. Respondent characteristics include age in years, Body Mass Index (BMI) (Kg/m2, sleep duration (hours), the duration of swimming time in Preparation level (month) and exercise pulse (x/minutes).

Table 2. Respondent Characteristic Table

Classification	Mean ± SD	Min	Max
Age (year)	9.15 ± 1,46	7	12
BMI (Kg/m2)	20.02 ± 4,30	13.88	26.37
Sleep duration (hour)	8.31 ± 0,63	8	10
Swimming time (month)	12.15 ± 7,46	0	20

Bivariate Analysis
Pict. 1. Short Term Memory Test
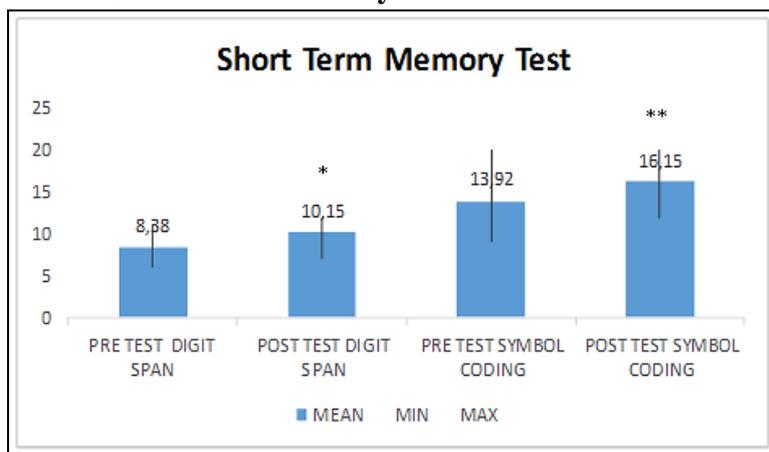
Note:
* = there are differences between the mean value of digit span pre test and post test with p<0,05 was 0,006
** = there are diffrences between the mean value of symbol coding pre test and post test with p value<0,05 was 0,045

Discussion.

The study sample consisted of 85% girls and 15% boys. There is no data about the influence of gender on short term memory in children so that we took a whole population that exist at Bina Taruna pool club. Age of respondent according the inclusion criteria were aged 7-12. The mean age of respondents who were 9,15 ± 1,46 years old. These periode of age is a critical period of short term memory maturation (Mundkur, 2005).

Cognitive development begins from the gestation, reaching a peak at 1-3 years old and then improve slowly until 16 years old (Grantham-McGregor, et al., 2007). Adolescence still experience an increase of neurons plasticity but not as fast as in children, so it needs an action for use children late age in increasing their memory function (Thompson & Nelson, 2001). Cognitive development is also affected by stimulus exposure. The greater the exposure to the stimulus, the greater the cognitive development (Grantham-McGregor, et al., 2007). According to Thompson and Nelson (2001) improvement, integration and growth of brain function occurs during childhood and adolescence. If children were given experience with the intervention programme which started in early age and ongoing, it can support cognitive growth in children associated with plasticity. Analysis of the Body Mass Index of respondents indicated the maximum value 26.37 and 13.88 mininal value, with the average of 20.02 ± 4.30. According to WHO (2007) regarding body mass index in children distinguished on gender and age, to obtain the classification of underweight, normal and overweight. Most of the respondents (61.54%) were classified into normal group and others are classified as overweight. The treatment which given is physical exercise of swimming in moderate

intensity (64-76%). Details of the swimming exercise are as follows: first week butterfly style - butterfly, backstroke second week, third week breaststroke, freestyle and fourth week of the fifth week of mixed style.

Digit span is used to measure children short-term memory (auditory). The mean of digit span pre test was 8.38 ± 1.45. The maximum value was 20 and the minimum value was 9. Seven of the respondents got digit span pre-test results with low interpretation and 6 respondents with moderate interpretation. The mean of digit span post test was 10.15 ± 1.77. The maximum value was 20 and the minimum value was 12. Two respondents achieved digit span post test with low interpretation and 11 respondents with moderate interpretation. There are differences between the mean for the digit span pre test and post test, $10.15 - 8.38 = 1.77$ thereby indicating an increase.

Symbol coding was used to measure the visual short-term memory. The mean pre test symbol coding was 13.92 ± 3.40. The maximum value was 20 and the minimum value was 9. Six respondents got pre test symbol coding results with moderate interpretation, 4 respondents with high interpretations and 3 respondents very high interpretations. Mean of symbol coding post test was 16.15 ± 2.79.

The maximum value was 20 and minimum value was 12. One respondent obtain symbol coding post test with moderate interpretation, 8 respondents with high interpretation and 4 very high interpretations respondents andt here is no lower interpretation of the results of symbol coding pre-test and post-test. There are differences between the mean and standard deviation for the value of symbol coding pre-test and post test 2.23 ± 0.61. Thus seen an increase in test results of symbol coding. Mean of pre-test digit span overweight respondents was 8.6. Mean of pre-test digit span normal respondents was 8.25. Mean of pre-test symbol coding obese respondents was 14.2 and the normal was 13.75. The mean value of the digit span pre test - post test obese respondents was 1.8 and the normal was 1.75. The mean value of the symbol coding pre test - post test obese and normal respondents was 4 and 1.125. Characteristic of short-term memory in normal and obese respondents are relatively the same, so the researchers included all respondents regardless of nutritional status. Analysis respondents duration sleep had a maximum value of 10 hours and a minimum value of 8 hours with a mean of 8.31 ± 0.63 hours. Mean sleep duration were obtained from respondents is enough sleep for school-age children according to Agustin (2012). Romcy-Pereira, et al. (2009) said that sleep can restabilizate and strengthen synaptic pathways in the brain, because sleep can rest a reseptor like NMDA receptors, AMPA-R and TrkB. These receptors will affect the learning activities and affects LTP from the synapse to the cycle of short-term memory and increase the plasticity (Minichiello, 2009). LTP affected by BDNF which response for learning and memory, which will work on the pre-synaptic and post-synaptic (Cunha et al., 2010). There was a significant influence of swimming to short term memory in children and knew the value of short term memory before and after swimming in children We suggest that it needs to study further to determine the short-term memory by measuring serum BDNF in humans. After getting the result that the swimming influence on short-term memory in children, researchers hope their future research to look at the effect of swimming to the long-term memory in children. The effect of swimming to short-term memory can be performed in younger children than the age of the respondents of this study. With the aim that brain development occurs more and improve the quality of children's achievement.

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Nursing Students' Medical Errors in Clinical Education Phase

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Abstract

Medical error was a health care problem that threaten the patient safety. Besides of health professions, nursing students also have the risk to do medical errors in their clinical education phase at the hospital. Many factors caused this problems, so that the researchers wanted to explore about the incidence of medical errors that commited by nursing students. This study was to identify the types of medical errors that commited by nursing students on their clinical education phase. This was a quantitative study with the survey approach. The samples were 104 nursing students in a school of nursing in Yogyakarta that we took by a simple random sampling technique. The data analysis used univariate analysis. The most common medical mistake committed by the nursing students was communication error (52.9%). The other medical error were medication error (40.4%), procedural error (24.5%), diagnostics error (23.1%), documentation error (23.1%), and transfusion error (2.9%). The impacts of the error were near miss and adverse events. Medication error was the most common medical error that commited by the nursing students. This information guides our role as nursing educators to influence change of nursing education to improve nursing students competencies and increase patient safety.

Keywords: medical error, medication error, nursing student, clinical education

Introduction

Medical errors are failures in accomplishing something planned or using the wrong plan to achieve a certain purpose. An error may result in medical injury or adverse event and near miss[1].

Students in the clinical education phase have limitations in clinical experience so that they have a risk to make mistakes, that can affect the patient's condition.

Existing research suggests that nursing students feel dissatisfied with their clinical ability and experience anxiety. The nursing students also experience high anxiety when the initial clinical practice so that they potentially make mistakes3.

Observational studies conducted on 52 students of the nursing profession showed 153 incidents of errors from 372 observations conducted at the Arak educational hospital, Iran. Common mistakes are medication errors such as drug dilution (2.68%) and errors in actions such as inaccuracy in drip drops (11.55%)4. The research conducted on nurse profession students at UIN Syarif Hidayatullah Jakarta (2011) shows that drug administration is the most common error that commited by the nursing students (44.8%). Factors that cause these errors are student factors, environmental factors and counseling factors[5].

This article aims to describe the medical errors made by nursing students during the clinical education.

Research methods

The type of this research was descriptive cross sectional study. Population in this research was 142 students in a bachelor of nursing program in Yogyakarta.

The sample of this study were 104 student that selected by random sampling technique. The place of study at the Hospital of nursing profession education conducted in March-May 2015.

The instrument of this research is a questionnaire that was made based on theoretical review by the researcher. Data collection was done by giving questionnaires to respondents.

Data analysis in this study using univariat through the description of the frequency distribution or the percentage of the percentage.

Result

1. Characteristic of respondents

Tabel 1 Characteristic of respondents
(n= 104)

N	Characteristic	f	(%)
1.	Age		
	21	6	5.8
	22	48	46.2
	23	41	39.4
	≥24	9	8.7
2.	Gender		
	Female	70	67.3
	Male	34	32.7
3.	GPA		
	≥3.51	15	14.4
	≤3.50	63	60.6
	Missing Case	26	25.0
4	Patient safety lectures		
	Received	103	99.0
	Never received	1	1.0
	Total	**104**	**100.0**
5	Resourse of patient safety training		
	Campus	44	42.3
	Hospital	16	15.4
	Campus and hospital	38	36.5
	Others	6	5.8
	Total	**104**	**100.0**
6	Patient safety briefing in hospital		
	Attended	75	72.1
	Never attended	29	27.9
	Total	**104**	**100.0**

Based on table 1, the respondent's characteristic in the research showed that the most respondents age was 22 years (46.2%) and the gender was the most female (67.3%). The majority of respondents have GPA of ≤3.50 were 63 respondents (60.6%), had received a lecture on patient safety (99%) and the majority of respondents had received patient safety lectures on campus (42.3%). Majority of the students received patient safety briefing from the hospital (72.1%).

2. **Description of medical error**

In general, medical error that commited by nursing students can be seen in table 2.

Tabel 2 Frequency distribution of medical error
commited by nursing students UMY (n= 104)

	Type of error	f	%
1	Medication error	42	40.4
2	Procedural error	41	39.4
3	Diagnostic error	24	23.1
4	Communication error	55	52.9
5	Documentation error	24	23.1
6	Transfussion error	3	2.9

The next table were the explanation of the types of mistakes made by students.

a. Medication error

Tabel 3 Frequency distribution of medication error that commited by nursing
students in clinical education (n= 104)

	Type of error	f	(%)
1.	Giving medication to the wrong patient (wrong patient)	12	11.5
2.	Wrong time	12	11.5
3.	Wrong medicine	8	7.7
4.	Inappropriate drug dilution (wrong dose)	8	7.7
5.	Drugs are not all consumed by patients	5	4.8
6.	Not documenting treatment	3	2.9
7.	Wrong rute	2	1.9
8.	Wrong prescribing	1	1.0

Table 3, illustrates that the majority of medication errors was wrong patient and wrong time of administering medicine.

b. Procedural error

Tabel 4 Frequency distribution of procedural error that commited by
nursing students (n= 104)

	Type of error	f	(%)
1.	Not applied the sterile procedure	27	26.0
2.	The infusion drip was not set properly	20	19.2
3.	The wound care set was used together for some patients	15	14.4
4.	Failed in arterial blood collection	14	13.5
5.	The vital sign check was not really done	8	7.7
6.	Error in injecting	5	4.8
7.	Wrong location when putting catheters on women	5	4.8

Table 4 described the type of procedural error with the majority of errors was not applied the sterile procedure.

c. **Diagnostic error**

Tabel 5 Frequency distribution of diagnostic error (n= 104)

	Type of error	f	(%)
1	Error in diagnosing patient	10	9.6
2	Do not conduct patient assessment correctly	15	14.4
3	Patient control plans are not notified to the patient	3	2.9
4	Error checking in laboratory data	2	1.9

Table 5 illustrates that the majority of the errors was not doing the patient assessment correctly (14.4%).

d. **Communication error**

Tabel 6 Frequency distribution of communication error (n= 104)

	Type of error	f	(%)
1	Not understand the information when hand over process	14	13.5
2	Not understand what the nurse talked about patient's condition	17	16.3
3	Not understand what to do when received delegation from the nurse	16	15.4

Table 6 described that the majority of communication error was students didn't understand what the nurse talked about patients' condition (16.3%).

e. **Documentation error**

Tabel 7 Frequency distribution of documentation error (n= 104)

	Type of error	f	(%)
1.	Documentation was incomplete	18	17.3
2.	Error in drawing graph in documentation	5	4.8
3.	Error in writing assesement data	3	2.9

Table 7 showed that the majority of mistakes was writing incomplete data in nurse documentation (17.3%).

f. **Transfussion error**

Tabel 8 Frequency distribution of transfussion error (n= 104)

	Type of error	f	(%)
1	Blood sampling error	3	2.9

Table 8 described that some nursing students had taken wrong blood sample (2.9%).

3. **Impact of medical error**

Tabel 9 Frequency of distribution of impact of error (n = 42)

Nu	Type of error	f	(%)
1	Medication error		
	Adverse event	1	2.4
	Near miss	41	97.6
2	Procedural error		
	Adverse event	4	9.8
	Near miss	37	90.2
3	Diagnosis error		
	Adverse event	1	4.2
	Near miss	3	95.8
4	Communication		
	Adverse event	1	1.8
	Near miss	54	98.2
5	Documentation error		
	Adverse event		
	Near miss	0	0
		24	100
6	Transfussion error		
	Adverse event	0	0
	Near miss	3	100
	Total	42	100

In table 9, it appears that most injuries were due to procedural error (9.8%).

Discussion

The results of this research found that all of the medical errors that was commited by the students were less than 50%, except the communication error. Communication error and medication error were the two highest presentation of medical error.

In line with research conducted at UIN, that the medication error that often commited by nursing students in the clinical education were wrong time in administering drugs and wrong patient[5]. These showed that problem of medication error still occurred in some nursing institution.

In a 3-year retrospective study conducted by Harding & Patrick, there were 77 treatment errors in nursing professionals in professional education programs. This was due to lack of understanding and knowledge on pharmacology[6].

Baghcheghi & Kooshestani argue that the common cause of drug error was the inadequacy of nursing profession students' knowledge of pharmacology, this was supported by the research of King, et al. that there was lack of pharmacology content within the curriculum of nursing education[4,12].

The results of the study also showed that the majority of the types of procedural error was the students didn't applied sterile principles in nursing procedures. The second was the students didn't set the infusion drip properly. Some students reported that there were limitation of the facilities in the district hospital- like the limitation of sterile handscoon, limitation of the sterile set for the wound care and others facilities. This conditions sometimes caused them couldn't applied sterile principle. In line with research conducted by Khasanah, shows that 75% of students judge he/she ever made a mistake in the procedure of action[5].

At the type of diagnostic errors, a minority of respondents have done a diagnostic error. The majority of the types of mistakes that occured were the respondents did not conduct the assessment of the patient correctly. The second sequence is the error in diagnosing the patient.

Gandhi, et al. reported the results of his study of malpractice claims based on misdiagnosis that reported 181 claims (59%) involved diagnostic errors that endanger patients. 55 of 181 claims have been made wrong and caused the patient to die[7].

Errors in the diagnostic process may occured due to incomplete clinical data. The health worker conducted the assessment did not write correctly so that resulting in a fault in the diagnostic process.

Communication errors are the most common error that was made by nursing students. The majority were the students didn't understand what the nurse talked about patient's condition.

Based on Agency for healthcare Research and Quality report (AHRQ) there was a communication error of 65%. In the medical service, the communication process is the central role holder[8]. Communication between physicians with doctors, doctors with patients, doctors with nurses, nurses with patients occurring at any time. Nursing and physician communication may occur at the time the nurse reported the patient's progress and they discussed about treatment plan. Communication between nurses may involve the handover of responsibilities or change of duties[7].

On documentation errors, a small percentage of respondents have made a mistake, with the majority of the types of errors that occured was making mistakes in writing incomplete data in the documentation.

Based on a study conducted by United Stated Pharmacopeia (USP) in 2002 out of 94,498 medical records under study it was concluded that poor documentation was the cause of error with an incidence rate of 11,622 (12.0%)[9].

Transfusion errors are the least mistakes made by nursing students, with the majority of mistakes that occur was the error in taking blood samples. Based on the study of Serious Hazard of Transfusion (SHOT) it was reported that there were 366 cases of severe transfusion reactions, as many as 191 patients or 52% received wrong blood component transfusion. Meanwhile, according to the FDA (Food and Drug Administration) said that 3% sampling error, 13% in blood test error[10].

The transfusion procedure begins and ends through stages: decision making that the patient needs transfusion, blood demand writing, sampling and labeling on blood samples, delivery, storage, transfusion, and monitoring of transfusion side effects. If the procedure can not be executed properly then there will be errors that can endanger the patient.

Blood sampling is an important step in every blood transfusion. The results of this study mentioned that there was a mistake in taking blood samples, so that when the blood sampling course has been a mistake then the next stage will occur errors, such as blood labeling and blood giving wrong[10].

Based on the results of this study, most of the impact of medical errors that commited by nursing students was near miss. It was possible that in this study there were the lack of observation, the respondents only fill out the questionnaire, or they didn't follow up the patient after the mistakes so that the respondent did not know about the incident of injury or not injured, and they did not report the impact of the error because of fear.

According to Aspden showed that the impact of no injuried occured as much as seven to one hundred times compared to adverse event[11]. Near miss forms reported by Shaw, et al, out of a total of 28,998 incidents reported drug-related incidents of 9% source-related incidents, 8% facilities, and 7% on treatment[12].

For the impact of injury or adverse event reported by Ballard, accounted for 28% of reactions from treatment or prescribed drugs, 42% was a life-threatening but preventable event, 20% of services were found in the polyclinic. 10-30% was a laboratory error[13].

JCAHO reports that failure to communicate causes more than 70% of patient injury. Communication failure also leads to longer hospitalization of patients in the hospital resulting in harm to patients, both financial and physical[1].

Conclusion

Based on the results of research that has been done about the mistakes made by professional students, it can be concluded as follows:

1. The two most common medical errors that commited by nursing students are communication error and medication error.
2. The impact of most errors was near miss.

Suggestion

The results of this study can be used as an evaluation in nursing education and to improve the skills of students in performing nursing procedures and improve the patient safety education for nursing students.

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Control of Aedes Aegypti Mosquito as A Dengue Health Feast Vector (DBD) Based Duku Plant (*Lansium domesticum* Corr)

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Abstract

Research on mosquito vector control is done by exploring various plants that have potential as insecticide. One plant that has potential as a plant insecticide plant Duku (*Lansium domesticum* corr). Plants belonging to the family Meliaceae is known as a producer of substances that are antifeedant and insect growth control with low toxicity to mammals. The purpose of this research is to know the effect of insecticide extract of bark and duku leaf of various concentration to various stages of *Ae. aegypti*. This research type is true experiment with After Only With Control Design, using 750 *Ae. aegypti* were treated with bark extracts with concentrations of 30%, 35% and 40%, and 45% and controls were observed for 24 hours and calculated the percentage of deaths of the test mosquitoes. The data obtained were analyzed by using variance analysis of One Way Anova followed by Least Significant Diference (LSD). Phytochemical results showed that leaf extract and bark of duku contain flavonoids, saponins and alkaloids. LC 50 for duku bark extract was at concentration 33,84% while LC50 for duku leaf extract was at concentration 25.60%. The highest number of mosquito mortality was found at concentration of 35% on duku leaf (97% mortality) and 45% concentration on duku bark (97,3% death).

Keyword : *Aedes aegypty*, Duku, Ekstrak, Insektisida

Introduction

The main vectors of dengue fever, Chikungunya are *Aedes aegypti* and *Aedes albopictus*. Vector control efforts to reduce the number of cases of vector infectious disease have been widely practiced. The use of insecticide as a larvacide is the most commonly used way for people to control the growth of the vector. The use of chemical insecticides aimed at reducing mosquito populations, but in fact can lead to disruption of natural biological systems. Problems that can arise due to the continuous use of chemical insecticides such as resistance, environmental pollution and undesirable effects in humans, mammals and other non-target organisms (Lee et al., 2001).

One of the efforts being developed to reduce the negative impact is the search for insecticides from natural ingredients, especially products derived from plants that are selective, safe and environmentally sound. Vegetable insecticides leave no residue in the air, water and soil and have a higher level of safety when compared with inorganic toxins. This is because the molecular composition of plant-based insecticides consists mainly of carbohydrate, nitrogen, oxygen and hydrogen which readily decomposes into environmentally safe compounds and also decreases the chances of animals that are not subjected to residue (Matsumura 1985 in Rochmat et al., 2009) .

Several studies have investigated the possible potential of natural ingredients from plants as insecticides, although the results are varied but are an alternative to replace synthetic materials as they are proven effective and do not interfere with human, animal and environmental life (Chaitong et al., 2006). Plant families considered to be potential sources of vegetable insecticides are Meliacea, Annonaceae, Astraceae, Piperaceae and Rutaceae.

One of the plants that have the potential to become an insecticide is Duku (*Lansium domesticum* corr). Duku is one of indigenous plants of Indonesia which in Banyumas Regency and Purbalingga Regency this plant become excellent product especially in District of Karang Lewas (Banyumas) and Kejajar Village (Purbalingga). Various classes of compounds that have activity as insecticide that is alkaloid, flavonoid and saponin contained in plant duku (Oktavianti, 2009). These compounds are found in the skin of fruit, seeds and stems of duku plants (Astawan, 2008). Elis research (2012) proved that the extract of duku fruit skin with 35% effective as an anti-mosquito electric to the power of *Aedes aegypti* mosquito kill. Duku fruit seeds as well as effective as larvacide also nutritious for worming drugs, fever medication and diarrhea medicine (Astawan, 2008).

This encourages this research, namely by providing stem bark and duku leaf extract by testing the concentration range enough to obtain information LC 50 and total death of larvae in *Aedes aegypti*. With the knowledge of insecticidal effect of bark and duku leaf extract on *Aedes aegypti* it is expected to provide information about potential duku as a vegetable insecticide.

Research Methods

The type of research used in this study is a true experiment with the posttest only control group design design. The experimental group was 25 Aedes aegypti mosquitoes in chamber glass given by duku bark extract while the control group was 25 mosquitoes in glass chamber given aquades.

The study was conducted in two places. Preparation of bark and duku leaf extracts was done at the Physiology Laboratory of Biological Faculty Plant. The effectiveness test was conducted at Laboratory of Research Institute for Research and Development of P2B2 Banjarnegara

The subject of this research is *Aedes aegypty* mosquito. The sample is determined by using Completely Randomized Design with the number of repetitions done is 3 times
This research consist of two variables namely independent variable (Independent variable) that is bark and duku leaf extract with concentration of 30%, 35%, 40% and 45%; and the dependent variable (a dependent variable) is aquades

The data obtained in this study were analyzed using probit test and One Way Anova test. The probit test is a test used to determine the killing power of duku bark extract and duku skin on *Aedes aegypti* mosquito deaths expressed in Lethal Concentration (LC) ie LC50 and KT90. One-way Anova test was used to find difference of mosquito mortality in control group, 30% 35%, 40%, 45%, bark and duku leaf extract.

Results and Discussion

3.1 **Phytochemical Extract Skin Duku Trunk Test**

To know the effective content of insecticide found in extraction of bark and duku leaf, phytochemical test. Phytochemical test results can be seen in the following table:

Table 1. Phytochemical Test Results of duku and duku leaf stalk

No	Senyawa	Colour	Information
1	Alkaloid	There is a brownish orange sediment	Positive
2	Flavonoid	There are dark green deposits	Positive
3	Saponin	Formed stable froth	Positive

Based on the table it is known that the leaf bark extract and positive duku leaves contain alkaloid group compounds, flavonoids and saponins.

3.2 Measurement of Temperature and Humidity

Temperature and Humidity in this research is done every time will test the insecticide material. This aims to ensure that no other factors can affect mosquito mortality at the time of the study. Based on the result of temperature measurement known that the room temperature is around 27^0 C, humidity is around 83%. This temperature and humidity is a normal condition for surviving mosquitoes.

3.3 Knockdown Time (KT$_{90}$) After Exposure

Knockdown Time (KT$_{90}$) represents a 90% drop in mosquitoes after a 30-minute treatment. Based on the observation result, it is known that no one mosquito exorcist died during the first 30 minutes either on control or in the treatment group. The results showed that mosquitoes first fell in the 42nd minute with concentration of 35% and minute 59 at 45% concentration for duku bark extract. The mosquitoes given duku leaf extract experienced death at the 46th minute at 45% concentration and 50 min for concentration of 40%.

3.4 The death of *Aedes aegypti* mosquitoes

The number of *Aedes aegypti* mosquito deaths after being given treatment for 1 x 24 hours can be seen in the following table:

Table 2. Number of Deaths of *Aedes aegypti* mosquitoes in various concentrations of Duku bark extract.

Replication	Number of Mosquitoes in Glass Chamber	Number of Dead Mosquitoes after 24 hours treatment of Batang Duku bark extract concentration				
		Control	30 %	35 %	40 %	45 %
1	25	5	16	10	24	24
2	25	0	10	5	19	25
3	25	0	7	10	19	24
	Amount	5	33	25	62	73
	Average	1.6	11	8,33	20.66	24.33
	%	6.66%	44%	33.33%	82.66%	97.33%

Based on the table can be seen that the average death of mosquitoes in the control group as much as 6.66%. The lowest percentage of deaths was found at a concentration of 35%, and the highest was at a 45% concentration of 97.3%.

Table 3. The number of *Aedes aegypti* mosquito deaths in various concentrations of duku leaf extract.

Replication	Number of Mosquitoes in Glass Chamber	Number of dead mosquitoes after 24 hours treatment of duku leaf extract concentration				
		Control	30%	35%	40%	45%
1	25	0	20	25	20	23
2	25	0	13	23	20	19
3	25	0	17	25	12	24
	Amount	0	50	73	52	66
	Average	0	16,6	24,3	17,3	22
	%	0%	66,6%	97,%	69,3%	88%

Based on the table can be seen that the average death of mosquitoes in the control group as much as 0%. The lowest average mortality rate was found at 30% concentration, and the highest was 97% at 97% concentration.

3.5 Lethal Concentration 50 (LC50).

Here is an analysis of LC 50 from bark and duku leaf extracts of *Aedes aegypti* mosquitoes.
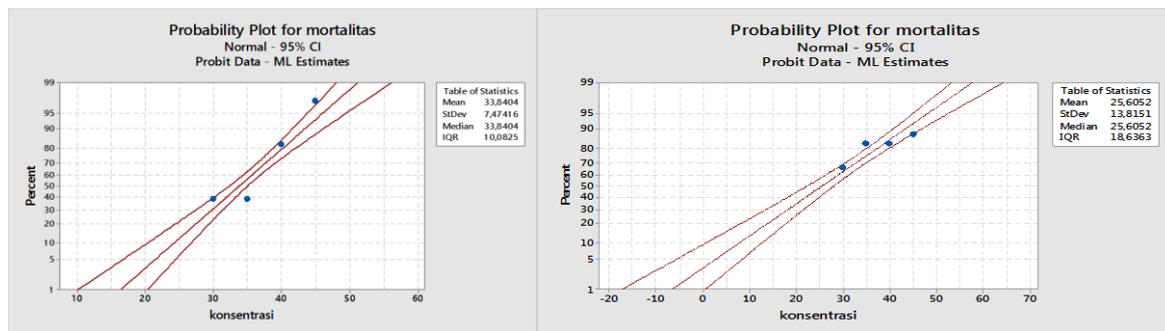
Picture 1 . LC 50 probit analysis of bark duku extract and duku leaf extract

Based on probit analysis known that LC50 for bark duku extract is at concentration 33,84% while LC50 for duku leaf extract are at concentration 25.60%.

Discussion

1. Compounds in Duku Trunk Skin Extract

The results of phytochemical test on bark duku extract showed that the extract contained alkaloid, flavonoid and saponin compounds. These results indicate that the insecticidal active ingredient contained in the bark of duku is similar to that found in the skin of duku and duku seeds (Ni'mah et al., 2012).

According Katzung in Hartini (2012) saponin is a compound that has a strong surface tension that acts as an insecticide. This compound can disrupt the stability of the cell membrane and can cause the cell to lysis. Saponin is also capable of irritating the gastrointestinal mucosa and has a strong effect as an insecticide because of its sotoxic and hemolytic properties (Chaieb, 2010)

Alkaloid compounds in the bark duku serves as a stomach poisoning or stomach poison by weakening the nervous system in the gastrointestinal organs. Mosquitoes will lose appetite so mosquitoes will slowly die (Anizewski, 2007)

The flavonoid compound in the bark of duku serves as a powerful inhibitor of the adult respiratory system. When the mosquitoes do the respiratory process flavonoit will follow inhaled, then the compound will weaken the nerves and cause damage to the spiracel cells so that the respiratory work system will run slowly and mosquitoes experience death due to lack of oxygen supply (Djojosumarto, 2008., Hanum et al, 2013).

2. Effectivity of Duku Trunk Bark Extract As an anti-mosquito spray against *Aedes aegypti mosquito* death Based on KT 90

Based on the results of KT 90 it is known that none of the mosquito deaths were found in the various concentrations and types of extractions tested. The results showed that mosquitoes began to die in the 42nd and 50th minutes. The longer time it took to drop *Aedes aegypti* mosquitoes showed less effective insecticide or the insecticides were already resistant to the insecticide (Liener, 2012, and Heinrich, 2009).

According Arbiastuti (2008) the potential of duku plant extract will increase along with the length of time exposure and increased concentration. This is because the mechanics of contact toxins and respiratory toxins contained in the extracts of bark and duku leaf need some time to give the effect of death on *Aedes aegypti* mosquitoes. This is most likely the

time it takes to turn off a number of mosquitoes longer than 30 minutes. Therefore the longer the exposure and the higher the concentration will make the effect of death to *Aedes aegypti* mosquitoes is greater.

3. Potency of Duku bark extract as Anti Mosquito Spray against Aedes aegypti Mosquito Death

The results of research have been done to prove that the extract of bark and duku leaf can affect the death of *Aedes aegypti* mosquitoes. In the stem bark extract the number of mosquito deaths is directly proportional to the increased concentration. The most proven effective concentration in mosquitoes is 45%. In contrast to the duku extract the highest number of deaths was found at 35% concentration.

This shows that bark and duku leaf extracts can be used as an alternative to making vegetable insecticides even when viewed from their effectiveness (KT90) still do not meet the requirements of insecticide.

The use of duku bark and leaves as a natural insecticide material is safer and more economical when compared to synthetic insecticides (Elis, 2012 and Ni'mah, 2014).

4. Lethal Concentration 50 (LC50).

LC 50 is a calculation to determine the toxicity of an extract or compound. Based on the results of probit analysis in the known that the concentration required to kill the test animal (*Aedes aegypti*) on duku leaf extract (25, 60%) is less than the duku bark skin concentration (33.84%). This shows that the active ingredient content of insecticide in duku leaves more than in bark of duku.

Research Limitation

In doing research the researchers found some limitations:
1. The study time is very short and the number of mosquitoes is limited because it must be cultured first in the laboratory, so researchers can not compare with other parts of the plant Duku.
2. Extraction process that takes a long time due to lack of adequate extraction equipment.
3. Equipment to test the effectiveness of insecticide that is limited glass chamber so that does not allow researcher to do test simultaneously at the same time.

Conclusion
1. Duku bark extract is shown to contain alkaloids, saponins and flavonoids.
2. The most rapid concentration of duku bark extract to kill mosquitoes was 45% concentration at minute 59
3. The most rapid concentration of duku leaf extract to kill mosquitoes was 45% concentration at 46 minutes
4. KT90 duku bark extract and duku leaves were not found until 30 minutes
5. The lowest average mortality rate was found at concentration of 35%, and the highest was at 45% concentration as much as 97,3% in treatment of bark duku extract
6. The lowest average mortality rate was found at the concentration of 35%, and the highest was at a concentration of 35% as much as 97% in the treatment of duku leaf extract
7. LC50 from duku bark extract of 33,84% and duku leaf of 25,60%.

Recommendation
1. For the R & D center P2B2 Banjarnegara
   More tools and materials are needed to conduct effectiveness research on insecticides in adult mosquitoes.

2. For the Community
   This research can be used as an alternative to control the *Aedes aegypti* mosquito that is amam for environment and human
3. For other researchers
   a. It is necessary to measure the content of the active ingredients of insecticides contained in bark and duku leaf extracts
   b. Further research is needed for field use

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The Health Factors Correlated to Intelligence Quotient of School Children

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Abstract

Intelligence Quotient is score derived from Intelligence test for measure level of children intelligence. There are several factors which korelation with intellegence quotient. Purpose of this research was to determinate correlation between level of physical fitness, iron intake, nutriotioanal status and intelligence quotient of school children. It was explanatory survey with Crossectional approach. Population of this research are all of children in 4 elementary school at Sumbang district, amounts 743. Sampel was taken by purposive with inclusion criteria is children who they are in fourth graders study, amounts 101. Data Analysis by univariat and bivariat analysis by Rank Spearman Analysis. There were 53,5% children who had enough Intelligence Quotient. Conclusion of this research were there was correlation between level of physical fitness and intelligence quotient, while level of iron consumption and nutritional showed there was no significant (p value: 0,376 and p value: 0,324).

Keywords: Physical, fitnes, intelligence, nutritional

Introduction

Intelligence is person's ability to acquire knowledge (learn and understand), apply knowledge (solve problems), and abstract thinking. Intelligence Quotient or IQ is a score obtained from intelligence tests. Intelligence is governed by parts of the cerebral cortex that can provide the ability to count, analyze, imagine, and have the power of creation and innovation (1). There are three factors that influence the level of intelligence such as heredity, health and education (2)

Health factors that affect the level of intelligence include the level of physical fitness. Physical fitness is the body's ability to carry out duties and daily work diligently, without experiencing significant fatigue (3). Students with good physical fitness will be accustomed to performing learning tasks well (4). Research conducted by Chaddox et al shows that the level of physical fitness is related to brain structure and function in children (5). Research conducted by Charles et al shows the correlation of physical fitness with cognitive function such as memory and speed of response in children(6).

Another health factor that correlates closely with intelligence is nutrition. The main factor that affects the growth of the brain is the quality consumed food (3). One of the essential nutrients for brain development is iron. Iron is not only important for normal child growth, but also for mental motor development as well as cognitive function. The brain requires adequate amounts of iron because of its high oxidation metabolism compared to other organs. Lack of iron will cause a child to suffer anemia and result in mental and motor disorders that persist until an adult child (7).

Nutrition requirement to be expressed with nutritional status. Nutritional status is an expression of the balance of nutrients needed by the body(8). According to Reserach of health national, nutritional status is still a problem in school children. The national average

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prevalence (according to Body mass index for age) in children aged 5-12 years is 11.2%, consisting of 4% severe wasting and 7.2% wasting (9). Research conducted by Ijarotimi and Ijadunola shows a significant correlation between nutritional status and Intelligence level in schoolchildren in Nigeria(10). Research conducted by Hein et al states that there is a correlation of nutritional status to the level of intelligence in 4204 schoolchildren in rural Zambia (11). Research conducted by Puspitasari showed a significant correlation between nutritional status and cognitive function in schoolchildren in Central Java(12).

Banyumas regency is one of the districts in Central Java with a high prevalence of nutritional status problems. Health screening conducted by Banyumas District Health Office showed that as many as 7.4% of schoolchildren are wasting. The school children found in the work area of Puskesmas Sumbang II experienced the highest case of wasting much as 43.2% (13). The objective of the study was to know the health factors correlation to intelligence level in school children.

Material and Method

This research is an explanatory research. This study explains the health factors of intelligence level such as physical fitness, level of iron intake and nutritional status. The approach used is crossectional that all variables are collected simultaneously (one at the same time). The population in this research is all elementary school children in 4 schools, amounted to 743 children. The location of the research was conducted in 4 elementary schools in Kecamatan Sumbang, It were Banjarsari Kulon I, Banjarsari Wetan 2, Watujaran and Limpakuwus. The time of research is March-July 2016. The sample is taken by purposive, with inclusion criteria that is only in 4th grader amounted to 101 people. Physical fitness test by using Physical Freshness Tests Indonesia conducted by a sports practitioner. Measurement of nutritional status with body mass index for age (BMI for age), while standard intelligence test using Standard Progressive Matrices (SPM) performed by a Psychologist. Univariate analysis with frequency distribution presented in table, while bivariate analysis by cross tabulation and Rank Spearman correlation test for physical fitness, level of iron consume and nutritional status with intelligence level in school children.

Result

Measurement of Intelligence level by *Standard Progessive Matrices* (SPM). Mean of score is 32,3, while 12 in minimum and 46 in maximal score. Large amount (53,5%) have intelligence level optimum (Tabel 1).

Tabel 1. Univariat Analysis of Intelligence Level, Physical Fitness, Level of Iron Intake and Nutritional Status

No	Categories	Total	
		n	**%**
	Intelligence Level		
1	Less	1	1
2	Low	15	14,9
3	Average	54	53,5
4	High	31	30,7
	Total	101	100
	Physical Fitness Level		
1	Good	7	6,9
2	Moderate	40	39,6

3	Low	47	46,5
4	Less	7	6,9
	Total	101	100
	Level of Iron Intake		
1	Less	87	86,1
2	Low	7	6,9
3	Normal	4	4
4	Over	3	3
	Total	101	100
	Nutritional Status		
1	Overweight	14	13,9
2	Normal	71	70,3
3	Wasting	16	15,8
	Total	101	100

The average of physical fitness is 13.3, with a minimum score of 8 and a maximum of 21. Most students have a low physical fitness level (46.5%) (Table 1). Students with a good physical fitness level (28.6%) and moderate (50%) will have a higher level of intelligence more than the level of physical fitness low (19.1%) and less (0%) (Table 2).

Tabel 2. Cross Tabulating of Physical Fitness Level, Level of Iron Intake, Nutritional Status and Level of Intelligence Quotient

		Intelegency Quotient Level									
No	Categories	Less		Low		Average		High		Total	
		n	%	n	%	n	%	n	%	N	%
	Physical Fitness Level										
1	Good	0	0	2	28,6	3	42,9	2	28,6	7	100
2	Moderate	0	0	6	15	14	35	20	50	40	100
3	Low	1	2,1	6	12,8	31	66	9	19,1	47	100
4	Less	0	0	1	14,3	6	85,7	0	0	7	100
	Level of Iron Intake										
1	Less	1	1,1	13	14,9	46	52,9	27	31,0	87	100
2	Low	0	0	1	14,3	4	57,1	2	28,60	7	1
3	Average	0	0	1	25	2	50	1	25	4	100
4	Over	0	0	0	0	2	66,7	1	33,3	3	100
	Nutritional Status										
1	Overweight	0	0	0	0	8	57.1	6	42.9	14	100
2	Normal	1	1,4	14	19,7	34	47,9	22	31,0	71	100
3	Wasting	0	0	1	6,25	12	75	3	18,75	16	100

The result of Rank Spearman test showed that there was a significant correlation (p = 0,024) between physical fitness level and intelligence level (Table 3).

Tabel 3. Rank Spearman Analysis

Variabel	Total (n)	Correlation Score	p-value	Information
Level of Physical Fitness	101	0,224	0,024	Correlation
Level of Iron Intake	101	0,089	0,376	No Correlation
Nutritional Status	101	0,099	0,324	No Correlation

The average level of iron intake samples were 54.18% with the lowest intake level was 8.75% and the highest was 164.23%. Most students (86.1%) had less levels of iron intake (Table 1). Students with less levels of iron intake (31.0%) and low (28.6%) will have a high enough intelligence level more than normal consumption (25%) (Table 2). Rank Spearman test results showed no significant correlation (p = 0.376) between the level of iron intake with intelligence level (Table 3).

Discussion

Most (46.5%) of the physical fitness level of the samples were in the less category. The level of physical fitness is still a health problem in school children. Research conducted by Yoga et al showed that 72.7% of schoolchildren in SDN 1 Rempoah, Baturaden Sub-district of Banyumas Regency had low physical fitness level (14). Research conducted by Purnamasari in 4 primary schools in Banyumas district showed 47.7% of schoolchildren have less physical fitness (15).

Research conducted by Yoga et al showed the most influential factor on the physical fitness level of school children is physical activity (14). In this study most students stated that only exercising while in school alone. Koutedakis et al states that physical activity in schools through a physical education curriculum affects physical fitness levels related to cardiovascular and motorcycles(16). In addition to achieving maximum results, movements in physical fitness tests need to be involved in the pattern of daily child play, so that the movement can increase physical fitness(17).

In this study there is a significant correlation between the level of physical fitness and intelligence level. The results of this study in line with research conducted by Charles et al showed a correlation of physical fitness level with cognitive functions such as memory and speed of response in children (6). In this study samples with good and moderate physical fitness will have a higher level of intelligence more (28.6%) and (50%), compared with less physical fitness (19.1%) and low (0%). Good level of physical fitness will make a child is not easy to experience fatigue during the move like studying in school. Continuously trained physical activity will have a positive effect on the durability of body(18). Students who have good physical fitness will have higher lung survival. This means that blood vessels function optimally so as to maximize Oxygen (VO2 max) and channel it throughout the body, especially the active tissue including the brain maximally(4). Research conducted by Fong-Li et al shows that physical fitness will stimulate the excretion of enkephalin and β-endorphins in humans, which will help to reduce pain and pressure so as to further improve mental balance (19). The research undertaken by Mavrovelli and Ruiz shows the relationship between intelligence levels and learning achievement. Children with high intelligence levels will have better learning achievements(20).

Most (86.1%) students had less iron intake. Rank Spearman analysis results showed no significant correlation (p = 0.376) between the level of iron assumption with intelligence

level. Students with very low levels of iron intake and less will have a higher enough intelligence level (31.0%) and (28.60%) higher than normal energy consumption level (25%). Iron deficiency to cause anemia occurs gradually. In the early stages of iron bone reserves from the bone marrow and decreased serum ferritin, subsequently decreased serum iron concentration and increased Total Iron Binding Capacity (TIBC) and transferrin, the third stage is increased porphyrin erythrocyte cell concentrations, whereas the last stage there is anemia , namely the decrease in hemoglobin levels (7). In this study did not check the hemoglobin level, so the possibility of lack of iron has not resulted in a decrease in hemoglobin or anemia. Thus not so affect the level of child intelligence.

According to Irsa, if the child has anemia condition, will lead to iron deficiency in the tissues and brain. The brain needs more iron because of its higher oxidation metabolism than other organs. In the brain, iron participates in enzymatic activities including the cytochrome oxidase system, lowering Nicotinamide Adenine Dinucleaeotide Phosphate (NADPH) reductase and ribonucleotide that regulate brain growth. Anemia will result in decreased cognitive function and learning achievement in school children(7).

Most (70.3%) students have normal nutritional status. Normal nutritional status is common in school children. This research is in line with research conducted by Nurhaendah et al in the research as much as 78,43% children have normal nutritional status.[21] In line with research conducted by Purnamasari et al, that is 72,6% student in Banyumas Regency have normal nutrient status (15). Result Rank Spearman analysis showed no significant correlation (p = 0.324) between nutritional status with intelligence level. Although there is no significance in the results of statistical analysis but there is a tendency for students with normal nutritional status to have a significantly higher level of intelligence (31%) than lean students (18.75%).

Normal nutritional status means there is a balance between nutritional intake and requirement of the students (17). Normal nutritional status means the fulfillment of all the nutrients the body needs, including the nutrients needed by the brain (21). Research conducted by Yulni shows an intake relationship energy with nutritional status in schoolchildren in Makassar (22). Research conducted by Purnamasari et al also showed a relationship of energy consumption with nutritional status in school children (23). Adequate energy consumption ensures that a child is able to perform well, including activities related to the use of the brain's ability. The results of the study may be different if the number of samples is enlarged so that the nutritional status of the students is more balanced between normal and lean nutritional status(24).

Conclusion

Most (53.5%) samples are at sufficient intelligence level. As many as 46,5% have less physical fitness level, 86,1% sample have level of iron intake is less 70,3% have normal nutrient status. There was a correlation of physical fitness level with the level of intelligence (p = 0,024), while the level of iron consumption and nutritional status showed no significant correlation (p = 0.376 and p = 0.324). It is recommended to improve the physical fitness level of students by improving the physical activity programmed in school.

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The Difference of Glycemic Index after Consuming White Rice (Oryzasativa), Cilembu Sweet Potato (Ipomoea batatas cultivar cilembu) and Purple Sweet Potato (Ipomoea batatas cultivar ayumurasaki)

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Abstract

An example of nutrition issue found in Indonesia is the overnutritional state, a state which occured due to excessive food consumption. As a result of that state, someone wouldhave a body weight above the norma,l but with the lower health status. If this condition is allowed to continue, it will induce the degeneratives diseases such as cardiovascular disease, hipertention and diabetes. This overnutrition issue may be overcomed by changing the high carbohydrate foods with low glycemic index foods. This study was to know the index glycemic difference after consuming white rice, ubi cilembu and ubi ungu. An experimental clinical study with pre-post time series design. Ten subjects will consume 100 grams of the selected food and would be taken the blood sampling in 0, 15, 30, 45, 60 and 120 minutes.The foods would be changed every 7 days. There is a significant difference in blood sugar after consuming white rice, ubi cilembu and ubi ungu**.** There is a difference in glycemic index after consuming white rice, ubi cilembu and ubi ungu.

Introduction

Nutritional issue is one of the main issues in Indonesia. One example of nutritional issue is overnutritional state, a condition which occurs due to excessive food consumption. This state causes people having overweight body, but followed by poor health. Overnutritional state could be induced by some factors, i.e.lifestyle changing, an unequal pattern between food diet and activities, especially high carbohydrate diet. Nutritional problems that are left could cause obesity, degenerative diseases, e.g. cardiovascular disease, hypertension, diabetes mellitus. [1]

The overnutritional issue in Indonesia is expected to be overcome by replacing carbohydrate source with potatoes. Potato contains lower glycemic index value than rice's [2]. Glycemic index is blood sugar's respond towards carbs in certain time and dose. Food with high index glycemic could increase blood sugar level [3]. Food with low glycemic index could be absorbed slowly and smoothly so it creates longer satiety. Food with low glycemic index has some benefits i.e. preventing and controlling diabetes, preventing cancer, hypertension and obesity, as well lossing excessive weight. Most of low glycemic index foods also frequently contain high fiber so it will accelerate the digestion system [5].

Potato couldbe processed as substitution carbs. It is assessed be able to provide better calorie source because of its low index glycemic. A well known species of potato in Indonesia is sweet potato. Sweet potato is one of the staple foods and main agricultural commodities. It could be found easily in all parts of Indonesia, for it can be planted in both of lowland and highland. Beside, sweet potato contains essential minerals and vitamins, that posses benefits for the body [5]. Two of the most popular sweet potato in Indonesia are cilembu sweet potato and purple sweet potato [6].

Research Methods

Type of research was an experimental with clinical test using pre-post test time series design. The research performed on April 2015 in Bioscience Laboratorium at UniversitasJember Dental Hospital.

Respondents were 10 female UniversitasJember dental students, with normal BMI : 18,0-22,9, has no diabetes mellitus history, not in condition with physician's supervision and volunteering as well completing the informed consent.

Measuring glycemic index was undertaken by 10 respondents fasting for ± 10 hours (excluded water). After 10 hours of fasting, we took respondents's blood (1-2 µL) by finger-prick capillary blood sample method as well. Respondents were fed 100 grams white rice . Capillary blood sample were taken in 15, 30, 45, 60 and 120 minutes by GCU-Easy Touch glucometer. Blood glucose level in certain time in two axis, time in minute (x) and blood glucose level (y). Glycemic index was determined by comparing the area under the curve between chosen food and reference food. In week 2, white rice were replaced with 100 grams steam cilembu sweet potato and in week 3, it was replacing with purple sweet potato.

Results

Results of research conducted on 10 subjects at the Bioscience Laboratories, Faculty of Dentistry, University of Jember. Calculation of weight, height and body mass index is shown in Table 1.

Table 1. Subject description based on body weight, height and body mass index

N	Weight (kg)	Height (cm)	BMI
1	158	48	19,23
2	157	52	21,10
3	161	50	19,29
4	160	50	19,53
5	159	49	19,38
6	158	53	21,23
7	160	56	21,88
8	159	54	21,36
9	159	52	20,57
10	158	49	19,63
Mean	158,9	51,30	20,32
Std	1,19	2,54	101,36

Table 2. Blood glucose level value after consuming white rice

No	Time (minute)					
	0	**15**	**30**	**45**	**60**	**120**
1	89	138	150	130	126	92
2	90	133	143	128	120	95
3	85	138	152	128	125	90
4	88	137	145	132	120	93
5	86	136	146	135	125	99
6	89	138	143	133	123	90
7	86	135	147	127	121	90
8	91	137	146	132	124	93
9	90	134	150	134	121	96
10	86	136	149	133	123	90
Mean	88	136,2	147.1	131.2	122.8	92.8
Std	2,11	1,75	3,07	2,78	2,2	1,77

Table 3. Blood glucose level value after consuming cilembu sweet potato

No	Time (minutes)					
	0	**15**	**30**	**45**	**60**	**120**
1	89	118	132	130	122	99
2	90	115	135	130	121	103
3	87	116	133	129	120	100
4	86	117	132	130	120	101
5	90	114	137	131	121	103
6	88	118	135	132	125	98
7	91	113	136	130	124	99
8	87	117	138	129	125	102
9	90	114	134	132	124	102
10	89	115	136	133	122	98
Mean	88.7	115.7	134.8	130.6	122.4	100.5
Std	1,64	1,77	2,04	1,35	1,96	1,96

Table 4. Blood glucose level value after consuming purple sweet potato

No	Time (minutes)					
	0	**15**	**30**	**45**	**60**	**120**
1	90	120	133	127	120	102
2	89	119	136	132	126	101
3	92	110	133	126	120	99
4	88	112	139	133	125	103
5	91	115	135	130	122	98
6	93	112	138	131	124	102
7	86	114	138	130	123	99
8	91	113	134	128	121	103
9	88	115	135	130	122	98
10	92	118	133	128	121	102
Mean	90	114.8	135.4	129.5	122.4	100.7
Std	2,21	3,29	2,27	2,22	2,06	2,82

According to the table above, it is known that glucose levels of subjects who consumed three test-foods, which is white rice, purple sweet potato and cilembu sweet potato will experience an increase in blood glucose levels in the 15th minute and the 30th minute and then experiencing the decrease of blood sugar the 45th, 60th and 120th minute.

The average value of blood glucose levels after consuming threetest-foods can be seen in Figure 1.
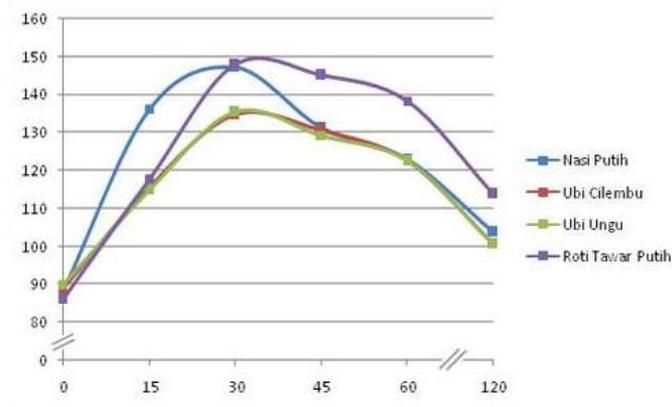
Fig 1.Graphic of the mean of blood glucose level (mg/dL) increasing and decreasing blood glucose level in 120 minutes after consuming pure glucose, white rice, cilembu sweet potato and purple sweet potato.

From Figure 1 it can be seen that the blood glucose levels from the consumption of bread, white rice, cilembu sweet potato and purple sweet potato increased in the 15th minute and was at the top in the 30th minute and then decreasing in the following minute. The lowest blood glucose can be found on the consumption of bread and white rice. It is caused by low fiber content in both foods which results in satiety that lasts more briefly. On purple sweet potato and cilembu sweet potato, the blood glucose levels is decreasing less than the previous foods. This is caused by higher fiber content on sweet potatoes so the decrease in blood glucose levels happens more slowly which results in longer effect of satiety.

Discussion

The glycemic index is a blood glucose response to the intake of carbohydrate-containing foods. The glycemic index is influenced by several factors, including the method of cooking food, type of food starch, dietary fiber, fat and sugar. The glycemic index of white rice, cilembu sweet potato and purple sweet potato obtained from the difference between glucose levels before and after consuming foods. [8]

From the research, it was found that white rice has higher glycemic index value than the purple sweet potato and cilembu sweet potato. It can be caused by the way of cooking. Foods containing starch that undergo gelatinization in the process of cooking, will lead to more easily digested food, so it will have a higher glycemic index. In this case, white rice has undergone a process of gelatinization during cooking with water. This is probably what caused white rice to have a higher glycemic index than purple sweet potato and cilembui sweet potato which is cooked by steaming. [9]

In addition to cooking, the glycemic index is also influenced by the content of amylose and amylopectin. Amylose starch is an unbranched simple sugar structure. Therefore, the structure of amylose will bind strongly making it harder to digest and gelatinized by the body.

Amylose molecules consisting of 50-500 glucose units, while amylopectin starch structure is a simple sugar that is branched in structure, has a molecular structure that is open and larger so that it can be digested better than amylose. The high amylose in food can lower the in vitro starch digestibility. Low starch digestibility will determine hypoglycemic activity because it will produce glucose more slowly and less in number so less insulin is needed to convert glucose into energy. Therefore, foods that have a lower starch digestibility has a lower glycemic index. In this case, purple sweet potato and cilembu sweet potato has higher amylose content than rice. This has resulted in purple sweet potato and cilembu sweet potato having lower glycemic index compared to rice. [10]

Conclusion

In The Difference of Glycemic Index after Consuming White Rice (Oryza sativa), Cilembu Sweet Potato (Ipomoea batatas cultivar cilebu) and Purple Sweet Potato (Ipomoea batatas cultivar ayumurasaki) research, it can be concluded there is index glycemic difference after consuming white rice, cilembu sweet potato and purple sweet potato. The highest glycemic index was obtained by white rice, and the moderate index glycemic were obtained by cilembu sweet potato and purple sweet potato.

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The Difference of tooth Demineralization after Soaking in Human Milk and Infant Formula Milk using Scanning Electron Microscope

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Abstract

Milk is considered as a good source of Calsium. Comparison studies of tooth demineralization after soaking with milk from human and infant formula feeding in Indonesia are rare, so we compare the effect of soaking tooth with milk from human and formula to deminaralization of enamel. Demineralization of enamel is influenced by pH, buffering capacity, fluoride, calcium and phosphorus contents. The aim of this study was to determine the level of tooth demineralization after soaked with human milk and infant formula Feeding. This was an experimental laboratory study with post-test design only with control group design. Then samples were soaked in artificial saliva pH 7, human milk and infant formula milk for 24 hours. The depth of microporosity that occurs in each sample observed using Scanning Electron Microscope (SEM). The infant formula feeding result the highest level of tooth demineralization followed by human milk and artificial saliva. There is a significant difference in level of tooth demineralization after soaked in human milk dan infant formula feeding. Human milk has a longer pH stability than infant formula feeding, so it is slower to cause enamel solubility than infant formula feeding. In human milk also containing a right amount of protein and non sucrose that can cause enamel solubilty. Level of teeth demineralization was highest from infant formula feeding followed by human milk and artificial saliva.

Keywords : tooth demineralization, human milk, infant formula milk, artificial saliva

Introduction

Human milk is uniquely suited to the human infant, both in its nutritional composition and in the non-nutritive bioactive factors that promote survival and healthy development [1]. Breast milk contains over 200 nutritional, as well as functional, components. The fundamental composition of breast milk includes, protein, salt, and sugar, which are all contained in a fat suspension. In addition to those nutrients breast milk also provides the infant with immune factors, growth and hormone factors, and enzymes [2]. The milk produced during the first month following parturition by mothers delivering between 28-36 weeks gestation contained significantly higher concentration of nitrogen and lower concentration of lactose than milk produced by mothers delivering at term [3]. Human milk is a complex matrix with a general composition of 87% water, 3.8% fat, 1.0% protein, and 7% lactose [4]. In contrast to protein and fat, lactose content is fairly constant in mature milk (after 21 days postpartum). The stable concentration of lactose is important in maintaining a constant osmotic pressure in human milk. Lactose also aids the absorption of minerals and calcium. In human milk, many carbohydrate-based bioactive compounds, such oligosaccharides, are attached to lactose [5]. Human milk, in contrast to formula, contains breast-specific Lactobacilli and substances,

including human casein and secretory IgA, which inhibit the growth and adhesion of cariogenic bacteria, particularly oral Streptococci [6].

Infant formula is intended as an effective substitute for infant feeding and is formulated to mimic the nutritional composition of breast milk for normal infant growth and development [7,8]. Cow milk or soymilk are most commonly used as the base, with supplemental ingredients added to better approximate the composition to human breast milk and to attain health benefits, including iron, nucleotides and compositions of fat blends. The fatty acids of arachidonic acid (AA) and docosahexenoic acid (DHA) are added. Probiotics and compounds, produced by genetic engineering, are either added or currently being considered for addition to formula. The most common infant formulas consumed by infants are made from modified cow's milk with added carbohydrate (usually lactose), vegetable oils, and vitamins and minerals. Casein is the predominant protein in cow's milk [9]. Both human milk and infant formula important to stimulate the bone and teeth modelling, especially to help the strength of dentine and enamel.

Dental Enamel consists of densely packed mineral crystal mainly hydroxyapatite (HA) and it can become demineralized due to exposure to plaque acids. Besides HA, dental enamel consists another minerals such as Ca, Na, Cl, Zn and P. Tooth enamel can undergo a process called demineralisation if the pH of the mouth falls to lower than normal levels [10]. Demineralization of the enamel is damaged hydroxy apatite tooth enamel which is the main component of enamel due to chemical processes [11]. Its occurs through a diffusion process, ie the process of moving molecules or ions dissolved in water to or from the enamel to saliva because there are differences in the concentration of acidic water on the surface of the tooth enamel [12]. In the development of dental caries, the relationship between demineralization and remineralization is influenced by the presence of saliva, which facilitates the transportation of ions, oral bacteria, and fermentable carbohydrates to the exposed surfaces of teeth [13]. Sucrose has the highest cariogenity, followed by sorbitol and lactose. Lactose in milk can be synthesized into lactic acid with an acidity degree (pH) of 5.5. If foods and beverages containing lactose are consumed too often, the oral cavity will be in acidic conditions, which eventually leads to demineralization of the tooth enamel [14].

The relationship between breastfeeding both human milk or infant formula and tooth demineralization has been systematically and narratively reviewed with conflicting results between studies. There is controversy about what constitutes the best form of infant feeding to prevent enamel demineralization and promote optimal dental health. Consequently no definitive optimal breastfeeding practices have been determined to specifically address the risk of enamel demineralization that can lead dental caries. The aim of this study is to determine the level of tooth demineralization after soaked with human milk and infant formula Feeding.

Research Methods

Type of research was an experimental laboratory with post test only control group design. The research performed on Desember 2016 – Januari 2017 in Bioscience Laboratorium at Dental Hospital of Jember University.

Samples were three piece of first upper premolar with healthy surfaces and no visible defects, from each tooth, four fragments containing a superficial enamel layer and a subjacent dentine portion were obtained by cutting with a water-cooled carborundum disk mounted on a low speed handpiece. Two bucco-lingual, combined with two mesio-distal incisions containing occlusal surface enamel were discarded, resulting in a total of 12 dental fragments.

The fragments were covered with a 20mm wide strip of adhesive tape (Scotch, 3M, Sumar´e, SP, Brazil) containing an orifice ranging from 2.5 to 3.5mm in diameter, according to the width of the enamel surface to allow the exposure of a controlled area to the demineralization solution.

Two experimental protocols were designed. In the first protocol, applied to four fragments teeth, first quadrant (labeled A) was used as a control, which is soaking in artificial saliva. Second quadrants (labeled as B) was soaked with human milk at consentration pH 5,5 for 24 hours and changed every 8 hours. The last quadrant (C) was soaked with infant formula milk (Frisian baby, Frisian Flag, Indonesia) at consentration pH 5,5 for 24 hours and changed every 8 hours.

After the demineralization period, the tapes were removed and the fragments were washed with de-ionized water, dried at room temperature and observed with the scanning electrone microscope (SEM, Hitachi TM3030Plus, Japan) examination according to the usual protocols. The samples were examined with a Hitachi TM3030Plus Scanning Microscope (Hitachi Ltd. Tokyo, Japan), at 30 KV acceleration voltage and magnifications of 600×. The images – three for each quadrant of each tooth – were captured with a TM3030Plus (Hitachi Ltd., Tokyo, Japan). The images, viewed on a monitor, were evaluated by three examiners (I–III) and scored as follows: (1) smooth, normal enamel; (2) fissures on the enamel surface; (3) images of mildly increased porosity; (4) images of exposed enamel prisms and dissolution type I–III.

Each examiner scored all the three images of the quadrants of each tooth; the mean score (the mean of the three images scored by each examiner) was included into Tables 1 and 2. In the first experiment, for the calculation of the statistical significance of changes in the enamel surface of samples A, B and C the final mean of scores for all three teeth was used. The statistic analysis was performed using paired samples *t*-test (significance at *p*<0.05).

Results

Typical SEM aspects of the dental enamel surface of teeth used in these experiments are presented in Figures 1–3. Figure 1 depicts unsoaked enamel. The surface is not completely smooth, however the aprismatic surface layer is uniform, but there is no pores and superficial irregularities, such as grooves on the control samples. the mean scores for the control quadrants is 0.00±0,00 (Table 1). For quadrant B, the mean scores is 13,73±1,70 and the difference between the studied group and the control group was statistically significant (p=0.00). For the quadrants C the mean of scores is 20,25±4,99 and the difference between the studied group and the control group was statistically significant (p=0.00).

Table 1. The scores of SEM images for tooth demineralization for each group

Group / Samples	Control (μm)	Quadrant B (Human Milk) (μm)	Quadrant C (Infant Formula Milk) (μm)
1	0,00	12.14	24.22
2	0,00	15.26	15.52
3	0,00	12.38	16.35
4	0,00	15.14	24.89
mean (μm) ± Standard Deviation	0,00±0.00	13.73±1.70	20.25±4,99

Morphological changes were observed in some of the samples treated with human milk, for 24 hours soaking, consisting in areas of depressions which seem sometimes deeper, generating a more variable aspect of the enamel surface (Figures 2 and 3). This aspect suggests an increase in the enamel porosity, as compared to the control samples. However, areas of depression were observed deeper in the samples treated with infant formula milk, for 24 hours soaking, as compared to the control samples and quadrant B.

Table 2. Statistically Difference between Groups

Group	mean (µm) ± Standard Deviation	Control	Quadrant B	Quadrant C
Control	0,00±0.00	N/A	0.001*	0,004*
Quadrant B	13.73±1.70	0.001*	N/A	0.049*
Quadrant C	20.25±4,99	0,004*	0.049*	N/A

The statistical significance of the difference of means compared between quadrant B and C group was high (p=0.049, respectively) (table 2). In this study, the pattern of demineralization followed either a version in which the central part of the prism was involved, or an irregular meshwork.
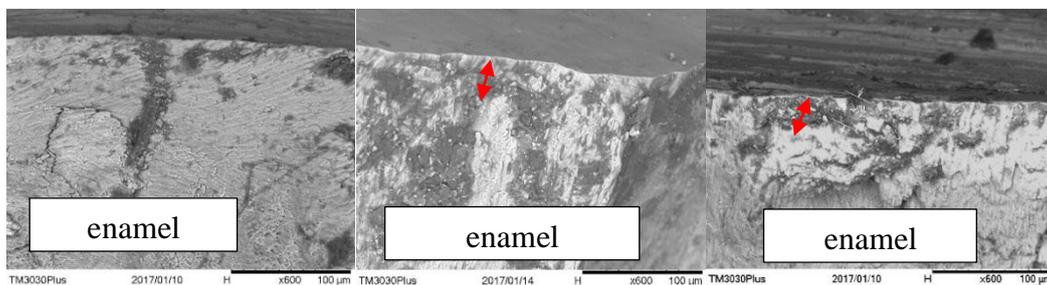
Fig 1. The SEM Micrograph of enamel surface of a control tooth sample (quadrant A)

Fig 2. The SEM Micrograph of enamel surface of a tooth sample soaked with human milk for 24 hours (quadrant B)

Fig 3. The SEM Micrograph of enamel surface of a tooth sample soaked with infant formula for 24 hours

Discussion

Demineralization is the process of removing minerals ions from HA crystals of hard tissues, for example, enamel, dentin, cementum, and bone. Demineralization is a reversible process; hence, the partially demineralized HA crystals in teeth can grow to their original size if they are exposed to oral environments that favor remineralization [12]. Similar to bone, teeth are composites comprised of the phosphate-based mineral HA in the enamel, collagen in the dentine, and living tissues. However, it is the anatomical arrangement and location of teeth that sets them apart from bones. Exposed to food, drink, and the microbiota of the mouth, teeth have developed a high resistance to localized demineralization unmatched by other mineralized tissues. This resistance is chiefly due to the enamel layer that covers the crown of the teeth.

Chemical demineralization of teeth is caused by acidic attack through two primary means: dietary acid consumed through food or drink and microbial attack from bacteria

present in the mouth. During an acidic attack, or a typical demineralization regime, chemical dissolution of both the organic and inorganic matrix components takes place. This is brought about by the water content of enamel and dentine, which facilitate acid diffusion in and mineral content out of tooth [14].

One of the best methods to study the enamel surface is SEM. There are conflicting reports regarding the effects of human milk and infant formula containing lactose on the enamel. Some authors reported morphological changes of the enamel surface after soaking of human teeth to both human milk or infant formula, such as focal areas of shallow erosion, loss of the prismatic layer, pitting, and exposure of the enamel prisms; moreover, it was suggested that after a prolonged exposure to increased concentration pH 5,5 of both human milk and infant formula such changes could be the cause of abrasion or cusp fractures, mainly in restored, weakened teeth [12].

In the present study, the SEM micrograph of Control Group (Quadrant A) showed that there is no enamel surface change. In this case, saliva is considered one of the most important biological factors in dictating the intraoral neutralizing effects of acid exposure. in addition to its cleansing and antibacterial action [16], saliva acts as a constant source for calcium and phosphate that helps in maintaining supersaturation with respect to tooth minerals, therefore inhibiting tooth demineralization during periods of low pH, and they promote tooth remineralization when the pH returns to neutral state. Furthermore, when saliva secretion is stimulated, a rapid rise in pH to above neutrality occurs. Due to its high solubility of calcium phosphate in salivary proteins (eight to ten times higher than calcium phosphate in tooth), it serves as a sacrificial mineral that dissolves preferentially before tooth mineral, ie, reducing demineralization. It also acts as a source of calcium and phosphate ions that are required for remineralization of decalcified tooth [12].

In this case, treated tooth using human milk with consentration pH 5,5 for 24 hours showed an irregular porosity on the enamel surfaces, and also showed a statistically significan than control group. An assessment of the composition of human milk is important to understand the reduced buffer capacity in comparison to bovine milk. Human milk has significantly less phosphate (15 mg/ dL), especially inorganic phosphate (5 mg/dL), when compared to bovine milk (100 mg/dL total phosphate, 75 mg/dL inorganic phosphate). Human milk also has less protein with approximately one-fifth the amount of amino acids when compared to bovine milk [14]. Human milk containing carbohydrate and sugar (lactose). This component can dissolve become lactic acid. This acid will reduce the pH of saliva.

Sample quadrant C showed the deeper and shallower porosity of tooth enamel. In this case, infant formula containing of a higher carbohydrate and sugar (lactose and sucrose) than human milk. The composition of lactose between 6,8 – 23 g/100 ccal and sucrose between 0 – 7g/ 100 ccal. In this study, we use infant formula with 6,8g lactose and 0,5g sucrose. Sucrose is the higher cariogenic ingredient, followed by sorbitol and lactose. Sucrose and lactose will dissolve in to glucose and lactic acid. This structure of acid can influence the pH saliva, to he critical condition that can lead a demineralization of enamel. The condition occurs when the pH of the solution surrounding the enamel surface is lower than 5.5, (generally ranging from 2.3 to 3.6 pH) and the concentration of the acid that does not dissociate higher on the surface enamel, rather than in the enamel [13]. The sucrose control solution did dissolve calcium and phosphate from the powdered enamel, whereas the water control did not.

Human milk showed a shorter porosity on enamel surface than infant human milk. In this case, some authors reported that *S.mutans* may not be able to use lactose, the sugar found in breast milk, as readily as sucrose, found in food or artificial milk, and some breast-milk antibodies may help impede bacterial growth [14]. Phosphate and protein present within

human milk is capable of buffering the free hydrogen ions associated with these organic acids and thereby maintaining the pH near neutral when unchallenged by other acid sources. However, when additional acid is present, the buffering capacity is exceeded.

On the other hand, these irregularities are difficult to be considered as secondary effects of the treatment. When the enamel surfaces were examined in the control groups, sometimes pores, shallow depressions and superficial irregularities are observed, but this situation was reported by other authors, as well. On the surface of normal, sound teeth, circumferentially horizontal lines, known as perikimata, may be found across the face of the crown; on the other hand, lamellae or cracks are not unusual. Electron microscopy observations showed that the surface of the enamel varies with age [15].

Conclusion

Human milk can not lead a tooth demineralization, adding sugar ingredient such as sucrose will stimulate a rapid demineralization on enamel surfaces.

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Ovarian Failure Affected Leukocytes Profile in Peripheral Blood and Gingival Fluid (In vivo Study)

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Abstract

Ovarian failure can be caused by ovariectomy which induces estrogen deficiency. Estrogen influenced leukocytes as immune and inflammation cells systemically and locally, and leukocytes also contribute to ovarian function in order to be located in ovaries tissue. The aim of the study was to investigate the impact of ovarian failure to leukocytes profile in peripheral blood circulation and gingival fluid. This study was experimental laboratory study approved by the Health and Research Ethics Committee of Dental Faculty, Gadjah Mada University. The animal models have undergone ovariectomy which removed their ovarian bilaterally. Blood sampling from retro orbital plexus and gingival fluid were taken before and 3, 7, 14, 21 and 28th days after ovariectomy procedures. Total leukocytes counted manually. The result showed that total leukocytes in peripheral blood were higher than in gingival fluid. Moreover, there were significant differences between leukocytes profile in peripheral circulation and gingival fluid based on the periods, except in basophils cells counting. The conclusion was ovarian failure affected leukocytes profile in peripheral blood circulation and gingival fluid.

Keywords: ovarian failure, leukocytes, peripheral blood, gingival fluid

Introduction

Ovarian failure is a pathological condition impacting ovarian and signed by dysfunction of ovaries, particular disturbance of sex steroid hormone production. The ovarian failure occurred before 45 years old is termed primary ovarian failure or premature ovarian dysfunction that induces early menopause. Ovarian failure can be caused and induced by bilateral oophorectomy or ovaries removal bilaterally. Ovariectomy is well-established technique in animal model to mimicking early menopause in human which removes ovaries unilaterally or bilaterally.[4, 6, 21, 25]

Ovarian failure induced ovariectomy can also cause sex hormone deficiency, especially estrogen. Estrogen is established sex hormone which not only in reproductive tissue, but it also influences to nonreproductive tissues, such as immune system, skeletal, vascular, and periodontal tissue. Therefore estrogen has receptors in many tissues. In immune system, estrogen regulates both innate and adaptive immune system. In innate immune system, estrogen regulates production number, chemotaxis, and infiltration neutrophil and macrophage which both cell type leukocytes are also played role in inflammation process. In adaptive immune, estrogen down regulates lymphocytes response which lymphocytes are chronic inflammatory cells. Those showed that estrogen also played as anti-inflammatory agent.[14, 24, 25]

Moreover, leukocytes as immune and inflammatory cell contribute in ovarian function. Leukocytes are located and contain in each ovaries tissue. Although they have difference function, the regulation is similar which regulated by estrogen. Furthermore, the leukocytes also influence estrogen excretion.[5] This may be caused presence of estrogen receptors on leukocytes and tissue. However, it is still unclear.

This became basic of recent study to investigate effect ovarian failure induced ovariectomy to leukocytes profile which not only in systemic circulation (peripheral blood),

but also in local circulation which represented by gingival fluid. Although gingival fluid is transudate or exudates fluid originated periodontal tissue, the production and composition are also affected systemically. The objective of study was to investigate impact of ovarian failure to leukocytes profile in peripheral blood circulation and gingival fluid. It was not only to know effect estrogen deficiency-induced ovarian failure to leukocyte profile, but it is also utilized as biological marker and screening marker of morbidity and mortality of ovarian failure, so women can improve their life expectancy.

Materials and Methods
Animals and Adaptation

This study was experimental laboratory study using white rats (*Rattus norvegicus*) Sprague Dawley Strain. This study was approved by the Health and Research Ethics Committee of Dental Faculty, Gadjah Mada University. The criteria of rats were 11 to 12 weeks old, female, 200-250 g body weight. Before the treatment, all of the animal models were adapted to laboratory environment for 7 days. The rats were kept at constant room temperature and relative humidity under a 12-h day and night cycle, with free access to food and water (diet and water ad libitum).

Surgical Procedure (Ovariectomy)

This procedure was aimed to get ovarian failure and early menopause model. We used dorsal ovariectomy bilaterally. The rats were anesthetized with ketamine/ xylazine (80/10 mg/kgBW) intramuscular (Sigma Aldrich, Singapore). The area of surgery was with disinfectant. A small transverse dorsal incision of 0.5 – 1.0 cm was made with surgical scalpel blade no. 11 on the left and right incision. The ovary and associated fat were easily located and exteriorized by gentle retraction, bound with silk ligature, and then ovaries were removed. The wound was closed in two layers (muscle and skin) using sterile sutures. Finally, antibiotic powder was put on surgical wound.[8]

Peripheral Blood and Gingival Fluid Sampling

Peripheral blood and gingival fluid samples were taken before ovariectomy and on 3rd, 7th, 14th, 21st, and 28th days post ovariectomy. Blood sampling was from retro orbital plexus 1.5-2.0 cc. The gingival fluid was taken from buccal area of maxillary molar of rats. In gingival fluid sampling, the fluid was obtained by collecting gingival fluid using paper point #20 and 20 mm length that inserted in buccal area of maxillary molar for 30 seconds. Total leukocytes from peripheral blood were undergone manually using *improved Neubauer* chamber. Therefore differential counting also used manual method with Giemsa staining.[23]

Gingival fluid needed special treatment before it was observed. The paper point was taken in 0.5 ml Eppendorf tube and diluted with 200 µL PBS 2.0 M. The supernatant was put in other Eppendorf. For total leukocytes, the fluid taken was same with peripheral blood manually using *improved Neubauer* chamber. For differential counting leukocytes, 20µL the supernatant was put on slide and then it was dried. After that, it was stained with Giemsa.[12, 23]

All of the data leukocyte profile was analyzed by analysis variants, multiple comparisons and correlation with 95 % significance (p<0.05).

Result

Table 1 illustrated trending pattern of leukocytes profile in peripheral blood and gingival fluid of ovarian failure rats induced ovariectomy during 28th days. Leukocytes profile in peripheral blood was significantly higher than in gingival fluid. Furthermore, all of the leukocyte types were detected in peripheral blood. While in gingival fluid was only

monocytes not detected. Eosinophil and basophil in peripheral blood had similar percentage in gingival fluid. However, lymphocytes in peripheral blood had higher percentage than neutrophil in peripheral blood, while lymphocytes in gingival fluid had lower percentage than neutrophil in gingival fluid.

Based the counter time of observation, there were significant differences leukocytes profile ovarian failure rats induced ovariectomy ($p < 0.05$), except basophil, eosinophil, and monocytes in gingival fluid ($p > 0.05$). Almost on 28th-day, the leukocyte profiles in peripheral blood and gingival fluid had the highest value, especially in gingival fluid the value of total leukocytes was higher followed with percentages of neutrophil and lymphocytes. Although on 28th days basophil and eosinophil were the highest percentage in peripheral blood, the total leukocyte on 28th days was the lowest during observation, because basophil and eosinophil had minor percentage in leukocyte total percentage peripheral blood. The highest total leukocyte in peripheral blood was on 7th days and followed with monocytes. Neutrophil and lymphocytes in peripheral blood had different pattern which neutrophil had the highest percentage on 3rd days and lymphocytes was on 14th days (table 1).

Table 1. Leukocytes Profile in Peripheral Blood Circulation and Gingival Fluid of Ovarian Failure Rats Induced Ovariectomy (n=5)

	Counter-Time						P
	0 days	3rd days	7th days	14th days	21st days	28th days	value
Peripheral blood							
WBC	7420±139.64	9380±1055.11	9410±1944.67	8050±916.52	7120±1771.16	6430±1260.26	0.006[a*]
Ba	0.20±0.45	0.80±0.84	1.00±1.23	0.00±0.00	2.20±1.64	2.60±1.82	0.000[b*]
Eo	1.40±0.55	2.00±1.00	1.20±1.10	0.80±1.10	2.60±1.52	3.00±0.71	0.019[a*]
Seg	24.40±0.55	29.00±1.58	27.20±0.84	20.40±1.52	20.20±1.79	15.60±1.14	0.000[a*]
Mo	21.40±2.88	19.60±3.36	28.40±4.16	24.20±2.49	22.80±5.26	25.76±4.69	0.024[a*]
Lym	44.20±2.59	49.40±1.67	52.60±1.67	57.00±1.87	53.60±1.52	54.40±2.07	0.000[a*]
Gingival Fluid							
WBC	120±57.01	220±67.08	490±74.16	290±263.15	520±210.95	630±405.59	0.009[a*]
Ba	0.00±0.00	0.40±0.55	0.00±0.00	0.20±0.45	0.20±0.45	0.00±0.00	0.350[b]
Eo	0.00±0.00	0.40±0.55	0.40±0.55	0.00±0.00	0.40±0.55	0.20±0.45	0.389[b]
Seg	1.80±0.84	4.00±1.23	6.40±1.14	2.20±0.84	5.80±1.92	7.40±1.14	0.000[a*]
Mo	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.00±0.00	0.467[b]
Lym	0.40±0.55	1.00±1.00	1.60±0.89	1.00±1.00	2.00±0.71	2.40±0.55	0.004[a*]

Data were expressed as mean (SD, standard deviation) for all variables.
P value was significant value of mean difference within groups based on the counter time
[a] was derived from one-way analysis of variance ($p < 0.05$); [b] was derived from Kruskal Wallis analysis ($p < 0.05$)
* significantly different between the groups ($p < 0.05$)
n, number of study subjects in each group; WBC, total leukocytes number (cell/mm3); Ba, basophile (%); Eo, eosinophil (%); Seg, neutrophil (%); Mo, monocytes (%); Lym, lymphocytes (%).
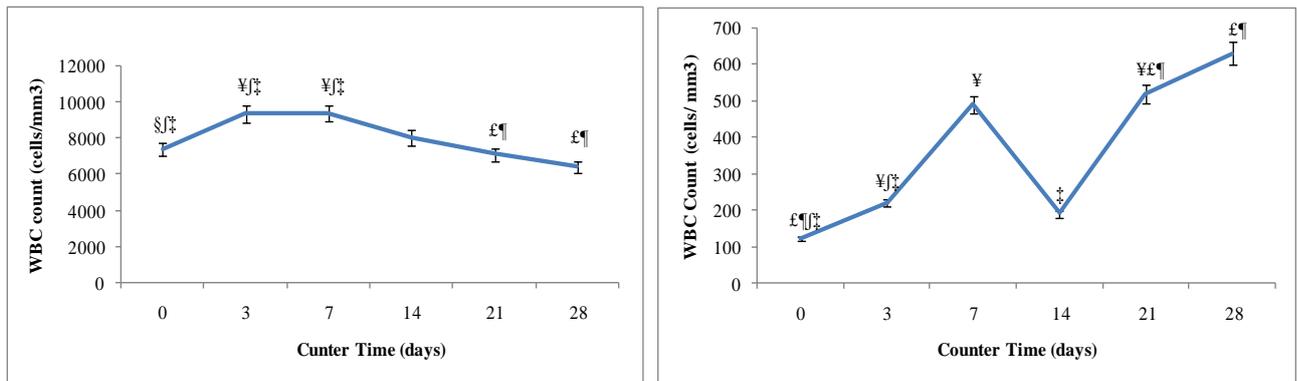
Figure 1. **Total leukocyte based on counter time of ovarian failure rats induced ovariectomy, a. in peripheral blood, b. in gingival fluid**

Data were presented mean and standard errors and significant difference of multiple comparison tests. *Significant difference inter-group on all counter time ($p<0.05$); ¶ significant difference inter-group on 0 days ($p<0.05$); £ significant difference inter-group on 3rd days ($p<0.05$); ¥ significant difference inter-group on 7th days ($p<0.05$); § significant difference inter-group on 14th days ($p<0.05$); ∫ significant difference inter-group on 21st days ($p<0.05$); ‡ significant difference inter-group on 28th days ($p<0.05$).

Figure 1 illustrated line graph about total leukocytes trending in peripheral blood and gingival fluid during 28 days of ovarian failure rats induced ovariectomy. Total leukocytes in peripheral blood had different pattern of gingival fluid. Total leukocytes in peripheral increased on 3rd and 7th days, after that it gradually declined till to 28th days. Almost total leukocyte in peripheral blood had significant difference inter-group ($p<0.05$), except on 14th days ($p>0.05$). Although total leukocytes on 14th, 21st, and 28th gradually declined, there was no significant difference between the groups ($p>0.05$) (Figure 1a).

Total leukocyte in gingival fluid was more fluctuant than in peripheral blood and it significantly increased on 28th days which is the peak of total leukocyte in gingival fluid. The total leukocyte was remarkably increased till 7th days then decline, after that, it significantly increased to 28th days ($p<0.05$). Almost the total leukocytes had no remarkable mean difference inter-groups to 7th and 14 days ($p>0.05$).

Figure 2 described differential counting of ovarian failure rats induced ovariectomy in peripheral blood and gingival fluid following 28th days. There are difference pattern leukocytes in peripheral blood and gingival fluid. Almost leukocyte types had similar patterns which they increased to 28th days, except neutrophil. While neutrophil and lymphocytes in gingival had similar patterns which they gradually increased to 7th days, and then they decreased on 14th days. After that, they went up on 28th days at the peak of their percentage. Lymphocytes in peripheral blood were the highest percentage leukocytes in peripheral blood followed neutrophil and monocytes, while basophil and eosinophil was the lowest percentage, less than 5%. Whereas basophil and eosinophil in gingival fluid was the lowest percentage, less than 1%, and their percentage were more stable.

There was significant mean difference of leukocytes in peripheral blood statistically between the groups based on counter time ($p<0.05$), especially neutrophil and lymphocyte. Almost basophil percentage in peripheral blood of ovarian failure rats induced ovariectomy had significant difference following a long time, with 21st and 28th days, except basophil percentage on 21st which was significantly different to 0 and 14th days ($p<0.05$). Eosinophil percentage also had significant difference between 21st and 28th days ($p<0.05$), except on 3rd days which there showed no significant difference in all of the counter time ($p>0.05$). For monocyte percentage, the difference was significantly on 3rd and 7th days ($p<0.05$) and there

was no significant difference on 14th days (p>0.05). There was no significant mean difference in percentage of basophil and eosinophil of gingival fluid statistically between the groups (p>0.05). However, neutrophil percentage in gingival fluid of ovarian failure rats induced ovariectomy had significant mean difference inter-group, especially on 0, 3rd and 7th days with 21st and 28th days and except on 14th days. Whereas lymphocyte percentage in gingival fluid showed there was significant difference between 0, 3rd and 14th days with 21st and 28th days.
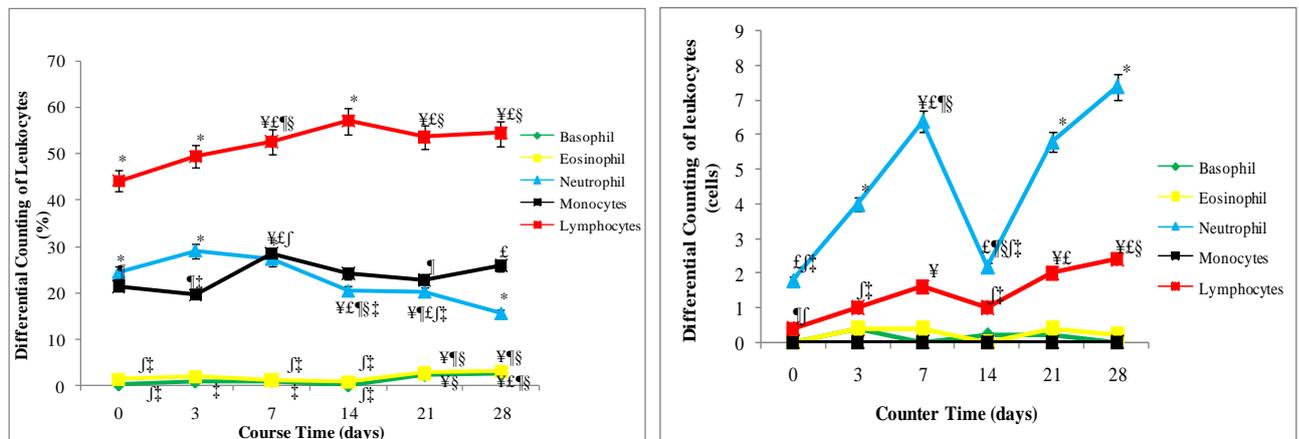
Figure 2. Differential counting in peripheral blood and gingival fluid based on counter time of ovarian failure rats induced ovariectomy

Data were presented mean and standard errors and significant difference of multiple comparison tests.

 * Significant difference inter-group on all counter time (p<0.05); ¶ significant difference inter-group on 0 days (p<0.05); £ significant difference inter-group on 3rd days (p<0.05); ¥ significant difference inter-group on 7th days (p<0.05); § significant difference inter-group on 14th days (p<0.05); ∫ significant difference inter-group on 21st days (p<0.05); ‡ significant difference inter-group on 28th days (p<0.05).

Table 2. Association between Leukocytes Profile in Peripheral Blood Circulation and Gingival Fluid of Ovarian Failure Rats Induced Ovariectomy and Counter Time

Leukocytes profile	P value[a]	*r* value[b]	Leukocytes profile	P value[a]	*r* value[b]
Peripheral blood			**Gingival Fluid**		
WBC count	0.000[§]	0.779[‡]	WBC count	0.000[§]	0.599[†]
Basophil	0.002[§]	0.518[†]	Basophil	-0.382	0.057[#]
Eosinophil	0.020[*]	0.378[#]	Eosinophil	0.358	0.069[#]
Neutrophil	-0.000[§]	0.800[‡]	Neutrophil	0.000[§]	0.600[‡]
Monocytes	0.054[*]	0.292[#]	Monocytes	-	-
Lymphocytes	0.000[§]	0.745[‡]	Lymphocytes	0.000[§]	0.635[‡]

[a] Pearson's correlation test; [b] linear regression test

[*] significantly correlation between variables (p<0.05); [§] significantly correlation between variables (p<0.001)

[#] significant but weak correlation; [†] significant and moderate correlation; [‡] significant and strong correlation

According to correlation analysis (table 2), most of the variables had correlation between leukocytes profile and counter time (days). Although the correlation power was varied from each variable, total leukocytes, neutrophil and lymphocytes in peripheral blood and gingival fluid of ovarian failure rats induced ovariectomy had significant and strong correlation to counter time ($p<0.05$, $r>0.6$), except basophil in peripheral blood which had moderate correlation ($p<0.05$, $r\geq0.3$) and the other was weak correlation ($p<0.05$, $r\leq0.3$).

There was difference imaging between leukocytes in peripheral blood and gingival fluid. The recent study could not find monocyte in gingival fluid. Moreover, leukocytes in gingival fluid were not intact, the cell walls were lysis. So they were observed nucleus form and granules.
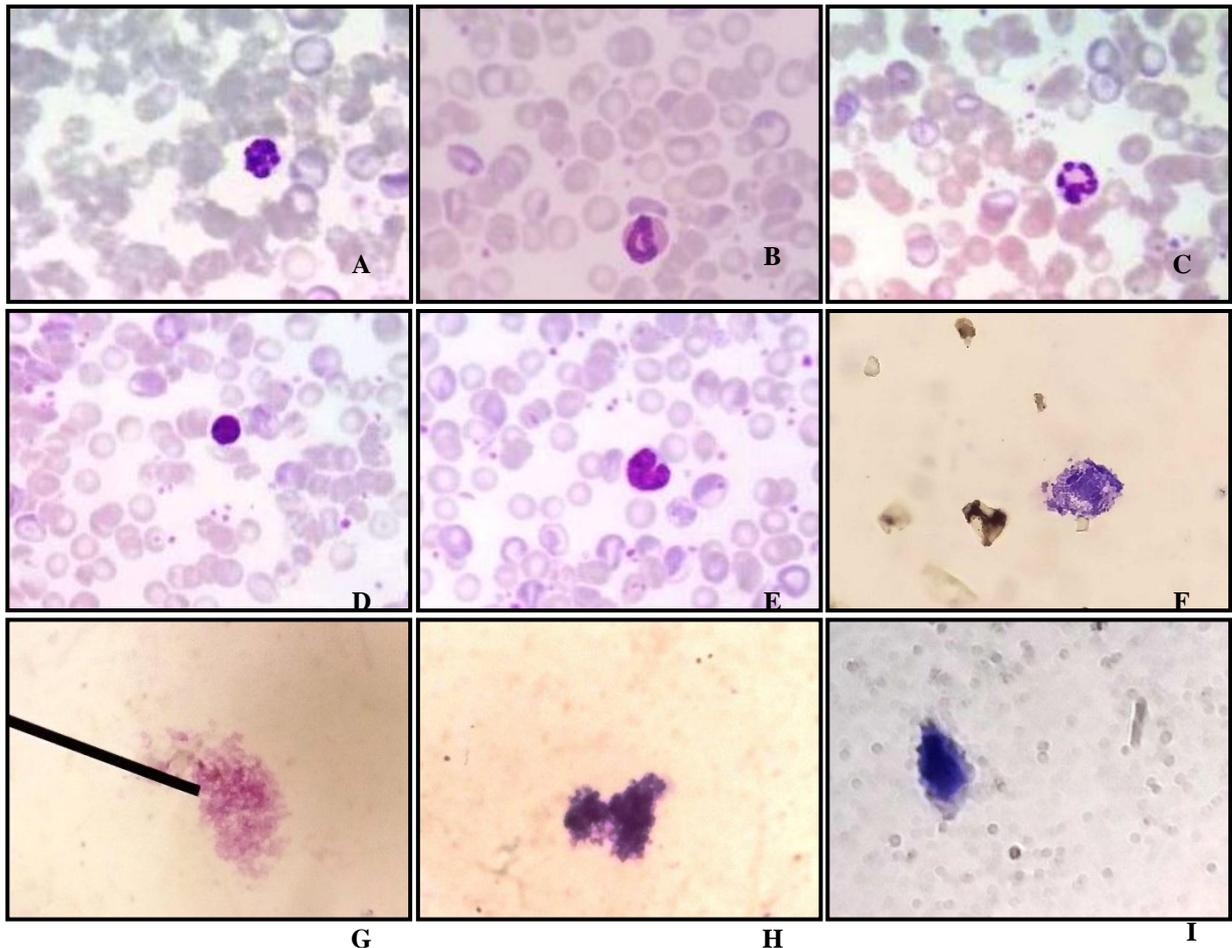
Figure 3. Morphology characteristic of leukocytes in peripheral blood and gingival fluid of ovarian failure rats induced ovariectomy
The presented images were histology preparation with Giemsa staining under 1000x magnification.
A. basophil, B. eosinophil, C. neutrophil, D. lymphocyte, E. monocyte in peripheral blood; and F. basophil, G. eosinophil, H. neutrophil, I. lymphocyte in gingival fluid

Discussion

In this study, leukocytes profile in peripheral blood was significantly higher than in gingival fluid. Furthermore, all of the leukocyte types were detected in peripheral blood. While in the gingival fluid was only monocytes not detected. It might be caused by leukocytes source in those sites were different which the peripheral blood was originated from the haemopoietic system of bone marrow and lymphoid and they were circulated in vascular, whereas leukocytes in gingival sulcus were derived from the systemic source that

accumulated in periodontal tissue, especially in gingival sulcus. The leukocytes excreted to gingival pocket when there were permeability changes of gingival sulcus epithelium.[26, 29] In addition, leukocytes was only 2 % of gingival fluid component.[22]

Moreover, total leukocytes in peripheral blood were gradually declined to 28th days. It might premature ovarian failure induced ovariectomy suppressed leukocytes production and it might be impacted immune system suppression. On the contrary, the previous study showed that ovarian failure induced ovariectomy stimulated low-grade chronic inflammation that was manifest high inflammation response correlated increasing total leukocytes, however, the leukocytes functions decreased. Therefore premature ovarian failure induced ovariectomy would enhance morbidity and mortality due to immune system dysfunction.[2, 13] Hirokawa et al described that total leukocytes were affected by increasing of ages.[10] Furthermore, Wakf explained that alteration total leukocytes in menopause women were influenced by menopause phase. Total leukocyte in early menopause was higher than premenopause and lower than late postmenopause. In this study, we suggested the periods of counter time mimicking the menopause phase that 3rd and 7th day might be early menopause phase and after 14th days was late menopause.[1, 15, 19, 28]

Otherwise total leukocyte in gingival fluid was fluctuant and it tent to increase following the days of observation. The peak was on 28th day. It might be affected local and systemic factors. Ovarian failure rats induced ovariectomy was supposed modifying environment in periodontal tissue that influenced migration and excretion leukocyte from periodontal tissue to gingival sulcus area. Rahnama et al described that proportion leukocyte in peripheral blood and gingival fluid was difference which neutrophil was more accumulated in gingival fluid in order to protect periodontal tissue from injuries.[17, 22]

The percentage of leukocytes was different between peripheral blood and gingival fluid, which lymphocytes in peripheral blood had higher percentage than neutrophil in peripheral blood, while lymphocytes in gingival fluid had lower percentage than neutrophil in gingival fluid. It might be ovarian failure rats induced ovariectomy stimulated immune cell activity. Neutrophils constituted 91-97% of the immune system among all leukocytes in gingival fluid and the remaining were monocyte/ macrophage and lymphocytes.[22] The previous study showed that ovariectomy cause deficiency of sex steroid hormone, estrogen and progesterone. Those deficiencies altered accumulation leukocytes in gingival sulcus.[9, 16, 17]

This study also showed there were differences imaging of leukocytes in peripheral and gingival fluid which leukocytes cell wall were more intact than in gingival fluid. We suggested that leukocyte cell in gingival fluid had through gingival sulcus epithelial and the excretion process caused cells damage. Moreover, we supposed that leukocyte cells were lysed in order to phagocyte and chemotaxis function. Gingival crevicular fluid is an exudate secreted by gingival and it accumulates the crevices gingival. The concentrations of this fluid are influenced by inflammation.[22]

Conclusion

This recent study concluded that ovarian failure induced ovariectomy affected leukocytes profile in peripheral blood circulation and gingival fluid. Leukocytes profile might be effect in ovarian function, although it needed further study to know the effects. Moreover, leukocytes could be used as biological marker of ovarian function, and morbidity and mortality status in ovarian failure or menopause. However, this study needs further studies in order to know effect ovarian failure induced ovariectomy to leukocytes activities.

Acknowledgements

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Practice of Smooking Adolescent at Nurul Huda Az Zuhdi Islamic Boarding School in Semarang City

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Abstract

The number of students smoking at Nurul Huda Az Zuhdi Islamic boarding school Semarang reached 62.9%. Most of the students who smoke experiencing respiratory infections, bronchitis, damage to the mouth and high blood pressure by 55% and amounted to 64.2% suffered from asthma for passive smokers. The goal of this study was to analyze the factors associated with adolescent students smoking behavior in Nurul Huda Az Zuhdi Islamic boarding school Semarang. Design of this research is observasional with cross-sectional approach. The populations are adolescent male moeslim students in junior and senior high schools level with a total of 140 people and all were taken as saturated sampling. Analyzed using univariate and bivariate with Chi Square test (significance level 0.05). Respondents had poor knowledge (95.4%), favorable attitudes (98.2%), availability of cigarettes is available (97%), affordability of cigarettes is not affordable (64%), there is a violation commitment or smoking regulations in boarding school (82, 6%), smoking habits officer or head of boarding school (76.6%) and smoking behavior of peers (94%). Chi Square test results found there are relationship between students smoking behavior with knowledge, attitudes and availability of cigarettes, commitment or smoking regulations in boarding school, the smoking habit of the officer or leader and peer smoking behavior.

Keywords: student smoking behavior, islamic boarding school, respiratory infections.

Introduction

The number of smokers worldwide is on the rise, according to World Health Organization (WHO) data in 2013, the number of smokers worldwide almost two-thirds live in 10 countries in China, India, Indonesia, Russia, the United States, Japan, Brazil, Bangladesh, Germany, and Turkey. An estimated 900 million or 84% of world smokers live in developing countries. If not immediately handled based on the survey of deaths from cigarettes in 2020 reached 8.4 million deaths of the world's population each year, and in 2030 reached 10 million people[1]. Global Youth Tobacco Survey (GYTS) in Indonesia in 2014 shows, 19.4% of school age children 13-15 years old smoke. First-year smokers aged 10-14 years have doubled in the last 10 years, from 9.5% in 2001 to 17.5% in 2010, and 25.6% in 2014.

Various studies in the world reveal that cigarette advertising and promotion affect the increase in the number of smokers. This condition occurs in Indonesia. As many as 89.3% of adolescents aged 13-15 years in Indonesia have been exposed to cigarette advertisement through the media outboard (billboards) and 76.6% through print media (newspapers and magazines)[2].

The population of Central Java is one of 17 provinces with daily smoking prevalence above the national average daily prevalence of smoking. Trend prevalence of smoking in population> 15 years in Central Java province in 1995 showed men and women smoking 23,5%, in 2001 showed men and women smoke as much as 30,8%, in 2007 showed men and women smoke as much as 34.3%.

In 2010, Central Java residents who smoked daily according to the characteristics of age, most were younger at 41.6% (15-19 years) and 20.2% (20-24 years), followed by 12.4 % (10-14 years)[3]

The city of Semarang, although not among the 10 largest districts / municipalities, has a daily prevalence of smoking above the prevalence rate of Central Java Province, but its presence as the capital of Central Java Province has a substantial impact on the number of smokers, 18.2% cigarettes per day 9.1 cigarettes.

The result of self introspection survey (SMD) in Dusun Karangwetan and Dusun Sumber, Kalisalak District Magelang Regency Central Java Province prevalence of non-smoking family member 34,64% from total population, while the remaining 65,96% are smokers, to the II in both villages.[4] This is contrary to the suggestion in Islam that prohibits smoking because cigarettes is likened to "self-murder weapon" contained in Alqur'an Surat Al Baqarah verse 195. Cigarettes burn in vain rizki from Allah, listed in the Qur'an Surah Al Israa verses 26-27. Smoking harms others especially in passive smokers, increasing crime, making worship so imperfect and causing smokers to become odor. The results of research indicate that the motivation of santri smoking is due to experiment in the background of wanting to be recognized as an adult because it has developed thinking among santri that a man's mark of virility is characterized by smoking and mustache.[5]

The results of research at Ponpes Roudlatut Thalibin Subdistrict Leteh District Rembang with the number of teenage students amounted to 3055 students consisting of 2,375 santri rate and 680 santri mukim. In the Ponpes there are 77.7% of santri who smoke. This is because from the kiai and the board or ustadz are also smoking and the absence of regulation or cottage commitment about smoking ban in ponpes.[6]

One of the ponpes in Semarang City is Pondok Pesantren Nurul Huda Azzuhdi located on Jl. KH. Zuhdi No.10 Meteseh Village Tembalang District was established in 1996. The number of students in the ponpes is 300 students, with details of 140 santri men and 160 female santri.

Students in ponpes are divided into three levels namely elementary, junior high and high school. While the number of kyai and ustadz (officer ponpes) amounted to 13 people, 4 kyai or nanny and 9 people ustadz or ponpes officer.

Students in Pondok Pesantren are still smoking. Nearly 57.1% (80 santri son of 140 santri son) in ponpes still smoking. Based on secondary data and interview result at Nurul Huda Azzuhdi Ponpes with officer and or ponpes officer showed that students who smoke by 55% (77 students) suffered from smoking disorders, respiratory problems, bronchitis, damage to the mouth and high blood pressure. Besides santri who do not smoke (passive smokers) for 64.2% or about 90 santri suffering from asthma. Whereas in ponpes already no smoking ban. For violating santri given moral sanctions as requested to smoke and spend a pack of cigarettes in front of all residents ponpes.

Based on the background, it is necessary to conduct research related to factors related to smoking behavior of adolescent students at Pondok Pesantren Nurul Huda Az Zuhdi Semarang City.

Research Methods

The design of this study was observational with cross sectional approach[7].

Populations and samples of 140 people taken with the following inclusion criteria:
a. Teens of santri son educated junior high-school level
b. Willing to be a respondent
c. Able to communicate well
d. Go to school or a student at Pondok Pesantren Nurul Huda Az Zuhdi Semarang City

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Research variables
a. The independent variables of this study are the characteristics of respondents (age and education), smoking knowledge, smoking attitudes, availability of cigarettes, affordability, commitment or smoking regulations in ponpes, smoking habits (officers or ponpes leaders) and smoking practices.
b. The dependent variable of this research is the smoking practice of adolescent santri at Pondok Pesantren Nurul Huda Az Zuhdi Semarang City.

Results and Discussion

Table 1. Statistical Relationship

Independent variables	p-value	Description Ho
Age	p = 0,8620	accepted
Education	p = 0,3610	accepted
Knowledge	p = 0,0001	rejected
Attitude	p = 0,0001	rejected
Availability of cigarettes	p = 0,0001	rejected
Affordability of cigarettes	p = 0,0001	rejected
Commitmen/Rules of smoke	p = 0,0001	rejected
Habit smoking officer/Leader	p = 0,0170	rejected
Peer smoke behavior	p = 0,0001	rejected

The table shows that there are six variables that have relationship with smoking practice of santri that is knowledge, attitude, availability of cigarette, affordability of cigarette, commitment or regulation of smoking in ponpes, smoking habit officer or ponpes leader and smoking cigarette behavior (p ≤ 0,05).

Knowledge

There is a relationship between knowledge and the practice of smoking teenage students. Knowledge is a very important domain for the formation of open behavior (overt behavior). According to Green theory one of the factors that influence one's behavior is predisposing factors in the form of knowledge. The better a person's knowledge the better the behavior of health and behavior will tend to last longer, and vice versa the less good a person's knowledge will be less good also health behavior.[8]

The results are in accordance with Mugiono research which states that the knowledge of students at boarding school Roudlatut Thalibin Village Leteh Rembang District Rembang regency still less understood about the material content of cigarettes, smoking-related diseases, passive smoking and smoking cessation method, so with the low knowledge of cigarettes is increasingly many santris are smoking.[6]

Attitude

There is a correlation between attitude and smoking practice of adolescent santri. Attitude is a person's tendency to behave with an element of judgment that can be positive or supportive and also negative or resistant to an object. A person's attitude is not always fixed. If the individual has a positive attitude towards an object, he will be ready to defend. Conversely, if a person has a negative attitude towards an object, then he will threaten, reproach and even attack the object.[9]

Green theory says one of the factors that influence a person's behavior is a predisposing factor of attitude.[8] The results are in accordance with the Larasati stating that the teenagers

have different reasons in smoking, partly because of factors within oneself (internal) and environmental factors (external). It also causes teenagers to have different attitudes toward smoking reasons. Attitudes about the reasons for smoking teenagers in Pondok Pesantren Miftahul Huda Malang has a supportive attitude, so most teenagers in Pondok Pesantren are smoking.[10]

Aspect Availability

The results showed that the availability of cigarettes related to the practice of smoking teenage students. The availability of cigarettes is where cigarette providers make it easier for respondents to get cigarettes. Availability of cigarettes in boarding schools and around boarding schools. make it easier for students to get a cigarette.

Mugiono's research found that in Pondok Pesantren Roudlatut Thalibin Sub-district of Leteh Sub-district of Rembang, Rembang Regency, there is a shop that records a bill or cigarette debt for santri who buy cigarettes and a kind of habit in every event Khoul given cigarette allocation for santri who work. The boarding school administrator distributes cigarettes to the students to motivate them to work for the santri. In this case the existence of stalls and the ease of getting a cigarette from the boarding house is one of the factors that encourage students to smoke.[6]

Commitmen or Regulation

Commitment or regulation is something that must be adhered to in accordance with the established orders that must be executed by a person, if a person is committing an offense will get sanction. Researchers conclude there is a relationship between the availability of smoking with the practice of smoking teenage students.

Mugiono's research shows that all the students at Ponpes Roudlatut Thalibin smoke because there are no express written rules prohibiting santri from smoking. The suggestion for santri not to be smoked was conveyed by the board of the past period, but its implementation did not go as expected. The cause of ineffectiveness of smoking ban for santri due to the lack of strict sanctions and lack of consistency of the board in its supervision.[6]

Support Officer/Head of Ponpes

Officers or ponpes leaders have an effect on the behavior of santri teenagers. Leader is the highest figure who always used as a role model santri to perform an action. Officers or leaders ponpes be role models santri-santri to perform an action. Officers or leaders ponpes in the practice of smoking is still not good because there are still many who smoke and violate the rules themselves.

Mugiono research supports that smoking behavior of kiai can influence santri smoking habit that is with the tradition of seeking blessing kiai through cigarette butts so santri who do not smoke will be smoking when given kiai cigarette butts that are believed to contain blessings. This is where the kiai as the figure and idol santri so that any words and behavior will be followed and imitated. In addition there is a very strong conviction that the culture of smoking cottage society is in accordance with the teachings of the kiainya religion.
Smoking students who smoke become steady and do not hesitate to violate the teachings of religion because the kiai also smoking.[6]

Peer smoking behavior

Behavior of a friend is very influential for teenagers. Adolescence is the period of puberty. More time spent with friends than with family. Most teenagers will follow the behavior of their friends, who are both good and bad behavior. If a lot of friends who smoke, then the teen will be smoking as well.

Ali also stated as a santri who is also studying in full day education, santri more intensely interact and communicate with peers (friends room or classmates). In the boarding school Tebuireng Jombang santri smoking behavior is strongly influenced nearby students with friends. Santri smokes because many of his friends smoke, and vice versa.[11]

Age of respondents

Age of respondents is a predisposing factor that affects a person's behavior. Predisposing factors are the facilitating and underlying factors for the occurrence of certain behaviors.8 The authors concluded that the age of the respondents was not related to the smoking practice of the santri adolescent.

The results of research Lindawati et al who stated that the smoking behavior of a person is affected by age. The more mature a person will be the higher one's smoking behavior and the younger the lower one's smoking behavior. This is because in adulthood is a period in which a person is said to be mature so to say it is cooked then someone will smoke as a symbol of maturity someone.[12]

Education of Respondents

Education is a persuasive effort or learning to the community so that people will take actions or practices to maintain (overcome the problem) and improve their health. The researchers concluded that respondents' education had nothing to do with santri teen smoking.

Mugiono's research shows that education has no effect on smoking behavior. The level of formal education of santri and administrators at Pondok Pesantren Roudlatut Thalibin is high, while for formal education most of the kiai are still low. But both santri and kiai at Pondok Pesantren Roudlatut Thalibin are mostly still smoking. This shows that smoking habits have no effect because both high and low educated are all smoking, smoking behavior is more influenced by friends and family.[6]

Affordability of Cigarettes

One's smoking behavior is influenced by the affordability of a person getting a cigarette. The affordability of cigarettes in this study is the access of respondents to get cigarettes, that is far or not the place of cigarette providers with ponpes and easy or not the way or business respondents in getting cigarettes. Nevertheless, the results showed no association between cigarette affordability and smoking behavior.

Rahman's research shows that the smoking behavior of santri is not influenced by the easy access or absence of santri get a cigarette. Santri who can not buy cigarettes in the warung because there is no shop selling cigarettes around and inside boarding school actually take cigarettes from home and keep it in the room, so the behavior of smoking santri is still high.[13]

Conclusion

Respondents who practiced smoking were 62.9% and non-smokers were 37.1%. Knowledge of respondents less good 95,4%. Attitude of respondents favor smoking 98.2%. The number of friends who smoke in the boarding school is 94%. Leaders and officers ponpes smoking 76.6%. Commitment of ban meroko still violated 82,6%. The availability and accessibility of cigarettes around the ponpes made respondents smoke.

There is a relationship between knowledge, attitude of respondent, availability of goods, commitment or regulation of ponpes, smoking habit of officer or leader of ponpes, and behavior of friend with smoking practice of adolescent of santri at Pondok Pesantren Nurul Huda Az Zuhdi Semarang City.

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Improving the Cognitive Function of Elderly by Reading the Al-Qur'an

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Abstract

Human life is divided into several phases including infant, toddler, adolescent, adult, and elderly. At the time a person has entered elderly age there are biological changes in his life such as a change in brain function. The brain is a part of the human body that serves to regulate the body system and as a cognitive center. Difficulties of memory function and expressing verbal functions (speech) are examples of cognitive forms impairment in elderly people. One way that can be used to hold up the incidence of cognitive impairment function in the elderly is by therapy of reading the Al Qur'an. Reading the Al Qur'an therapy can be conducted by reading slowly and harmonious to be able to reduce stress hormones. This study aims to determine the effect of the the Al Qur'an reading therapy on cognitive function in the elderly. This study used quasi experimental method with one group pre test-post test design. 35 samples were taken by purposive sampling at posyandu (Integrated Health Service) for elderly in Semondo Village, Kalitengah, and Kemukus Gombong. Data analysis used descriptive analysis and bivariate using paired t test. Respondents given 12 days the Al- Qur'an reading therapy experienced improvement of their cognitive function score after the post-test. This therapy can be the way as one of the interventions to improve the cognitive function and quality of life. It because there are changes in muscle electric flow, blood stream changes, heart beat changes, and blood level of the skin. These changes indicate the relaxation or decline of nerve tension resulting in dilation of blood vessels and blood perfusion in the skin, accompanied by a decrease in heart rate (Faradisi, 2009). The results indicate that most respondents (71.4%) had normal cognitive function before doing the Reading the Al Qur'an therapy of Most of the respondents (91.4%) had an increased cognitive function score after doing therapy.There is an influence of Reading the Al Qur'an therapy toward cognitive function in elderly with p = <0.001 (<0.05). Reading the Al Qur'an therapy can be done routinely for the elderly to improve cognitive function and prevent dementia.

Keywords: cognitive function, elderly, reading the Al Qur'an therapy

Introduction

Human's life is divided into some stages of life such as baby, toddlers, teenage, adult and elderly. Each stage has it own development demand due to reach optimum growth. Each stage is also accompanied by various developmental tasks that must be done to reach development optimally. In addition each stage of development is also characterized by various events such as changes from the previous stage to the next stage. By the time a person has entered old age, he/she will undergo a change. Difficulties with memory function or in expressing verbally or speaking are examples of the form of cognitive impairment in elderly people (Suardiman, 2011).

Data sourced from the World Health Population Prospect 2015 Revision explains that by 2015 there are a total of 910,000,000 people aged 60 or over who are included in 12% of the global population and by 2050, it is predicted the number of elderly population will be much more than the global population as much as 2-fold that reaches 2.1 billion people (Unites Nations, 2015).

Kebumen regency is one of the regencies in Central Java Province. Based on data sourced from the Central Bureau of Statistics (BPS) Kebumen Regency in 2015, the population of Kebumen regency is as many as 1.184.938 residents. As for the elderly in

Kebumen District there are 1,181,006 people who are divided into various sub-districts (BPS Kebumen) Meanwhile, based on preliminary study results that have been conducted on November 09, 2016, the results of the total number of elderly people in the work area of Gombong Primary Health Center 2 (Puskesmas) are 4615 people. On February 09, 2017, the elderly who actively follow the activities in elderly Posyandu are 346 persons starting from January 2017.

A literature study has found that the number of elderly population who experience decreased cognitive function is increasing and is proportional to the increase of the elderly population number. The incidence of cognitive decline in the elderly population is estimated to reach 121 million people with a composition of 5.8% of men and 9.5% of women (WHO, 2012).

When the brain begins to aging it will be a decline in brain function from a human that can lead to a decrease in cognitive function and balance the body, therefore an elderly will experience a decrease in cognitive function of memory loss. Decreased cognitive function in the elderly can not be avoided but can be slowed down in various ways. One way that can be used to slow the incidence of cognitive impairment function in the elderly is to use Qur'an reading therapy. This study aims to determine the effect of reading the Al Qur'an therapy on cognitive function in elderly at Posyandu.

Methods

The research used quasi experimental with one grup pre dan post-tests designs. To test the independent variable toward the dependent variable pre-test and post test were conducted. The observation was conducted before the research. Observation before the research (O) is pre-test and observation after the research (O1) is Post-test with O1 O1 pattern (Arikunto, 2006). the populations are all elderly who visit the Posyandu in the working area of Gombong 2 Primary Health Center (PUSKESMAS) from january 2017 as many as 346 elderly. The samples consist of 46 respondents. Reading the Al-qur'an therapy was conducted for 15 minutes in 12 days after Subuh prayer time.

Results

1. Description of elderly characteristics in elderly Posyandu of Semondo Village, Kalitengah, and Kemukus, Gombong.

Indicator	Characteristics of the Respondents	f	%
Sex	Male	4	11.4
	Female	31	88.6
Age	60 – 65	22	62.8
	65 – 70	7	20,0
	70 – 75	3	8.6
	75 – 80	3	8.6
Education	Elementary School	25	71.4
	Junior High School	7	20.0
	Senior High School	3	8.6
Total Number		35	100.0

The table shows the biggest frequency based on age is female (31 respondents /88.6) whereas Male is only 4 respondents/ 11.4%.

2. Cognitive function of the elderly before treatment of Al-qur'an reading Therapy.

Cognitive Function Score Pre Test	f	%
24 – 30 (Normal)	25	71.4
17-23 *(Probable)*	10	28.6
0 – 16 *(Definite)*	0	0
Total Number	35	100.0

The table shows the frequency distribution of the respondents based on the biggest results of pre-test cognitive score is for 25 respondents (71.4 %) with normal cognitive function.

3. The elderly cognitive function after reading the Al-Qur'an therapy treatment.

Cognitive Function Score Post Test	F	%
24 – 30 (Normal)	32	91.4
17-23 *(Probable)*	3	8.6
0 – 16 *(Definite)*	0	0
Jumlah	35	100.0

Respondents frequency distribution based on the post test cognitive score shows the biggest score is for 32 respondents (91.4 %) with normal cognitive function.

4. The influence of reading the Al Qur'an therapy toward the elderly cognitive function.

Cognitive Score	Mean	T	P
Pre Test	24.34		
Post Test	26.40	-7.748	<0.001

The average cognitive score of the elderly from the intervention group before the Al-Qur'an reading therapy is 24.34 and became 26.40 after the therapy.

Discussion

The statistical test results show that the proven therapy of reading the Al Qur'an affects the elderly cognitive function that is with the increase of value or the cognitive function score before and after therapy. The influence of reading Qur'an therapy is supported by the procedure that had been done by reading the Qur'an 15 minutes. One of the Surah in the Qur'an that the researcher chose was Surah Taha. The statistical test result shows p value <0.001 which means reading the Al- Qur'an therapy gives effect on cognitive function for the elderly. The respondents who had been doing the 12-day recitation of the Qur'an experienced an increase of the cognitive function score after the post test. This is supported by the design of solutions from Hoyer & Verhaeghen in Suardiman (2011) that can provide the effect of improving cognitive function. The way to improve cognitive function (memory) of the elderly is by giving nursing intervention to achieve health outcomes and improving the quality of life because applying memory stimulation habits by reading a good reading will be able to provide cognitive development of the elderly. The benefits of improved cognitive function (memory) techniques for the elderly significantly influence outcomes on the health and mental status of the elderly. The influence of reading the Al Qur'an therapy is due to changes in electric current in the muscle, changes in blood circulation, changes in heart rate, and blood levels in the skin. These changes indicate the relaxation or decline of nerve tension resulting in dilation of blood vessels and blood perfusion in the skin, accompanied by a decrease in heart rate (Faradisi, 2009). This is relevant to research conducted by an expert named Ahmad Al-Qadhi, president of the Islamic Medicine Institute for Education and Research in Florida, USA. At the XVII Annual Conference of the American Physicians Association, the US

Missouri region, Ahmad Al-Qadhi made a presentation on his research with the theme of the influence of the Qur'an on humans in the perspective of physiology and psychology. From the explanation it can be concluded that by reading the Qur'an it can bring some vibration of sound that reaches the ears, flow into the brain cells then bring the effect to the reader through the electronic field that is born in the cells. Then the cells will respond to the fields and compensate for the vibrations. This vibration change is what we find and understand after going through long and repeated experiences (Al-Kaheel, 2012).

Recommendation

Based on the research findings it is recommended for the elderly and the family to give emotional support and specific attention for the elderly who experience cognitive function problems specially those with probable cognitive function. Family plays important roles in maintaining the cognitive function of the family. Al-Qur'an reading therapy can be implemented to maintain the cognitive function and can be done independently by the elderly. The therapy is good not only for the elderly but also for any age of human life.

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Family Support toward the Nutritional Management of Patients With Diabetes Mellitus

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Abstract

Diabetes Mellitus is a health problem that affects the productivity of patients. According to International Diabetes Federation (IDF) of data by 2015, the prevalence rate of global DM patients reaches to 387 million cases. Nutrition management and management in DM patients cannot be separated from the role of family members in motivating and looking at the nutrients consumed by DM patients. The purpose of this study was to determine whether there is a correlation between family support and nutritional management of patients with diabetes mellitus. This research used quantitative method with cross-sectional approach. There were 37 samples taken by using total sampling from PROLANIS group at Gombong II Community Health Center. Bivariate tests were analyzed by using the Pearson concept. The results indicate respondents with good family support (94.6%), poor health support (5.4%), obedience to nutrition management (81.1%) and non-compliance with nutrition management (18.9%). The result of statistical test shows value (p value = 0.249), mean at alpha (α) 5% which means there is no correlation between family support of nutritional management and health status of DM patients. It is recommended for the health center officers to give more education for DM patients and focus more on on self management, improving self-motivation of patients for translating the nutritional management so that patient's blood sugar can be controlled.

Keywords: Diabetes Mellitus, Family Support, Nutrition Management Compliance

Introduction

Diabetes Mellitus or DM is a health problem that affects the productivity of the patient. DM is a degenerative disease that caused carbohydrate, fat and protein metabolism disorders due lack of absolute or relative insulin hormone that increased blood sugar levels (hyperglycemia). According to IDF data (2015) the global prevalence rate of DM patients in 2014 amounted to 8.3% of the total population in the world and increased to 387 million cases.

DM lead as the eigth cause of death in the world. In Southeast Asia, by 2014 the prevalence of DM patients was 8.6% or 96 million patients. According to Riskesdas (2013) data, in Indonesia there was increases prevalence in DM patients from 1 , 1% in 2007 to 1.5% in 2013 from the total population of 250 million people.

The latest data by the Association of Endocrinology (PERKENI, 2015) shown that the number of DM patients in Indonesia has reached 9.1 million people. By 2013 in Central Java Province the number of insulin-dependent DM cases reached 9,376 cases, while the number of non insulin dependent DM reached 22,534 cases. At Kebumen District the number of non insulin-dependent DM was 230 patients by 2015.

Methods

This research used quantitative method with cross-sectional approach. There were 37 samples taken by using total sampling from PROLANIS (Pengelolaan Program Penyakit Kronis) group at Gombong II Community Health Center. Each of the respondent was giving a quetionaire that they should answer. Then, the data was collected and analyzed by using the Pearson concept.

Result

Here are the results of the research:

Table 1. Characteristics of Diabetes Mellitus Respondents at Gombong II Community Health Center

Characteristics	f	(%)
Age		
35-45 years old	3	8.1
46-55 years old	16	43.2
56-65 years old	16	43.2
66-75 years old	2	5.4
Sex		
Man	6	16.2
Woman	31	83.8
Educational Level		
No School	2	5.4
Elementary	25	67.6
Junior High School	6	16.2
Senior High School	4	10.8
DM Complications		
No Complications	20	54.1
Diabetic Ulcer	2	5.4
Hypertensi on	15	40.5
Time for Suffering of DM		
1-5 years	29	78.4
6-10 years	4	10.8
≥ 10 years	4	10.8
Family Care Giver		
Couple	23	62.2
Son	7	18.9
No one	7	18.9
Marital Status		
Married	32	86.5
Widow	5	13.5

The table showed that most of the DM patiens were 46 – 55 years old and 56 – 65 years old (43.2 %), women 31 person (83.8 %), graduated from Elementary School 25 person (67.6 %), have no complications (54.1 %), suffering from DM 1 – 5 years 29 person (78.4 %), have couple as care giver 23 person (62.2 %) and married 32 person (86.5 %).

Table 2. Family Support and Nutritional Management Compliance of Diabetes Mellitus Patients at Gombong II Community Health Center

Component	f	(%)
Family Support		
Good	35	94.6
Less	2	5.4
Nutritional Management Compliance	30	81.1
Obey	7	18.9
Disobey		

Most of the respondent have a good family support 35 person (94.6%) and obey with the nutritional management 30 person (81.1%).

Table 3. Bivariate Analysis of Family Support and Nutritional Management Compliance of Diabetes Mellitus Patients at Gombong II Community Health Center

Family Support	Nutritional Management Compliance				Total		OR	P Value
	Obey		Disobey					
	f	(%)	f	(%)	f	(%)		
Good	29	82.9	6	17.1	35	100.0	4.833	0.249
Less	1	50.0	1	50.0	2	100.0	(0.264-88.534)	
Total	30	81.1	7	18.9	37	100.0		

The results indicate respondents with good family support (94.6%), poor health support (5.4%), obedience to nutrition management (81.1%) and non-compliance with nutrition management (18.9%). The result of statistical test shows value (p value = 0.249), mean at alpha (α) 5% which means there is no correlation between family support of nutritional management and health status of DM patients .

Discussion

According to WHO (2006) aging process over 30 years made an anatomical, physiological and biochemical changes. Blood glucose levels for a person after 30 years old will rise1-2 mg / dL / year at the time of fasting and will rise 5.6-13 mg / dL at 2 hours after eating. Women have a bigger risk of DM because the have opportunity increased body mass index. The percentage of fat deposits in women is greater than men. This is also the cause of the incidence of DM higher in women than men (Kurniadi, H & Nurrahmani, 2014). A person with a higher level of education has a higher level of self-management of diet, exercise and self-blood glucose examination and it is easier to understand health information related to diet, physical activity and self-blood glucose examination. So, higher educational level will make a better treatment on DM patients (Xu, Pan, Liu,2010). Notoatmojo (2007) said the level of education can be determining whether or not a person easy to understand what they are getting, as well as a more mature level of education can transform himself towards a more positive and open in receiving information.

Based on the distribution frequency, 35 people (94.6%) had good family support. In this case the most widely accepted family support by respondents was the empathy dimension in which the family reminded to control blood sugar, provide assistance when patients have problems, helps and understand the patient's condition, providing food and remind about the regularity of meal time, remind and encourage patients with nutrition management, giving advice and delivering patients to control to doctors / health centers, exercise and regular medicine. Previous research conducted by Fatimah (2016) said the same things. Most of the repondents (37.1%) have good family support such as assisting in providing care, modify the home with good facilities and motivate them to do DM treatment. Goz et al (2007) states that DM patients require to control their lifestyle by use insulin therapy or drugs, food, blood sugar measurements and exercise. This can be achieved by the involvement and participation of the family. So family support is very important in helping individuals wit DM solving the problem.

From the data we can see there were 30 respondents (81.1%) who obedient to nutrition management, while the non-obedient respondents were 7 (18.9%). The respondents restrict consumption of rice, limit the consumption of meat, offal, egg yolk, sausage, jerky and fried foods. The patient obedient because it was reminded by families and Health Worker Officers. The results of research conducted by Fatimah (2016) stated that respondents with good self-

management are 16 people (46.7%), while respondents with poor self-management were 19 people (54.3%). The study states that most respondents do not know how to do self-control and have not been able to comply with something that has been determined in maintaining self care. It was influenced by differences in education level of respondents.

The result of the research shows that the probability value (p value = 0.249), meaning that at alpha (α) 5% there is no significant relationship between family support and nutrition management compliance in DM patients. This is because in everyday life the family has their own bussiness so the family can not monitor the activity of the patient during outdoors. It is also found that patients suffering from DM can take their own decisions in treating and controlling the disease so that patients can violate or comply with nutrition management and exercise according to his own desires. The same results is find from the research conducted by Fatimah (2016) which shows that there is no relationship between family support and self-management (p value = 2.743) due to self-confidence of the patients to do DM self-management. The social support of the family does not directly affect patients behavior on their DM self-management.

Conclussion

The result of statistical test shows value (p value = 0.249), mean at alpha (α) 5% which means there is no correlation between family support of nutritional management and health status of DM patients .So it is recommended for the health center officers to give more education for DM patients and focus more on on self management, improving self-motivation of patients for translating the nutritional management so that patient's blood sugar can be controlled.

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Determinant on Characteristic Assosiated With Disability of Leprosy Patients in Rural Area West Java Indonesia

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Abstract

Indonesia has a large number of leprosy cases. The latest study has found that 273 patients with a prevalence of 0.71 per 10,000 populations with disability for each grade 1 and 2 is 18% and 12%. The research aims to determine the relationship of characteristic in leprosy patients through the incidence of disability by age, gender, education, type of work, knowledge, early diagnosis, treatment regularity, personal care. The method use was observational analytic case control study. The estimated number of samples was calculated based on the formula Lemeshow minimal. The population in this study was all lepers in the working area of health centers in Karawang, as the most representative leprosy cases in West Java. Samples cases are patients with disability leprosy and control samples were all leprosy patients without disabilities. The number of sample are 141 respondents, consist of 47 cases and 94 controls. Statistical analysis showed the significant risk factors in age, gender, education, the type of work, knowledge, early diagnosis, and personal care and the unsignificant ones in treatment regularity. The conclusion is the variables of age, gender, education, type of work, knowledge, early diagnosis and personal care are the risk factors for the incidence of leprosy.

Keywords: determinant, leprosy, disability, characteristics

Introduction

WHO Expert Committee on Leprosy report stated that there is 75% leprosy patient with disability and there is 25% without disability in several countries after leprosy treatment (Singhi et al, 2004). WHO expected 25% patient with disability. In Indonesia the leprosy patient with disability is 10.4% (Kemenkes, 2012). WHO report showed the leprosy cases found in 2011 is 219,075 cases with 12.225 cases of grade 2 disability. The data showed the increase number of disability cases from 2010 by 230 cases of 1.822 cases.Based on the data, it most likely happened in South-East Asia region (160,132), followed by America region (36,832), Africa region (12,673) and the rest of other regions (WHO, 2009). Indonesia has reached the elimination process in national level because of the prevalence rate is less than 1 per 10.000 populations in 2000, in which the appointed target is leprosy reduction up to 35% in the end of 2015.

Leprosy is one of infectious diseases which causes a complex problem. It is not only the medical problem but also it affects social, economic, and cultural issues. Most of leprosy patients come from low-economic society. They could not afford the early-medical treatment because they have no money to cover the treat payment. The development of leprosy diseases on patient could be worse if they are not treated immediately. It might turn out to be permanent disability and it will hamper their daily activity. It causes the inability of earning money and affects their social-economic life. Epidemiologic triad, the standard model of infectious disease caution, is host, agent and environment. The relation among host, agent and environment is one dynamic component and they required the balance continuity in the relation. If it is not, it will cause the disease (Nur, 2006).

WHO stated that 90% of leprosy patient occurs in low-socioeconomic or poor community. Type of job influence the incidence of leprosy or the treatment goals. Social economic status of family determined from type and condition of house, the number of person per room, type of job and property ownership. Low social economic community faces the hardship in accessing a proper health facility, so that leprosy is a threat for them.

On the other hand, some reference discovered by Tavi (2008) in Nugroho (2010), the older patient get, the more severe the disability grade will be. Age is one of main personal characteristic. Age has relation with the level of infection, risk and resistance. The difference of experience in encountering disease and decision making was influenced by individual age. Hence, the disability mostly happens within male than female. It is because of job and outdoor habits. Leprosy is happening in almost whole province in Indonesia. One of the highest prevalence level is in North Maluku Province with 49.1/100,000 citizen. Meanwhile the prevalence of West Java province is 5.2/100,000.

The occurrence of leprosy diseases in Karawang, the rural area in West Java is an endemic and 42 out of 50 health centre in Karawang has leprae disease cases. Leprosy cases had recently happened in Karawang in 2013 with 385 patients and 20% of patients with disability. In 2014, there was decreasing number of patient into 273 patients, but the disability cases increased up to 31%. During 2014, the leprosy patients in Karawang were found around 273 patients, with 4% of PB cases and 96% of MB cases. In 2013, there were found 385 patients with 10% of PB cases and 90% of MB cases. The new discovery of the cases among per 100.000 citizens. If It is related to MB patients proportion, it means new patients reaches 90% in 2014. It showed the high transmission of leprosy disease.

Based on the preview, this research proposed to collect data related to disability factors in West Java. The data could be a basic consideration to obtain some effective program to do prevention and erodiction of leprosy diseases regarding to the factor of disability in several health centre in West java. This research is hopefully able to resilience the leprosy diseases in West Java.

Method
Research Design

Case control study is a study design of epidemiology that study about the relationship between research factor and diseases by comparing case group and control group based on research factor status. The characteristic of case control study is the choice of subject based on diseases status to be observed whether the subject has research factor or not.

Timing approach done is retrospective approach, reviewing leprae patient with disability in the past to identify the factors related to the disability of leprae patients. The correlations researched are the correlation of age, gender, education, job, education, early diagnosis, treatment discipline and self-treatment.

The population in this research is leprosy patients in health centre of Karawang district, West Java as the most representative data. Sample contained 47 cases and 94 controls, with minimum sample amount 141 respondents. Sampling method include primer data and secondary data. Primer data was obtained by direct interview corresponding to questionnaire guideline. The data collected with the help of health centre staff who was already being explained about the guideline. Meanwhile secondary data obtained by literature study and annual document or report of leprosy cases in Health department of Karawang district and Health Department of West Java Province. Instrument used is questionnaire. It used to collect needed data to measure independent variable, such as ages, gender, type of work, education, knowledge, early diagnosis, treatment regularity and personal care. In research plan of case control study, the measurement used is Odds Ratio (OR) obtained by comparing odds in exposed group with odds in unexposed group.

Results and Discussion
Results
Univariate Analysis

a. The Frequency Distribution of Leprosy Patient Characteristic with Disability

Table 1. The Frequency Distribution of Leprosy Patient Characteristic with Disability

Variable	Cases		Control	
	n	**%**	**n**	**%**
a. Age				
- <15 Years Old	10	21.3	73	77.7
- ≥ 15 Years Old	37	78.7	21	22.3
Total	47	100	94	100
b. Gender				
- Female	20	42.6	69	73.4
- Male	27	57.4	25	26.6
Total	47	100	94	100
c. Education				
- Finish High School	16	34	73	77.7
- Not Finish				22.3
Elementary/High School	31	66	21	
Total	47	100	94	100
d. Type of work				
- Not Rough	0	0	70	74.5
- Rough	47	100	24	25.5
Total	47	100	94	100
e. Knowledge				
- Good	14	29.8	70	74.5
- Less	33	70.2	24	25.5
Total	47	100	94	100
f. Early Diagnosis				
- Not Late	16	34	76	80.9
- Late	31	66	18	19.1
Total	47	100	94	100
g. Treatment Regularity				
- Regular	33	70.2	72	76.6
- Not Regular	14	29.8	22	23.4
Total	47	100	94	100
h. Personal Care				
Treating	13	27.7	53	56.4
Not Treating	34	72.3	41	43.6
Total	47	100	94	100

Source: Research Questionnaire. 2015. Calculated.

Table 3 shown the cases group, variable age ≥ 15 years old, male gender, elementary / not graduated, rough worker, lack of knowledge, late of early diagnosis and no personal care has bigger percentages than variable age < 15 years old, female gender, high school graduates, not a rough worker, good knowledge, early diagnosis patient and with personal care, except for regular treatment.

Bivariate Analysis

Table 2. The Relation of Leprosy Patient Characteristic with Disability Cases

Variable	Cases		Control		Total		*P*	OR
	n	%	n	%	F	%	*Value*	95% CI
a. Age								
- <15 Years Old	10	21.3	73	77.7	83	58.9		12.8
- ≥ 15 Years Old	37	78.7	21	22.3	58	41.1	0.000	5.4-30.1
Total	**47**	**100**	**94**	**100**	**141**	**100**		
b. Gender								
- Female	20	42.6	69	73.4	89	63.1		3.7
- Male	27	57.4	25	26.6	52	36.9	0.001	1.7-7.7
Total	**47**	**100**	**94**	**100**	**141**	**100**		
c. Education								
- Finish High School	16	34	73	77.7	89	63.1		6.7
- Not Finish Elementary/High School	31	66	21	22.3	52	36.9	0.000	3.1-14.6
Total	**47**	**100**	**94**	**100**	**141**	**100**		
d. Type of work								
- Not Rough	0	0	70	74.5	70	49.6		0.00
- Rough	47	100	24	25.5	74	50.4	0.000	
Total	**47**	**100**	**94**	**100**	**141**	**100**		
e. Knowledge								
- Good	14	29.8	70	74.5	84	59.6		6.8
- Less	33	70.2	24	25.5	57	40.4	0.000	3.1-14.9
Total	**47**	**100**	**94**	**100**	**141**	**100**		
f. Early Diagnosis								
- Not Late	16	34	76	80.9	92	65.2		8.1
- Late	31	66	18	19.1	49	34.8	0.000	3.7-18.0
Total	**47**	**100**	**94**	**100**	**141**	**100**		
g. Treatment Regularity								
- Regular	33	70.2	72	76.6	105	74.5		1.3
- Not Regular	14	29.8	22	23.4	36	25.5	0.539	0.6-3.0
Total	**47**	**100**	**94**	**100**	**141**	**100**		
h. Self Treatment								
- Treating	13	27.7	53	56.4	66	46.8		3.3
- Not Treating	34	72.3	41	43.6	75	53.2	0.002	1.5-7.2
Total	**47**	**100**	**94**	**100**	**141**	**100**		

Source: Research Questionnaire. 2015. Calculated.

Based on Table 4, it was obtained respondent data that from 58 respondents with age ≥ 15 years old, there were 37 cases with disability of leprosy. Meanwhile there were 10 cases with disability of leprosy from 83 respondents with age less than 15 years old. Based on statistic examination valued p=0.000 ≤ 0.05 obtained OR 12.86 (CI 5.494-30.110). It means people with age ≥ 15 years old has 12.8 times risk than patient at less than 15 years old and this is significant.

There were 27 cases of male leprosy patients with disability from 52 respondents, meanwhile only 20 cases of female leprosy patients with disability from 89 respondents. Based on statistic examination valued p=0.001<0.05 obtained OR 3.73 (CI 1.782-7.789). It means male has 3.73 times risk than female and it has significant meaning. From 52 respondents, there were 31 cases of leprosy disability from patient who never graduates from elementary or high school. On the other hand, only 16 cases found the disability on leprosy patient who graduated from high school. The statistic examination valued p=0.000<0.05 obtained OR 6.74 (CI 3.105-14.609) which means people who never graduates from elementary or high school has 6.74 times risk than people who graduated from high school and it is significant.

The research also found 47 cases of leprosy patient with disability with a rough job from 74 respondents. In opposite, there was no disability case of leprosy patient without a rough job. This result was collected from 70 respondents. Based on statistic examination valued p=0.000<0.05 obtained OR 6.74 (CI 3.105-14.609). It means people with no rough job have no risk than people who has rough job. Leprosy patient with lack knowledge posed disability was found in 33 cases of 57 respondents. Meanwhile, there were only 14 disability cases found from 84 for leprosy patient with good knowledge. Statistic examination showed p=0.000<0.05 obtained OR 6.88(CI 3.157-14.972). It means people with lack knowledge has 6.88 times risk than people with good knowledge for disability occurrence

The disability on leprosy patient during late diagnosis shorted as 31 cases from 49 correspondents. In contrast, the leprosy patient posed disability during early diagnosis only found 16 cases from 92 respondents. Based statistic examination valued p=0.000<0.05 obtained OR 8.18(CI 3.704-18.069). It means patient who got late diagnosis has 8.18 times risk than the one who got early diagnosis and it is significant. Collected from 75 respondents, there were 34 cases of leprosy patient with disability on patient who does not do personal care. On the other hand, there were only 13 cases from 66 respondents of patients with disability who does personal care. Statistic examination valued p=0.002<0.05 obtained OR 3.38 (CI 1.584-7.215) which means patient who does not do personal care has 3.38 times risk than the one who does personal care and it means significantly.

Discussion

The disability of leprosy patients at more 15 years old has 12.8 times risk than patient at less than 15 years old. It statistically means (p-value (0.000) < 0.05: 95% CI: 5,4-30.1). The disability most likely (78.7%) to happen in leprosy patients in category age in more than 15 years old then those one who are less in 15 years old. The age of 15 years old up to 34 years old is a productive age whereas leprosy likely to happen (Peter and Eshiet, 2002) and where there are a number of outdoor activities to work. The type of job doing people over 15 years old is mostly a rough job. Not only the type of job, but also the habits to take care a personal hygiene are less. The awareness of treatment is also very low.

The disability in male patients has 3.7 times higher than female patients. It statistically means (*p-value* 0.001) < 0.05: 95% CI: 1.7-7.7). The result showed there were more (57.4%) male leprosy patients with disability than female ones (42.6%). Male is more likely to do outdoor activities and rough job than female. The habits of personal hygiene are better in female than male. There is a different level and various type of leprosy between male and female. The comparison of disability on hand and foot between male and female is 2 : 1 (Muhammed, Nandakumar and Thomas, 2004). The male activities such as outdoor activities, working and smoking tend to cause the disability of leprosy (Iyor, 2005).

The disability happened in patients who not finished elementary/high school has 6.74 times higher than patients who finished high school. It statistically means (*p-value* (0.000) < 0.05: 95% CI: 3.1-14.6). The result showed that patients who not finished elementary/high

school (66%) is more numerous than patients who finished high school (34%). There was the relationship between education and disability. The low education caused less knowledge in patients. This caused mistreatment in the process of treatment and caused disability. Moreover, the patients have no idea how to cure their wound because of lack of basic knowledge. It makes the wounds even worse.

The disability in leprosy patient with no rough job has less risk than in patients with rough job. It statistically means (*p-value* (0.000) < 0.05). The result showed there are more (100%) disability patients with rough job such as farmer, becak rider, construction laborers. Those jobs are more likely done outdoor and the worker rarely use safety tools that use to take care themselves from disability. A though and rough occupation can lead a damage on skin tissue and nerve become more severe. A job with long intensity increases the eyes activity so that leprosy patient posses Loftalmus. It is dryness of the cornea that results in keratitis. A type of work that causes disability on leprosy patients is farmer. Regarding to Smith (1992), the number of disability on leprosy patient is higher on a rough worker because he get physical trauma in which an important factor of disability pathogenesis on leprosy patients.

Meanwhile, the research done in Nepal by Ghimire divided the respondent into two categories, manual worker and non-manual worker. The result obtained 64% of manual worker posed secondary disability. It is because in Nepal as agriculture country, most of them work individually as farmer. The disability in leprosy patients with less knowledge has 6.88 times higher than patient with good knowledge. It statistically means (*p-value* (0.000) < 0.05: 95% CI: 3.1-14.9). The result showed the amount of disability with less knowledge is higher than those one who has good knowledge. It could be caused by low education level, low economic or low income. Less knowledge caused the mistake and retardation of diagnosis that possibly causing disability.

Basically, knowledge consists of several facts and theories that lead someone to solve the problem in front of them. The knowledge can be obtained from the direct experiences or other's experiences. The knowledge also can be learnt through formal and informal education. Bloom categorized knowledge into cognitive and put it as the first category. It is because knowledge is basic component contains comprehension, application, analysis, synthesis and evaluation.

The disability in leprosy patients with not regular treatment has 1.39 times higher than those ones with regular treatment. It statistically means (*p-value* (0,539) > 0.05: 95% CI:0.6-3.0). The result showed there was no relationship in patient with disability (70%) doing regular treatment.

The disability in patients who did not do personal care has 3.38 times higher than those ones who did self-treatment. It statistically means (*p-value* (0.002) < 0.05: 95% CI: 1.5-7.2). The result showed disability is more likely to happen in patients who did not do personal care. Personal care can reduce disability risk. Personal care such as daily check up over disable area (hand, foot, eyes), treatment of those area by providing a lotion or soaking in hot water. Based on Department of Health (2007), personal care could help rectifying the disability level more than 50% patient. Lack of personal care on leprosy patient can cause a damage become worse. Doing an accurate treatment is one of prevention aspects. Moreover, the living environment affects the occurrence of leprosy diseases in somebody and family. The house which is not qualified into the rules relates to the occurrence of leprosy diseases.

Conclusion

Based on the result showed there was significant relationship between the disability occurrence in leprosy patients in health centre in work area in rural area of West Java, with age, gender, education, type of job, knowledge, early diagnosis, and personal care. But there was no relationship with treatment regularity with the disability.

Suggestion

Based on this research, it is suggested to undergo prevention and eradication program for leprosy diseases in West Java, such as,

1. Early Diagnostic of Leprosy Cases Program.
2. Treatment Control Program.
3. Healthy lifestyle Promotion Program.

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Post-Power Syndrome Tendency in Civil Servant's Retirees in Central of Java, Indonesia

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Abstract

Retirement is a time that will be experienced by all civil servants after reaching the age of 56-70 years, depending on the institution and type of work. Post-power syndrome is a symptom that often arises when a person enters retirement. They appear to be weak, unhealthy or sickly and not eager to perform various activities. In severe conditions, they may suffering stroke or depression. This study aims to see the tendency of post-power syndrome to retirees from various institutions and regions that are entirely retired civil servants who are incorporated in the Association of Wredhatama Republic of Indonesia (PWRI). Data collection using Post power syndrome scale, consisting of 48 valid items (α = 0.918). The number of subjects is 294 retirees, determined by cluster sampling. The data analysis technique used was Kruskal Wallis (Nonparametric) test, besides found the categorization of each subject group. The results showed that there was a difference in Post-Power Syndrome tendency of the six groups, whereas the Semarang group subjects had larger mean than all subject groups, and the Cirebon group subjects had a larger mean compared to the Jepara group subjects. This means that Semarang retired groups tend to show symptoms of post power syndrome is lower than other groups of subjects. Descriptive test results show differences in category, ie post-power syndrome tendency in PWRI Semarang low, Jepara high, Banjarnegara low, high Cirebon, high Tegal and low Undip. From the interview results, there are many factors that affect the post power syndrome condition of the subject, including the decline in income, the amount of free time, loss of power, and lack of social support.

Keywords: retirement, post-power syndrome tendency, civil servant.

Introduction

Retirement will definitely be experienced by all individuals who work after reaching the age of 56-70 years, depending on the department and field of work. Schwartz (in Hurlock, 2009) stated that retirement acts as either the end of one's life pattern or transitional period to a new pattern of life. Referring to Indonesia Dictionary, retirement is defined as a condition when individuals stop conducting a job because they have reached the age limit set by the law or for any other reasons so that individuals are forced to quit their job. There are several reasons why an individual decided to retire, two of them are personal reasons (illness, time freedom) and institutional reasons (condition to retire). Retirement can be seen as two sides of a story, from its positive and negative points of view.

Retirement always relates to changing of roles, desires and values, and individual patterns of life (Papalia, Old, & Feldman, 2008). Retirement period is always started with elderly period and aging process. The process of aging is a natural process characterized by physical, psychological and social decline, which have an effect on one another. The situation tends to cause health problems to the elderly. Commonly, the elderly experience changes or deterioration of psychological functions, in terms of the ability to think, feelings as well as their behavior. This psychological condition will definitely affect an individual's life.

A research on a group of elderly retired from their job suggests that retirees experience a decline in their cognitive flexibility, compared to those who keep busy (Grip, Dupuy, Jolles, & Boxte, 2015). Besides that, they also face changes in their routines, as suggested in a

research that many elderly have sleeping disorders such as sleep deprivation or other disorders due to their excessive free time. (Yu, Mahendran, Abdullah, Kua, & Feng, 2017). Changes faced by elderly in their retirement are aimed to the desire of achieving successful aging for the elderly, so that supports from family and community are important (Desiningrum, 2010).

Another research suggests that during the elderly, there is a decline in health characterized by the emergence of various diseases such as diabetes and hypertension (Liu, Lv, Li, Lib, He, 2017; Seow, Subramaniam, Abdin, Vaingankar, and Chong, 2015). Retirement can be seen as "the golden years" since the retirees can go on vacation and enjoy freedom. Yet, there are some opinions stating that retirements is a period of darkness, boredom, and meaningless. Negative perceptions on retirement results in high level of anxiety and depression, which is known as post-power syndrome. (Indriana, 2012).

Besides physical changes, there is a specific condition experienced by retirees. The condition is characterized by a feeling of powerless and being not respected by the children. The feelings mentioned above are several symptoms of post-power syndrome. Post-power syndrome is defined as a set of symptoms of illness, injury, physical and mental destruction which is progressively observed on an individual and the individual with the symptoms can no longer think realistically. These symptoms are usually experienced by individuals who feel that his/her power or position is over. During the retirement period, an individual might experiences changes in his/her role or patterns of life that might cause anxiety. (Rini, 2001; Kartono, 2002; Suardiman, 2011).

According to Setiati (Dinsi, Setiati, dan Yuliasari, 2006) *syndrome* is defined as a set of symptoms while *power* is defined as authority. *Post-power syndrome* is a set of post-power symptoms in the form of psychological symptoms or emotions that are less stable and the symptoms are usually negative. Those negative symptoms will get worse of individuals experience physical disorder (Elia, 2003). They appear to be weak, unhealthy and not eager to perform various activities. Under severe conditions, they may experience stroke or depression. A study on 515 elderly suggests that the elderly are susceptible to depression and anxiety (Yu, et al, 2017). The elderly who has retired from work usually experience post-power syndrome, yet, many people has succeed through this phase quickly and can accept the reality cooperatively. However, in certain cases, the individual is unable to accept the facts, added with the urgent demands of life. If the individuals are the breadwinner, the risk of post-power syndrome is getting higher. Support and understanding from family and environment are important in providing help for the elderly (Desiningrum, 2010), besides, emotional maturity is essential for retirees to face the challenges of post-power syndrome (Wardhani, 2006).

The research is expected to develop community knowledge on post-power syndrome and its symptoms as well as its influencing factors. Thus, the post-power syndrome tendency will not get worse. It is expected that community can have better understanding of post-power syndrome so they handle it well during their retirement period. In addition, it is expected that there will be follow-up from the government, related to policies on retirees, such as financial benefits for the retirees (Graham, C. 2010.)

The research was aimed to observe post-power syndrome tendency in government retirees from various institutions. The research involved 208 elderly subjects, both male and female, who are government retirees enlisted as member of Persatuan Wredhatama Republik Indonesia (PWRI) from five different areas in Central Java.

Research Methodology

The subjects of the research are government retirees from different fields of work and various organizations of retirees known as Paguyuban Wredhatama from different areas. Data

were collected and categorized based on post-power syndrome scale prepared by the researchers. The post-power syndrome scale is applied in the research was derived from the theory of post-power syndrome based on Osborne research results (2012), Kartono (2012) and Dinsi (Dinsi, Setiati, dan Yuliasari, 2006). With aspects, namely: low self-esteem, loneliness and despair. The number of items is 50 items.

Researchers were distributed to choose subjects from different branches of PWRI, under the circumstances that the subjects are government retirees. The data obtained from each researcher were presented in the categorization of post-power syndrome tendency, namely, very low, low, high, and very high. All data were then compiled and categorized based on the criteria as follows.

1. Very low if within the interval of   Mean - 3 SD   < X < Mean-1,5 SD
2. Low if within the interval of   Mean-1,5 SD < X < Mean
3. High if within the interval of   Mean< X < Mean + 1,5 SD
4. Very high if within the interval of   Mean + 1,5 SD < X < Mean + 3 SD

The subjects of the research were:
1. Government Retirees enlisted as members of PWRI Gajah Mungkur sub-district, Semarang.
2. Government Retirees enlisted as members of PWRI Pecangaan sub-disctict, Jepara Regency.
3. Government Retirees enlisted as members of PWRI Purwareja sub-disctict, Klampok Banjarnegara.
4. Government Retirees enlisted as members of PWRI Cirebon Branch.
5. Government Retirees enlisted as members of Paguyuban Pensiunan Pendidikan, Tegal Regency.
6. Government Retirees enlisted as members of Paguyuban Wredhatama Universitas Diponegoro Semarang

The data, which were first tested for normality and homogeneity test, were analyzed using One-Way Anova (Parametric) Test. When the data failed to meet the assumption of One-way Anova, Kruskal-Wallis(Nonparametric) Test was applied to analyze the data.

Result

Table 1. Overview of Mean, SD and the Number of Research Subjects

	Semarang	Jepara	Banjarnegara	Cirebon	Tegal	Undip
Mean	135,93	92,62	97	99,69	98,24	95.2297
SD	15,67	14,5	12,04	12,30	11,96	9.86976
N	42	44	50	39	45	74

The first research was conducted by Ariyanti (2014) who focused on the tendency of post-power syndrome in Government Retirees enlisted in PWRI Gajahmungkur sub-district, Semarang. The result shows that the tendency of post-power syndrome is low, observed in 55% subjects of 45 research subjects. The details are presented in the following categorization:

Post-power Syndrom Tendency in PWRI Semarang

0%

12%

33%

55%

- Very Low
- Low
- High
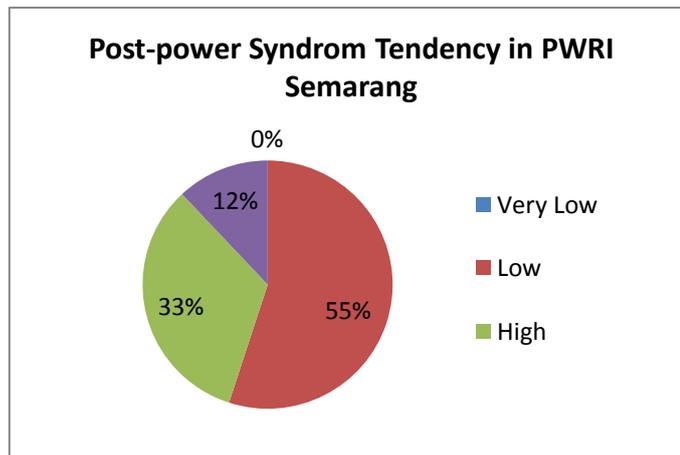
Figure 1. Categorization of Post-power Syndrome Tendency in PWRI Semarang

The second research was conducted by Ni'mah (2014) who focused on the tendency of post-power syndrome in government retirees enlisted in PWRI Pecangaan sub-district, Jepara Regency. The result shows that the tendency of post-power syndrome is high, observed in 41% subjects of 44 research subjects. The details are presented in the following chart:

Post-power Syndrom Tendency in PWRI Jepara

16%

14%

41%

29%

- Very Low
- Low
- High
- Very High
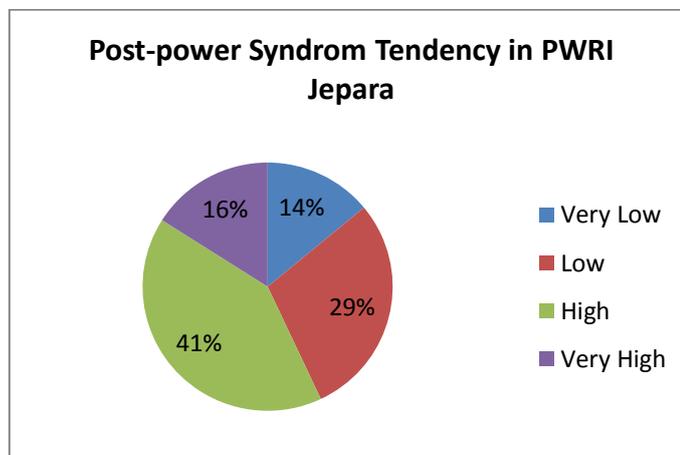
Figure 2. Categorization of Post-power Syndrome Tendency in PWRI Jepara

The third research was conducted by Hapsari (2014) who focused on the tendency of post-power syndrome in government retirees enlisted in PWRI Purwareja sub-district, Klampok, Banjarnegara. The result shows that the tendency of post-power syndrome is low, observed in 52% subjects of 50 research subjects. The details are presented in the following chart:
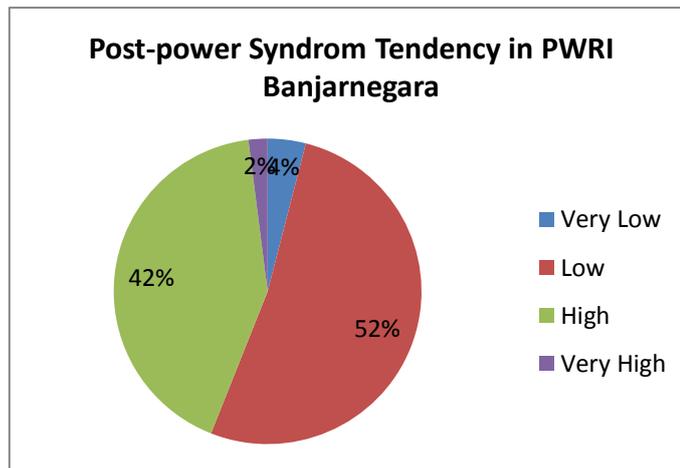
Figure 3. Categorization of Post-power Syndrome Tendency in PWRI Banjarnegara

The fourth research was conducted by Nurhayati (2014) who focused on the tendency of post-power syndrome in government retirees enlisted in PWRI Cirebon Branch. The result shows that the tendency of post-power syndrome is high, observed in 46.15% subjects of 39 research subjects. The details are presented in the following chart:
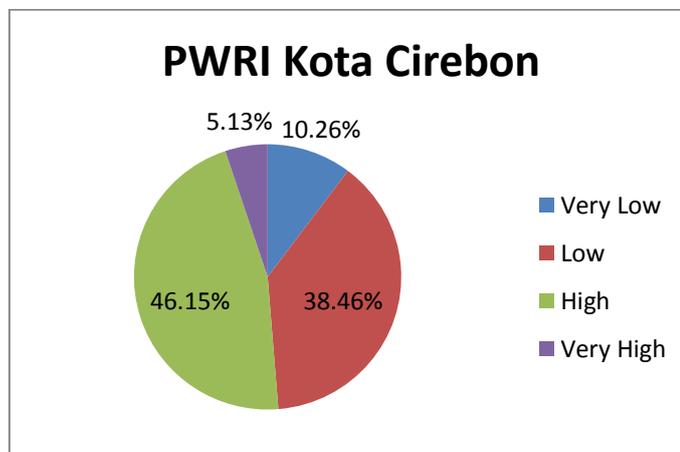
Figure 4. Categorization of Post-power Syndrome Tendency in PWRI Cirebon

The fifth research was conducted by Herani (2014) who focused on the tendency of post-power syndrome in government retirees enlisted in Paguyuban Pensiunan Pendidika, Tegal Regency. The result shows that the tendency of post-power syndrome is high, observed in 46.15% subjects of 45 research subjects. The details are presented in the following chart:
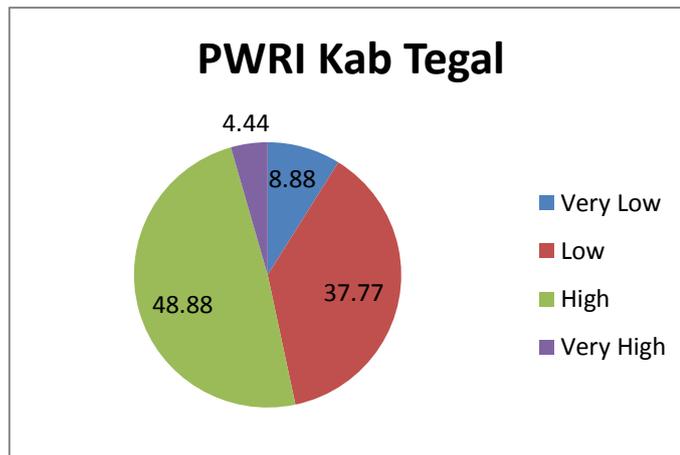
Figure 5. Categorization of Post-power Syndrome Tendency in PWRI Tegal

The sixth research was conducted by Indriana (2012) who focused on the tendency of post-power syndrome in government retirees enlisted in Paguyuban Wredhatama Universitas Diponegoro Semarang. The result shows that the tendency of post-power syndrome is low, observed in 42% subjects of 74 research subjects. The details are presented in the following chart:
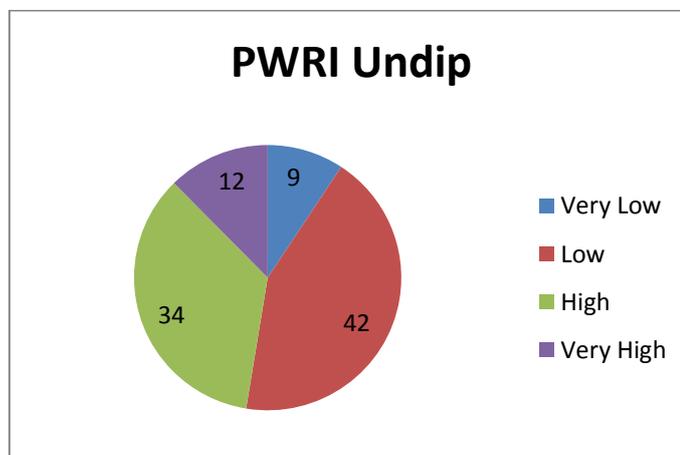

Figure 6. Categorization of Post-power Syndrome Tendency in PWRI Undip Semarang

Data obtained from six researches were analyzed using One-Way Anova (Parametric) Test to observe differences or compare the tendency of post-power syndrome showed by each group of subjects. When the data failed to meet the assumption of One-way Anova, Kruskal-Wallis (Nonparametric) Test was applied.

One-Way Anova Assumption Test

Test of Normality

Table 2. Test of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	Df	Sig.	Statistic	Df	Sig.
subject score	SMG	0,163	42	**0,007**	0,914	42	0,004
	JPR	0,115	44	0,170	0,953	44	0,072
	BJR	0,073	50	0,200[*]	0,986	50	0,812
	CRB	0,081	39	0,200[*]	0,977	39	0,595
	TGL	0,114	45	0,176	0,966	45	0,208
	UND	0,074	74	0,200[*]	0,985	74	0,539

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Table 3. Result of Normality Test

Group	Sig	Remark
Semarang	0,007	Not normal
Jepara	0,170	Normal
Banjarnegara	0,200	Normal
Cirebon	0,200	Normal
Tegal	0,176	Normal
Undip	0,200	Normal

Notes: There is a not normal data group; it is Semarang group, so that the assumption of normal-distributed data is rejected.

Test of Homogeneity

Table 4. Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1.982	5	288	.081

The significant value shows 0.81 (p>0,05) means that the data is stated as homogenous.

1. *One Way Anova*

After assuming that the data of 5 (five) groups are normal and homogeneous distributed, then One Way Anova test is conducted to see the difference of the five groups: Jepara, Banjarnegara, Cirebon, Tegal and Undip. For the Semarang group, because the data are not normal, data were then analyzed by using Kruskal-Wallis analysis. The following table shows the results of One Way Anova test in 5 (five) groups: Jepara, Banjarnegara, Cirebon, Tegal and Undip:

Table 5. One Way Anova test result on 5 groups of Research Area

	Sum of Squares	Df	Mean Square	F	Sig
Between Groups	1325,422	4	331,356	2,320	0,058
Within Groups	35278,145	247	142,826		
Total	36603,567	251			

From result of data analysis shows sig value of 0,058 (p> 0,05) so it can be concluded that there is no difference from the five groups. The following is a description table of the data being tested:

Table 5. Descriptive Data

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
JPR	44	92.61	14.487	2.184	88.21	97.02	66	118
BJR	50	97.00	12.036	1.702	93.58	100.42	66	131
CRB	39	99.69	12.301	1.970	95.70	103.68	75	129
TGL	45	98.24	11.960	1.783	94.65	101.84	72	119
UND (SMG)	74	95.23	9.870	1.147	92.94	97.52	72	116
Total	252	96.35	12.076	.761	94.85	97.85	66	131

The overall mean of the data shows the number 96,35 with the deviation standard of 12,076 and the minimum subject score is 66 and maximum subject score is 131.

b. Kruskal-Wallis Analysis.
Further data analysis used Kruskal-Wallis analysis due to assumption of normality was not fulfilled in Semarang data group. The result of Kruskal Wallis analysis is as follows:

Table 6. Kruskal Wallis Analysis Result

Test Statistic	
Asymp. Sig	0,000

The significance value above shows the number 0.000 (p <0.05). This means that there is a Post-Power Syndrome difference between Semarang group and the other five groups. The results of the analysis are as follows:

Table 7. Semarang and Jepara Groups

	Semarang	Jepara	Remark
Mean Rank	66,31	22,68	Different
Sum of Ranks	2743,000	998,000	
Asymp. Sig (2-tailed)		0,000	

Table 8. Semarang and Banjarnegara Groups

	Semarang	Banjarnegara	Remark
Mean Rank	71,07	25,86	Different
Sum of Ranks	2985,000	1293,000	
Asymp. Sig (2-tailed)		0,000	

Table 9. Semarang and Cirebon Groups

	Semarang	Cirebon	Remark
Mean Rank	59,95	20,59	Different
Sum of Ranks	2518,000	803,00	
Asymp. Sig (2-tailed)		0,000	

Table 10. Semarang and Tegal Groups

	Semarang	Ceribon	Remark
Mean Rank	66,19	23,29	Different
Sum of Ranks	2780,000	1048,00	
Asymp. Sig (2-tailed)		0,000	

Table 11. Semarang and Undip Groups

	Semarang	Undip	Remark
Mean Rank	95,36	37,58	Different
Sum of Ranks	4005,00	2781,00	
Asymp. Sig (2-tailed)		0,000	

Discussion

Retirement is a time to be faced by all employees who work in an agency. This retirement period can cause problems because not everyone is ready to deal with it. Retirement will stop someone from a routine activity that has been done for years. In addition, it will break the social chain that has been established with colleagues and the most important is the disappearance of someone's identity that has been attached for so long (Agustina, 2008). In retirement, a person will experience a change of life, both changes in lifestyle and role. Retirement is often regarded as an unpleasant reality so that by the time it arrives, some people already feel anxious because they do not know what kind of life will be faced later (Rini, 2001).

There are symptoms that accompany retirement, such as the emergence of various physical illnesses such as minor to chronic and acute diseases. Symptoms of this disease can be caused by stress (tension, inward pressure), a sense of disappointment and fear that disrupts organic and psychic functions resulting in a variety of diseases, progressive injuries and damage (continuously growing or expanding). Fuller power syndrome is much faced by retired people, former retired, and former employees. Because of this, they are unable to make a healthy adaptation to the demands of new life conditions in retirement.

Agustina (2008) mentions the characteristics of people who are prone to suffer post power syndrome are as follows:

a. People who are happy to be honored and respected by others, whose requests are always granted and are willing to be served by others.

b. People who need recognition from others because of lack of self-esteem, so if the individual has a position he/she will feel more recognized by other people.
c. The people who put their life meaning on the achievement and on the ability to manage the lives of others and to rule over others. Those people consider that power is everything or is a very significant thing in life.

From the results of research and analysis of this research data, it appears that the tendency of post-power syndrome on retired civil servants differ in different areas. The tendency of post-power syndrome on retired civil servants is in low category in Semarang city, including Undip, and Banjarnegara. This is different from the tendency of post-power syndrome on retired civil servants in Jepara, Cirebon and Tegal districts.

Nevertheless, the results of data analysis using one-way anova technique show that post-power syndrome tendency in retired civil servants in different cities is no different. The average value and the spread of their scores are not much different. This indicates that the post-power syndrome tendency of retired civil servants is different but not significant. The high and low tendency of post-power syndrome in some areas is only a difference within their scope but it is not different when viewed or compared with other regions.

The low post-power syndrome tendency shows a quite encouraging picture that elderly retired civil servants are relatively able to adapt to post-retirement conditions. No visible pressure, stress, or depression. Decreased incomes and relatively narrow daily activities, including the empty cage syndrome that is common in the elderly, are well received and without many complaints so they are relatively healthy. This contrasted with a cross-sectional study of 488 elderly people aged 60-92 years in China, who found that there was a correlation between mental health and the factors affecting the empty cage syndrome. This means that this syndrome can affect the mental health of the elderly (Guo, Zhang, Huang, Zheng, Pan, and Zheng, 2016).

Differences appeared in Semarang group is different with the other five groups. This could be due to the Semarang group who are retired civil servants PWRI members of Gajah Mungkur District Semarang are varied. They live in the middle of town, there are elite groups and there are middle-class groups so they are difficult to unite and more than half are never present in the activities held. The reasons for their absence are illness, shame and lack of confidence to get together with others. It is in contrast to other PWRI groups whose members seemed enthusiastic to follow the activities undertaken. Members assume that the activities are fun for them. In addition to gather with people on the same age so that they can share many things, they can also obtain important information about elderly life. This is contrary to a study of retired people in the Netherlands, that individual education influences the decline in the speed of information processing (Grip, Dupuy, Jolles, and Boxte, 2015). This means that the higher a person's education, the more be avoided from post power syndrome.

Conclusion

It can be concluded that post-power syndrome tendency in PWRI member of Semarang group is low, Jepara is high, Banjarnegara is low, Cirebon is high, Tegal is high and Undip is low. There is no significant difference in post-power syndrome tendency in the Jepara, Banjarnegara, Cirebon, Tegal and Undip groups. While Semarang group has tendency of post-power symdrom which is different from five other group; those are Jepara, Banjarnegara, Cirebon, Tegal and Undip groups.

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Water Pollution in Bedadung Watersheds Area and Diseases in Elderly People

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Abstract

Water pollution involves the pollution of surface waters and/or groundwater. Water pollutants are moving slowly into the watersheds, carrying bad affect for large areas. Accumulation of water pollutant in the body, especially in elderly, could have serious health impacts, which may cause a series of diseases. The diseases caused by water pollution include diabetes type-2, uric acid, rheumatic disease, vascular diseases, myocardial infarct, nervous system damage, liver damage, and cancer. These factors can accelerate aging process. The aim of this study is to analyse the diseases of elderly people in the Bedadung Watersheds area, Jember, Indonesia. These are needed to develop an aging health care strategy. This study is conducted by interviews and questioners in the elderly who live in the Bedadung watersheds area randomly (n=77), who are willing to fill in informed consent. The source of drinking water for the community consumption comes mainly from the dig wells. Groundwater contamination for Bedadung watersheds area is mostly caused by sewage households, plastics waste, natural waste, styrofoam, chemical waste water, baby diapers and menstrual pads. Elderly who consumes drinking water from dig wells generally suffer more than one disease. Diseases suffered by elderly in the Bedadung watersheds area of are uric acid, hypertension, cholesterol, gastric ulcers and skin diseases (five common diseases). Elderly who suffering diseases are 62.79%. Accordingly, educational and awareness programs should be organized to control the water pollution.

Keywords: degenerative diseases, water pollution, elderly people, water consumption

Introduction

Water is one of the important natural resource in human's lives.[1] One person a day needs minimum of 7.5 litres of water to fulfil their needs for drinking, preparing food, and personal hygiene. Standard requirement of water per person is 50 litres to ensure all their needs.[2] One of the source of the water is a river but in many developing countries, river is heavily polluted mainly due to human activity.[3] Water pollution will change the water quality which leads to environment damage and decrease quality of human health.[1] Drinking water from ground water, although generally has low pathogen concentrations, because the water is filtered during transit through underground layers by sand, clay, or rocks, but water-soluble chemicals can harm health body.[3] Besides that, there are nonpoint-source pollution involves many small sources that combine to cause significant pollution. It is very difficult to control and may come from different sources like sewage from households, pesticides, fertilizers, industrial wastes, etc. Non-point source pollution is the main and leading cause of water pollution.[4]

Bedadung river is one the big river in Jember, East Java, Indonesia which has 16 watersheds. Bedadung River flows through the Jember city so it's a well-known river. This river has 46,875 meters long and enable to irrigate the rice field up to 93.000 hectare.[5] Characteristic of this river is very unique due to easily overflow on rainy season but have very low which tend to dry in the dry season. The number of population in Bedadung watersheds area is increasing every year. It is means that the need for clean water also increasing.[5]

Bedadung watersheds area receive a variety of pollutants, either from pollutants that flow directly into the river or from non-point sources.[6] There are a lot of people aware about this but some of them are doesn't know or doesn't care about these things. The water of Bedadung river is used for drinking, laundering, bathing, and toileting. Often too, the people throw the garbage in this river.[5] Polluted water is harmful to our body due increase risk for the disease.[7]

Epidemiological evidence shows that one of the major epidemiological trends of this century is the rise of chronic diseases that affect more elderly than younger people.[8] Many diseases associate with polluted water are diabetes type-2, uric acid, rheumatic disease, vascular diseases, myocardial infarct, nervous system damage, liver damage, and cancer.[9] This study is an preliminary study about the effect of water pollution in health status of elderly people in Bedadung watersheds area. The aim of this study is to determine the characterize of elderly people in Bedadung watersheds area.

Material and Method

This is the descriptive analytic study. Population of this study are elderly people (>45 years old, pre-elderly) who live in Bedadung watersheds area (Sumbersari sub-district, Jember, East Java, Indonesia). This study conducted with 77 elderly people, who are willing to fill in informed consent. This sample was randomly chosen from three village in Sumbersari sub-district.

This study conducted with questioner and interview with elderly people. Before taking questioner, the elderly people were asked to fulfil the informed consent. The questioner consist of identity of the sample, source of water for consumption, and health status of elderly people. The questioner was made by the researcher with collaboration with Research Centre for Elderly People in University of Jember, East Java, Indonesia.

Result

Based on observation in Bedadung watersheds area is contain much garbage and waste product, especially areas that pass through Jember district. The people who dwelling in watersheds areas is still have bad behavior, such as often throw the sewage into the riverbank, dispose of toilet waste into runnel and rivers. The area in riverbanks is very dirty.

Characteristic of elderly peoples in three area Sumbersari sub-district, Jember, are shown generally consume drink water from dug well (Fig 1). As known, dug wells in Bedadung watersheds area can receive water from groundwater that flows from river water and from various places, which may have been contaminated with various pollutants from anywhere places. The long-term accumulation of water pollutans in the body can stimulate various chronic diseases for many elderly people. Majority elderly people consume drink water from dug wells followed with refilled water, tap water, and packaged drinking water. Generally, the distance of dug wells with septic tanks is less than 10 m (52%). This is showed that the elder people dwelling in Bedadung watersheds area consumed the contaminated water which may harm their health status.

The consumption of drinking water as presented in Figure 2 shows the relation to diseases suffered by the elderly in the watersheds as listed in table 1. Table 1 showed many diseases which suffered by the elderly people who consume drinking water from several

sources. Table 1 also shows that Female more suffered diseases than male. Generally, diseases suffered by elderly more than one. The most diseases suffered by the elderly are uric acid disease, and five main diseases suffered by elderly living in sumbersari sub-district Jember include uric acid, hypertension, cholesterol, gastrointestinal disorder, and rheumatic disease.

(a)   (b)

Fig 1. Condition the Bedadung watersheds area. Garbage spot (yellow spot) are surrounding the Bedadung watersheds area (greenline) (a) and garbage heap (b) in garbage spot.
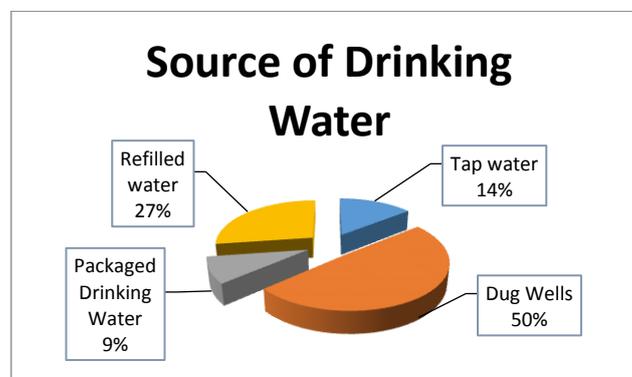
Fig 2. Source of drinking water for elder people in Sumbersari sub-district, Jember

Table 1. Source of drinking water and Health status of elderly people dwelling in Bedadung watersheds area

No	Diseases	Water service owned by government (tap water)		Dug Wells		Packaged Drinking Water		Refiled Water	
		M	F	M	F	M	F	M	F
1.	Uric acid disease	2	1	4	6	-	-	2	2
2.	Hypertension	-	4	1	3	-	1	-	-
3.	Cholesterol	-	-	-	4	1	1	-	1
4.	Gastrointestinal disorder	-	2	1	2	-	-	-	2
5.	Rheumatic disease	-	2	2	-	-	-	2	-
6.	Allergy	-	1	-	2	1	1	1	-

7.	Vertigo	1	1	1	-	-	-	-	1
8.	Asthma	1	-	-	-	1	-	-	-
9.	Cataract	-	-	1	-	1	-	-	-
10.	Migraine	1	-	-	-	-	-	-	-
11.	Stroke	-	1	-	-	-	-	-	-
12.	Diabetes Mellitus	-	2	-	-	-	-	-	1
13.	Toothache	-	1	-	-	-	-	-	-
	Total	**5**	**15**	**10**	**17**	**4**	**3**	**5**	**7**
	Persentage (%)	**6,50**	**19.48**	**12.99**	**22.08**	**5.19**	**3.90**	**6,50**	**9.09**

M (male); F (Female)

Discussion

Water pollution and health problem have a great association, especially for elder people who are very susceptible to diseases.[1,3] Based on this results shows generally the community dwelling in Bedadung watersheds area drink water from dug wells (50%), which can be caused by water contaminants.

The most diseases suffered by the elderly in sumbersari sub-district Jember, are uric acid disease. Few studies have investigated the association between serum uric acid (UA) and cadmium exposure.[10] Higher blood cadmium (CdB) level have positive relationship with serum UA. Serum uric acid (UA) is the final enzymatic product when the body breaks down purine. Increased production or decreased excretion of UA causes hyperuricemia. Previous studies have indicated that hyperuricemia is associated with cardiovascular diseases and metabolic diseases such as diabetes, hypertension and dyslipidemia.[11-16] In fact, uric acid has a useful antioxidant function in cell regeneration. Every cell rejuvenation we need uric acid. However, if the body lacks antioxidants, there will be many free radicals that kill the body cells. Humans are known to be the only mammals that can not make their own antioxidants. Therefore, humans (especially elderly) need to get antioxidants from the outside, such as vitamin E and vitamin C.

The accumulation of uric acid in the organs of the body can cause the emergence and development of disease. The accumulation of uric acid in the heart causes the emergence of heart disease. Although not clearly the relationship between heart disease and blood vessels caused by uric acid yet. However, research shows that patients with high uric acid levels are at risk for heart disease and blood vessels (hypertension and other blood vessel disease).

Tap water is a source of water that can cause illness, after dug wells, but tap water more trigger incidence of hypertension than uric acid. It seems need to know further why condition like this happen, and why women are generally more easily contaminated by water pollutants. Refilled Water also seem potential to cause illness in the elderly. This is allegedly because the purification process is done less perfect.

Prevention of the occurrence and development of diseases due to water pollution in the elderly living in the Bedadung watershed area needs to be anticipated through education to the community to maintain clean water sources and the impacts on health. In addition, clean living behaviors as well and need to be done so that they can live healthy. Together with that, waste management around the Bedadung watersheds area needs to be well regulated, so as not to impact on public health more broadly.

Conclussion

Major sources of water pollutions in the Bedadung watershet are household waste, natural waste, plastics, agriculture wastes (pesticides and fertilizers). The most diseases suffered by the elderly in sumbersari sub-district Jember, are uric acid disease, follows by hypertension, cholesterol, gastrointestinal disorder, and rheumatic disease. Prevention of

diseases by water pollution and improve the health status of the elderly need to be done through education and awearness programs.

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The Effect of Early Mobilization on Pain Intensity after Sectio Caesarea Operation an Hospital in Bengkulu City

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Abstract

According to World Health Organization (WHO), they estimated that in 2008 there will be 35% woman deliver with SC from all childbirth, meanwhile in Indonesia according to Riskesdas in 2010 states that there are15,3% delivery are conducted by operation. The highest province with SC are delivery (27,2%), Riau island (24,7%), and West Sumatra (23,1%). This research purpose is to analyze the mother perception about pain from post-operation Sectio Caesarea (SC), mobilize or movement will not amplify the pain, otherwise movement can reduce the pain intensity. This research design is using pre-experimental with one group approach of pretest-posttest. Sample in this research are 40 mothers after SC operation at Hospitals in Bengkulu City. Sampling are taken by using accidential sampling technique. The result of this research shows that there is an effect of early mobilization with reducing pain intensify after SC operation with P value 0,000. Researcher suggest to Hospital personnel to conduct early mobilization to patient after SC operation.

Key Words Pain, Post SC Operation

Introduction

Sectio Cessarea treatment (SC) is an alternative for a woman in choosing delivery process even there are also medical indication and non-medical indication, SC treatment will break continuity or joint the tissue because of inspissation which pour out pain receptor so patient will feel pain after the end of anesthesia effect

Pain feeling can cause stressor where individual will respond biologically where it causes physical act respond and psychologic. Early mobility is an effort to make the patient act themselves gradually due to great responsibility which must be done by mother to recover herself and care her baby. But many mothers afraid doing a movement because it will cause pain while that movement can reduce pain while early mobility can practice the mother independence.

Early mobility is a main factor which can fasten recovery time after SC and can prevent and avoid complication after SC, by early mobility, it is hoped that childbirth mother can be more healthy and strong, it is also can unleash lochia, helping delivery process, helping bleeding recovery process after delivery, accelerate involution uteri, accelerate internal gastro tool function and urinal also increase blood flow so it will accelerate mother breastmilk and spread out residual metabolism.

According to World Health Organization (WHO) it is estimated that in 2008 it is reported that women who delivery by SC are 35% from all delivery process, meanwhile in Indonesia according to Riskesdas 2010 result states that there are 15,3% delivery process is conducted by operation. Province which has the highest childbirth by SC is DKI Jakarta (27,2%), Riau island (24,7%) and West Sumatra (23,1%) (Depkes RI 2011).

According to Medical Record from Bengkulu Hospitals in 2013, the number of mothers who choose SC are 905 mothers, those numbers are increased in 2014 becomes 1086 mothers and in 2015 becomes 1010 and in 2016 on January period are 172 mothers who chose SC. It shows that Sectio Caesarea from years improved.

This research purpose is to affect early mobilization on patients after SC by reducing patients pain intensity after SC.

Method

This research is using Quasy Experiment. Sample in this research are 40 patients after SC operation. This research is conducted at Hospitals in Bengkulu from August 2017 until September 2017.

Result

Table 1. Pain level frequency after early mobilization on Post SC operation patients at hospitals in Bengkulu.

No	Pain Level	Frequency	Percentage (%)
1	4	5	12.5
2	5	14	35.0
3	6	14	35.0
4	7	7	17.5
	Total	**40**	**100**

According to table above, research result shows almost half respondents who feel level 5 and 6 pains are 14 patients (35,0%).

Table 2. Pain level frequency after early mobilization on patients post SC at hospitals in Bengkulu

No	Pain Level	Frequency	Percentage (%)
1	1	1	2.5
2	2	4	10.0
3	3	18	45.0
4	4	14	35.0
5	5	3	7.5
	Total	**40**	**100**

According to table above, this research level shows that almost half respondents feel pain level 3 are 18 (45%)

Table 3. The effect of early mobilization on pain intensity on post SC patients at home

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	T	Df	Sig. (2-tailed)
Pain level before early mobilization – Pain level after early mobilization	2.2250	.65974	.10431	2.01401	2.43599	21.330	39	.000

According to table above, research result shows average for reduced pain level is 2,2 and there is an effect between early mobilization on reducing pain intensity where p value $\leq$ 0,05 and p (0,000).

Conclusion

There is an effect between early mobilization on reducing pain intensity post SC at hospitals in Bengkulu city.

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The Effectiveness of Topical Breast Milk Application Toward the Neonates Umbilical Cord Separation Time in Rahma Room PKU Muhammadiyah Hospital Gombong

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Abstract
Infectious disease is one of the causes of infant mortality and mortality. The main cause of tetanus neonatorum is umbilical cord care problems. Treatment methods are vary widely from modern treatments using antiseptic ingredients such as sterile gauze, 70% alcohol, 10% povidon iodine, and traditional treatments using honey, ghee (India) and breast milk (ASI). This study aims to determine the effectiveness of topical breast milk application toward the the neonates umbilical cord separation time. This research used Quasi Experiment method with Non-equivalent Posttest Only Design. Samples of 42 neonatal were taken by purposive sampling technique at Rahma Room of PKU Muhammadiyah Gombong Hospital. Data were analyzed by using descriptive and comparative analysis with independent t-test. The average time of umbilical cord separation in topical breast milk group was for 5.52 days while the average dry care group was for 7.48 days. The separation umbilical cord time between breast milk application and dry treatment was 1.96 days. Topical breast milk decreases the separation time of the neonatal umbilical cord compared to dry treatment. Maternity nurses and midwives in postpartum maternal health education may suggest topical breast milk to decrease the neonates umbilical cord separation time.

Keywords: neonates, time length separation of umbilical cord, topical breast milk

Background
Infant mortality rate (IMR) is a common indicator used to determine the degree of public health. According to the World Health Organization (WHO) (2015) tetanus and infectious diseases are the cause of continuous morbidity and infant death in many countries. Each year, 500,000 babies die from tetanus neonatorum and 460,000 die from bacterial infections. According to the SDKI (2012), the majority of neonatal deaths occur in the first week of life. Every 1 hour there are 10 infant deaths in Indonesia. The most common causes of infant mortality are prematurity and infection. The cause of neonatal death in the age group of 7-28 days is infection including sepsis, tetanus, and pneumonia by 40% (SDKI 2012). IMR in Central Java Province in 2015 reached to 10.25 / 1,000. it had exceeded the 4th Millennium Development Goals (MDGs) year 2015 ie 17 / 1.000 live births. IMR in Kebumen District 2015 had reached to 201 / 20,444 live birth or 9.83 / 1,000 live births. The death caused by sepsis are 2.99% and 57 cases due to infection, heart abnormalities, febrile, seizures and others.

The main cause of tetanus neonatorum due to poor umbilical cord care. The umbilical cord is the entrance gate of Colistridium Tetanus bacteria at the time of delivery or at the time of umbilical cord care (Anwar S, 2008). Good umbilical cord care will have a positive impact that the umbilical cord will be separated on the 5th day until the 7th day without any complications, while the negative impact of improper umbilical cord care is the baby will have Tetanus neonatorum disease and may result death (MOH, 2007). The signs of the umbilical cord infection and tetanus neonatorum include elevated temperature of the baby, the baby does not want to drink, red and smelly umbilical cord, (Saifuddin, 2008).

The purpose of umbilical cord care is to prevent tetanus disease in newborns. The disease is caused by the influx of tetanus bacteria into the body through the umbilical cord, either from non-sterile devices, the use of drugs, powders or leaves sown to umbilical cord that lead to infection (MOH RI, 2005). The phenomenon of umbilical cord care in infants still varies in the use of materials. Treatment methods vary widely from modern treatments using antiseptic materials such as sterile gauze, 70% alcohol, 10% povidon iodine (betadine), and traditional treatments using honey, ghee (India) oil, and breast milk (Sodikin 2009)). Treatment of the umbilical cord using topical breast milk methods can speed up the umbilical cord separation and prevent infection in the neonatal period. Breast milk is the best and most complete source of nutrition for neonates. Breast milk contains immunoglobulin A / IgA, an anti-infective agent that can provide passive immunity to specific and non-specific infants (Farahani, 2008).

A Research by Kurniawati (2006) in Indonesia proves that the separation time of umbilical cord using breast milk is 127 hours (fastest time 75 hours). According to Sari (2016) the average separation time of the cord with topical breast milk is 6.18 days and dry treatment is 7.41 days. Separation time of the cord with topical breast milk is 1.23 days faster than separation with dry treatment. Umbilical cord Separation time using topical breast milk is faster than cord separation using dry treatment and the topical breast milk application can reduce infection (Sodikin, 2009). Signs of infection of umbilical cord and tetanus neonatorum include elevated temperature of the baby, baby does not want to drink, red and smelly umbilical cord (Saifuddin, 2008). Farahani's study (2008) from Iran proved that bacteria found on the umbilical cord which were treated with the dry method are more than the bacteria found in umbilical cord treated with colostrum. The most common types of bacteria found on the umbilical cord are S. Epidermis, S. Aureus, E. Coli and Klebsiela Pneumoniae. The rest of the umbilical cord attached to the baby's stomach is the entrance medium of the bacteria.

Based on a preliminary study conducted in Rahma Room PKU Muhammadiyah Gombong Hospital, umbilical cord treatment with topical breast milk has never been done before. The treatment were mostly using dry treatment technique. This study aims to determine the effectiveness of topical breast milk toward the the umbilical cord separation in Rahma room PKU Muhammadiyah Gombong Hospital.

Research methods

The research uses Quasi Experiment method with Non-equivalent Post-test Design Only. Samples of 42 neonates were taken by purposive sampling technique. Data were analyzed by using descriptive and comparative analysis using independent t-test

Research result

1. Time of umbilical cord Separation.

   The results show the fastest time of cord separation in dry treatment group is 6 days and the longest time is 9 days with the average separation time 7.48 days while in topical breast milk group, the fastest time is 5 days and the longest time is 7 days with the average separation time 5.52 hari

Table 1. neonates umbilical cord separation time

Group	Mean	SD	Min	Max
Dry Care	7.48	0.814	6	9
Topical Breast milk	5.52	0.750	5	7

2. The Effectiveness of topical breast milk toward the neonates umbilical cord separation

Table 2. The Effectiveness of topical breast milk toward the neonates umbilical cord separation

Umbilical Cord Separation Time	Mean	SD	Mean Difference	p
Dry Care	7.48	0.814	1.96	0.000
Topical Breast Feed	5.52	0.750		

The above table shows the independent t-test results. The average umbilical cord separation time for dry treatment is 7.48 days (SD=0.814) meanwhile the breast milk treatment shows 5.52 average days (SD=0.750). the difference mean or cord separation average is 1.96 days with *p value*: 0.000. The p value (0.000<0.05) indicates Ho is rejected. The value indicates that the topical breast milk treatment is effective in reducing the time length of the umbilical cord separation.

Discussion
1. The Time Length of Neonates Umbilical Cord separation
The results of the research show the average umbilical cord separation time for dry treatment is 7.48 days and the breast milk treatment shows 5.52 average days. It is not much different from Subiastutic (2010) research which shows average cord care with topical breast milk 5.69 days and 7.06 days for dry care.
When it is compared with the results of studies using 10% povidine iodine, umbilical cord treatment with topical breast milk is faster. The results of Eprila (2013) study on the separation time of umbilical Cord Care Method in Newborn show 138.51 average hours of cord separation using sterile dressing with standard deviation 23.453 and 173.53 average hours of cord separation using povidine iodine 10% with standard deviation 31.867. The results show the general treatment group has 6 days as the shortest time and 9 days as the longest time with 7.48 days average separation of umbilical cord. The topical breast milk group has 5 days as the shortest cord separation and 7 days as the longest time with the average 5.52 days. The factors causing long-loose umbilical cord are environmental sanitation, disease center, nutrition and humidity. In this study there was 1 neonate gemeli with nutrient inadequacy (breast milk) condition with 9 days umbilical cord separation time.

2. The effectiveness of Topical Breast milk toward the length time of Neonates Umbilical Cord separation
The average cord separation time in the topical breast milk group is 5.52 days and the dry treatment is 7.48 days. The prolonged separation of umbilical cord between breastfeeding treatment and dry treatment was 1.96 days. The result of analysis shows that p = 0.000, so it can be concluded that Ho is rejected which means cord separation using topical breast milk is faster than using dry treatment.
The umbilical cord is a network consisting of two arteries and one vein covered by a mucoid binding tissue known as the Wharton's jelly, which is covered by a thin layer of mucous membrane. The umbilical cord will detach itself within 5-15 days after birth, although there is also a new separation after 4 weeks. Long separation of the umbilical cord is said to be rapid if it is <5 days, normal if it is between 5-7 days, and slow if it is > 7 days (Sodikin, 2009).
The separation cord treated with breast milk is 4 days 3 hours, whereas dry treatment is 6 days 4 hours, so there is a significant difference between the two interventions. Treatment of the umbilical cord with breast milk is faster because breast milk contains immunoglobulin

A, G and M as anti-infective, while non-immunoglobulin in breast milk such as Lactoferin and lysozom serves as an anti-bacterial, anti-viral and anti-microbial that causes anti inflammatory or anti-inflammatory (Mullany, 2003). During umbilical cord care with topical breastmilk, the mother in this study was motivated to breastfeed her baby as early as possible. Early breastfeeding and will often provide antibodies to infants to fight infections (Lumsden H., 2012).

Baby's skin has a pH of 6.34 at birth and changed to 4.95 within 4 days due to normal flora colonization. The unhygienic cord care method, facilitates the entry of pathogenic bacteria that can interfere with the work of normal flora and changes in skin pH around the umbilical cord resulting in infection. The occurrence of infection inhibits the process of drying and separation of the umbilical cord. This is reinforced by the results of a study by Farahani, et al (2008) that cord topical treatment with topical breast milk lowers colonization rates and shorter umbilical cord separation than dry treatments. It is evidenced that bacterial colonies found on the umbilical cord treated with a dry method on average is more than the umbilical cord treated with colostrum. The most common types of bacteria found on the umbilical cord are S. Epidermis, S. Aureus, E. Coli and Klebsiela Pneumoniae.

The umbilical cord care needs to be noted for newborn care. The shorter cord separation will reduce the risk of infection, taking into account the hygiene around the umbilical cord and hand washing before and after treating the umbilical cord. The results of this study prove that the separation of umbilical cord with topical use of breast milk is faster than dry treatment because breast milk contains immunoglobulin A / IgA, an antiinfectious agent that can provide passive immunity to the baby. Breast milk coating the umbilical cord will keep the cord dry and keep it away from happy bacteria in damp places. Based on this research it can be concluded that treatment with topical breast milk is faster than dry treatments. Topical treatment of breast milk is also cheap and easy to obtain.

Conclusion and Suggestion

The topical breast milk group has 5.52 average days of cord separation. The dry treatment group has 7.48 average days of cord separation. Topical breastfeeding is more effective than dry treatments in shortening the umbilical cord time of separation with the difference between two treatments 1.96 days.

Suggestion

Umbilical cord care using topical breast milk ca be recommended as the standard of newborn care because it shorten the cord separation time. It is also proven all mothers can perform this treatment as it is proven to be safe, effective, efficient and easy to do while maintaining the cleanliness of the mother's hand.

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Geographical Information System: Distribution of Diarrhea Disease on Community Health Center in Bantul Yogyakarta

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Abstract

The purpose of this study was to map diarrhea case distribution in toddlers and to know case risk factors that help to guide prevention intervention and ultimately reduce the incidence. This research was quantitative descriptive research with case-control study design. The sample for this research was 150 respondents, which were 75 case respondents and 75 control respondents. Data analysis methods were spatial analysis, univariate and bivariate analysis with chi square test with 95% confidence level. Diarrhea case risk factors were availability of water sources (OR = 4.032 CI = 1.002-10.151, p value = 0.004); distance of water sources with lavatory (OR = 5.390 CI = 2.407-12.07, p value = 0.000); unclosed water tanks (OR = 4.032 CI = 1.602-10.151, p value = 0.004); garbage dumpsters (OR = 5.390 CI = 2.407-12.07, p value = 0.000); not-given-exclusive-breastfeeding infants(OR = 10.698 CI = 2.375-48.195, p value = 0.001); waiting time of processed foods> 4 hours (OR = 3.188 CI = 1.631-6.229, p value = 0.001); and no hand washing after bowel movements and before feeding the child (OR = 4.188 CI = 1.743-10.059, p value = 0.02). Exposures that were not diarrhea risk factors were clean water facilities (OR = 0.493 CI = 0.419-0.581, p value = 0.497); and clean water that did not meet the physical indicators (OR = 1.184 CI = 0.378-3.704, p value = 1.000); The Conclusion is Geographic Information System is able to get the spread of case based on Host, Agent and Environment. Diarrhea case risk factors are the availability of water sources, distance of water sources with lavatory, unclosed water tanks, garbage dumpsters, not-given-exclusive-breastfeeding infants, waiting time of processed foods> 4 hours, and no hand washing after bowel movements and before feeding the child

Keywords: Geographic Information System, Diarrhea in Toddlers, Risk Factors

Introduction

GIS (Geographic Information System) is one part of the health information system that can generate spatial information about certain circumstances so that it can assist in decision making and it seems that the implementation of this system has not been implemented properly, especially in Health Office Bantul Yogyakarta then in this study will be analyzed using the Arc Gis Software about the incidence of Diarrhea disease and then explained about the things or factors that may affect the incidence of Diarrhea in the area of Puskesmas Banguntapan I.Bantul Yogyakarta Indonesia, in Indonsia, infant mortality caused by infectious diseases is still high. The cause of death in infants is mostly due to diarrhea (31.4%) and pneumonia (23.8%).[1]

Diarrheal disease is included in ten diseases that often cause extraordinary events. Based on reports obtained from the Integrated Surveillance of Disease from Outbreaks, the frequency of diarrhea outbreaks is sixth after dengue fever, Chikungunya, food poisoning, diphtheria and measles).[2] Using contaminated drinking water can be a risk factor for diarrhea in infants. Water can be contaminated from sources or storage at home, as it is stored in a water reservoir. Using contaminated drinking water can be a risk factor for diarrhea in infants. Water may have been polluted from the source or during storage at home, as it is stored in a water reservoir.[3] The purpose of this study was to map diarrhea case distribution in toddlers and to know case risk factors that help to guide prevention intervention and ultimately reduce the incidence.

Materials and Methods

The type of this research is descriptive quantitative with Case Control approach. In this study will be described on the distribution of Diarrhea disease and risk factors of the disease. And using the Geographic Information System to get an idea of the spread of Diarrhea.Research location in in the working area of Puskesmas Banguntapan I Bantul Yogyakarta in January to September of 2016, with the number of Diarrhea sufferers as population there are 296 people. The number of samples obtained from the Slovin formula with the largin of error 10% obtained 75 cases and 75 controls (1:1). Techniques of data collection with questionnaires and observation sheet. The instrument used is the questionnaire on the environment and behavior, the direct recorder used for the point of coordination of the patient's house Diarrhea in Toddler, GPS (Global Positioning System) tool used to determine the point of coordinates. ArcGIS 10.2 software is used to process and analyze data.

Diarrhea is a bowel movement with a consistency of soft or liquid, it can even be water only with frequent frequency more than usual (three times or more) in one day[2]. Diarrhea indicators in this study include Acute Diarrhea and Chronic Diarrhea; The environment is everything that is around humans and affects the development of human life.[3] Environmental indicators are Clean water facilities, Type of water source, Water source distance with wc, Closed water storage, Clean water, Family toilet, Defecate in family toilet, garbage dump, type of latrine; Behavior is what the organism does, whether it can be observed directly or indirectly. Behavior is what the organism does, whether it can be observed directly or indirectly.[4] Behavioral indicators are exclusive breastfeeding, food waiting time how to consume water, Closes water storage, washing cooking utensils, washing hands, and how to get rid of feces Data analysis using SPPSS for Windows program., the following stages: Bivariate Analysis using statistical test of chi square, while spatial analysis, used to see the distribution area of Diarrhea patients using ArcGIS 10.2 software to find out the exact location distribution of diarrhea disease incidence in toddlers. Study time in October 2016 - February 2017. The diarrhea case map based on the number of children under five at the Bantul District Health Center in January-September 2016 is as follows:
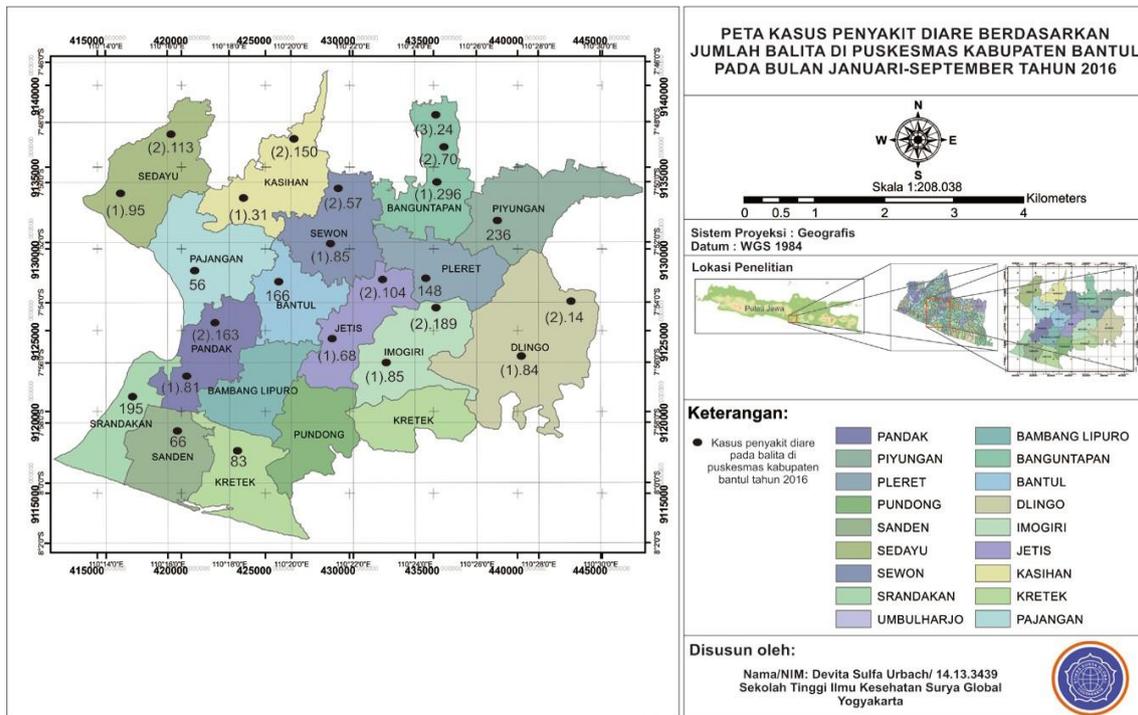
Figure 1. Map of diarrheal diseases cases based on the number of children under five at the Puskesmas Kabupten Bantul in January-September 2016

Results

Socio-demographic characteristics Respoden

Table 1 shows the Socio-demographic characteristics responden. Respondents had toddlers aged between 7 - 24 months (in age group) of 55 (73.3%) and 57 (76%) in the cotrol group, 38 (50.7%) were women (by sex) in the case group and 41 (54.7%) in the control group were men 44 (58.6%) were elementary school children (primary school, junior high school / equivalent (last education), in case group and 47 (62.7% %) in the control group, 57 (76%) were housewives (based on work in the market) of 57 (76%) in the case group and 60 (80%) in the control group.

Table 1 Socio-demographic characteristics respondent

Characteristics	Group cases	Group cotrol
Age (month) Todler		
0-6	3 (4)	2 (2,7)
7- 24	55 (73,3)	57 (76)
36-60	17 (22,7)	16 (21,3)
Gender		
Male	37 (49,3)	41 (54,7)
Female	38 (50,7)	34 (45,3)
Last education		
Basic (SD, SMP/ equivalent)	44 (58,6)	47(62,7)
Middle (SMA)	22 (29,3)	21(28)
High (Diploma, S1)	9 (12)	7(9,4)
Job		
Labor	12(16)	10(13,3)
Private	6(8)	5(6,7)
Housewife	57(76)	60(80)

The pattern of disease distribution of diarrhea in under-five children in working area of Banguntapan I Bantul Public Health Center by using buffer based on river distance with respondent well radius 95 meter, buffer population density. The pattern of disease distribution of Diarrhea in the working area of Puskesmas Banguntapan I Bantul can be seen in the picture below:
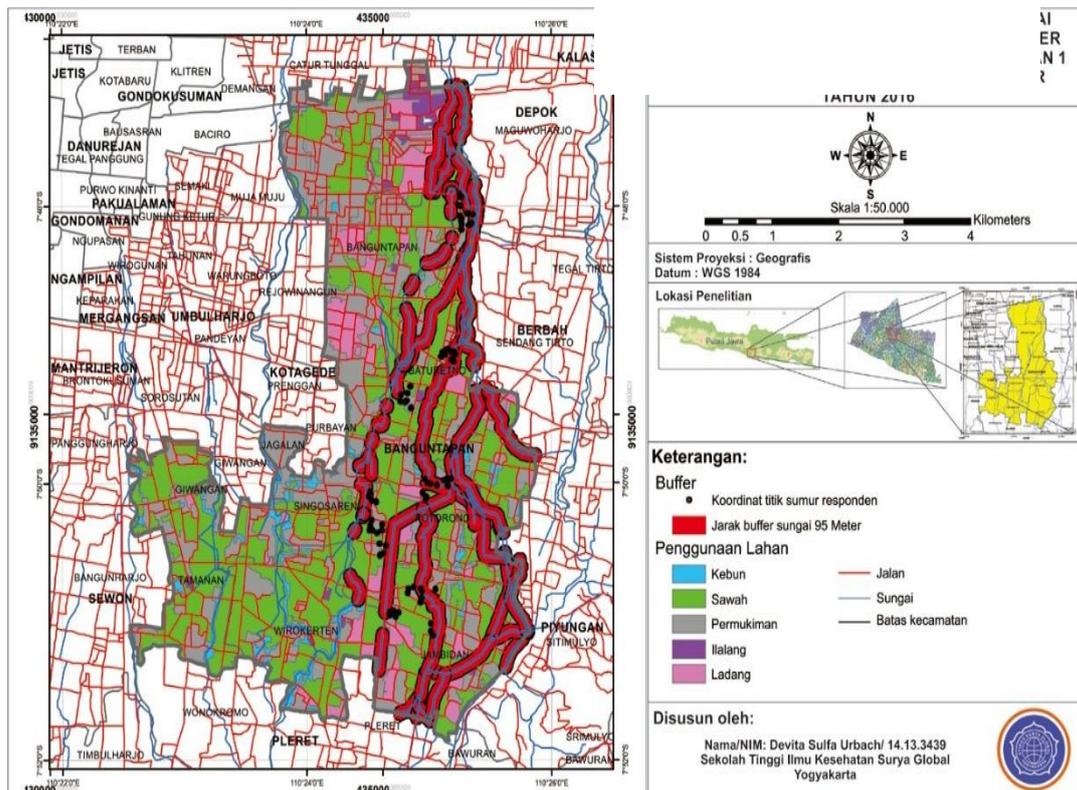

Figure 2. Buffer map based on river distance with radius of water source radius 85 meters

Bivariate Analysis

The bivariate analysis using chi suquare test. Diarrhea case risk factors were availability of water sources (OR = 4.032 CI = 1.002-10.151, p value = 0.004); distance of water sources with lavatory (OR = 5.390 CI = 2.407-12.07, p value = 0.000); unclosed water tanks (OR = 4.032 CI = 1.602-10.151, p value = 0.004); garbage dumpsters (OR = 5.390 CI = 2.407-12.07, p value = 0.000); not-given-exclusive-breastfeeding infants(OR = 10.698 CI = 2.375-48.195, p value = 0.001); waiting time of processed foods> 4 hours (OR = 3.188 CI = 1.631-6.229, p value = 0.001); and no hand washing after bowel movements and before feeding the child (OR = 4.188 CI = 1.743-10.059, p value = 0.002). Exposures that were not diarrhea risk factors were clean water facilities (OR = 0.493 CI = 0.419-0.581, p value = 0.497); and clean water that did not meet the physical indicators (OR = 1.184 CI = 0.378-3.704, p value = 1.000).

Table 2 The result of chi suquare test for Diarrhea case risk factors

Variable	OR	CI	p value
availability of water sources	4.032	1.002-10.151	0,004
distance of water sources with lavatory	5.390	2.407-12.07	0,000
unclosed water tanks	4.032	1.602-10.151	0,004
garbage dumpsters	5.390	2.407-12.07	0,000
not-given-exclusive-breastfeeding infants	10.698	2.375-48.195	0,001
waiting time of processed foods> 4 hours	3.188	1.631-6.229	0,000
no hand washing after bowel movements and before feeding the child	4.188	.743-10.059	0,002
Exposures that were not diarrhea risk factors were clean water facilities	0.493	.419-0.581	0.497
clean water that did not meet the physical indicators	1.184	0.378-3.704	1.000

From the observation that has been done by the researcher there are case respondents do not have clean water facilities that are used private property, while the control respondent has clean water of private property. Clean water is water used for everyday purposes will be drinking water after cooking first. As a rule, clean water is water that meets the requirements for water supply systems. Requirements are requirements in terms of water quality that includes physical, chemical, biological, and radiological qualities, so that if consumed does not cause side effects [5]. Unprotected drinking water sources such as wells, must meet health requirements as water for households, water should be protected from pollution. A good well must meet health requirements, among others, the well distance with the latrine, the distance of the water source with the excavation pits, the sewerage, and other sources of impurities. Distance of wells with stool disposal is better 10 meters or more[6] By keeping a healthy aquatic life can contribute to human health[7]

Conclusion

The Conclusion is Geographic Information System is able to get the spread of case based on Host, Agent and Environment. Diarrhea case risk factors are the availability of water sources, distance of water sources with lavatory, unclosed water tanks, garbage dumpsters, not-given exclusive-breastfeeding infants, waiting time of processed foods> 4 hours, and no hand washing after bowel movements and before feeding the child.

Acknowledgments

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The Effect of Oil Sardine (*Sardinellalongiceps)* on Alveolar Bone Mineralization Process in Rat Post Periodontal Infection

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Abstract

Oil Sardine *(Sardinellalongiceps / S. longiceps)*belongs to anti-inflammation as it contains high omega 3 Polyunsaturated Fatty Acid (PUFA). Periodontal inflammation causes alveolar bone demineralization and tooth growth disruption. The study aims to analyse the effect of oil sardine on alveolar bone mineralization process in rat post periodontal infection. Forty five *Spraque dawley* rats, aged 5 days are divided into 3 groups. The first group was not in treatment. The second group was injected lipopolysaccharide (LPS) at alveolar bone. The third group was inducted LPS and orally given oil sardine. Observation was made on bone cells and protein non collagen, hydroxyapatite crystal of bone alveolar and tooth enamel formation. The analysis shows that numbers of osteoblast and BSP expression were significantly higher in rats given oil sardine than control and LPS-induced rats, whereas numbers of osteoclast and BSP expression were smaller. BSP as protein non collagen plays an important role in osteoblast activity. Increasing osteoblast and BSP triggers hydroxyapatite crystals formation on bone alveolar and perfectly stimulates tooth enamel formation. The conclusion describes that oil sardine inhibits inflammation process and stimulates osteoblast activity and the formation plays a pivotal role in bone mineralization and prevents it from abnormal enamel formation.

Keywords: oil sardine, Sardinella longiceps, omega 3 PUFA, mineralization, periodontal infection

Introduction

Oil sardine (*Sardinella longiceps/S. longiceps*) is liquid lipid contains high omega 3 polyunsaturated fatty acid (PUFA), e.i. eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)[1]. The omega 3 PUFA affects phospholipid concentration in cell membrane[2] and competes with fatty acids released by adipose tissue. This is a precursor of eicosanoid that has inflammatory properties, such as prostaglandine E2 (PGE$_2$), whereas omega 3 PUFA is precursor of eicosanoid with different series (PGE$_3$, tromboxan-5 and Leukotrines-5 [3] that has anti inflammatory properties. Increasing of membrane fluidity, due to high omega 3 PUFA content, affects modification of signaling cascade. Saturated fatty acids ables to active pro-inflammatory signaling pathway directly via mechanism mediated by Toll-like receptor (TLR4). Furthermore, saturated fatty acids increases pro-inflammatory gens expression in macrophage with induces dimeritasion and recruitment signaling proteins related TLR4.[4]

Periodontal disease is a tooth supporting tissue disease caused by negative gram bacterial. That has hallmark alveolar bone resorption causes premature loss of tooth. The bone destruction caused by immune system stimulated and inflammation process in response bacterial agent. Lipopolysaccharide, a component of sub-gingival plaque bacterial cell membrane (endotoxin), stimulates cytokine expression and inflammatory mediator such as PGE2. The mediator plays a important role on ostoclast activity and formation. Osteoclasts differentiate from precursor of monosit and macrophage that regulated by cytokines macrophage colony-stimulating factor, receptor activator of nuclear factor kappa beta ligand (RANKL) and osteoprotegerin.[5] (OPG). Moreover, increasing of osteoclast numbers and activities also affected by TNF-α, IL-1, and PGE2 When the periodontal disease develop during tooth growth will disturb its tooth formation. Indahyani et.al (2007)[6], showed that LPS

induction on periodontal tissue can inhibit tooth eruption and generate abnormalities of enamel.[7]

Proteins non collagen plays a important role on bone resorption and mineralization. The proteins are included BSP and OPN. Bone sialoprotein (BSP) has been shown to be a promoter of both osteoblastic differentiation and mineralization. In contrast, osteopontin (OPN) has been shown to be an inhibitor of mineralization.[8] The aims of the study was to analyse the effect of *S. longiceps* oil on alveolar bone mineralization process in rat post periodontal infection

Method

Forty five *Spraque dawley* rats, aged 5 days, divided into 3 groups. The first group was no in treatment. The second group was injected LPS (lipopolysaccharide) in alveolar bone. The third group was inducted LPS and oil *Sardine* orally. LPS was injected at maxilla right molar tooth apex buccal area, used syring (27GX½") for 8 days daily with dose 5μl LPS/0,03ml PBS. Dose of oil sardine is 1ml/300-350 gram/BW, orally, uses stomach sonde. Oil sardine was given daily until timming of decapitation. All of rats were given standar food for rat AIN 93 ad libitum.

After decapitation, right maxilla conducted analyse on tooth formation, mineralisation of bone alveolar use X-ray deffractometer. Ostoblast and osteoclast observed by light micrskop after HE staining. BSP was observed imunohistocemically. Detection of BSP used anti BSP by Michael Solursh and Ahnders Franzen (*The Developmental Studies Hybridoma Bank developed under the auspices of the NICHD, The University of Iowa, Departement of Biological Sciences,* Iowa City, IA 52242). Slicing was stained by non imune serum is control. The slicing is negative if it is colourless. Slides were observed with ligth microscop. BSP were scored to analyze (1) undetectable - (score 0), (2) weak + (score 1), (3) BSP was strong ++ (score 2), (4) BSP was stronger +++ (score 3).[9]

Result

Result of study showed that LPS induction cause increase numbers and activity of osteoclast. LPS induction and oil sardine administration on rat showed numbers of osteoclast were lower than osteoblast (table 1).

Table 1. Averates of osteoclast and osteoblast numbers

Treatment	Osteoclast		Osteoblast	
	Mean	Std. Deviation	Mean	Std. Deviation
control - 13 days	7.40	.89	7.40	.89
control - 21 days	4.20	.83	11.00	1.73
LPS 13 days	7.60	3.78	3.00	4.79
LPS 21 days	9.00	2.00	6.25	2.62
LPS MI 13 days	4.80	2.16	5.20	2.38
LPS MI 21 days	4.20	2.86	5.60	4.77
Total	6.10	2.83	6.41	3.87

Anova test showed that oil sardine significantly ($P<0,05$) cause increasing numbers of osteoblast, whereas osteoclast significantly detected at LPS-induced rat (figure 1).
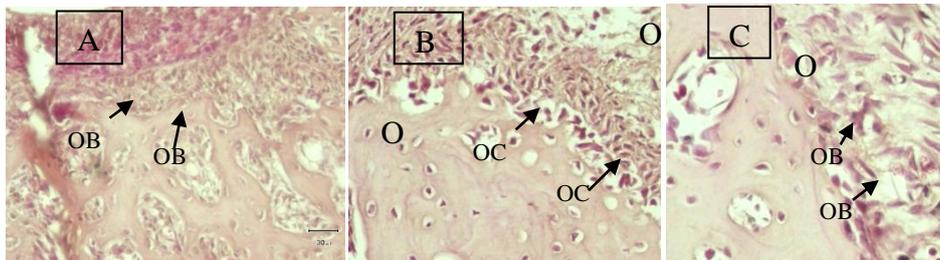
Figure 1. Picture of osteoblast and osteoclast with HE staining (magnification 400x). A. Control group (no treatment), B. LPS-induced rat (osteoclasts were more and more active than osteoblast), C. LPS-induced and oil sardine treatment.

LPS-induced during tooth development resulted abnormality of tooth formation. The disturbation could be seen at tooth crowth cups formation perfectly. Oil sardine administrated rat had cups of tooth crown more perfect and complete compared to LPS induced rats (table 2), example tooth crown looks more yellow, brownies and blurry.

Table 2 : Molar tooth crown cups formation

Treatment	Complete crown	Loss of cups	Crown unperfect
Control 13 days	5	0	0
Control 21 days	5	0	0
LPS 13 days	0	5	0
LPS 21 days	0	5	0
LPS+oil sardine 13 days	1	0	4
LPS + oil sardine 21 days	0	1	4

In control group, all of rats had complete crown and translution and white colored. LPS induced rats failed form cups, wheareas oil sardine administration had complete crown but happened alteration of tooth crown (figure 2).
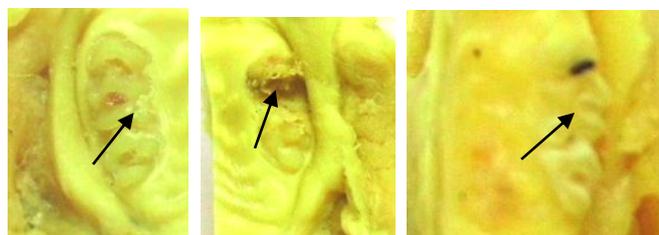

Figure 2. Molar tooth cups formation. A. control, B. LPS –induced rats, C. LPS –induced rats + oil sardine adminitration.
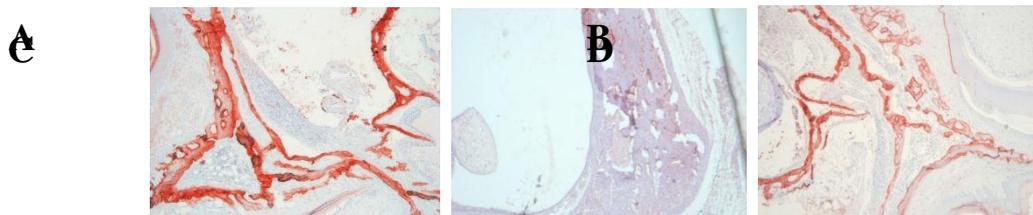

Figure 3. Ekspression of BSP use IHC method and cromogen AEC (magification100x). Red colored showed BSP exsspression was positif. A. Control, B. LPS induced rats, C. LPS induction and oil sardine administration

Observation to known mineralization process with examine crystal hidroksiapatit use X-ray Deffractometer. Hydroxyapatite crystal in bone detected highly on administrated oil sardine. LPS induced caused demineralization alveolar bone. Diffractogram showed short peak on LPS treated rats. That imagine HA cryatalization is small in LPS treated (figure 4).

Figure 4. *Diffractogram* ilustrate crystal HA formation. High and wide of graphic peak explained HA formation . A. control, B. LPS induced, C. LPS induced and oil sardine

Discussion

Numbers of osteoclast in LPS-induced rat was high. LPS stimulates osteoclast formation throug receptor CD14. It is surface receptor of monosit and macrophage. Therefore *Toll-like receptor-4* (TLR4) macrofag and monosit interact with bacteria cause CD14 induce cytokine secretion and mediator lipid inflammation. The mediator triggers osteoclast formation. *Receptor activator for NF-κ B ligand* (RANKL) expressed by osteoblast and RANK expressed by steoblast. *Macrofag colony stimulating factors* (M-CSF), IL-1 and RANKL cause precursors of osteoclast differentiate and fuse to become osteoclast multinuclear. That inhibits osteoblast formation. Activities of osteoclast causes *carbonic anhidrase II* (CA II) in their sitoplasma forms carbonat acid (H_2CO_3) from carbondioxside (CO_2) and water. Carbonic acid is unraveled become bicarbonat (HCO_3^-) and proton (H^+). Proton move in lacuna via ruffled border in vacuolar proton pump (H^+-ATPase). Ruffled border membrane is maintained by channel chloride pairs with H^+-ATPase produce HCL. Acid environment cause degradation of HA ($Ca_{10}(PO_4)_6(OH)_2$). That is component of bone mineral. Proton degrade HA become Ca^{2+} dissolved in phosphate anorganic (HPO_4^{2-}) and water.[10] Therefore in the deffractogram LPS- induced rat had HA crystal lower.

Consumpsion of oil sardine results high EPA and DHA composition, but arachidonat acid (AA) is low in cell membrane. EPA and DHA were fatty acid function as precursor eicosanoid that have antiinflammatory properties. That caused less immune response and inflammation, so that cytokine proinflammatory and PGE-2 decrease. Cytokines is key regulator interaction osteoprotegerin/receptor activator of NFKB ligand (OPG/RANKL) in bone. RANKL expressed by osteoblast and activate its receptors e.i RANK that is expressed by osteoclast. RANKL and RANK interaction cause formation and activation of osteoclast and also prevent osteoclast apoptosis. Decreasing of mediator proinflammatory would cause osteoblast secrete soluble decoy receptor (osteoprotegerin, OPG) that block RANK/RANKL interaction through RANKL binding. Interaction of OPG/RANKL inhibit differentiation of osteoclast and its activy.[11] That administration of oil sardine on rat showed numbers of osteoclast were lower than osteoblast.

Active osteoblast marked by isoenzime alkaline phosphatase expression. In according to Watkins, et.al.,[12] that diet of omega 3 PUFA cause high isoenzime alkaline phosphate in serum, be acompanied process of bone mineralization. Mature osteoblast begin secrete osteoid and express osteocalsin and BSP. BSP is call a protein non collagen potencially to cause nucleation of hydroxyapatite crystal. The potency caused by sequent of acidic that attractive Ca^{2+}, and will recruite PO_4^-. Those are important element in mineralization process.[8] In Addition to that BSP look involved in activity of enzim alkalin phosphatase. BSP also increase activity of enzim that play a role in mineralisation process.[13]

LPS induction disturbs tooth formation. In this study showed that the tooth crown fail was formed or colour of enamel changed example yellow, brownies and blurry. In tooth formation period, prisma enamel had deposited at aposition and depositeian stage will damaged. Furthermore ameloblast is very sensitive to environment change.[14] Alteration of physiologis and phatologis affects ameloblast and result modification of enamel structure. Usually, the alteration did not detected clinically and only appear under microscope. Disturbation or infection can cause disruption matrix secretion by osteoblast or cell death. The abnormalites appear clinically[7] Omega 3 PUFA inhibit inflammation process. Therefore oil sardine treated-rats had tooth cups is perfect although there are colored changed.

Conclusion

Concluded that oil sardine contains high omega 3 PUFA. The omega 3 PUFA able to supress inflammation process, so that stimulate mineralization in bone and tooth.

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Prevalence of Depression among the Elderly People Living in A Social Shelter Agency in West Java Province

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Abstract

Depression has been identified as one of the significant predictors of the quality of life among the elderly. The prevalence of depression among the elderly population residing in senior homes was reported 3-4 times higher than the community-dwelling elderly population. Previous studies have indicated several socio-demographic variables associated with depression in older adults. This research aimed to identify the prevalence of depression and its association with some of the socio-demographic variables (age group, sex, marital status, and educational background) in a social shelter agency (*Balai Perlindungan Sosial Tresna Werdha [BPSTW] Ciparay*) in West Java Province.This research used a descriptive correlational design with cross-sectional approach. Samples were recruited utilizing a consecutive sampling technique (n=41). Data were collected using an Indonesian GDS-15 and a socio-demographic questionnaire. Data were analyzed using a descriptive statistics to determine the degree and prevalence of depression. Chi-square tests were employed to assess the relationship between depression and socio-demographic variables. Results indicate that 60.98% of the elderly had depression. Among the depressed group, 72.0% had mild depression, 24.0% had moderate depression, and only 4% suffered from severe depression. None of the socio-demographic variables assessed were significantly correlated with the prevalence of depression (p value$\square$0.05).It is concluded that more than half of the elderly living in *BPSTW Ciparay* suffered from depression. Further investigation is needed to explore other socio-demographic and biological variables that may have potential relationships with the prevalence of depression. Developing interventions to prevent and reduce depression among the elderly population is necessary.

Keywords: depression, elderly, senior home, social shelter agency

Introduction

According to Law No. 13 year of 1998 on the Prosperity of the Elderly, it is stipulated that an elderly is someone whose age is above 60 years. In 2050, the population of the elderly in the world is estimated to be almost double (25.3%) from the present population, namely 2013 (13.4%). After 2100 even the number of the population of the elderly in Indonesia is predicted to exceed that of the global [1].

The average life expectancy among the Indonesian population is reported to increase from 68.6 year to 70.8 year during 1 decade (2004-2015) and is projected to reach 72.2 year in 2030-2035. Such a high average life expectancy is one of the indicators of the success in the national development, especially in the field of health [1]. However, the ageing process and its related health problems may give challenges for individuals, families, an socio-

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economic system, including the health service system. In this case, the health service system is demanded to support the 'healthy" life expectancy [2].

Sex, nutritional status, the number of chronic health problems, functional status, and depression status serve as the predictors of life quality among the community- dwelling elderly population in 43 cities in Indonesia (N=487) [3]. The Social Ministry of the Republic of Indonesia states that there are 400 elderly nursing homes throughought Indonesia [4]. Since 2006, the government has been implementing an aid program to fulfill the basic need of the elderly living in a social shelter agency, and gradually has improved the social security service to the elderly neglected [5]. However, living in a social shelter agency is not a popular choice for the elderly who still possesses family, remembering that in Indonesian culture, it is an obligation for a family to care for their parents and it is improper for a family to send the elderly to a social shelter agency.

The elderly living in a social shelter agency has a worse "social engagement" (rated from social media and the elderly's social activities) (almost 90%) than those living in families [4]. With age, morbidity and decline of functional ability may also increase, so that the elderly group tend to experience depression [6]. Depression is projected as the second cause of disability throughout the world in 2020. Prevalence of depression among the community-dwelling elderly, especially in developed countries, is reported to vary between 0.4 − 35% based on tens of studies [7].

In three countries in Asia (Myanmar, Indonesia and Japan), the prevalence of depression is identified to be around 30% (measured from GDS-15). Moreover, the elderly group with depression possesses the Activity Daily Living (ADL) and the subjective life quality scores which are significantly lower than those who do not suffered from depression[7].

Researches in the Dutch, and Nepal showed that the prevalence of depression among the elderly) in a social shelter agency is three-four times higher than those living in the community [6,8]. It is also the case in a study in Iran made by Nazemi et all (2013) that about 90% elderly) in a social shelter agency experience depression from moderate to severe levels.

The prevalence of depression shown in various researches is related to various factors including psycho-social, biological, and medication factors, and socio-demographic characteristics [9]. The socio-demographic variable mostly related to depression is among others age, sex, educational background, marital status, family support, social support, the length of social shelter agency . The psychosocial factor which is often related to depression is among others depression dealing with financial problems and psychosocial support. The biological factor dealing with depressions is nutritional status (BMI, folic acid, and vitamin B12) and also chronic diseases. The medication factor related to depression among the elderly includes the uses of medicine such as anxiolytics, sedative, anti-inflammation, and the like [4, 6, 9].

West Java province is a province with the highest percentage of the elderly living in a social shelter agency or similar social facility [5]. According to the data released by the Social Office of West Java province (2015), in four social protection facilities for the elderly belonging to the government, an "overload" occurs. The four facilities are social shelter agency in West Java Province, sub unit social shelter agency Garut, social shelter agency Kawarang and social shelter agency Bogor. The facilities may accommodate 350 persons, but those living in the facilities are more than 360 persons.

To improve the life quality of the elderly living in a social shelter agency , it is important to identify the prevalence of depressions and the predictors of the depression level among the elderly group. Based on the descriptions above, the problem of this present research is formulated as follow: "How is the prevalence of the depression and predictors

among the elderly covering age, sex, educational background, marital status, family and social supports among the elderly people living in social shelter agency in West Java Province?

Methods

A descriptive correlational design with a cross-sectional approach was employed in this present research. The variable examined is the prevalence of the depression levels and predictors among the elderly covering age, sex, educational background, marital status, family and social supports. The data on the depression level were collected using the GDS-15 (Geriatric Depression Scale). The GDS-15 possesses the sensitivity of 0.805 and specificity of 0.750. The population is 150 persons living in a social shelter agency, in West Java province. The sample was taken using a consecutive sampling technique, where the respondents participating in this present research are those with good cognitive functions. Therefore, they were screened using the *Mini-mental Status Examination* (MMSE). Through the screening, 41 persons were recruited as the sample and they agreed to participate in this research. The data on either the depression level or the socio-demographic variable were univariately analyzed using a descriptive statistic method such as frequency and percentage. For the depression level, the scores obtain from the respondents were interpreted as follows: score 0-4 = normal/no depression; score 5-8 = mild depression; score 9-11 = moderate depression and score 12-15 = severe depression. To determine the predictor of the depression levels among the elderly, a further analysis was made using either a Chi-Square test in (for independent variable with the nominal/other metrical measurement scale) or a one -way ANOVA (for independent variable with interval measurement scale).

Results
Description of the Depression Level among the Elderly People Living in a Social Shelter Agency in West Java Province

The description of the depression level among People Living in a Social Shelter Agency in West Java Province is presented in Table 1.

Table 1. Depression Level among the Elderly People (n=41)

Depression Level	f	%
Normal/No Depression	14	34,10
Mild depression	20	48,80
Moderate Depression	6	14,60
Severe Depression	1	2,40
Total	41	100,0

On the basis of Table 1, it is shown that almost half of the Elderly (20 persons or 48.8%) suffered from mild depression, 14 persons or 34.1%) no depression, some of them, 6 persons (14.6%) moderate depression and 1 person (2.4%) suffered severe depression.

The Correlation between Socio-Demography (sex, marital status, education, social and family supports) and their Depression Level

The Correlation between Socio-demography (sex, marital status, education, social and family supports) and their Depression Level and the depression level among the Elderly people is presented in Table 2.

Table 2. **The Correlation between Socio-demography (sex, stat marital status, education, social and family supports) and the Depression Level among the Elderly People**

Category	Normal/ No Depression	Mild Depression	Moderate Depression	Severe Depression	p-value
Sex					
Male	9	12	2	1	0,662
Female	5	8	4	0	
Marital Status					
Not Married	0	1	1	0	
Married	3	1	1	0	0,561
Widow/Widower	11	18	4	1	
Education					
No Education	1	2	1	0	
Elementary School	2	3	2	1	
Junior High School	2	8	2	0	0,570
Senior High School	6	5	1	0	
Higher Education	3	2	0	0	
Social Support					
Moderate	13	14	6	1	
High	1	6	0	0	0,189
Family Support					
Mild	6	11	2	1	
Moderate	6	6	4	0	0,655
High	2	3	0	0	

On the basis of Table 2, it is shown that the moderate depression more highly occurred among the female than the male. But one male suffered from severe depression. Moderate depression level happened to the elderly with marital status of widow/widower, and 1 person suffered from severe depression. Severe depression occurred to the elderly with the last education in elementary school. Moderate depression happened to the elderly with moderate social support and moderate family support.

From Table 2, it is known that no correlation happened between the depression and sex, marital status, last educational level, religion, social support and family support (p-value $\geq$ 0,05). The P-value of the respondent's characteristics of sex, marital status, last education, social suppor t and family support was 0.662, 0.561, 0.570, 0.189 and 0.655, respectively.

Discussion

From Table 1, it is known that almost half of the elderly, namely 20 person (48.8%) experienced mild depression. This research result is in line with a research on the prevalence of the depression among the elderly living in a social shelter agency showing that 26.9% elderly suffered from mild depression, 9.6% from mild depression and 1.9% from severe depression [10]. There research on the elderly at the age of $\geq$ 60 years with 42 respondents in Ladang Panjang village, Sarolangun regency, Jami province showed that 52.4% elderly suffered from depression [1].

Someone suffering from depression is easy to be touched, sad and crying [12]. Not all the elderly living in a social shelter agency suffered from depression since those living in a social shelter agency had high social support from the nursing home, the healthy elderly would help the sick to fulfill his/her need. The elderly with high social support would be more comfortable and happy, although some of them did not have any family since their fellow would give them love and affection in a social shelter agency.

Activities in a social shelter agency varied. The social shelter agency had a schedule that would be made by the elderly. The activities were among others *angk lung,* singing, handicraft, praying together, gymnastics held each morning. The making of handicrafts is intended to train their skill to stay productive although they do not work anymore. This condition is in line with the result of the occupation therapy that this therapy may reduce the depression level among the elderly [13].

Moreover, as shown in Table 2, there is no correlation between depression and sex, marital status, last education, social and family supports. It is different from the research in Bali showing that depression among the elderly was significantly correlated with the social support (p = 0,000; p < 0,05) [14].

Factors influencing the depression among the elderly are biochemical, genetic, personal and environmental [9]. The biochemical factor is caused by the decrease in the neurotransmitter content namely serotonin, epinephrine, and dopamine in the brain. The genetic factor influencing the depression among the elderly occurs when there is a family with the story of one identical twin, there is 70% possibility to suffer from depression between the twin. The personal factor influencing the depression among the elderly happens when someone has low self-confidence, is easily influenced by stress, or is always too pessimistic, he tends to suffer from depression. The environmental factor influencing the depression among the elderly occurs when one is badly treated by others.

Conclusion and Suggestions

From the research results, it can be concluded that half of the elderly suffers from mild depression, almost half of the elderly show no depression, few of them has mild depression and very few suffers from severe depression. Moreover, no correlation happens between the depression and sex, marital status, educational level, social and family supports.

For the a social shelter agency, they should be able to study psychosocial problems (depression) among he elderly so that the prevalence of depression among the elderly may be prevented. For other researchers, they are suggested to examine other factors influencing depression among the elderly such as their biochemical, genetic, personal and environmental factors.

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FACTORS ASSOCIATED WITH THE USE OF CONTRACEPTION DUAL PROTECTION IN COUPLE OF PEOPLE LIVING WITH HIV/AIDS

Kusila Devia Rahayu

Abstract

Contraceptive dual protection on people living with HIV/AIDS couples aimed to preventing transmission of HIV and sexually transmitted infections other concomitant diseases and prevent unplanned pregnancies. This research aims to identify use of contraceptive dual protection of the couples living with HIV and others factors that associated. This research is a descriptive cross sectional study with sample of 185 couples of people living with HIV/AIDS and analyzed by Chi Squaretest. Results of the study found that 50.8% of people living with HIV/AIDS couples not using contraception dual protection and 49.2% of people living with HIV/AIDS couples using contraceptives dual protection. The result of statistical analysis showed that the factors of knowledge, confidence, support and attitude associated with contraceptive dual protection use of the couples of people living with HIV/AIDS (P<0.05). Counseling and health promotion of contraceptive dual protection by health workers need to be improved in order to maximize cover age of contraceptive dual protection use of the couples of people living with HIV/AIDS.

Key words: dual contraceptive protection, people living with HIV/AIDS.

Preliminary

Human immuno deficiency virus (HIV) is a virus that if entered in to the human body will weaken the immune system and if it continues to deteriorate will lead to AIDS (acquired immuno deficience syndrome) is a condition of progressive loss of the body's defense system so that all types of infections can enter and cause death (Cunningham, 2010).

The prevalence of HIV/AIDS is increasing every year in every country. The number of people living with HIV/AIDS (PLWHA) in the world in 2012 is 34 million, the number of PLWHA in Asia Pacific is 4.734.000 and the number of PLHIV in Indonesia is 610.000. Indonesia is the 3rd country of the 12 Asia-Pacific countries with the greatest number of PLWHA after India and China (UNAIDS, 2013; Kemenkes RI dalam SDKI, 2012).

Transmission of HIV can occur through multiple modes of transmission through intercourse with sexual intercourse with HIV-infected people, contamination with HIV-infected blood products in drug users and transmission from PLWHA mothers to their pregnant fetuses or to breastfeed children (Cunningham, 2010). HIV/ AIDS transmission in Indonesia mostly occurs through sexual intercourse (77.75%) (Kemenkes RI, 2013).

Sexual intercourse on couples of PLWHA should be done safely that does not cause the transmission of HIV to their sexual partners and does not lead to unplanned pregnancies. Contraceptives that fit the needs of couples of people living with HIV/AIDS are dual protective contraceptives (Kemenkes, 2012) The dual protection contraception in couples of PLWHA should be used Simultaneously by women and men as sexual partners (Ntshebe, 2011). Contraception dual protection consists of two options: intra uteri device (IUD) - condom and surgical method: female sterilization–condom (Kemenkes, 2012; Wanyenze, et al., 2013).

UNAIDS (2013) explains that the percentage of the use of dual protective contraceptives in PLWHA couples in the world is 34.1%. The percentage of the use of dual protective contraceptives in PLWHA couples in Indonesia 2014 is 40% (BKKBN, 2014) and

the percentage of use of dual protection contraceptives of couple with PLWHA in West Java 2014 is 30% (KPA West Java, 2015). The percentage indicates low Coverage of the use of dual protection contraceptive in couples with PLWHA, so as to be an opportunity for the occurrence of HIV transmission and pregnancy at risk to women from PLWHA couples.

The phenomenon of high incidence of sexual transmission of HIV, increased prevalence of HIV/AIDS, low coverage of the use of dual protection contraceptives and the absence of research on factors related to the use of contraceptives in PLWHA couples make the desire to conduct research that can answer the question "what factors that related with the use of dual protective contraception incouple with PLWHA "

Method

This research is a quantitative research with descriptive cross sectional design. This study aims to identify the use of dual protective contraceptives in couple with PLWHA and its related factors. The study was conducted using a decision conflict scale questionnaire devised by O'Conor in 1995 in uncertainty in decision making and had four dimensions of assessment of knowledge, attitude, support and beliefs.Sample of this study was 185 couple of PLWHA that taken using the consecutive sampling technique. The inclusion criteria for this study sample were ODHA heterosexual couples, both of them were either ODHA, aged 15-49 years old, able to read and write, able to communicate well and willing to be respondents, while the exclusion criteria is homosexual couples, pregnant and had menopause. The research procedure starts from meeting respondent in unit of HIV / AIDS followed by conveying research objectives and activities, requesting willingness to be the respondent and filling out the questionnaire.

This research is conducted by applying three ethical principles of research that is confidentiality and respect for privacy, autonomy (right to willing or refused to be respondent) and justice (right to get equal treatment). Data processing done using Chi square test to see the relationship between the characteristics of PLWHA couples, knowledge, support, beliefs and attitudes of PLWHA couples to the use of dual protective contraceptives.

Results

Characteristics of Respondents

Table 1 shows that most wives respondents is 20-30 year old (57.8%) and most husband respondents is 31-40 year old (69.2%), on characteristics of HIV diagnostic status found that more than half of respondents diagnosed both PLWHA (50.8%) And other half are only one of the partners who are PLWHA (husband of PLWHA) (16.2%) and wife of PLWHA (33.0%), on the characteristics of education is known that most respondents wife and husband educated advanced SLTA/PT (84.3%; 88.6%), on the job characteristics it was found that most respondents were unemployed (78.4%) and most of the husband respondents were self-employed (56.2%), on the long-term characteristics of HIV diagnoses it was found that most of the wives and husband respondents were diagnosed HIV > 6 months (80.0% ; 64.3%) and on the long-term characteristics of anti retroviral therapy it was found that the majority of the wives and husband respondents were use an anti retroviral therapy >6 months (78.4% ; 63.2%) (table 1)

Use of Respondent Contraception

Table 2.Contraception Used Respondent (couple PLWHA)

Respondents Use of Dual Protective Contraception	Couple	
	n	%
Dual Protection		
- IUD + condom	76	41.1
- Surgical methode: female sterilization + condom	15	8.1
	91	49.2
Non Dual Protection		
- Hormonal + condom	60	32.4
- Uncontraseption	34	18.4
	94	50.8

Table 2 shows that 50.8% couple of PLWHA do not use dual protective contraceptives and 49.2% couple of PLWHA use dual protective contraceptives.

Table 1. Respondent's characteristic (couple with PLWHA)

Respondent Caracteristic	Responden					
	wife		husband		Total	
	N	%	n	%	n	%
Ages						
- <20 or >40	0	0	2	1.1	2	0.5
- 20-30	107	57.8	55	29.7	162	43.8
- 31-40	78	42.2	128	69.2	206	55.7
diagnosis status HIV						
- Couples are ODHA	94	50.8	94	50.8	188	50.8
- Husband ODHA	30	16.2	30	16.2	60	16.2
- Wifes ODHA	61	33.0	61	33.0	122	33.0
Education						
	29	15.7	21	11.4	50	13.5
-Ellementary school	156	84.3	164	88.6	320	86.5
-High School SLTA/PT						
Occupation						
- Official employee	1	0.5	81	43.8	82	22.2
- Un official employee	39	21.1	104	56.2	143	38.6
- Not work	145	78.4	0	0	145	39.2
Long term of diagnosed HIV						
- < 6 month	7	3.8	5	2.7	12	3.2
- ≥ 6 month	148	80.0	119	64.3	267	72.2
- not HIV/AIDS	30	16.2	61	33.0	91	24.6
Long term of therapy ARV						
- < 6 month	10	5.4	7	3.8	17	4.6
- ≥ 6 month	145	78.4	117	63.2	262	70.8
- not therapy ARV	30	16.2	61	33.0	91	24.6

Factors Associated with Respondent Use of Contraception

Table 3 describes the relationship of wives respondent characteristics and the use of dual protective contraceptives. Based on table 3 it is known that for wife respondents, HIV diagnostic status, education, occupation, duration of HIV diagnosis and duration of anti retroviral therapy are related to use of dual protective contraceptives ($P<0.05$), but respondent age is not related to use of dual protective contraceptives ($P>0.05$)(see table 3)

Table 4 describes the relationship of husband respondent characteristics and the use of dual-protective contraceptives. Table 4 shows that for the husband respondents, age, HIV diagnostic status, education, duration of diagnosis and duration of anti retroviral therapy have a relationship with the use of dual protective contraceptives ($P<0.05$) But the husband's occupation is not related to the use of dual protective contraceptives ($P> 0.05$)

Table 5 describes the relationship of knowledge, support, beliefs and attitudes of PLWHA partners to the use of dual protective contraceptives. Table 5 shows that knowledge of dual protection contraceptives, support for dual-protection contraceptives, beliefs on dual-protection contraceptives and attitudes toward dual protection contraceptives related to use of dual protective contraceptives in PLWHA couples ($P<0.05$) and OR>1 show that knowledge, support, beliefs and attitudes are risk factors for the incidence of dual protective contraceptive use in HIV-infected couples.

Table 3. Relationship Characteristics of wife Respondent and Use of Dual Contraceptive Protection

Wifes Respondent caracteristic	Dual Protection		Non Dual Protection		Total		P Value
	n	%	n	%	n	%	
Ages							
- <20 or >40	0	0	0	0	0	0	0.351
- 20-30	49	45.8	58	54.2	107	57.8	
- 31-40	42	53.8	36	46.2	78	42.2	
diagnosis status HIV							
- Couples are ODHA	59	62.8	35	37.2	94	50.8	0.000
- Husband ODHA	7	23.3	23	76.7	30	16.2	
- Wifes ODHA	25	41.0	36	59.0	61	33.0	
Education							
-Ellementary school	3	10.3	26	89.7	29	15.7	0.000
-High School SLTA/PT	88	56.4	68	43.6	156	84.3	
Occupation							
- Official employee	0	0	1	100	1	0.5	0.001
- Un official employee	9	23.1	30	76.9	39	21.1	
- Not work	82	56.6	63	43.4	145	78.4	
Long term of diagnosed HIV							
- < 6 month	0	0	7	100	7	3.8	0.000
- ≥ 6 month	84	56.8	64	43.2	148	80	
- not HIV/AIDS	7	23.3	23	76.7	30	16.2	
Long term of therapy ARV							
- < 6 month	0	0	10	100	10	5.4	0.000
- ≥ 6 month	84	57.9	61	42.1	145	78.4	
- not therapy ARV	7	23.3	23	76.7	30	16.2	

Tabel 4. Relationship of Respondent Characteristics of Husband and the Use of Dual Contraceptive Protection

Husband respondent caracteristic	Dual Protection		Non dual protection		Total		P value
	n	%	n	%	n	%	
Ages							
- <20 or >40	2	100	0	0	2	1.1	0.023
- 20-30	20	36.4	35	63.6	55	29.7	
- 31-40	71	55.5	57	44.5	128	69.2	
diagnosis status HIV							
- Couples are ODHA	59	62.8	35	37.2	94	50.8	0.000
- Husband ODHA	7	23.3	23	76.7	30	16.2	
- Wifes ODHA	25	41.0	36	59.0	61	33.0	
Education							
	2	9.5	19	90.5	21	11.4	0.000
-Ellementary school	89	54.3	75	45.7	164	88.6	
-High School SLTA/PT							
Occupation							
- Official employee	46	56.8	35	43.2	81	43.8	0.094
- Un official employee	45	43.3	59	56.7	104	56.2	
- Not work	0	0	0	0	0	0	
Long term of diagnosed HIV							
- < 6 month	0	0	5	100	5	2.7	0.015
- ≥ 6 month	66	55.5	53	44.5	119	64.3	
- not HIV/AIDS	25	41.0	36	59.0	61	33.0	
Long term of therapy ARV							
- < 6 month	0	0	7	100	7	3.8	
- ≥ 6 month	66	56.4	51	43.6	117	63.2	0.004
- not therapy ARV	25	41.0	36	59.0	61	33.0	

Tabel 5. Knowledge, Attitude, Support and Bellief of Respondents to Use of Dual Protective Contraception

Related factors	Dual Protection		Non Dual Protection		Total		P value	OR	CI 95%	
	n	%	n	%	n	%			min	mak
Knowledge of dual protective contraception	82	97.6	2	2.4	84	100	0.000	419.1	87.99	1996.
- Good	9	8.9	92	91.1	101	100			8	1
- not good										
Support for dual protective contraception	68	94.4	4	5.6	72	100	0.000	66.5	21.9	201.3
- Strong	23	20.4	90	79.6	113	100				
- Weak										
Belief in dual protective contraseption	62	96.9	2	3.1	64	100	0.000	98.3	22.6	427.1
- Good	29	24.0	92	76.0	121	100				
- not good										
Attitudes toward dual protective contraception	78	100	0	0	78	100	0.000	8.2	4.9	13.7
- Good	13	12.1	94	87.9	107	100				
- not good										

Discussion

Dual protective contraception in couple of PLWHA in addition to functioning to prevent unplanned pregnancies also serve to prevent HIV transmission and transmission of

other sexually transmitted communicable diseases. The dual protective contraception for ODHA couples consist of two choices: IUD-Condom or surgical method: female sterilization-Condom, while hormonal-Condoms are not dual protective contraceptives.

Dual protective contraception for men with HIV-positive is condoms. Its function use to prevent transmission of HIV and other STD's and to prevent unplanned pregnancies despite being absolute (Hutcinson, Kip, Ness., 2007). The use of male condoms is very easy, cheap and has no side effects, but many couples who do not use condoms on the grounds said that condoms their use reduces satisfaction during sexual intercourse (Dirjen Bina Gizi dan KIA, 2013; Kemenkes, 2012).

Dual protective contraceptives for women with PLWHA are IUD and surgical method : female sterilization (Cetjin, 2003). IUD is a long-term contraceptive that effectively prevents pregnancy for 5 or 7 years, the way it works not affected by anti retroviral therapy, does not cause the occurrence of drop outs and has high effectiveness (Stoddard, Nicholas, Peipert., 2011). IUD is recommended for use by PLWHA couples, but many PLWHA couples do not use IUD. This indicates the need for the provision of information on IUD from health workers. Todd, et al., (2012) explains that one reason of cause of HIV-positive women not using IUD is due to a lack of knowledge about the benefits and ease of IUD compared with other types of female contraception.

Another contraceptive that is a dual protection for women with PLWHA is surgical method : female sterilization. surgical method : female sterilization can prevent pregnancy permanently, the way it works is not affected by anti retroviral therapy, has high effectiveness and low failure rate (Director General of Nutrition and MCH, 2013; Petterson, Xia & Wilcox, 2001) surgical method : female sterilization is recommended for use by PLWHA couples, but many couples PLWHA chooses not to do surgical method : female sterilization on the grounds because the procedure involves surgical intervention, permanent and does not guarantee freedom from HIV transmission or other sexually transmitted infections (Boeckxstaens, et al., 2007).

Other contraceptives are known by people living with HIV but not a contraceptive pair of dual protection is injectable hormonal contraceptives or pills. The contraceptive pill or injection work in the body as a systemic action that may be affected by anti retroviral therapy, in addition pills and injections are also have a short term contraception that may cause the incidence of drop out kontraseption. Late to take pills or get contraceptive injections can quickly restore fertility and lead to unplanned pregnancies (DG Community Nutrition and KIA, 2013)

Crede, et al., (2012) explains that the majority of pregnant women living with HIV that occur as unplanned pregnancy, comes from a group that uses pills or injectable hormonal contraceptives used in the long term and couples men do not use condoms during sexual intercourse. However, many couples living with HIV and choose to use pills or injections with the reason for not knowing that contraception is a way of working that is affected ARV therapy.

The use of dual protection contraceptives is related to the characteristics of PLWHA couples, knowledge of PLWHA couples, confidence of PLWHA couples, couples support for PLWHA and cycles of PLWHA to dual protective contraceptives. Characteristics of PLWHA couples associated with the use of dual protection contraceptives consist of age, HIV diagnosis status, education, occupation, duration of diagnosis and duration of anti retroviral therapy.

Age is a protective factor against the use of dual protective contraceptives in Couple of PLWHA (Chibwesha, et al., 2011). Couples of PLWHA in age more than 30 year old are using dual protective contraception compared to PLWHA <30 years of age. There are still

other factors related to the factors of knowledge, support, beliefs and attitudes of PLWHA couples to contraceptive dual protection.

Coverage of user of contraceptive use increased significantly in couples after they were diagnosed with HIV (Chakrapani, et al., 2011). In this study it was found that dual protective contraception were used by most PLWHA couples with the status of PLWHA and were not used by many PLWHA couples with HIV status just one. This requires the attention of health workers because all PLWHA couples should use dual protective contraception.

Education is a risk factor for appropriate use of contraceptive use (Kamsatun, 2013; Chibwesha, et al., 2011). The dual protec- tion contraceptive is used by the majority of HIV-positive couples who are well-educated and not used by the majority of couples with basic education. Chakrapani, et al., (2011) explains that the use of contraceptive couples is influenced by the level of education, the higher the education level of people living with HIV will the better the behavior of contraception.

Occupation is a risk factor for proper selection of contraceptives (OR>1) (Kamsatun, 2013). The work of spouses of PLWHA is related to the use of dual protective contraceptives but the work of spouses couples is not related to the use of dual protective contraceptives. The dual protective contraceptives are used by most Spouses of PLWHA couples who work and are not used by most of the wives of unemployed PLWHA and condoms used by male partners of PLWHA without being distinguished by the type of work. It is also supported by Huda, Sirajudin, Fazla & Akter (2012) that women's work is related to contraceptive use but men's work is not related to contraceptive use.

Characteristics of long-term HIV diagnoses and duration of anti retroviral therapy have been associated with the use of dual protective contraceptives in couples with HIV/AIDS. Dual protective contraception were used by most couple PLWHA that diagnosed HIV >6 months and received anti retroviral therapy > 6 months. Chibwesha, et al., (2011) Explains that dual contraceptives are widely used by couple with HIV-infected that diagnosed HIV-positive > 6 months, get counseling and ARV therapy and not used by many HIV-infected PLWHA couples that diagnosed HIV positive <6 months.

Factors of knowledge, belief, support and attitudes related to the incidence of the use of dual protective contraception on couple with PLWHA(P<0.05). Dual protective contraception used by most couples who are well-informed and not used by most couples of PLWHA with lake knowledge. Crede, et al (2012) explains that the knowledge of PLWHA couples is related to the use of dual protective contraceptives. It is also supported by Imbuki, et al., (2011) that couples with good knowledge of dual protective contraception will use true and continuously.

Conclusion

Characteristics of couple with PLWHA asociated with the use of dual protective contraception comprised of HIV diagnostic status, education, duration of diagnosis of HIV, duration of anti retroviral therapy, occupation of wives and age of spouses of partners of PLWHA, besides this study also found that knowledge, attitude, support and beliefs influence with the use of dual rotective contraception. Knowledge of dual protective contraception is an important factor related to the use of dual protective contraception. Knowledge of dual protective contraception can be enhanced through counseling and health promotion by health workers, in addition counseling and health promotion can also motivate couples with HIV to use dual protective contraception and also increase coverage of the use of dual protective contraception in PLWHA couples

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Applying Task-Technology Fit Model to The Primary Health Care: a Case Study of Nutrition Information System

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Abtract

In order to improve the quality and performance of healthcare services, healthcare information technology is among the most important technology in healthcare supply chain management. Over the past decade there has been a notable increase in the use of Task-Technology Fit (TTF) theory within the field of information systems. This theory argues that information system use and performance benefits are attained when an information system is well-suited to the tasks that must be performed.This study sets out to apply and test the Task-Technology Fit (TTF), to examine the factors influencing healthcare Information Technology (IT) services. A structured questionnaire was developed and distributed to healthcare representatives in each primary health care surveyed in Banyumas district. Data collected from 50 employees including nutrisionist, nurses/midwife, and nutrition officers at 39 primary health care in Banyumas district members were tested the model using regretion analysis. The results found that the factors with a significant effect are task characteristics, technology characteristics with task-technology fit. They were also found to have a significant impact on task-technology fit with performance impact of nutrition information system. In addition, was found significance factors on task-technology fit with utilization. Based on research findings, in order for healthcare information technology to be widely adopted and used by healthcare staffs, must pay attention to task characteristics, technology characteristics, task-technology fit, nutrition information system performance, and user utilization.

Key word: information system, TTF, nutrition, evaluation

Background

Information Technology (IT) is defined as the group of technologies that is revolutionizing the handling of information and embody a convergence of interest between electronics, computing and communication. Since the early 21st century, IT has undergone rapid advances affecting information systems and their respective management is no exception. Information and communication technologies (ICTs) embody all digital technologies that support the electronic capture, storage, processing, and exchange of information in order to promote health, prevent illness, treat disease, manage chronic illness, and so on [1, 2]. In the health sector, ICTs refer to a set of projects or services that allow for remote care (telehealth), interdisciplinary clinical support, as well as knowledge transfer [3]. The use of ICTs has the potential to promote patient-centered healthcare at a lower cost, improve quality of care and information sharing, educate health professionals and patients, encourage a new form of relationship between patients and their health providers, reduce travel time, etc. [1, 4, 5]. The use of IT in healthcare systems has promoted healthcare quality and the access to healthcare services leading to a noticeable reduction in medical errors and costs. Internet-based health applications including electronic health records, electronic prescribing, mobile health, for enhancing the efficiency of healthcare industry and reducing errors in care delivery processes.

Regardless of these potentials, implementation of health information systems are lagging behind its adoption in health care organizations [6]. Despite these well-known advantages, the implementation of ICTs in practice remains difficult and involves changes at different levels, including with respect to patients, healthcare providers, and healthcare organizations. However, thoughtful attention to IT acceptance is required, when implementing any HIT system.

The literature shows that there are many barriers to the implementation of IT in healthcare organizations [7, 8]. The barriers are mainly observed in the areas where human issues, economics and technologies are involved. Among these barriers, human issue is by far more fundamental than the other barriers and its ignorance makes the resolving of the other two issues unlikely. User acceptance of technology, categorized under human issue, is the first key element in applying IT in healthcare services [9] and has been an important area of interest initiated in the 1970s, when there was an increasing demand in technology for research due to failures of system adoption in health organizations. Recently, a number of other barriers responsible for hindering the development and implementation of IT in healthcare have been identified. A change in physicians' efficiency, low familiarity with technology, inadequate legal framework, lack of explicit standards, interoperability problems of application systems, confidentiality and privacy concerns, time shortage, and insufficient researchare some of the variables related to the aforementioned barriers [10, 11]. Human issues including resistance to change, user acceptance, persistence and failures highlight the emerging focus on user acceptance in a number of health organizations [12]. Although the universal perception of IT integration suggests that it is of vital importance to physicians and healthcare providers, the literature provides evidence of the failure of health system implementations, due to the ignorance of user acceptance [12].

Researchers and policymakers who are running a new information system can measure the acceptance of the system among the target population. Measuring the acceptance will provide significant assistance in the successful implementation of a system. Therefore, before the implementation, technical and non-technical factors must be identified, and the barriers to implementation must be eliminated [13]. Models present the process of implementing new technologies by assuming a number of systemic factors that jointly or independently predict success in the implementation phase [14]. Implementation of health information systems may fail due to their being rejected by the users. This information will allow an organization to actively implement reforms to increase the acceptability of the new systems [15, 16, 17]. Nematolahi *et al.* considered the users' attitudes to have a significant effect on the success of the implementation of electronic health records, and they emphasized the importance of being familiar with the applications and the concepts of electronic health records [18]. In recent decades, several models have been proposed in the field of technology acceptance. Among these models are the "Task-Technology Fit (TTF) model,"the "Technology Acceptance Model (TAM)," and the "Unified Theory of Acceptance and Use of Technology (UTAUT) model." IT theories to predict the response of end-users in IT are very important [19, 20]. In terms of technology acceptance, there are many theories and patterns, some of which have been used in the health care field. The Task-Technology Fit (TTF) puts the fit between the task and technology as the major indicator of success. Framework the TTF model, developed by Goodhue, was used for the purposes of this study (Fig. 1). The model proposed by Goodhue makes explicit the role of fit between a technology and the users' tasks. In addition to recognizing the role of utilization and user attitudes in influencing performance impacts, Goodhue's model emphasizes the role of TTF in understanding how technology influences performance.

The core of a Task-Technology Fit Model is a formal construct known as Task-Technology Fit (TTF), which is the matching of the capabilities of the technology to the

demands of the task, that is, the ability of IT to support a task. TTF models have four key constructs, Task Characteristics, Technology Characteristics, which together affect the third construct Task-Technology Fit, which in turn affects the outcome variable, either Performance or Utilization. TTF models posit that IT will be used if, and only if, the functions available to the user support (Fit) the activities of the user. Rational, experienced users will choose those tools and methods that enable them to complete the task with the greatest net benefit. Information Technology that does not offer sufficient advantage will not be used [21].

Material and Method

This cross-sectional analytical study was done in 2017. The research methodology included the following steps: selection of research setting and population, selection and modification of survey instrument, pre-testing the survey instrument with a pilot population and modifying it by applying necessary changes, distributing the questionnaire, and finally analyzing the results. The population of this study included 50 personnel in nutrition staff of primary health care of Banyumas district. A sample of 50 respondents from the population of 50 persons working in nutrition officer of 39 primary health care of Banyumas district (by total sampling). A pilot study was performed before conducting the final version of the instrument in order to prevent the problems emerging when the instrument of the study would be used. The reliability of the questionnaire was confirmed by Cronbach's alpha equal to 0.948. Analysis of the obtained data with SPSS 16 software. A researcher-made questionnaire on the basis of Goodhue's model, questionnaires was developed for data collection.

The content and face validity of the questionnaire were confirmed by thirty partisipan in primary health care Purbalingga District. All questions are valid (p <0.05). The survey consisted of 45 structured questions (14 questions on technology characteristic; 8 questions on task characteristic; 8 questions on performance impacts; 5 questions on utilization; 10 questions on task technology fit). The questions were designed in a way that could help identify factors personnel of nutrition staff of primary health care evaluate as impotent in decisions they make to adopt IT. There were also a number of demographic questions. "Totally agree", "Agree", "Disagree", and "Totally disagree", formed the questionnaire which was based on 4-point Likert scale. In this study, task characteristics and technology characteristics were independent variables, while task technology fit, performance impact and utilization were dependent variables. A correlation matrix was constructed to identify the relationship between variables and to simplify the model prior to testing. A graphical path model was developed to replicate the proposed research model (Figure 1). The collected data were analyzed by SPSS software (version 16). The relationship between variables was assessed by a regression test. Pearson's correlation was applied to examine the relationship between variables. Descriptive statistics were used for reporting the level of acceptance of IT.
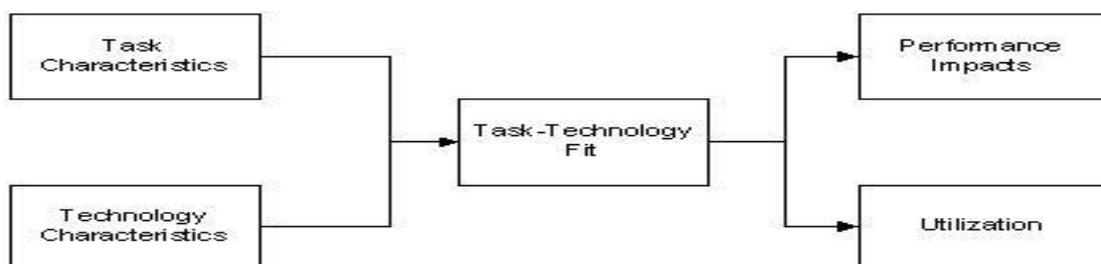
Source: Goodhue and Thompson, (1995)

Fig. 1: Research Model of Task Technology Fit Theory

Result

a. Respondent Characteristics

Based on the univariate analysis, it is known that the majority of respondents are women (96%); the majority of respondent ages ranged in age $\leq$ 30 years (44%); duration of employment of majority of respondents 6-10 years (30%); education majority respondents graduated from diploma degree (74%); the majority of respondents were nutrition officer of primary health care (44%); the majority of work experience using nutrition information system ranges from 1-5 years (42%); the majority of nutrition information system usage every day < 2 hours (60%).

b. The relationship between dependent and independent variable

Table 1 shows the relationship between dependent and independent variables. As it is seen, there is a significant relationship between task characteristics, technology characteristics with task-technology fit (p = 0.023 and p= 0.000). It was also found that task characteristics and technology characteristik was positively associated with task-technology fit (r = 0.702). Based on determination analysis obtained value R^2 (R Square) of 0.492 or (49.2%). This shows that the percentage contribution of influence of independent variable (task characteristics, technology characteristics) to dependent variable (task-technology fit) equal to 49.2%. The constant of -6.771 that if task characteristics is 0 then task-technology fit is -6.771. The regression coefficient of variable X1 of 0.452 means that if other independent variables are fixed then any increase of 1% task characteristics will increase the task-technology fit 0.452. The regression coefficient of variable X1 of 0,566 means that if other independent variables are fixed then any increase of 1% technology characteristics will increase task-technology fit 0,566.

Table 1. Factors Associated with Task Technology Fit

Factors	Coefficient B	95% CI	*p*-value	R	R^2
(Constant)	-6.771	-16.985 - 3.443	.189	0,702	0,492
Task characteristics	.452	.066 - .839	.023		
Technology characteristics	.566	.333 - .799	.000		

Table 2 shows the relationship between dependent and independent variables. As it is seen, there is a significant relationship between task-technology fit with performance impact (p= 0.000). It was also found that task-technology fit was positively associated with performance impact (r = 0.597). Based on determination analysis obtained value R^2 (R Square) of 0.357 or (35.7%). This shows that the percentage contribution of influence of independent variable (task-technology fit) to dependent variable (performance impact) equal to 35.7%. The constant of 10.022 that if task-technology fit characteristics is 0 then performance impact is 10.022. The regression coefficient of variable X1 of 0.452 means that if other independent variables are fixed then any increase of 1% task-technology fit will increase the performance impact 0.452.

Table 2. Factor Associated with Performance Impact

Factor	Coefficient B	95% CI		*p*-value	R	R^2
(Constant)	10.022	5.279 -	14.764	.000	0,597	0,357
Task Technology Fit	.452	.276 -	.627	.000		

Table 3 shows the relationship between dependent and independent variables. As it is seen, there is a significant relationship between task-technology fit with utilization (p= 0.002). It was also found that task-technology fit was positively associated with utilization (r = 0.418). Based on determination analysis obtained value R^2 (R Square) of 0.175 or (17.5%). This shows that the percentage contribution of influence of independent variable (task-technology fit) to dependent variable (utilization) equal to 17.5%. The constant of 11.548 that if task-technology fit characteristics is 0 then utilization is 11.548. The regression coefficient of variable X1 of 0.119 means that if other independent variables are fixed then any increase of 1% task-technology fit will increase the utilization 0.119.

Table 3. Factor Associated with Utilization

Factor	Coefficient B	95% CI		*p*-value	R	R^2
(Constant)	11.548	9.527 -	9.527	.000	0,418	0,175
Task Technology Fit	.119	.044 -	.044	.002		

Discussion

TTF theory defines that when the characteristics of individuals' tasks and characteristics of the technology integrate well together, the individuals' performance will be high [22]. Empirically, the results show that TTF factors directly affect performance [23]. The consistency of the characteristics of the technology with the individuals' tasks requirements leads to the enhancement of performance [24]. The use of a technology is not always voluntary and thus the performance impact is to an increasing extent dependent on the supportive and instrumental value of a technology instead of the degree of utilization. Therefore, as Goodhue and Thompson argue [24], if the employed technology does not fit with the user requirements, higher utilization will not increase one's productivity.

The advantage of applying the task-technology fit model is that it could serve as a diagnostic tool, hence it is possible to address specific problematic areas in the digital workspace (for example the ability of indentifying information). A major disadvantage of applying this model is that it is fairly large and therefore costly and demanding for applying it in empirical settings. Besides, throughout time most of the studies that applied this fit perspective developed their own fit factors in order to address a certain technology. Instead, one general and consistent assessment of task-technology fit is needed which is broadly applicable for ICT tools in the digital workspace. Also, the task-technology fit model that was validated by Goodhue (1995) was designed for 'evaluating the overall information systems and services provided in organizations', instead of evaluating fit on individual work level. Since the composition of digital workspaces can vary for each individual, there is a model needed to identify fit on individual work level.

Task-technology fit is "the degree to which a technology assists an individual in his or her portfolio of tasks". "The heart of the task-technology fit model is the assumption that [ICT tools] give value by being instrumental in some task or collection of tasks and that users will reflect this in their evaluation…"(Goodhue, 1995). Task-technology fit is

conceptualized according to "fit as profile deviation". A profile is an ideal specified situation; the less a real situation deviates from the profile, the higher the fit. Since the ideal digital workspace situation is different for each individual, task-technology fit is a normative construct, which is reflected by a user's evaluation of correspondence between the task requirements and technology capabilities to support their tasks. It was found that users are able to evaluate their degree of task-technology fit.

Based on our analysis, the following interventions and external factors can be found which may have a positive influence on the fit between individuals, technology and tasks and therefore on IT adoption:

a. Positively affecting individual-technology fit: IT training sessions, positive external norms (e.g. computers belong to managing), high computer acceptance, high motivation and training of key users, intensive user support, step-wise implementation of functionality.
b. Positively affecting individual-task fit: Efficient training session, high acceptance by management, reorganization and restructuring.
c. Positively affecting task-technology fit: reorganisation and restructuring, update of software functionality, introduction of mobile tools in case the tasks make this necessary.

A variety of factors can be found that influence the fit between individuals, technology and task and therefore IT adoption. This supports the often discussed fact that success and failure is a rather complex and multidimensional construct. Please note that the interventions do in fact directly influence attributes of individual, technology, or task, thereby only indirectly influencing one or two of the three fit dimensions. For example, by organizing additional training session, we can improve the IT skills (attributes) of the individuals, and thereby also indirectly influence the individual-technology fit. This framework was used to evaluation of nutrition information system. The detailed analysis of the case study showed common features.

Conclution

The implementation of task-technology fit evaluation framework proves that:

a. Task characteristics and technology characteristik was positively associated with task-technology fit, contribution of influence of task characteristics, technology characteristics) to task-technology fit equal to 49.2%.
b. Task-technology fit was positively associated with performance impact, contribution of influence of task-technology fit to performance impact equal to 35.7%.
c. Task-technology fit was positively associated with utilization, contribution of influence of task-technology fit) to utilization equal to 17.5%.

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Biomarker Cytokines / Pro-Inflammation And Neurotropik As A Depression Parameter In Elderly : Literature Review

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Abstract

This literature review has a purpose to determine a biomarker for a specific pro-inflammatory and precise neurotrophical for elderly with depressed. We found 14 data from literature based on database search EBSCO HOST, Google Schooler, Pubmed, Pro Quest, by using keywords search: depression, cytokine, interferon, interleukin, TNF-α, IL-1β, IL-6, IL-4, IL -2, IL-8, IL-10, neurotropic, BDNF and elderly. The searches were conducted in April 2017 and the articles obtained were selected based on the subject, the year of publication begin from 2010 to 2017 using English. Based on the results of the study, it was concluded that the concentration levels of pro-inflammatory cytokines IL-6, IL-1β, TNF-α and CRP showed significantly high rates in the elderly group with depressed compared with the elderly group without depression as well as the Brain Derived Neurotrophic Factor (BDNF) showed a low rate in the elderly group with depressed compared with the elderly group without depression. Further research is expected to be the basis for intervening elderly people with depressed through a biomarker approach that is IL-6, IL-1β, TNF-α and CRP in addition to the use of Geriatric Depression Scale (GDS)

Keywords: Biomarker, Depression in Elderly, Pro-Inflammatory, Cytokine, Neurotropic

Introduction

Depression is a mental disorder that is a serious medical problem. Depression is one of several neuropsychiatric disorders in the elderly population that often arise[1]. Inflammatory cytokines play an important role in the incidence of depression in the elderly. Cytokines are small cells that signal to proteins that mediate and regulate the immune response and inflammation. Cytokines are divided into two categories namely pro-inflammatory cytokines and anti-inflammatory cytokines. Pro-inflammatory cytokines include interleukin (IL) -1β, IL-6, IL-8, and Tumor Necrosis Factor (TNF) −α. Anti-inflammatory cytokines include IL-1Rα, IL-4, IL-10, Transforming Growth Factor (TGF) -β1 [2]. To date, Interleukin L-1β, IL-6, TNF-α and C-Reactif (CRP) are the most widely studied inflammatory biomarkers in people with depression and the levels are higher in depressed individuals than in healthy individuals [3]. The above study is supported also by other research results that states that levels of TNF-α increased significantly in the elderly who experienced depression with a significant relationship with age. There is also a significant relationship between IL-6 levels and TNF-α with age [4]. Several studies with animal and human samples have shown that elevated inflammatory cytokines can reduce Brain Derived Neurotropic Factor (BDNF) and central neurogenesis, leading to behaviors such as depression. The study above was reinforced by other studies that showed lower BDNF levels in depressed patients compared with the control group (healthy patients) [5].

The brain-derived neurotrophic factor (BDNF) plays an important role in the pathogenesis of major depression since the alteration of BDNF signals in the patient's brain [8]. However, most of the research is more focused on cytokines (IL-1β, IL-6, and TNF-α) in patients with severe depression [6].

Biomarkers for mental disorders have been the concern of the Special Task Force for the Biological Markers of the World Federation of Societies for Biological Psychiatry (WFSBP) through various consensus initiatives on depression, schizophrenia, alcoholism, and ADHD; as an effort to gain a deep understanding of the causes of these mental disorders [7].The purpose of this literature review is to determine a biomarker (remark) for aspecific pro-inflammatory cytokine / pro-inflammatory (IL-1β, IL-6, TNF-α, CRP) and neurotrophic (BDNF) biomarkers in elderly with depressed. In addition, the literature review aims to explore the results of publications that provide information on the latest literature, research results and practices in intervening elderly patients who experience depression in addition to using instruments to assess the level of depression in the elderly (Geriatric Depression Scale, Hamilton Depression Rating Scale, Beck Depression Inventory).

Research Method

The design of the methodology of writing this article begins by reviewing the literature systematically guided by database search as follows: EBSCO HOST, Google Schooler, Pubmed, Pro Quest, using keywords search: depression, cytokine, interferon, interleukin, TNF-α, IL- 1β, IL-6, IL-4, IL-2, IL-8, IL-10,neurotropic, BDNF and elderly. The searches were conducted in April 2017 and the articles obtained were selected based on the subject, the year of publication begin from 2010 to 2017 using English. Only the study focused on measuring the concentration of cytokines and BDNF in elderly subjects with depressed and non-depressed as reference. Inclusion criteria included subjects aged over 55 years, subjects with some medical comorbidities such as heart disease and diabetes were also included, and subjects free of anti depressant drugs at least 1 week before starting treatment. The exclusion criteria were based on the results of the study with subjects currently in pharmacological therapy for depression, lack of specific diagnosis of major depression, and lack of control group (healthy elderly).

Research Results

Based on the search strategy, 14 articles were selected. The article was written by many professionals, including neurologists, nurses, pharmacists, psychiatrists and public health experts. A total of 14 studies comparing cytokine and BDNF levels among elderly subjects with depression and healthy elderly were identified for review. Unit to see the concentration of cytokines in pg/mL, whereas the concentration of BDNF in pg /mL and ng /mL.

Research conducted in various countries on changes in levels of CRP, IL-1β, IL-6 and TNF-α in elderly people with depression, as follows:

1. Research in Italy in 2014 using the GDS-15 instrument in the elderly aged 53-59 years, found 57 elderly people suffering from depression and 132 healthy elderly people. The results showed that CRP levels in elderly depression were greater than that of healthy

elderly (5.52 ± 3.24 VS 3.24 ± 1.3 pg /mL). Also found levels ofIL-6 in elderly depression greater than healthy elderly (5.52 ± 1.7 VS 2.71 ± 1.2 pg / mL). [8]

2. Research in New York in 2014 using the instrument Patient Health Questionnaire (PHQ-9) in the elderly aged 71-72 years, found 50 elderly people depressed and 50 healthy elderly people. The results showed that CRP levels in elderly depression were greater than healthy elderly (4.5 VS 1.6 p / mL). Also found levels of IL-6 in elderly depression showed higher rates compared with healthy elderly (4.4 VS 2.4 pg / mL). [9]

3. Research in Brazil in 2010 using the Hamilton Depression Rating Scale (HAMD-21) instrument in the elderly aged 69-70 years, found 23 elderly people depressed and 44 healthy elderly people. The results showed that IL-1β levels in elderly depression were greater than healthy elderly (7.8 ± 3.6 VS 2.0 ± 3.6 pg / mL). [10]

4. Research in India in 2017 using instruments HAMD-21 in the elderly 66-68 years old, found 31 elderly people suffering from depression and 37 healthy elderly people. This study showed that IL-1β levels in elderly depression were greater than healthy elderly (6.7 VS 4.8 pg / mL). Also found that levels of IL-6 in elderly depression showed higher rates compared with healthy elderly (9.2 VS 4.4 pg / mL). [11]

5. Research in Hospital Universitario La Paz, Madrid, Spain in the year 2013 using BDI instruments in the elderly aged 53-59 years, found 462 elderly people depressed and 120 healthy elderly people. The results showed that IL-6 levels in elderly depression were greater than healthy elderly (1.62 VS 1.27 pg / mL). [12]

6. The results reported strong negative correlation of BDNF with depression of 83.9%. From the results of this study showed changes in BDNF levels can be used as biomarkers to determine the severity of depression levels. [13]

7. Research in 2011 in India using the GDS-15 instrument in the elderly aged 76-77years, found 20 elderly people suffering from depression and 149 healthy elderly people. The results showed that BDNF levels in elderly depression were smaller than healthy elderly (30.91 ± 7.27 VS 36.17 ± 9.21 pg / mL). [14]

Discussion

Based on the results of the study above, 9 studies were found that examined levels of pro-inflammatory cytokine concentrations, and the result reported that the concentrations of pro-inflammatory cytokines IL-6 and TNF-α showed a significantly high rate in the elderly group with depressed compared with the elderly group without depression. IL-6 as the key of pro-inflammatory cytokines that will increase in patients with depression[15].

IL-6 and TNF-α, simultaneously coordinate various cell functions that can stimulate and promote inflammation [16]. IL-1, IL-6, and TNF-α also promote the differentiation of cytotoxic T cell lymphocytes, which kill pathogens that enter the body as long as the body is injured [17]. There were 4 studies that measured IL-1β, which is the response of a third acutepro-inflammatory phase protein. The results of the study showed that concentrations of the IL-1β in the overall depression subject showed higher rates than the control subjects. IL-1β is an important pro-inflammatory cytokine that plays a role in the coordination

of immune responses and regulation of cell proliferation, differentiation and apoptosis [18]. Variant of The IL-1β has been shown to be associated with decreased amygdala and anterior cingulate cortex function. This part of the brain associated with memory, emotional processing, reward mechanisms, and impaired function in each of these neural pathways have been implicated in the manifestations of depressive symptoms [19].Depression is also closely related to high levels of C-Reactive Protein (CRP). Increased levels of CRP serum have been found in the subject of depression in both clinicaland population studies [20]. Higher serum concentrations of CRP are also a marker of increased release of pro-inflammatory cytokines, such as IL-1, IL-2 and IL-6 by activated macrophages and IFN-γ which activated by T cells[21]. From the biomarkers above, we found no difference in the concentrations of pro-inflammatory cytokines from IL-1α, IL-2, IL-10, and sTNFR2 between depressed subjects and non-depressed subjects [3].

Brain Derived Neurotrophic Factor (BDNF) is an important member of the neurotrophin family in the central nervous and peripheral systems [9]. The brain-derived neurotrophic factor (BDNF) is one of the neurotrophins whose levels have been associated with impaired cognition, depression and Alzheimer Disease [3]. The research above shows that BDNF factor plays a key role in major pathophysiology of depressive disorder [8]. There was 6 evidence of significant decrease in BDNF rates in elderly patients with depressed compared with control subjects. The neurotropin hypothesis is strongly supported by clinical evidence of large-scale meta-analyzes in depressed patients, and their presence has shown that serum levels of BDNF are low [22]. It is therefore possible that BDNF levels become biomarkers for depressed patients [23].

Conclusion and Suggestions

Based on the results of the study above, it was concluded that the concentration levels of pro-inflammatory cytokines IL-6, IL-1β, TNF-α and CRP showed a significantly high rate in the elderly group who were depressed compared with the elderly group without depression as well while the Brain-Derived Neurotropic Factors (BDNF) showed a low rate in the elderly group who were depressed compared with the elderly group without depression.

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The Efektiveness of Asam Kandis (*Garcinia Parvifolia*) for full thickness wound healing in Mice

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ABSTRACT

Garcinia parvifolia belongs to the same family as mangosteen (Garcinia mangostana), which is known locally as "asam kandis" or cherry mangosteen. The present study was conducted to determine the phytochemicals content (total phenolic, flavonoid, anthocyanin, and carotenoid content) and antioxidant and acetylcholinesterase inhibition activity of the flesh and peel of G. parvifolia. The purpose of this study was to investigate the potential of Asam Kandis as cleanser in wound healing. This study was true experiment and data are expressed as mean of wound area. Tree groups of male mice were treated to produce 1 cm circular, full-thicness skin wounds on the dorsum. They were then allocated to receive 10%, 20% of boilled water of asam kandis and NaCl 0.9% (control) every three days. Microscopic findings on days 14 after wounding were obtained. Macroscopis findings were observed from day 3, 7, 9 dan 14 after wounding. Wound areas of 20% of asam kandis were smaller than the other group on day 6. Wound areas of Asam Kandis group gradually decreased to almost the same wound area as the control group on day 14. Collagen bundles in Asam Kandis group seemed to be thicker than control group but 20% Asam Kandis group more thicker than the others. These Result indicate that Asam Kandis more effective as cleanser than control group.

Keywords : *Garcinia Parvifolia, wound care and Wound cleansing*

Introduction

Wound healing is a complex process and influenced by many factors. The overlapping process includes of homeostasis, inflammation, proliferation (granulation, contraction and epithelialization) and remodelling[6]. Nurses play a very important role in wound management both locally (cleansing, debridement, dressing) and systemic (nutrients). Velocity and delay of wound healing process can be affected by nursing intervention. Therefore, the nurses must be knowledgeable of the wound healing process and related wound management[4].

Microskopic finding of full thicknes wound healing, after days 11 until day 14 was myofibroblas decreased at the edge and was changed by collagen bundle perform on the granulation of wound[12]. Local management of the wound begin by assesment to deside intervention will doing. After that cleansing, debridement dan dressing were be held (Suriadi, 2007). As a nurse will choice the type of cleansing can be used that good for wound healing independenly.

Cleansing use to for clean the wound is normal salin 0,9% that isotonis but without antiseptic. Iodine is one of the antiseptic but another writer said that iodine iritatif even toxic for wound[4]. The inflammatory stage is clearing phase of microorganisms of wound that beginning at the first day until day 7 after wounding. At this stage needed activity of compounds that can help get rid of and kill microorganisms on the wound. The role of bactericidal or bacteriostatic by damaging the cell wall and sitoplasm membrane of bacterial

cell and damaging the protein denaturation of bacteria[3,10,11] Antimicroba of the rind of asam kandis regularly used for natural presevative for fresh fish by malay comunity[2]. Therefore, asam kandis have potential as antimicroba for wound healing as specially for inflamation phase. Content of asam kandis and phytokimia proved effect as antioxsidant, antimicrobial and anticancer and antiinflamation[8].

The purpose of this study is to determine the potential of the boilled water of asam kandis in enhancing wound contraction, accelerates wound closure time, and collagen density activity in wound healing of full-thickness excision wounds in comparson with normal salin as cleansing.

Methode

Animal. fifteen 2-3 months old male mice, weighing 18.0-23.0 g were placed in a cage and given food and drink experimentation on animal treatment standards of Biomedical Laboratory of the Medical School, University of Muhammadiyah Yogyakarta. This study has been approved and permission of the Research Ethics Committee of the Faculty of Medicine and Health Sciences, University of Muhammadiyah Yogyakarta.

Cleansing. Asam Kandis fruit was collected from traditional market for cleansing preparation devide two groups 10% and 20% each one that boilled with water. The third groups was cleansing with normal salin 0,9% as control group.

Wounding. Mice were general anesthized with inhaled chloroform that put in a large glass jar, covered for 20-30 seconds. Dorsal of mice cleaned with 70 % alcohol and skin on the backs of mice sterile manner excision of 1 cm diameter circular shape and depth of deep cutaneous layers on each animal. The wound was cleaned immediately with 0.9 % NaCl (control group) and two group was cleaned 10%, 20% of Asam Kandis Local wound care and systemic conducted once every three days. Measurements done manually wound with clock methods for once every three days starting at day 3 to day 13 assessment.

Histological prosedure. The mice were euthanized by chloroform inhalation performed on day 14 after injury. Excision performed on the wound and surrounding skin tissue ± 0.3 cm from the edge of the wound, stapled on to thin cardboard to prevent excessive contraction of the sample and fixation with 10% formaldehyde for ± 24 hours. Sample dehydrated with alcohol series, clearing in pure toluene and embedded in paraffin to prepare serial 6 μm sections.

Alternate sections of the wound center were stained with mollary. Stage of staning, put the glass object on xylol for 15 minutes x 3, 96 % alcohol for 15 minutes x 3, then washed with running water for 15 minutes, then put on a glass object Hematoxylin dye for 15 minutes and washed with running water for 15 minutes . Object glass put on Lithium carbonate for 20 seconds and washed with running water for 15 minutes. Further object inserted in glass eosin dye for 15 min , 96 % alcohol for 15 minutes x 3 and xylol for 15 minutes x 3. The last stage is the preparation using covered with a deck glass Entellan.

Contraction and wound closure time. Wound contraction is defined as a broad new epithelialization (mm^2) divided by the area of the wound preview of each sample from day 7 to day 11. Wound closure time (day) is caunted result of extensive prior treatment divided by the initial wound epithelialization area and multiplied by the long of the treatment.

Collagen observation. The collagen density were observed with a field of view at 40x. The collagen density were observed with a field of view at 40x according to existing procedures in the Laboratory of Histology Faculty of Medicine, University of Gajah Mada.

Statistical analysis. Data are expresed as mean±SD and were analyzed using one-way ANOVA and Bonferroni multiple comparison test were performed. The differences were consedered significant at $p < 0.05$.

Results and discussion

   Macroscopic observation of wound healing. On the first week at day 3 after wounding, the skin around the wound in the local intervention with cleansing of kandis water visible redness, but no edeme or odor, the wound edges are form and intact on the wound base, presence of granulation that filled the wound bed and visible contraction. But the wound area in control group which are average was apparent edema, odor and larger than the other. Contraction has been to count on day-7, its means that the wound size at day 7 were smaller than at day-3 before. The highest Percentage of contraction at day 7 shown in the intervention group with kandis 20%, followed by intervention group 10% and control group. The ratio of wound areas on day 0 to day 13 after wounding to the initial wound area on day 0 were observed. Wound area in control group increased on day 7 and then decreased rapidly. There were no significant diferences between the control group and 10% kandis ($p=0.76$) and 20% of kandis groups ($p=0.63$) on day 11.

Table 1:mean (cm) of wound area and collagen

Group	Wound area	collagen
NaCl 0,9%	0.31	14.20
10% kandis	0.30	15.90
20% kandis	0.28	19.30

   Collagen. On day 14, the identification of collagen density contained in the scar tissue in each group. The analysis showed there were differences in the average density of collagen in each group is significant with $p = 0.004$ ($p < 0.05$) with the lowest mean rank 14.20 in the group with NaCl 0,9% and the highest mean rank 19.30 on the group by giving 20% kandis.
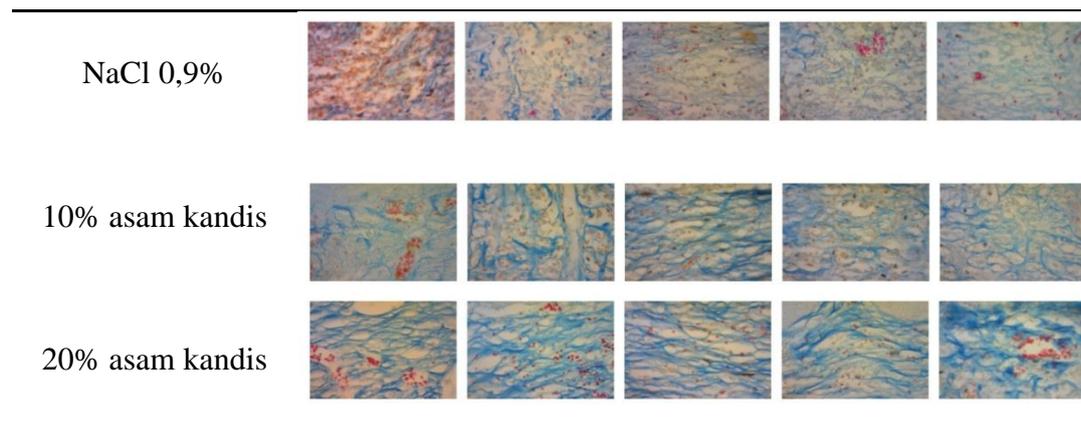
   The results of macroscopic observation on the first week at day 5 showed progress by intervention group with kandis is better than the control group. The observation of the percentage of wound contraction was greater in the intervention group with kandis compared to control group on day 5 to day 13. That is because the moringa asam kandis can inhibit inflammatory processes through the effects of antimicrobial and antioxidant content of rind of the fruit. The inflammatory stage is clearing phase of microorganisms of wound that beginning at the first day until day 7 after wounding. At this stage needed activity of compounds that can help get rid of and kill microorganisms on the wound. Asam kandis contain saponins, flavonoids, tannins, phenolic which are bactericidal or bacteriostatic by

damaging the cell wall and sitoplasm membrane of bacterial cell and damaging the protein denaturation of bacteria[3,8,10]. Anseptic properties of the compounds may have an important role in the inflammatory phase of the wound healing process. Whereas the control group is cleaned with NaCl 0,9% not have bactericidal and bacteriostatic effect, but only as cleansing the wound even it may be have the potential for bacterial growth if the secondary bandage opened.

All of groups of intervention showed the presence of wound granulation tissue and new epithelium that facilitates the wound closure. The macroscopic observation that contraction of the wound with intervention group of Moringa leaves were faster than the negative control group and it is supported by the results of the time for wound closure measurements rapidly on the intervention group with kandis until the 13 day.

The results of microscopic observation at day 14 were performed the collagen density in the intervention group with kandis was found more support accelerated wound healing compared to control group. Significant difference to the spread of collagen density occurred in the intervention group 20% of kandis and control group. This is caused by an antioxidant protected the white blood cells so can improves immune function on the inflammatory phase, and increasing the synthesis of collagen by fibroblasts[11]. Asam Kandis fruit is potential as preservative agent, the compaund wich are responsible for antimicrobial activity were flavonoid[5]. Based on this study showed the intervention cleansing with kandis more effective to accelerate wound healing than NaCl 0,9% administration.

Conclusion

The rate of wound healing effectiveness of the intervention were have similar for contraction and wound closure time. wound healing of oral intervention of NaCl 0,9 % more slowly and increased gradually, while the kandis cleansing more rapidly during the inflammatory phase. Microskopic finding showed cleansing of asam kandis more efective than NaCl 0,9%. Kandis administration can be used alternative in wound care in lokal management as cleanser.

Acknowledgements

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