



KEMENTERIAN  
KESEHATAN  
REPUBLIK  
INDONESIA



# Proceeding

**The First International Conference  
on Health, Social Sciences and  
Technology**

**Palembang, Indonesia, Oct 20<sup>th</sup> – 21<sup>st</sup>, 2020**

## **ICoHSST 2020**



**ISBN: 978-623-6541-46-3**



# The Influence of the TANDUR Learning Model on the Ability of Nurse Practices in Wound Nursing Care at Dr. H. Ibnu Sutowo Baturaja OKU Hospital

1<sup>st</sup> Sujati Ni Ketut  
Nursing Department  
Politeknik Kesehatan Kemenkes Baturaja  
Baturaja, Indonesia  
Email: ketut.sujati@poltekkespalembang.ac.id

2<sup>nd</sup> Aisyah  
Nursing Department  
Politeknik Kesehatan Kemenkes Baturaja  
Baturaja, Indonesia  
Email: Aisyahh050@gmail.com

Corresponding author: ketut.sujati@poltekkespalembang.ac.id

**Abstract** - Continuing education is needed by nurses to improve their competency. Education will succeed when using appropriate and fun methods, which ensures participants practice learning by presenting high interest. The syntax of the TANDUR model is the following abbreviation, Grow learning interest by knowing what benefits it is for me, Experience all processes, name it by identifying all the terms that exist, Demonstrate so as to obtain a psychomotor experience, repeat so that the memory process is deeper and celebrated. Issues that develop in nursing services related to the need for improvement in nurse competence are modern wound care known as the principle of moisture balance. The method developed and proven to be more effective is moist dressing. The research objectives are: Analyzing the effectiveness of TANDUR learning on the ability of nurses' practice in wound care nursing with the principle of Moisture Balance at Dr. H Ibnu Sutowo Baturaja OKU Hospital. Research Method: This study uses a quasi experiment method. Samples were taken from a random population of nurses in 21 case groups and 21 control groups. The data analysis of this study used the dependent and Independent t test obtained the results of P 0, 033, meaning that the TANDUR learning model effectively improved the nurse's practice ability in wound care. TANDUR learning models can be used in any learning in all learning activities. It is recommended that nurses develop themselves by applying the TANDUR learning model to the process of developing practical abilities.

**Keyword** - TANDUR, Injury care.

## I. INTRODUCTION

Introduction Nurses' practical ability in wound care is needed nowadays, because the prevalence of wounds (especially chronic wounds) is quite high. The association of wound caregivers in Indonesia, namely the Indonesia Wound Care Association (INWCCA), noted that 60% of injuries in modern wound care practices are chronic wounds [1]. Nurses' knowledge of modern wound care with balanced moist principles is still low (76.1%) of respondents show low knowledge of wound care, and low knowledge is associated with low behavior in nurses' practice in carrying out wound care with P 0.016 [2]. A growing issue in nursing services related to the need for

increasing nurse competence is modern wound care known as the principle of moisture balance. Wound care methods have developed rapidly in the last two decades. The method developed and proven to be more effective is moist dressing [3].

Traditional wound care emphasizes wound care on the principle of dry or wet, while current wound care uses a balanced moist concept. Wound care with the concept of moist, has now been developed based on evidence based, proven to support faster healing of wounds [4]. Increasing the ability to practice nurses can be done by learning in job training, so that hospital nursing staff can still carry out their duties and work systems in teams nursing care is not compromised. Continuous learning for nurses is needed as an effort to refresh competence and improve care that is avoidance base practice, a continuous learning approach for nurses on duty should be done with in-job training, so as not to neglect health services.

Research conducted by Siahaan on nurses at Bunda Hospital Medan reported that training had an effect on nurse performance [5]. One of the competencies that will be developed at the Dr. H Ibnu Sutowo Regional Hospital is wound care with the concept of moisture balance. Based on empirical data, the nurses at Dr. H Ibnu Sutowo Regional Hospital have never participated in an in-job training about modern wound care with the concept of moist balance. The learning process to achieve these competencies requires a workshop that is carried out with the application of an effective learning model.

Research conducted on high school students in Purworejo using quantum learning and qwanrum teaching approaches is effective and efficient in achieving competence in the field of science for students [6]. Each learning model has a syntax or steps that will be applied in learning. The syntax / steps for implementing the TANDUR learning model are as follows, Cultivate interest in learning by knowing what is in it for me, Experience all processes, Name by identifying all existing terms, Demonstrate 41 so that you get a psychomotor experience, repeat so that the memory process is deeper and celebrates [7].

The results of a review of the policy of training regulations at the Education and Training Center of the ministry of religion in Bandung by [8]. show that the principles of Quantum Learning are an approach that is commonly used in education and training, because the main training learning is to use the andragogical method. The andragogical

method in operation is not much different from the principles of Quantum Learning itself. With this study, it is hoped that a response will be received from policy makers to further strengthen learning in training by applying the principles of Quantum Learning, so that education and training learning will be more effective, quality, applicable, enjoyable and meaningful. In addition to learning methods that ensure good communication between trainers and trainees, trainee motivation can also be a determining factor for the success of a training [7].

Based on the above data, the authors are interested in examining the effect of the TANDUR learning model on the ability of nurses to practice nursing wounds. Moisture balance in Dr. H Ibnu Sutowo Baturaja Hospital.

## II. RESEARCH METHODOLOGY

This type of research is experimental with an observational design. The research was conducted at the Dr. H Ibnu Sutowo Baturaja Regional Hospital. The population of this study were all nurses (273 people) registered as employees of the DR H Ibnu Sutowo Regional Hospital. The sample is part of the population that meets the inclusion and exclusion criteria. Inclusion criteria include nurses who are active in carrying out wound nursing care, willingness to attend wound care workshops with moisture balance techniques. Work in Integrated Inpatient Rooms and Polyclinics or emergency units that provide wound care services. The exclusion criteria were nurses who worked in inpatient rooms where there was no wound care, and / or nurses who worked in management. Sampling was done randomly, using the Kretjie formula [9], with a 95% confidence level, so the number of samples is

$$n = \frac{\geq pq}{\delta_p^2} = \frac{(0.5)(0.5)}{[(0.7-0.5)/1.96]^2} = \frac{0.25}{0.0104} = 20.0292 \text{ or } 21 \text{ people}$$

The number of samples rounded off to 21 people in each group, namely the treatment and comparison groups.

The independent variable is TANDUR learning, the dependent variable is the skill of practicing wound care with the Moisture balance technique.

Data obtained through TANDUR learning activities and observation of the performance of wound care practices using the Moisture balance technique.

The data collection and retrieval procedures were carried out by submitting a concern inform, conducting a pre-test and post-test on the ability of wound care practices using the Moisture balance technique. Univariate data analysis to calculate the mean pre and post test of nurses' ability in wound nursing care in the control group and the treatment group. Meanwhile, bi-variate analysis was used to find the effect or effectiveness of learning on the practical ability of damam nurses to perform wound nursing care. Analysis by calculating the difference in the mean pre and post test of the control group and the difference in the pre and post test

of the case group, using the dependent t test. Furthermore, the mean difference between the case group and the control group post test was tested by using the independent t test.

## III. RESULTS AND DISCUSSION

Description	Treatment group		Control Group	
	Pre Test	Post Test	Pre Test	Post Test
Mean	66.27	82.14	62.22	67.46
Standar Error	.397	1.116	.450	1.182
Median	65.00	83.33	61.67	65.00
Standar Deviasi	1.818	5.114	2.064	5.417
Minimum	65	65	60	60
Maksimum	70	90	65	77
N	21		21	

In the treatment group the pre-test average score was 66.27, after the post-test it increased to 82.14. Whereas in the control group the average pre-test score was 62.22 and during the post-test it was 67.46.

Difference in Mean Pre and Post Test of the ability to practice care in wound care for the group of nurses who did not receive the TANDUR model learning at the Dr. H Ibnu Sutowo Baturaja Hospital 2019

**Table 2.1 Differences in Mean Wound Care Practical Ability for the Nurse Group who did not receive the TANDUR model learning and the Nurse group who took the TANDUR model learning at the Dr. H Ibnu Sutowo Baturaja Regional Hospital 2019**

Variabel	Nurse Group	Mean	Std. Deviation	Std. Error Mean	P Value	N
After Learning Model	Those who do not get TANDUR learning	67.46	5.417	1.182	0.0337	21
	TANDUR Those who do not receive TANDUR learning	82.14	5.114	1.116		

From the table presentation above, the average value of the ability to practice wound care for the group of nurses who did not get the TANDUR model learning 67.46, the standard deviation was 5,417 and the group of nurses who took the TANDUR model learning at the Dr. H Ibnu Sutowo Baturaja Hospital 2019 was 82.14 with a standard deviation of 5,114. The results of statistical tests obtained P = 0.0337 means that at a 5% there is an effect of learning the TANDUR model on the ability to practice wound care at the Dr. H Ibnu Sutowo Baturaja Regional Hospital.

The TANDUR learning model used in training nurses in wound nursing care has improved the practice skills of nurses. In the group of nurses who took the TANDUR model learning before training the average score was 67.46 and after learning the average score was 82.14 with a standard deviation of 5.114.

The ability to practice wound care is needed in nursing practice. By improving the learning model, the ability to practice nurses will increase.

In the group of nurses who did not participate in the tandur model learning, the initial score was 62.22. and the final score of observation is 66.27. Nurse's practice skills that require remedial training, especially in wound assessment activities. Because the assessment is the basis for postponement decisions. The ability to

wash the wound affects the control of wound infection. Selection of the correct dressing maintains a balanced inertness so that the success of wound care will be better [4], [10], [11].

The TANDUR learning model is a humanist approach model and activates all senses, and invites participants to learn actively with learning motivation that begins with awareness of the benefits that will be obtained during learning. Allows participants to attend in full. A pleasant and friendly learning atmosphere by adjusting sitting positions, telling stories, asking questions to repeat and concluding with friends, is a learning model that invites trainees to learn naturally [12]. The TANDUR learning model improves the trainers' knowledge and motor skills. Sukerti reports that the TANDUR learning model is more effective than conventional learning in terms of improving the abilities of students [13].

Active learning using the TANDUR model approach actually also gives trainees the opportunity to be creative in facing unexpected situations in practice, and makes nurses use both of their brains to nurture clients smartly, wise and humanist [14].

#### IV. CONCLUSION

The ability of nurses to practice in wound nursing care increased both in the control group and in the treatment group. However, the group of nurses who received the TANDUR model teaching had a higher average practical ability than nurses who did not receive the TANDUR model. The TANDUR learning model used in learning activities when improving the competence of nurses' practice through workshops has proven to be effective in improving the practice of nurses, especially in wound nursing care. Nurses' practical skills need to be improved along with the increasing need for quality of service. A learning model is needed that is in accordance with the needs of nurses with natural adult learning but still puts forward the objectives of achieving competence in the learning process. The TANDUR learning model can be used as an approach in carrying out continuing education in the nursing profession.

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# Effectiveness of Using Peanut Ball on the Progress of 1<sup>st</sup> Stage of Child Birth in BPM Palembang City

1<sup>st</sup> Eprila

Department of Midwifery  
Politeknik Kesehatan Kementerian Kesehatan  
Palembang, Indonesia  
eprila@poltekkeskemenkespalembang.ac.id

3<sup>rd</sup> Nurul Hidayati

Department of Midwifery  
Politeknik Kesehatan Kementerian Kesehatan  
Palembang, Indonesia  
Nurulhidayati.02.nh@gmail.com

2<sup>nd</sup> Nur Purnama Sari

Department of Midwifery  
Politeknik Kesehatan Kementerian Kesehatan  
Palembang, Indonesia  
nurpurnamasarinps@gmail.com

4<sup>th</sup> Nova Dwi Meilati

Department of Midwifery  
Politeknik Kesehatan Kementerian Kesehatan  
Palembang, Indonesia  
novadwimeylati@gmail.com

Corresponding author: eprila@poltekkeskemenkespalembang.ac.id

**Abstract** - As many as 99% of maternal deaths due to labor or birth problems occur in developing countries. One reason is the length of progress of labor accompanied by pain in uterine contractions. Birth ball is a physical therapy ball that helps mothers in their first year to a position that helps the progress of labor. A physical therapy that helps the progress of labor and can be used in various positions. One of the movements is by sitting on the ball and rocking back and forth. The purpose of this study is to find out the effectiveness of using peanutball on the progress of first-stage labor on maternity at the Palembang City BPM in 2018. Method: The research method used was Quasi Experiment. The population of this study was maternity at 3 BPM in Palembang as many as 30 respondents, namely 15 control respondents and 15 respondents treated with purposive sampling technique. The measuring instruments used are observation and partograph sheets. Test statistical data using an independent T-test. The results of this study indicate that the average length of labor in the treatment group was 3.00. While in the control group is 4.60. The value of p value = 0.003, so based on the Independent T-test Test the value of p value <0.05. So that it can be concluded that the treatment group showed more effective compared to the control group in increasing the progress of labor in multigravida maternity at the first time in the BPM of Palembang City with an average difference of 1 hour faster than the control group. This study can provide benefits for students for learning, for relevant agencies Can provide information, knowledge and insight to health agencies, especially Midwifery students and for health workers and other researchers.

**Keywords:** Progress of labor, peanut ball, gym ball

## I. INTRODUCTION

The delivery process consists of 4 times I, which is the time of opening of the 1–10 cm cervix, II is the fetal delivery, III is the release and reproduction stage, IV is the first post-partum observation period [1].

The World Health Organization (WHO) [2] in 2011 estimates that 585,000 women die every day from pregnancy complications, unsafe births and abortions and an estimated one woman dies every minute. Countries in Asia including Indonesia have 20-60 times more women than Western countries in terms of maternal deaths and pregnancy complications. According to the SDKI 2012, an average of 1

2 maternal mortality (AKI) is reported to be 359 per 100 thousand live births. The death toll was significantly higher than the 2007 SDKI results of 228 per 100 thousand. In this regard, the fact that this death is a shameful government has previously determined that it would reduce the AKI to 108 per 100 thousand in 2015 in line with the MDGs' target [3].

Maternal mortality in Palembang City 2014, according to a report of 12 people out of 29,235 live births (Profile of Basic Health Services, 2015). The causes were bleeding (41.7%), followed by pulmonary embolism (1 case), cardiogenic shock suspect (1 case), eclampsia (1 case), suspectTB (1 case), hypertension in pregnancy (1 case), and more. As of 2015, 102 / 100,000 live births [4].

According to [3] Lengthening Period I is the time it takes to get my baby started from regular uterine contractions until the cervix is fully open. In primigravida I lasted 13 hours, whereas in multipara

Birth ball is a physical ballet that helps my mother in the first place to help with her baby's progress. A physical ballet that helps with the progress of the dressing can be used in a variety of positions. One of these movements is to sit on the ball and wiggle to create comfort and assist in the progression of exercise using gravity while increasing the release of endorphins due to elasticity and curvature of the ball stimulating the pelvic receptors responsible for endorphin secretion [5]. When a woman is giving birth free from fear, her body muscles, including the uterine muscles, experience relaxation that makes the birth process easier and stress-free [6].

The Peanut Ball: A Remarkable Labor Support Tool notes that there are many advantages that can be used with peanut balls such as Side-Lying. This position will help birthways open and also provide comfort to the mother on the bed [5].

## II. RESEARCH METHODOLOGY

The design of this study is a quasi-experimental study, which is a design that attempts to reveal causal relationships by involving groups without intervention as well as groups with intervention as a comparison. The selection of both groups uses a group of subjects that have been established from the beginning who have similar behavioral characteristics [7]. This study was divided into two intervention groups. One intervention group was given Peanut Ball

technique treatment, while one control group was given gym ball technique treatment. The intervention was performed after the initial data was known [8].

The population of this study was 30 people with purposive sampling technique obtained a sample of 30 people. Peanut ball control group is 15 and gym ball control group is 15.

Indicators of measurement of dressing progress in the count of hours in which the time spent during the dressing process spontaneously starts from the time 1 patient arrives until complete opening. The data collected is the primary data obtained directly from the field research using the Observation Sheet and Partograph instruments.

The tools used in this research are 2 different balls namely, peanut ball which is a bean shaped ball that can be used in bed And Gym ball is a round ball that can be applied to sit.

### III. RESULTS

**Table 1. Overview of Research Respondents at BPM Palembang City**

No.	Group	Amount
1	Group (Peanut Ball)	15 Subjects
2	Group (Gym Ball)	15 Subjects
Amount		30 Subjects

Based on table 1 above can be explained that in the treatment group and BPM kontrol in Palembang as many as 15 people.

**Table 2. Distribution of Resondent Frequencies by age at BPM Palembang City**

Age	F	Percentage
21-30 year	16	53,3 %
31-40 year	14	46,6 %
amount	30	100 %

Based on Table 2 it can be seen that the average proportion of respondents is between 20-30 years old.

**Table 3. Frequency distribution of respondents by occupation in BPM Palembang City**

Occupation	F	Percentage
work	4	13,3 %
Does not work	26	86,6 %
amount	30	100 %

ws that 86.6% of respondents did not work.

**Table 4. Characteristics of respondents by occupation in BPM Kota Palembang**

Test of Normality	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Age	.140	30	.137	.942	30	.104
Duration of Labor	.162	30	.042	.946	30	.136

a. Lilliefors Significance Correction

Based on the results of the test of normality in table 4 above, the respondent's characteristic data has a score > 0.05 which

means the data is normally distributed, then the statistical test used is the unpaired t-test (parametric test). However, if the data does not meet the requirements, an alternative test is used, namely the Mann-Whitney test (non-parametric test).

**Table 5. Distribution of Respondents by Treatment using peanut ball and gymball with Progress in Delivery**

	n	mean ± s.b	Diference of mean (IK 95%)	P
Peanut ball	15	3.00 ± 1.414	(-2.615) – (-0.585)	0.003
Gym ball	15	4.60 ± 1.298		

Based on Table 5 the analysis results that the average length of delivery in the treatment group was 3.00. Whereas in the control group with an average delivery rate of 4.60. Value of p value = 0.003 which means that there are significant differences in the control group and the treatment group

### IV. DISCUSSION

Based on univariate research results, it is seen that the frequency distribution of respondent mothers using 15 treatments (100%) and the control group of mothers 15 people (100%).

From table 5.4 the analysis results show that the average delivery time in the treatment group is 3.00. Whereas in the control group with an average delivery rate of 4.60. Value of p value = 0.003 which means that there are significant differences in the control group and the treatment group.

The results of this study indicate if the value of p value = 0.003 then based on the independent t-test  $p < 0.05$  which means that there is a difference in effectiveness between the use of ball and gymball followers on the progress of labor in multigravida delivery mothers.

A birth ball is a physical therapy ball that helps first-time mothers in a position that helps with the progress of labor. A physical therapy that helps with labor and can be used in various positions.

The Peanut Ball: A Remarkable Labor Support Tool writes that many different positions can be used with peanut balls like Side-Lying. This position will help open the birth canal and also provide comfort to the mother on the bed (Grant, and Lynn) [5].

And supported by research conducted by Renaningtyas, et al (2013) proves that pelvic rocking with birthing ball is able to expedite the delivery process, especially in the first time and help mothers experience normal first time labor. And also supported by [5] peanut Ball will help the birth canal open and also provide comfort to the mother on the bed

Based on the description above, the researchers can conclude that based on the results of the research team in the field, the treatment group showed more effective than the control group on the improvement of labor progress in multigravida mothers in the first time in BPM Palembang City with a difference of 1 hour faster than the control group.

### V. CONCLUSION

Based on the results of research that has been done, it can be concluded as follows:

1. There is a difference in effectiveness between the use of peanut ball and gymball on the progress of labor in multigravida.
2. the treatment group (Peanut Ball) showed more effectiveness compared to the control group (Gym Ball) to increase the progress of labor in multigravida mothers in the first stage in BPM Palembang with an average difference of 1 hour faster than the control group

## **VI. ACKNOWLEDGMENT**

The author is grateful to the Palembang Health Polytechnic Institution through the Center for Research and Community Service for mentoring and funding with a beginner lecturer research scheme in 2020.

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# Effects of Hypnobreastfeeding Audio on Postpartum Mothers Anxiety in Palembang Midwife Independent Practice

1<sup>st</sup> Kharisma Virgian  
Department of Midwifery,  
Politeknik Kesehatan Kemenkes Palembang  
Palembang, Indonesia

2<sup>nd</sup> Desy Setiawati  
Department of Midwifery,  
Politeknik Kesehatan Kemenkes Palembang  
Palembang, Indonesia

Corresponding author: [kharismavirgian@poltekkespalembang.co.id](mailto:kharismavirgian@poltekkespalembang.co.id)

**Abstract** - The most common problems that arise in the process of breastfeeding is anxiety of postpartum mothers. Mom often feels unsure and not confident that she is able to give enough milk to her baby. Hypnobreastfeeding is a relaxation technique to help smooth the process of breastfeeding and the process of removing milk. The purpose of this study is to influence the Audio Hypnobreastfeeding on postpartum maternal anxiety in the Midwife Independent Practice of Palembang. This research uses non- random sampling with a sample size of 67 respondents. The sample in this study were 24-hour postpartum mothers who gave birth at Midwife Independent Practice of Teti Herawati, Ch. Mala and Meli Rosita Palembang. Quasi Experiment research design using a pretest and posttest control-group design approach. Postpartum maternal anxiety levels were measured before and after being given Audio Hypnobreastfeeding using the HARS (Hamilton Anxiety Rating Scale) instrument. The results showed that there was a significant difference between maternal anxiety levels before and after being given Audio Hypnobreastfeeding with Marginal Homogeneity Test  $p = 0,000$  ( $\alpha = 0.005$ ). Hypnobreastfeeding Audio has an effect on the reduction of postpartum maternal anxiety. The suggestion in this study was that midwives could further improve their ability to provide Hypnobreastfeeding to postpartum mothers and conduct to development of audio media into an android application.

**Keywords:** *Hypnobreastfeeding, postpartum, anxiety*

## I. INTRODUCTION

Breastfeeding is one of a series of life cycles of a woman. Starting from pregnancy, childbirth and continued with the next task which is feeding the baby. The process of breastfeeding has been prepared early when the mother is in pregnancy. However, breastfeeding problems may often occur such as non-fluent milk, abrasions nipples, nipples in, small breasts, pain during breastfeeding, anxiety and maternal worries when breastfeeding. A mother often feels anxious and insecure when breastfeeding their babies. This comes from psychological problems that arise from within the mother herself. The anxiety that arises is what most often causes problems when breastfeeding. The mother feels

unsure that she will be able to give enough milk to her baby. So that the thing that is feared happened in a mother. Finally, the mother gives a way out by giving formula milk to her baby various reasons so that the baby gets enough intake and the baby is no longer fussy (Susilowati, 2017). Problems faced by mothers when breastfeeding will have a very big impact on the growth and development of infants. The mother cannot provide adequate and optimal milk for her baby. Babies will not get exclusive breastfeeding and adequate nutrition.

Based on the Indonesia Demographic Health Demographic Survey (SDKI) data in 2017, in Indonesia children aged 0-1 months who do not get breast milk at 7.7%, aged 2-3 months who do not get breast milk at 13.2% and ages 4-5 month of 14.7% (Ministry of Health of Republic of Indonesia, 2017). The coverage rate of babies receiving exclusive breastfeeding in the province of South Sumatra is 60.36% (Ministry of Health Republic of Indonesia, 2017). And the scope of exclusive breastfeeding for the city of Palembang in 2017 was 72.76%. This figure is still far from the national target for Exclusive ASI at 80%. (Palembang City Health Profile in 2017). Another problem that will arise if the baby does not get enough nutrition since during pregnancy or even since birth is the problem of malnutrition in infants and children. Even though babies have to get enough nutrition in the womb or since the first 1000 days of life. Based on the data obtained, in 2016 3.12% of children aged 0-23 months experienced severe malnutrition, and increased by 3.50% in 2017. In South Sumatra province 1.61% of children aged 0-23 months experienced malnutrition in 2016, malnutrition 8.06%. And increased in 2017 by 1.90% malnutrition and 8.90% malnutrition. (RI Ministry of Health, 2017). Cases of Toddler with Nutrition Status below the red line in Palembang in 2017 were 404 children under five. (Palembang City Health Office, 2017).

To overcome these problems one way that can be done by strengthening maternal confidence while breastfeeding is to do Hypnobreastfeeding or Hypnolactation. This technique can be done alone by the mother or with a companion from the therapist. Hypnobreastfeeding techniques have begun to be applied when the mother is in pregnancy, especially when the mother has entered the third trimester or when the postpartum period is 0-24 hours (Susilowati, 2017).

Hypnobreastfeeding is a relaxation technique to help mothers in the smooth process of breastfeeding. Done by giving positive affirmation sentences to the mother into the subconscious mind when in a relaxed or calm condition. Positive affirmation is

expected to help petrify the process of breastfeeding and the process of spending milk. Deep and regular relaxation makes the endocrine system and blood flow in the body function properly and optimally. Forming a strong mother's confidence in the process of breastfeeding will make the mother relaxed and relaxed so that the endorphin hormone produced will make the baby also feel calm and comfortable (Susilowati, 2017).

## II. RESEARCH METHODOLOGY

This research using a pretest and posttest control-group design approach. Samples were taken by non-random sampling with a purposive sampling technique with a sample size of 67 respondents. The sample in this study were 24-hour postpartum mothers who gave birth at PMB Teti Herawati, PMB Ch. Mala and PMB Meli Rosita Palembang. Data collection through the provision of interventions through Hypnobreastfeeding audio media. Then an anxiety level was assessed using the HARS (Hamilton Anxiety Rating Scale) before and after the intervention was given. Postpartum mothers are given 0-24 hours Hypnobreastfeeding through Audio by using a headset so that the mother is more focused. Previously assessed anxiety levels using the HARS scale. Then the mother was asked to listen again to the Hypnobreastfeeding Audio at home at least once a day and then do a follow-up to assess the level of anxiety two weeks later.

## III. RESULTS AND DISCUSSION

Univariate data analysis aims to determine the frequency distribution of data and the percentage of each research variable. The research variable in question is the characteristic variable of the respondents which consists of age, parity, education, occupation, breastfeeding history and breastfeeding plans. Another variable is the variable level of maternal anxiety which is categorized into no anxiety, mild anxiety, moderate anxiety, and severe anxiety. Univariate analysis was performed on the characteristics of respondents and at the level of maternal anxiety before and after being given Audio Hypnobreastfeeding through. Univariate analysis data are presented in tabular and text form.

**Table 1. Characteristics of Respondents**

Characteristics	Categories	Frequency(n)	Percentage (%)
Mother's age (years)	< 20	4	6,0
	20-30	37	55,2
	>30	26	38,8
Parity	1	22	32,8
	2	21	31,3
	3	18	26,9
	4	6	9,0
Education	Elementary School	9	13,4
	Junior High School	9	13,4
	Senior High School	43	64,2
	Bachelor	6	9,0
Occupation	House wife	61	91,0
	Working	6	9,0
History of breastfeeding	No Breas tmlk	2	3,0
	Not breastfeeding yet	25	37,3
	Breast milk	40	59,7
Breastfeeding plan	Breast milk	67	100
<b>Total (N)</b>		<b>67</b>	<b>100</b>

From table 1 above it can be seen that from 67 respondents, most were in the age range of 20-30 years (55.2%) and > 30 years (38.8%), whereas in the age group <20 years only

consisted of 4 respondents (6.0%). At parity most in parity 1 that is 22 people (32.8%). Most education in high school education is as many as 43 people (64.2%). In the work variable, most of the mothers do not work or housewives are 61 people (91.0%) while only 6 people work (9.0%). In the history of breastfeeding as many as 24 mothers had given ASI to children before by 40 people (59.7%), 25 mothers had never given ASI (37.3%) and only 2 people who had never given ASI to their babies were (3 , 0%). All respondents plan to breastfeed their babies (100%).

The anxiety level variables in this study were no anxiety, mild anxiety, moderate anxiety, and severe anxiety. Measurement of anxiety using the HARS scale is done before and after being given Hypnobreastfeeding Audio

**Table 2 Frequency Distribution of Maternal Anxiety Levels Before and After being given the Hypnobreastfeeding Audio**

Level of Anxiety	Before		After	
	n	%	n	%
No Anxiety	-	-	56	83,6
Mild Anxiety	63	94,0	11	16,4
Moderate Anxiety	3	4,5	-	-
Severe Anxiety	1	1,5	-	-
<b>Total (N)</b>	<b>67</b>	<b>100</b>	<b>67</b>	<b>100</b>

From Table 2 it can be seen that before being given Hypnobreastfeeding Audio of 67 respondents, there was 1 respondent with severe anxiety (1.5%), 3 people with moderate anxiety (4.5%) and 63 people with mild anxiety (94.0%). After being given Audio Hypnobreastfeeding from 67 respondents, 56 people had no anxiety (83.6%) and only 11 people were at mild anxiety (16.4%). This means that after being given Audio Hypnobreastfeeding, the majority of respondents (83.6%) experienced a reduced level of anxiety from mild anxiety to no anxiety. While 1 person who experienced severe anxiety and 3 people who were anxiously experienced a reduced level of anxiety became mild anxiety.

**Table 3. Effects of Hypnobreastfeeding Audio on Postpartum Mother Anxiety**

		The anxiety level after given Hypnobreastfeeding Audio				Total n (%)	p value
		no anxiety n (%)	mild anxiety n (%)	moderat anxiety n (%)	severe anxiety n (%)		
		The anxiety level before given Hypnobreastfeeding Audio	56 (83,6)	-	-		
	mild anxiety	-	11 (16,4)	-	-	63 (94%)	0,000
	moderat anxiety	-	-	-	3 (4,5)		
	severe anxiety	-	-	-	1 (1,5)		
<b>Total</b>		56 (83,6)	11 (16,4)	-	-	67 (100)	

Based on the results of the bivariate analysis in table 3, it can be seen that before being given Audio Hypnobreastfeeding there were 63 respondents (94.0%) at mild anxiety levels and after being given Audio Hypnobreastfeeding anxiety levels dropped to no anxiety (83.6%). While from 1 person at the level of severe anxiety and 3 people at the level of moderate anxiety, after being given Audio Hypnobreastfeeding the level of anxiety dropped to mild anxiety by (16.4%). The statistical test used is the Marginal Homogeneity Test because it is a categorical comparative analysis in paired groups

where category > 2. Based on the statistical test results using the Marginal Homogeneity statistical test, the  $\rho$  value is 0,000 ( $<\alpha = 0.005$ ). This means that there is a significant difference between maternal anxiety levels before and after being given Hypnobreastfeeding Audio.

This research is an experimental research with pre and post control design. Anxiety level was measured in postpartum mothers using the HARS scale before and after the intervention. The HARS scale consists of several levels of categories calculated by scores, where the level of anxiety is divided into no anxiety (<14), mild anxiety (14-20), moderate anxiety (21-27) and severe anxiety (28-40). Measuring the level of anxiety or pre-test is done before the intervention is carried out at 24 hours postpartum while the post-test stage is done 2 weeks later to determine the level of maternal anxiety when breastfeeding.

The intervention in the form of giving Hypnobreastfeeding is the provision of words and sentences of positive affirmations accompanied by the accompaniment of relaxation music that can increase the calm, comfort and confidence of the mother when giving milk to her baby. Giving Hypnobreastfeeding is done through an Audio Hypnobreastfeeding media.

The results of this study are in line with research conducted by Kusmiyati (2014), Hypnobreastfeeding has a strong influence on anxiety in postpartum mothers as evidenced by the  $\rho$  value (0,000). And Hypnobreastfeeding also has an influence on the length of breast milk expenditure in postpartum mothers with a value of  $\rho$  value (0.004). In this research, the Hypnobreastfeeding technique is done by giving positive affirmations directly accompanied by the rhythm of a relaxation song that is played through a CD.

Likewise with research conducted by Rahmawati (2017), showing that Hypnobreastfeeding influences milk production in nursing mothers who work with a value of  $\rho$  value (0,000). The average milk production increased from 210 ml/day before being treated to 255 ml/day after Hypnobreastfeeding. The Hypnobreastfeeding technique used in this study was an independent method by the mother after being given an explanation and done at least 2x a day before breastfeeding.

Hypnobreastfeeding is a relaxation technique to help mothers in the smooth process of breastfeeding. Done by giving positive affirmation sentences to the mother into the subconscious mind when in a relaxed or calm condition. Positive affirmation is expected to help petrify the process of breastfeeding and the process of spending milk. Deep and regular relaxation makes the endocrine system and blood flow in the body function properly and optimally. Forming a strong mother's confidence in the process of breastfeeding will make the mother relaxed and relaxed so that the endorphin hormone produced will make the baby also feel calm and comfortable (Susilowati, 2017).

Hypnobreastfeeding is the latest technique that can create strong and positive motivation and confidence in a postpartum mother and can increase the amount and production of quality breast milk. With Hypnobreastfeeding techniques, mothers can feel relaxation and calmness in themselves so that they can produce a lot of quality milk and can support the success of mothers in breastfeeding. (Armini, 2016).

To maximize the breastfeeding process the process of administering Hypnobreastfeeding can be done in several ways both directly and through the media. And can also be combined with several other techniques such as Oxytocin Massage. Hypnobreastfeeding combined with the Oxytocin Massage technique is proven effective in reducing anxiety in breastfeeding mothers and can increase the quality and quantity of milk production (Lutfiana PS, 2017).

According to research conducted by Anggraini in 2012, one of the ways to motivate mothers to give ASI to their babies is through the provision of Hypnobreastfeeding techniques, a natural effort made to instill intentions into the mind and subconscious of the mother to produce and produce sufficient milk for the baby. Peace of mind and comfort and peace of mind felt by breastfeeding mothers is one of the main factors of success in breastfeeding especially to support the success of exclusive breastfeeding.

Hypnobreastfeeding is an effective way to support the success of breastfeeding in postpartum mothers. With the calmness and comfort felt by the mother, she will produce more milk and enough for her baby, which can eliminate the anxiety and anxiety felt by the mother during the breastfeeding process. Giving Hypnobreastfeeding can be done directly or through certain media.

#### IV. CONCLUSION

From the results of statistical tests, there were significant differences between the anxiety levels of postpartum mothers before and after through Hypnobreastfeeding Audio. Hypnobreastfeeding influences the level of postpartum maternal anxiety. It is recommended that health workers further enhance the ability to provide Hypnobreastfeeding to nursing mothers, to develop application media in further research

#### V. ACKNOWLEDMENT

The author would like to thank profusely to all parties who have helped and support the research. Especially to the Department of Midwifery, Health Polytechnic of Palembang Health Polytechnic.

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# Toddler Biscuit With Addition of Patin Flour and Pandan Leaves Extract Along with Acceptability Test

1 <sup>st</sup> Imelda Telisa	2 <sup>nd</sup> Indriani Ayu Lestari	3 <sup>rd</sup> Khusnul Alfia Artrizki	4 <sup>th</sup> Suci Prihatiningsih
<i>Nutrition Department</i>	<i>Nutrition Department</i>	<i>Nutrition Department</i>	<i>Nutrition Department</i>
<i>Health Polytechnic of Health Ministry</i>	<i>Health Polytechnic of Health Ministry Palembang</i>	<i>Health Polytechnic of Health Ministry Palembang</i>	<i>Health Polytechnic of Health Ministry Palembang</i>
<i>Palembang, Indonesia</i>	<i>Palembang, Indonesia</i>	<i>Palembang, Indonesia</i>	<i>Palembang, Indonesia</i>
Imeldatelisa@polekkespalembang.ac.id	lestariindrianiyu@gmail.com	alfiahkhusnul04@gmail.com	suciprihatiningsih@gmail.com

Corresponding author: Imeldatelisa@polekkespalembang.ac.id

**Abstract** - Stunting is a major nutritional problem facing Indonesia. Based on Pemantauan Status Data (PSG) for the past three years, stunting has the highest prevalence compared to other nutritional problems such as malnutrition, wasting and obesity. The prevalence of toddlers stunting has increased from 2016 which is 27.5% to 29.6% in 2017. Biscuits can be enjoyed from infants to the elderly with different biscuit compositions according to their needs. Biscuits have a longer shelf life and practically brought as provisions for healthy and nutritious food. Since 2009, wheat flour as a raw material for biscuits was obtained not from within the country (imported), which means it requires a large cost to obtain these raw materials. This study was an experimental study using a Completely Randomized Design (CRD) and Friedman non parametric data analysis. Organoleptic test show that there is a relationship between acceptability with the addition of patin flour in terms of biscuits in terms of taste ( $p = 0,000$ ), texture ( $p = 0,005$ ), aroma ( $p = 0,000$ ), and color ( $p = 0,005$  ). The results of physical analysis showed that the biscuits most favored by the panelists were formulas P0 and P1. The formula chosen as a potential biscuit to reduce the risk of stunting is P3 biscuits, which have a nutritional composition of 18.84% protein, 28.02% fat, and 41.25% carbohydrate.

**Keywords:** stunting, biscuit, patin flour

## I. INTRODUCTION

The incidence of stunting (short) children is a major nutritional problem facing Indonesia. Based on *Data Status Monitoring* for the last three years, stunting has the highest prevalence compared to other nutritional problems such as malnutrition, underweight and obesity. The prevalence of stunting under five has increased from 2017 [1] namely 29.6% to 30.8% in 2018[2].

The World Health Organization (WHO) recommends of fish intake at least two servings per week[3]. However, data shows that the level of Indonesian fish consumption tends to be low compared to other countries. The level of Indonesian fish consumption in 2013 was 35.14 kg / cap / year. This has shown an increase compared to previous years, namely 33.89 kg / cap / year (2012), 32.25 kg / cap / year (2011), and 30.48 kg / cap / year (2010)[4] Biscuits are baked products in the form of small pieces and have a dry, crunchiness texture or

consistency with a tighter pore texture. Biscuits are a thin product with a relatively low moisture content ( $\pm 5\%$ ), the dough is ground into thin sheets which are then cut or baked. The addition of patin flour is an effort to find other ingredients that can replace some of the wheat flour without reducing the nutritional value of the food, for example is patin flour. The content contained in patin from the analysis has 15 amino acids consisting of 9 essential amino acids, the highest being leucine is 5.92% and 6 nonessential amino acids with the highest value of lysine is 5.58%[5].

Fragrant pandanus is a plant whose leaves are often used as a food additive, generally as a green coloring agent and giving it a distinctive aroma. The content of fragrant pandan leaves which includes flavonoids, alkaloids, saponins, tannins, polyphenols, and dyes which are thought to have a contribution to antibacterial activity[6].

## II. RESEARCH METHODOLOGY

Toddler Biscuit With Addition of Patin Flour and Pandan Leaves Extract Along with Acceptability Test This research is a purely experimental study using a non-factorial completely randomized design study (CRD) with 4 (four) treatments. The research was carried out in July to October 2019. Biscuit making was carried out at the Food Laboratory of the Nutrition Department of the Palembang Health Polytechnic, the organoleptic test was carried out at the Palembang Health Polytechnic Nutrition Department, and the proximate content test was carried out at the Chemical and Microbiology Laboratory of the Faculty of Agriculture, Sriwijaya University Palembang.

The samples of this study were biscuits with the addition of patin flour and pandan leaf extract with a predetermined number of substitutions. Biscuit samples to be assessed by panelists were presented with 1 (one) piece for each formula. Samples were taken randomly from the results of the repetition of each formula.

The samples presented to the panelists then assessed for their characteristics including color, aroma, texture and taste, which were product stimuli that could be recognized by the senses (organoleptic)[7]. The biscuit characteristics were assessed using a preference test questionnaire so that it can be seen that the biscuits that received the highest preference level from the panelists were the biscuits that had the highest acceptance. Panelists in this study were

semi-trained panelists, namely 30 students of the Department of Nutrition, Palembang Health Polytechnic.

**Table 1. Formula of patin flour and pandan leaves extract biscuits**

Composition (g)	Formula			
	F0	F1	F2	F3
Wheat flour	100	100	100	100
Patin flour	0	20	30	40
Margarine	50	50	50	50
Egg yolk	30	30	30	30
Sugar	25	25	25	25
Pandan leaf extract	15	15	15	15

The ingredients used in the biscuits in this study were wheat flour, patin flour, margarine, egg yolk, sugar, and pandan leaf extract. The formulation of patin flour is presented in Table 1. Make the biscuits with the addition of patin flour and pandan leaf extract has begun by mixing the ingredients, namely granulated sugar, egg yolk, wheat flour, patin flour, margarine, and pandan leaf extract, and stirring until blended. The biscuit dough that has been mixed then rolled using a wooden roll to get the optimal thickness of 0.5 cm with a diameter of 3 cm, then printed using a round cake mold. The dough that has been printed then arranged on a baking sheet and baked in an oven at 180°C for around 25 minutes.

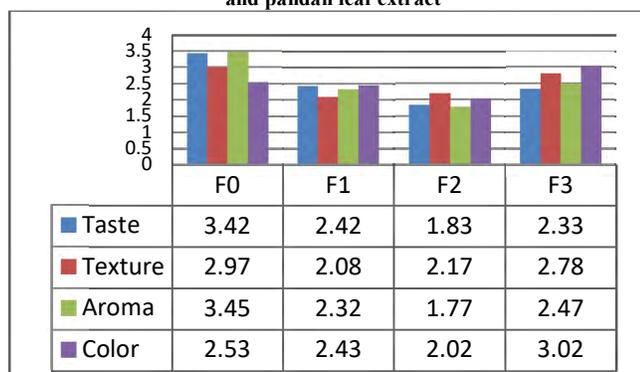
The assessment carried out in this study was the acceptance obtained from the preference level test using a preference test questionnaire. The formula of patin flour and pandan leaf extract biscuits which had the highest acceptance then laboratory tested for their nutrient content.

Organoleptic tests were carried out on the biscuit formula F0 (control biscuit) and the three formulas for patin flour biscuits and pandan leaf extract, namely F1, F2, and F3. Then after the data obtained from the organoleptic test results were analyzed using a non-parametric test (Friedman test) to see the average level of acceptance in the form of ranking and the effect of adding patin leaf and pandan leaf extract to the biscuits.

## RESULTS AND DISCUSSION

The results of the acceptability test on 30 semi-trained panelists on the level of preference for the characteristics of patin flour biscuits and pandan leaves extract can be seen in Graph I and Table II.

**Graph I. Distribution of acceptance of biscuits with the addition of patin and pandan leaf extract**



Based on Graph I, The organoleptic test results showed that the most preferred taste, texture and aroma were F0 biscuit (control biscuit), each of which had an average value of 3.43; 2.97; and 3.45. However in terms of color, the most preferred is F3 biscuit (addition of 40 grams of patin flour). Of the three types of formula for adding patin flour, the biscuit formula P3 was preferred in terms of texture, aroma and color with an average of 2.78; 2.47 and 3.02.

**Table II. The relation between biscuit acceptance of the addition of patin flour and pandan leaf extract**

Category	p-value
Taste	0,000
Texture	0,005
Aroma	0,000
Color	0,005

The results of the analysis using the Friedman test on the acceptability assessment (color, aroma, texture, and taste) showed a significant difference ( $\alpha < 0.05$ ) on all characteristics.

Next on, Table III showed chemical characteristics were carried out on the control biscuit formula (F0) and the most preferred formula for adding patin meal (F3).

**Table III. Chemical analysis of patin flour addition biscuits using proximate test**

Cod e	Water Content (%)	Ash Content (%)	Fat Conte nt (%)	Protein Content (%)	Carbohydrat e Content (%)
PO	5,02	0,98	25,87	9,54	58,59
P3	10,47	1,41	28,02	18,84	41,25

**Table IV. Nutritional value of F3 biscuits and PMT biscuits for toddlers according to SNI for biscuits (100 g of biscuits)**

Nutrient	F3 Biscuit	SNI Biscuit
Energy (kcal)	492,54	450
Protein (g)	18,84	9
Fat (g)	88,02	14
Carbohydrate (g)	41,25	71

Based on table III, known that from two sampling biscuit show that biscuit with addition of patin flour and pandan leaves extract having more nutrition than usual biscuit. Biggest differential show at the content of protein which is P3 biscuit protein as much twice as the P0 biscuit. At table IV, showing about comparison between P3 biscuit with standard nutrition for biscuit in Indonesia.

## III. DISCUSSION

The organoleptic test results showed that the most preferred taste, texture and aroma were F0 biscuit (control biscuit), each of which had an average value of 3.43; 2.97; and 3.45. However in terms of color, the most preferred is F3 biscuit (addition of 40 grams of patin flour). Of the three types of formula for adding patin flour, the biscuit formula P3 was preferred in terms of texture, aroma and color with an average of 2.78; 2.47 and 3.02.

Based on the organoleptic test that has been carried out, the more patin flour that is added can increase the color of the biscuits. The most preferred formula for biscuits with added patin flour is F3 biscuit with the most added amount of patin flour, which is 40 grams. The results of research conducted by Ningrum, et al in the manufacture of biscuits that are added with patin flour and ginger extract, the color obtained is brown, the more patin flour is added, the browner the resulting color will be [8].

Aroma is a stimulus from food received by the tongue. Aroma is one of the important characteristics in determining the acceptability of a food product[9]. Graph 1 shows that the average panelist liked the biscuits F0 with a value of 3.45. The aroma of F0 biscuits is typical of margarine with the aroma of biscuits in general, while the aroma of biscuits added with patin flour is typical of fish aroma, although not too sharp, this is probably due to the addition of pandan leaf extract so that it can slightly disguise the aroma of patin flour. The results of the analysis using the Friedman test on the assessment of the acceptability of the biscuit aroma showed that there was a significant difference ( $\alpha < 0.05$ ) the addition of patin flour to the aroma acceptance between the biscuit formulas. This is suitable to Winarno statement, that addition of foodstuffs can be influence aroma of biscuits [10]. Aroma has an important role in odor testing because it can provide an assessment of whether the product is liked or not.

Graph 1 shows that the most preferred biscuit texture characteristic is that among the formulas added with patin meal is F3 biscuit with an average value of 2.78. The texture of the biscuits is crunchy but the difference in the level of coolness between the biscuits is due to the difference in the amount of adding patin flour to the biscuit processing, the more patin flour that is added can affect the texture of the biscuits. Crunchiness or texture is one of the determinants of biscuit quality that needs to be considered, because it is closely related to the degree of consumer acceptance. In general, biscuits that are considered good are those that have a brittle texture, that is, if the biscuits are pressed with a finger they will break easily[11]. The more use of patin flour, the harder the texture will be obtained so that the biscuits are not easily crushed or broken. However, it resulted in the biscuit dough not expanding properly.

Taste is the most important characteristic in determining the acceptability of biscuits. Taste can arise due to the food ingredient itself or due to the addition of other substances [10]. Graph 1 shows that the biscuit flavor characteristic that the panelists most likes is F0 biscuit with an average of 3.42. Among the formulas for adding patin flour, the most preferred is F1 with the least amount of adding patin flour, which is 20 grams. With the addition of more and more patin flour, it will make the taste stronger, so it is not liked by the panelists. Mahmudah also mentioned that the addition of fish meal to biscuits will affect the taste of the biscuits, the addition of a strong flavoring ingredient (flavoring or spices) can be used as an alternative in reducing the strong taste of biscuits modified with patin flour [12]. The results of the analysis using the Friedman test on the acceptability assessment (color, aroma, texture, and taste) showed a significant difference ( $\alpha < 0.05$ ) on all characteristics.

Chemical characteristics were carried out on the control biscuit formula (F0) and the most preferred formula for adding patin meal (F3). Based on Table 3, the water content of F3 biscuits was higher than F0, which was 10.47%. These results indicate that the addition of patin flour to the biscuit formula will affect the water content of the biscuits. The more fish flour added to the biscuit formula, the more water content in the biscuits will increase. The highest protein

content was F3 biscuit, which was 18.84% with the addition of 40 grams of patin meal. The amount of protein SNI criteria for biscuits is at least 5 g per 100 g of product. The high or low value of the measured protein can be influenced by the amount of water lost (dehydration) of the material. The measured protein value will be greater if the amount of water lost is greater. According to Sebranek, the measured protein content depends on the amount of ingredients added and is largely influenced by the water content [13].

Biscuits with the addition of patin flour and pandan leaf extract as an alternative to supplemental food (PMT) for toddlers, especially those with stunting nutritional status, in addition to having high acceptance, they must also be able to meet the nutritional intake needs, especially energy and protein for toddlers. Table 4. Shows that the energy, protein and fat content for patin flour biscuits is higher than the SNI standard biscuits. This means that biscuits with the addition of patin meal and pandan leaf extract are suitable as an alternative to PMT for toddlers.

#### IV. CONCLUSION

The addition of patin flour and pandan leaf extract in the manufacture of PMT biscuits for toddlers with different proportions in each treatment could significantly affect the acceptability of the biscuits to taste, color, aroma and texture. Toddlers are encouraged to consume biscuits with the addition of patin flour and pandan leaf extract as PMT because it can meet the energy and protein needs of toddlers so that they can increase their body weight.

#### V. ACKNOWLEDMENT

The author is gratefully to DIPA Health Polytechnic of Health Ministry for assisting in funding under the program by Institute of Research and Community Services at Health Polytechnic of Health Ministry Palembang.

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# Educational Data Mining to Predict Students Performance Based on Deep Learning Neural Network

1<sup>st</sup> Mussa S Abubakari  
*Department of Electronics & Informatics*  
*Universitas Negeri Yogyakarta*  
 Yogyakarta, Indonesia  
 Email: mussas.2019@student.uny.ac.id

2<sup>nd</sup> Suprpto  
*Department of Electronics & Informatics*  
*Universitas Negeri Yogyakarta*  
 Yogyakarta, Indonesia  
 Email: suprpto@uny.ac.id

Corresponding author: [mussas.2019@student.uny.ac.id](mailto:mussas.2019@student.uny.ac.id)

**Abstract** - Recently, educational data mining has become very helpful in decision making in an educational context and hence improving students' academic outcomes. Thus, the goal of this study was to create a predictive model to predict students' academic performance based on a neural network algorithm. Authors implemented a Neural Network data mining technique using Anaconda 3 as datamining tool to extract knowledge patterns from student's dataset consisting of 131 students with 22 attributes for each student. The classification metric used is accuracy as the model quality measurement. The result indicates that when SGD optimizer was applied, the accuracy was below 80%. While, when Adam optimization technique was applied the accuracy improved to more than 96% which is more than a satisfactory percentage for our predictive model. This indicates that the suggested NN model can be reliable for prediction, especially in social science studies like education.

**Keywords** - Classification, Data Mining Techniques, Educational Data Mining, Neural Network Algorithm, Predictive Model.

## I. INTRODUCTION

The rapid advancement of science and technology, especially information and communication technology (ICT), is a fact which cannot be denied. The existence of ICT makes human life easier than some decades ago. ICT increasingly shows its glory in various fields of life, one of which is the educational aspect [1], [2]. The development of ICT encourages various educational institutions to use artificial intelligence to increase the effectiveness and flexibility of learning for better academic outcomes.

Currently, data mining has become an interesting topic for many researchers in various fields such as medicine, engineering, and even educational field. Especially in educational context, through mining of students' data, it has become easier to make decisions concerning students in their academic performance. The prediction of students' performance is a vital matter in educational context as predicting future performance of students after being admitted into a college, can determine who would attain poor marks and who would perform well. These results can help make efficient decisions during admission and hence improve the academic services quality [3], [4], [5].

### A. Related Work

Various studies have been conducted concerning data mining in educational context for uncovering knowledge patterns from students' information for improving academic performance of students. This current study will base its theoretical background based on the previous research done on the educational data mining contexts as explained below.

The study was conducted on engineering students based on different mining techniques for making academic decisions. Techniques involving classification rules and association rules for discovering knowledge patterns, were used to predict the engineering student's performance. The study experiment also clustered the students based on k-means clustering algorithm [6]. In another study, students' performance was evaluated based on association rule algorithm. The research was done by assessing the performance of students based on different features. The experiment was implemented based on real time dataset found in the school premises using Weka [7].

Baradwaj and Pal explained in their study on student's assessment by using a number of data mining methods. Their study facilitated teachers to identify students who need special attention to reduce the fail percentage and help to take valid measure for next semesters [5]. Also, another study was done to develop a classification model to predict student performance using Deep Learning which learns multiple levels of representation automatically. They used unsupervised learning algorithm to pre-train hidden layers of features layer-wisely based on a sparse auto-encoder from unlabeled data, and then supervised training was used for the parameters fine-tuning. The resulted model was trained on a relatively huge real-world students' dataset, and the experimental findings indicate the effectiveness of the proposed method to be implemented into academic pre-warning mechanism [8].

Other researchers developed models to predict students' university performance based on students' personal attributes, university performance and pre-university characteristics. The studies included the data of 10,330 students Bulgaria with every student having 20 attributes. Algorithms such as the K-nearest neighbour (KNN), decision tree, Naive Bayes, and rule learner's algorithms were applied to classify the students into 5 classes: Excellent, Very Good, Good, Bad or Average. Overall accuracy was below 69%. However, decision tree classifier showed best performance having the highest overall accuracy, followed by the rule learner [9, 10].

Recently, the study was conducted to predict user's intention to utilize peer-to-peer (P2P) mobile application for transactions. Logistic regression (LR) analysis technique together with neural network were used to predict the technology adoption. The results indicated that NN model has higher accuracy than LR model [11]. Another study proposed a student performance model with behavioral characteristics. These characteristics are associated with the student interactivity with an e-learning platform. Data mining techniques such as Naïve Bayesian and Decision Tree classifiers were used to evaluate the impact of such features on student's academic performance. The results of that study revealed that there is a strong relationship between learner behaviors and its academic achievement [12].

In this study, a predictive model is created based on neural network (NN) classification algorithm in predicting academic performance of students by using students' behavioral characteristics and their distinctive demographic data as variables. A predictive model using NN data mining approach can help in making decisions and conclusions on academic success of students hence enhancing academic management and improve education quality.

### B. Background

Analysis of students' educational data using data-mining techniques helps extract unique information of students from educational database and use that hidden information to solve various academic problems of students by understanding learners, improve teaching-learning methods and process [13], [14]. Moreover, these data mining techniques help educational stakeholders to make quality decisions to enhance students' achievement. Different data mining methods can solve different educational problems such as classification and clustering. The famous known data mining method in prediction models is classification. Various deep learning algorithms like Neural Networks, are used under classification matter [15].

Various methods like Decision tree and Naïve Bayesian were used by many researchers for predicting learners' academic performance and make decisions to help those who need help immediately [14]. Other researchers used ensemble methods such as Random Forest (RF), AdaBoosting, and Bagging as classification methods [14], [16]. In this current project, a predictive model is created based on neural network (NN) classification algorithm in predicting academic performance of students.

## II. METHOD

### A. Data Collection and Preparation

The student data implemented in this study were obtained from the study by [13]. and can be freely accessed and used from UCI Machine Learning Repository website. The dataset comprises demographic information, socio-economic features, and academic information of students. The total number of attributes of the dataset after data cleaning is twenty-two (22) consisting of 131 (instances) students. Note that, according to the source of dataset description, the

dataset is supposed to have 300 instances (students) [13]., but actually the dataset only has 131 instances.

Since the dataset contains variables with different categories, there was a need to transform them into a form the computer and NN model can process. The dataset consists of three main categories of variables, namely nominal variables with two categories, variables with numerical, and nominal variables with three or more categories. Nominal variables with two categories were transformed using label encoder mechanism. While, those with three or more categories were transformed using one-hot encoding (dummies method). Furthermore, continuous numerical variables were transformed by normalizing them using min-max scaler mechanism for normal distribution. Table 1 shows the description of all variables in the dataset [13].

Table 1. Dataset description

Attribute	Description	Values
GE	Gender	(Male, Female)
CST	Caste	(General, SC, ST, OBC, MBC)
TNP	Class X Percentage	(Best, Very Good, Good, Pass, Fail) If percentage $\geq 80$ then Best If percentage $\geq 60$ but less than 80 then Very Good If percentage $\geq 45$ but less than 60 then Good If Percentage $\geq 30$ but less than 45 then Pass If Percentage $< 30$ then Fail
TWP	Class XII Percentage	(Best, Very Good, Good, Pass, Fail)
IAP	Internal Assessment Percentage	Same as TNP
ESP	End Semester Percentage	(Best, Very Good, Good, Pass, Fail)
ARR	Whether the student has back or arrears papers	Same as TNP (Yes, No)
MS	Marital Status	(Married, Unmarried)
LS	Lived in Town or Village	(Town, Village)
AS	Admission Category	(Free, Paid)
FMI	Family Monthly Income (in INR)	(Very High, High, Above Medium, Medium, Low) If FMI $\geq 30000$ then Very High If FMI $\geq 20000$ but less than 30000 then High If FMI $\geq 10000$ but less than 20000 then Above Medium If FMI $\geq 5000$ but less than 10000 then Medium If FMI is less than 5000 then Low The figures are expressed in INR.
FS	Family Size	(Large, Average, Small) If FS $> 12$ then Large If FS $\geq 6$ but less than 12 then Average If FS $< 6$ then Small
FQ	Father Qualification	(IL, UM, 10, 12, Degree, PG) IL= Illiterate UM= Under Class X
MQ	Mother Qualification	(IL, UM, 10, 12, Degree, PG) IL= Illiterate UM= Under Class X
FO	Father Occupation	(Service, Business, Retired, Farmer, Others)
MO	Mother Occupation	(Service, Business, Retired, Farmer, Others)
NF	Number of Friends	(Large, Average, Small)
SH	Study Hours	Same as Family Size (Good, Average, Poor)
SS	Student School attended at Class X level	$\geq 6$ hours Good $\geq 4$ hours Average $< 2$ hours Poor (Govt., Private)
ME	Medium	(Eng, Asm, Hin, Ben)
TT	Home to College Travel Time	(Large, Average, Small) $\geq 2$ hours Large $\geq 1$ hours Average $< 1$ hour Small
ATD	Class Attendance Percentage	(Good, Average, Poor) If percentage $\geq 80$ then Good If percentage $\geq 60$ but less than 80 then Average If Percentage $< 60$ then poor

### B. Methods and Tools

For this study, authors used Anaconda 3 software environment for python machine learning language together with keras machine learning library and specifically TensorFlow utility which is powerful to create and evaluate the proposed NN classification model [17], [18], [19]. Keras is a python library widely used in deep-learning that run on top of TensorFlow and Theano, providing an intuitive best API for Python in NNs [20], [21].

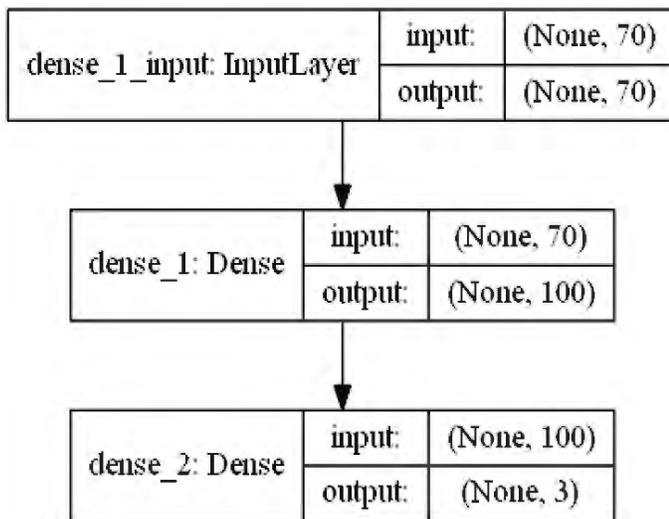
## III. RESULTS AND DISCUSSION

After data transformation, the inputs increased from 22 columns (inputs) to 70 columns and the output (classification outputs) of 3 outputs making a total of 73 columns in the NN model matrix. After that, the dataset was split into train data and test data with 25% of data for testing and the remaining percentage for training.

The following step was to create a predictive model based on Neural Network algorithm to evaluate the attributes which influence directly or indirectly student's academic success. Moreover, cross validation with 10-fold was used to divide the dataset for training and testing process. Then the process was followed by fitting the model by 50 iteration (epochs) with 10 batch-size of inputs and then followed by model evaluation for generating knowledge representation. The evaluation measure used is accuracy for classification quality. Accuracy is the proportion or ratio of the total number of correct predictions to incorrectly predicted.

The NN predictive model consists of three layers: (1) input layer with 70 neurons, (2) hidden layer with 100 neurons and (3) output layer with 3 outputs. The input layer receives input data from 22 attributes and the output layer send output of three grade categories, namely Good, Average, and Poor. There is a hidden layer between the input layer and output layer. Figure 1 below shows the NN model structure created by a python code.

Fig. 1. The NN model structure created by a python code



In this project, accuracy is used as the metric for measuring prediction quality of the developed NN model. Also, only NN algorithm was used for classification of the student dataset. The result of the experiment has two versions due to the implementation of two different model optimizers namely, Adam and Stochastic gradient descent (SGD).

The result indicates that when SGD optimizer was applied, the accuracy was below 80%. While, when Adam optimization technique was applied the accuracy improved to more than 96% which is more than a satisfactory percentage for our predictive model developed using NN algorithm. The knowledge patterns and results discovered in this project after applying NN classification method indicate that different attributes of students have impacts on their learning process as it can be seen in the classification accuracy results. The Figure 2 below illustrate a part of last iterations and accuracy result after running the NN algorithm.

Also, Figure 3 depict the python code used to create, fit, and validate the NN model. Note that, for simplicity, the code blocks used to encode (transform) the dataset is omitted.

Fig. 2. Part of last iterations and accuracy result.

```
Epoch 43/50
131/131 [=====] - 0s 346us/step - loss: 0.2445 - accuracy: 0.9313
Epoch 44/50
131/131 [=====] - 0s 334us/step - loss: 0.2325 - accuracy: 0.9466
Epoch 45/50
131/131 [=====] - 0s 236us/step - loss: 0.2252 - accuracy: 0.9542
Epoch 46/50
131/131 [=====] - 0s 305us/step - loss: 0.2180 - accuracy: 0.9466
Epoch 47/50
131/131 [=====] - 0s 284us/step - loss: 0.2058 - accuracy: 0.9542
Epoch 48/50
131/131 [=====] - 0s 309us/step - loss: 0.2035 - accuracy: 0.9542
Epoch 49/50
131/131 [=====] - 0s 312us/step - loss: 0.1964 - accuracy: 0.9542
Epoch 50/50
131/131 [=====] - 0s 360us/step - loss: 0.1933 - accuracy: 0.9618
131/131 [=====] - 0s 723us/step
accuracy: 96.95%
```

Fig. 3. Piece of python code used to create, fit, and validate the NN model

```
In [ ]: from keras.models import Sequential
        from keras.layers import Dense
        import pandas as pd
        import numpy as np
        import matplotlib.pyplot as plt
        import seaborn as sns
        color = sns.color_palette()
        sns.set_style('darkgrid')
        from scipy import stats
        from scipy.stats import norm, skew
        from scipy.special import boxcoxlp
        from sklearn.model_selection import cross_val_score, train_test_split, KFold, GridSearchCV
        from sklearn.preprocessing import OneHotEncoder, LabelEncoder, StandardScaler, MinMaxScaler
        from sklearn.metrics import confusion_matrix, classification_report, accuracy_score, precision_score
        from sklearn.pipeline import Pipeline, make_pipeline
        from keras.optimizers import SGD
        from keras.constraints import maxnorm
        from keras.utils import plot_model
        import os
        os.environ["PATH"] += os.pathsep + 'C:/Program Files (x86)/Graphviz2.38/bin/'
        %matplotlib inline

df = pd.read_csv('data/academic_record.csv')
df.head()
df.shape
data = df.values
X = data[:,0:70]
Y = data[:,70:]
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.25, random_state=7)

model=Sequential()
model.add(Dense(100, input_dim=70, kernel_initializer='uniform',activation='relu'))
model.add(Dense(3, kernel_initializer='uniform',activation='sigmoid'))
sgd = SGD(lr=0.01, momentum = 0.8, decay = 0.0, nesterov = False )
model.compile(loss='categorical_crossentropy', optimizer='adam', metrics=['accuracy'])
model.fit(X_train, Y_train, epochs = 50, batch_size = 10, verbose=2)
_, accuracy = model.evaluate(X_test, Y_test, verbose = 0)
print('accuracy: %.2f'%(accuracy*100))
model.predict(X_test)
plot_model(model, show_shapes =True, to_file = 'student_model.png')
```

#### IV. CONCLUSION

Education is a vital element in any community for their social-economic development. Data mining techniques or business intelligence allows extracting knowledge patterns from students'

raw data offering interesting chances for the educational context. Particularly, various studies have implemented machine learning techniques like Decision Tree and Random Forest to enhance the management of college resources and hence improving education quality.

In this study, the authors have presented a predictive model using NN technique to learn the patterns from students' data and predict their academic performance. By applying data mining techniques on students' database, academic stakeholders can find the important factors which have direct or indirect impacts on the student's academic success. The knowledge patterns and results discovered in this study after applying NN classification method indicate that different attributes of students have impacts on their learning process as it can be seen in the classification accuracy results. The final classification accuracy obtained was 96.95% which is more than satisfactory percentage for the predictive model developed using NN algorithm.

Like other studies, this study is with some limitations too. One of which is the dataset can only be applied to the similar context as this study. Also, the results presented here involves the accuracy as the only predictive measure of model quality. Moreover, only one algorithm, NN algorithm was used for classification purpose.

For future studies, authors intend to use the localized student data from a particular university in Yogyakarta city. Also, in the future we expect to apply other data mining methods such as RF, DT, and others for comparison. Moreover, future experiments will add more measurement classification qualities such as Precision, sensitivity, and Recall.

## V. ACKNOWLEDGMENT

I appreciate all the efforts of my close friends and my lecturer providing me the advice I needed to accomplish this work.

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The 1<sup>st</sup> International Conference On Health, Social, Sciences, and Technology (ICoHSST 2020)

# Relationship between Mothers' Knowledge with Diarrhea Prevention in Toddlers

1<sup>st</sup> Indah Dewi Ridawati  
Nursing Department  
Politeknik Kesehatan Kemenkes Palembang  
Lubuk Linggau, Indonesia  
indahdewiridawati@gmail.com

2<sup>nd</sup> Bintoro Nugroho  
Musi Rawas District  
Social Service  
Musi Rawas, Indonesia  
bintoro.nugroho99@gmail.com

Corresponding author: indahdewiridawati@gmail.com

**Abstract**— Diarrhea is a condition that is not normal feces expenditure or unusual, characterized by an increase in volume, thinned, and the frequency is more than three times a day. The prevalence of diarrhea diseases is increasing, the total cases of diarrhea diseases listed in the Work Area Air Lais sub-district Community Health centers Padang Jaya in 2014 reached 230 cases. This happens because the prevention of diarrhea diseases has not been done optimally by Padang Jaya sub-district community. The purpose of this research is to determine the relationship between knowledge with prevention of diarrhea disease in toddlers. This research is a quantitative research with *cross sectional* design. The sample in this study were mothers with children under five by purposive sampling technique. The participants of this research was 95 mothers and statistical analysis using *chi square*. Results of the analysis found correlation between maternal knowledge with efforts to prevent diarrhea disease in toddlers ( $p$  value = 0.000). Expected health workers can improve the promotion for better health and increasing efforts to prevent diarrhea diseases that can be carried by mothers as a prevention of diarrhea disease in Toddlers.

**Keywords**— Knowledge; prevention of diarrhea disease

## I. INTRODUCTION

According to data from the World Health Organization or WHO, diarrhea is the first number cause of infant mortality in the world, while diarrhea is the second number killer of children under five after acute respiratory infections. UNICEF (United Nations Agency for Children's Affairs) estimates that every 30 seconds there is one child who dies of diarrhea. According to WHO, diarrheal disease in Indonesia as much as 15,382 or 2.5% of the total population [1].

In 2000 to 2010 a morbidity survey conducted by the Department of Health's Diarrhea Sub-Department found that the incidence of diarrhea increased. In 2000 the diarrhea incident was 301/1000 inhabitants, in 2003 the incidence of diarrhea rose to 374/1000 population, in 2006 the incidence of diarrhea rose to 423/1000 population [2], with a total of 10,980 sufferers and 277 deaths (CFR, 2, 52%).

In Indonesia there are reported to be 1.6 to 2 diarrheal events per year in infants, so overall the estimated incidence of diarrhea in infants ranges between 40 million a year with deaths of 200,000-400,000 children under five. In a 2000 survey conducted by the Directorate General of P2MPL of the Ministry of Health in 10 provinces, it was found that from 18,000 households surveyed a sample of 13,440 toddlers was taken, and the incidence of diarrhea in infants was 1.3 episodes of diarrhea per year [3].

Based on data from the Bengkulu Provincial Health Office in 2011 the incidence of diarrhea in Bengkulu Province was 16,634, in 2012 as many as 18,660 people. Of the 9 districts and 1 municipality in Bengkulu Province in 2012, North Bengkulu Regency was one of the biggest contributors to diarrhea cases, which was 5,085 cases (43.7%). Furthermore, according to the North Bengkulu Regency Health Service Profile, in 2011 the incidence of diarrhea in infants was 2,021 cases, whereas in 2012 the incidence of diarrhea in infants was 5,085 cases. In 2014, the incidence of diarrhea in Bengkulu Utara Regency was ranked 6th out of 10 diseases with the largest incidence. Of the 47,077 cases of 10 most diseases, the incidence of diarrhea was found to be 4,118 events [4]. And according to the Air Lais Health Center Profile, in 2014, the incidence of diarrheal diseases in the Air Lais Health Center ranked 9 out of 10 most diseases. The incidence of diarrhea was found in 230 cases [5].

Many factors are cause diarrhea in infants and toddlers in Indonesia. One of the risk factors that is often researched is the factors that directly include the level of knowledge, hand washing behavior, sanitary hygiene, latrines, sewerage (SPAL), water bacteriological quality, home conditions. Handwashing with soap is the most inexpensive and effective health intervention compared to the results of other health interventions in reducing the risk of diarrheal transmission, especially in infants and toddlers [6].

Prevention of diarrheal disease is an effort to stop the spread of germs that cause diarrhea. Various efforts that have proven effective are exclusive breastfeeding to infants aged 0-6 months, avoiding the use of bottled milk, improving the preparation and storage of complementary foods (to reduce exposure to breast milk to bacteria and bacterial breeding), using clean water for drinking. The high mortality and morbidity of diarrhea is caused by the quality of drinking water sources and how to defecate, wash hands thoroughly after defecation and after defecating the baby and before preparing food or before eating, disposing of faeces (including baby faeces) properly [7].

According to the records of the Air Lais Puskesmas Profile in 2014 the high number of diarrhea cases in the working area of the Air Lais Puskesmas in the Padang Jaya District was due to conditions of low public knowledge, topography and climate change and other possibilities, so the diarrheal disease prevention program must still be further improved.

## II. METHOD

This research is a quantitative study using analytical research design and cross sectional design to determine the relationship of maternal knowledge with prevention of diarrheal diseases.

Data collection was carried out in the Air Lais Community Health Center in Padang Jaya District, North Bengkulu in May 2015 until June 2015. The population in this study were all mothers who have children under five in the Work Area of Air Lais Community Health Center in Padang Jaya District, North Bengkulu. The sample in this study were mothers who had children under five in the Work Area of Air Lais Health Center as many as 95 people who were selected purposively. The inclusion criteria used were: (1) Mothers who have children under five; (2) Willing to participate in research; (3) Able to communicate actively.

The research variables consisted of independent variables, namely (1) mother's knowledge about the definition, epidemiology of the disease, symptoms, ways of transmission of the disease, type and classification, factors that influence the frequency of occurrence of diarrhea in toddlers, and prevention of diarrheal disease. The dependent variable is prevention of diarrhea.

The data analysis technique used is the chi square method which aims to test whether the variable of mother's knowledge is related to efforts to prevent diarrhea in toddlers.

## III. RESULTS

Univariate analysis describes the frequency distribution of the variables studied, both the independent variable and the dependent variable. This analysis presents the characteristics of respondents such as age, education and occupation of mothers.

### Distribution of Respondent Characteristics

**Table 1. Distribution of Respondents by Characteristics of Respondents**

	Frequency	%
<b>Age (n=95)</b>		
20-30	49	51,6 %
31-40	46	48,4 %
<b>Education (n=95)</b>		
No school	13	13,7 %
Elementary school	17	17,9 %
Middle School	34	35,8 %
High school	22	23,2 %
College	9	9,5 %
<b>Job (n=95)</b>		
Farmers	43	45,3 %
Merchant	18	18,9 %
Private	25	26,3 %
Civil servants	9	9,5 %

Based on Table 1, we get a picture of frequency distribution based on age. Respondents with the age group 20-30 years are the most frequent or around 49 respondents (51.6%) and 46 people from the 30-40 year age group (48.4%).

Description of the distribution of respondents based on education. Respondents with junior high school education were ranked first with a frequency of 34 people or 35.8%, followed by high school with 23.2%, elementary school with 17.9%, no school with 13.7% and college with 9.5%.

Based on Table 1, of the 95 respondents 43 people (45.3%) of them were farmers, followed by the private sector 25 people (26.3%), traders as many as 18 people (18.9%) and civil servants as many as 9 people (9.5%).

### Knowledge

Knowledge in this study was measured by 13 question items with the distribution of answers attached. Based on the recapitulation of respondents' answers to the 13 questions about knowledge, knowledge is categorized into 3 categories, which is good if the respondent's score  $\geq 76\%$  answers correct; enough if the respondent scores between 56-75% correct answers; bad if the respondent's score  $<55\%$  answers correct.

**Table 2. Knowledge Categories**

No	Knowledge	f	%
1	Well	34	35,8%
2	Enough	45	47,4%
3	Bad	16	16,8%
Total		95	100%

Source: 2015 Research Results (data processed)

Table 2 shows that of the 95 research respondents, 34 people (35.8%) had good knowledge about diarrhea prevention efforts, 45 people (47.4%) had sufficient knowledge and 16 people (16.8%) had bad knowledge. Thus, the majority of respondents have sufficient knowledge about diarrhea prevention efforts, as many as 45 people (47.4%).

### Prevention of Diarrhea

Efforts to prevent diarrhea are measured by 10 question items with the following frequency distributions:

**Table 3. Efforts to Prevent Diarrhea**

No	Efforts to Prevent Diarrhea	f	%
1	Well	37	38,9%
2	Enough	50	52,6%
3	Bad	8	8,4%
Total		95	100%

Source: 2015 Research Results (data processed)

Table 3 shows that of the 95 research respondents, 37 people (38.9%) made good diarrhea prevention efforts, 50 people (52.6%) had enough to prevent diarrhea, and 8 people (8.4%) did not try to prevent diarrhea. Thus, the majority of respondents simply tried to prevent diarrhea, namely 50 people (52.6%).

## Bivariate Analysis

Bivariate analysis was performed to identify the relationship between the independent variable and the dependent variable (diarrhea prevention efforts)

### Relationship of Knowledge with Diarrhea Prevention Efforts

The relationship between knowledge and efforts to prevent diarrhea is done using the chi-square test at a 95% confidence level ( $p < 0.05$ ) which shows the following results:

**Table 4. Frequency Distribution based on Mother's Knowledge**

Knowledge	Diarrhea Prevention Efforts					
	Well		Enough		Bad	
	f	%	f	%	f	%
Well	18	18,9	16	16,8	0	0
Enough	16	16,8	29	30,5	0	0
Bad	3	3,2	5	5,3	8	8,4
Total	37	38,9	50	52,6	8	8,4

Table 4 shows that respondents who had good knowledge were 34 respondents (35.8%) there were 18 respondents (18.9%) had good diarrhea prevention efforts and 16 respondents (16.8%) had diarrhea prevention efforts which were enough. Respondents who have sufficient knowledge of 45 respondents (47.4%) there are 16 respondents (16.8%) have good diarrhea prevention efforts and 29 respondents (30.5%) have enough diarrhea prevention efforts. Respondents who have bad knowledge as many as 16 (16.8%) there are 3 respondents (3.2%) have good diarrhea prevention efforts, and 5 respondents (5.3%) have enough diarrhea prevention efforts, and 8 respondents (8.4%) have bad diarrhea prevention efforts[5].

Chi square analysis statistical test results obtained  $p$  value = 0,000, and  $\chi$  arithmetic = 45,802. Where the value of  $p = 0,000 < 0.05$  and  $\chi$  arithmetic 45.802 >  $\chi$  table which means that  $H_0$  is rejected. Thus it can be concluded that there is a meaningful relationship between mother's knowledge and efforts to prevent diarrhea in toddlers.

## IV. DISCUSSION

This study is in line with the research of Wulansari (2008) which concluded that there is a significant relationship between behavioral factors including knowledge, attitudes and actions of mothers with the incidence of diarrhea in infants in Batujajar Health Center, West Bandung Regency [8].

According to Notoatmodjo (2007), the knowledge a person has will be influenced by several factors including: the experience gained from what he has experienced himself and the experience of others he knows. Socio-culture, this culture is formed in a long time as a result of the life of a community together, beliefs can be obtained from generation to generation without any proof or obtained from the experience they have and proven true, print media, as well as electronic and books

are facilities information sources that can enhance community knowledge [9].

Based on the analysis of the relationship between mother's knowledge and diarrhea prevention efforts in infants in the Air Lais Community Health Center in Padang Jaya District, it can be concluded in accordance with the theory and related research that respondents with sufficient knowledge have adequate diarrhea prevention measures as well, this sufficient knowledge obtained from print and electronic media and the experience of the closest people who have experienced diarrhea disease in their children, and know it. The still lack of participation of mothers in attending counseling events about diarrhea disease, because many of them work in the garden for daily needs[5].

Based on the results of research and relevant theories above, the authors assume that there is a relationship between the results of research with supporting theories about the relationship of maternal knowledge with diarrhea prevention efforts in toddlers[3].

## CONCLUSIONS AND SUGGESTIONS

### Conclusion

Based on the results of research and discussion conducted regarding the relationship of knowledge and attitudes of mothers with diarrhea prevention efforts in infants in the Work Area of Air Lais Health Center, Padang Jaya District, North Bengkulu in 2015, it can be concluded that there is a significant relationship between maternal knowledge and prevention of diarrhea diseases in infants in the Work Area of Air Lais Health Center, Padang Jaya District, North Bengkulu. The better the respondent's knowledge, the better the disease prevention effort, while the lower the respondent's knowledge, the more likely it is to have less diarrhea prevention efforts.

### SUGGESTION

Considering the results of this study illustrate the relationship between mother's knowledge with prevention of diarrhea, the following suggestions are delivered:

1. It is hoped that the people of Padang Jaya Subdistrict should increase their knowledge of diarrhea diseases and preventive measures to reduce the incidence of diarrhea by attending counseling from health workers, reading books and the mass media.
2. It is hoped that the Air Lais Health Center can be more intensified by counseling, and briefing on diarrhea diseases and prevention efforts.
3. To other researchers it is recommended for further researchers to increase the number of respondents and increase the number of variables studied so that they can produce more accurate results.

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# The Related Factors To Development Of Pre-School Age Children In An-Nida Early Childhood Education Lubuklinggau City

**1<sup>st</sup> Nadi Aprilyadi\***  
Nursing Department  
Politeknik Kesehatan Kemenkes  
Palembang  
Palembang, Indonesia  
Email :apriyadi@gmail.com

**2<sup>nd</sup> Ira Kusumawaty**  
Nursing Department  
Politeknik Kesehatan Kemenkes  
Palembang  
Palembang, Indonesia  
Email:irakusumawaty@poltekkespalembang.ac.id

**3<sup>rd</sup> Yunike**  
Nursing Department  
Politeknik Kesehatan Kemenkes  
Palembang  
Palembang, Indonesia  
Email:yunike@poltekkespalembang.ac.id

**4<sup>th</sup> Yeni Elviani**  
Nursing Major  
Politeknik Kesehatan Kemenkes  
Palembang  
Palembang, Indonesia  
Email:piscesyeni732@gmail.com

Corresponding author: apriyadi@gmail.com

**Abstract--Growth and development in the pre-school is a fundamental stage of a very influential and became the foundation for the later development (Adriana, 2013). Each phase of the development of the potential for interference, resulting from the influence of various factors. Basic factors or traits and environmental factors or education becomes ghal important to know in order to avoid disruption in the child's development. The purpose of this study was determine the factors associated with the development of preschoolers. The method used is observational analytic cross sectional study. The amount sample of this study were 108 preschool children in Early Childhood Education (ECD). The used sampling technique was purposive sampling. Univariate data analysis using frequency distribution, bivariate analysis using chi-square, and multivariate logistic regression test. To find child development Denver II used methods that assess the development of social behavior, fine motor movement, gross motor movement and language. To get the data of participation in early childhood education, birth weight, parenting, sex, nutritional status, maternal education and education dad used questionnaires filled out by parents, whereas for assessing the nutritional status of use Registration Form Nutritional Status Monitoring (PSG) Toddler. The results of the study Test chi-square produce five independent variables (participation ECD, birth weight, parenting, sex and nutritional status) that have a significant relationship with the development of preschoolers and variable father's education and mother's education obtained does not have a meaningful relationship. Logistic regression analysis performed determine which variables most associated with motor development of preschool children is variable participation.**

**Keywords: Prescholl childern ,growth**

## I. INTRODUCTION

Growth and development includes two events that are different, but are interrelated and difficult to separate, namely growth and development. And to achieve optimal growth and development, depending on one's biological potential which is the result of the interaction of various interrelated factors, namely genetic factors, bio-physico-psycho-social environment and behavior. A unique process and different end results that give each child its own characteristics. Therefore, growth and development must

be a concern for the government, health workers, and the community [1].

The latest data obtained from Unicef , about 35 percent of children born with a short body in Indonesia. About 5 to 10% of children are estimated to experience developmental delays. Data on the general incidence 2014 of developmental delays is not known with certainty, but it is estimated that around 1-3% of children under 5 years experience general developmental delays [2].

### A. Related Work

According to the generation type of assumptions, we divided the existed work into two categories.

Given the importance of the Golden age (golden age), which is at the age of the first three years, early stimulation to promote growth and development to the fullest is very important to do as soon as possible. Parents play the main role to provide as early as possible the stimulation according to the age and development of the child, but in the implementation of parents in certain families is not always available and have time to provide such stimulation, so look for a substitute that allows children to still get the stimulation they need for growth and their development [3], [4]. Early childhood education (PAUD) is one alternative that can replace the role of parents as providers of education and stimulation in children. In this case PAUD should have adequate programs and resources to realize this substitute role [5].

Growth and development in pre-school is a basic stage that is very influential and becomes the basis for further development [1]. This period is short so that it is referred to as a critical period (critical period) or golden period (golden gold). No matter how small growth and development that occurs in children at preschool age, if not detected and intervenced as early as possible will reduce the quality of human resources in the future [3].

Other developmental disorders that often arise in pre-school age children are mental retardation, slow learning, autism and

impaired concentration[6]. In Indonesia, data on pre-sectional child development deviation have not been recorded accurately and specifically, but UNESCO can estimate children who have a deviant tendency to reach at least 10% and this can be a strong reference, meanwhile based on data from the National Statistics Agency at this time there are an estimated 351,000 children with special needs under the age of five.

There are four development parameters that are used in assessing the development of children under five, namely: Social behavior related to the child's independent abilities (eating alone, cleaning toys after finishing playing, interacting with the environment), language skills (responding to sounds, speaking, doing commands, and etc.), fine motor development, (the ability to draw, hold things, etc.), gross motor skills (ability to sit, kick, run, go up and down stairs, etc.) [7].

According to [3] individual development is entirely determined by environmental or educational factors, whereas the basic or inherent factor has absolutely no effect.

Whereas [5]. individual development is actually determined by both strengths, namely basic or inherent factors and environmental or educational factors. Some methods that can be an alternative to assess the development of children, especially pre-school children can include: observation, interviews, screening using the Pre Skinning Questionnaire (KPSP), child development screening tests with DDST (Denver Developmental Screening Test), IQ and psychological tests [8].

DDST is a screening method for child development, consisting of developmental tasks items that are suitable for children from 0-6 years old. These items are arranged in a special form divided into 4 sectors: social personal, fine motor, language and gross motor. Some DDST studies have proven to be effective 85-100% for detecting the development of infants and preschool children who experience developmental delays [9]. Early detection functions as a tool to estimate the development of children aged 0-6 years and is an indicator of the extent to which the effectiveness of stimulation has been given to children. Stimulation in children starts from 0 years and continues to change according to the child's development. This stimulation is important to do in order to optimize the growth and development of children.

### B. Our Contribution

This paper discusses the factors associated with the development of pre-school age children both uni variat analysis and multi variat analysis

### C. Paper Structure

The remainder of this paper is organized as follows. Section 2 introduces the introduction used in this paper, which includes theory and literature review \*. Section 3 presents the objectives and benefits of research in Section 4. Research Methodology Section 5 Results and discussion Finally, Section 6 concludes the paper and presents direction for future research.

## II. METHOD

### A. Research methodology

#### 1. Place and Time of Research

The research was conducted in June - October 2016. The research site was An-Nida Integrated Islamic Kindergarten and PAUD School in Lubuklinggau City.

#### 2. Research Design

This research is an analytic description research with cross sectional design to see the relationship between internal, external and supporting factors in children to the Development of Preschool Children in Kindergarten and PAUD IT An-Nida Lubuklinggau City. Analytical description research is research aimed at explaining the relationship between variables [10]. and cross sectional design means that the measurement of both dependent and independent variables is carried out once at a time [10].

#### 3. Research Population

The population is the whole subject of research. The population of this study was all kindergarten students.B registered in PAUD An-nida totaling 112 students.

#### 4. Research Samples

The sample in this study was to take all populations that met the conditions of inclusion and exclusion so that 108 respondents were able. students aged 4-6 years who enter at the beginning of the semester until the time of data collection

- a. In good physical and mental health
- b. His parents are willing to sign information Consent

Inclusion criteria in this study are:

- a. Has a congenital defect
- b. Children who cannot be assessed developmentally

The sample of this study consisted of 108 children of TK-TK and which was deposited from the KPAI (PAUD An-Nida IT classes in Lubuklinggau City, where 4 respondents were declared to have failed because two of them had congenital defects Inclusion criteria in this study are:

Kindergarten, one child with special development (Indonesian Child Protection Commission) of Lubuklinggau City, and another one his parents refused to sign informed consent.

Inclusion criteria in this study are:

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- b. Children who cannot be assessed developmentally

The sample of this study consisted of 108 children of TK-TK and PAUD An-Nida IT classes in Lubuklinggau City, where 4 respondents were declared to have failed because two of them had congenital defects, one child with special development which was deposited from the KPAI (Indonesian Child Protection Commission) of Lubuklinggau City, and another one his parents refused to sign informed consent.

### B. Types, methods and research tools

#### 1. Data collection

Dependent variable data that is child development is obtained by observing using DDST examination, while data related to

Independent variables and respondent characteristics are obtained by giving questionnaires to the respondent's parents, the questionnaire which contains questions about PAUD participation, child birth weight, parenting, parenting, gender, mother's education, father's education. While the nutritional status variable is obtained by doing anthropometric calculations.

functioned to obtain data on the characteristics of children and several other factors related to children, namely the child's age, number of siblings, immunization status, taking courses outside school hours and socioeconomic. This is to identify the influence of other factors that are thought to be related to research outcome.

The questionnaire also included a number of questions that

**Table 1. Operational Definition**

Defenition	Instrument measuring	How to Measure	Result	Scale
Aspects related to the increased ability and structure or function of the body that is more complex in a regular pattern, predictable and predictable as a result of the process of differentiation of cells, body tissues, organs and systems that are organized which includes the development of independence, fine motor , gross motor and language	DDST sheet	Observation	Advance Normal	Normal
PAUD participation: The participation of children at the age of 2-3 years in PAUD, before entering kinder-garten.	Question-naire	Interview	Follow-ing Not follow-ing	No-minal
Birth Weight: A child's weight is weighed shortly after birth expressed in grams	Question-naire	Interview	Enaough Less	Ordinal
Parenting : Parenting by a mother who performs her function as a housewife who guides and gives love to her children, as well as mothers who work in the office 6-8 hours or who are self-employed with more time outside the home	Question-naire	Interview	Doesnot work Work	Ordinal
Nutrition Status: Weight gain results based on age in kindergarten children. TK TK and PAUD IT An_nida Lubuklinggau	Baita Nutrition Status Monitoring Form (PSG)	Weigh a child's weight	Over Nutrition (> +2 SD) Good Nutrition ( $\geq$ -2 elementary school $\geq$ +2 elementary school) Malnutrition ( $\geq$ -2 elementary to $\geq$ -3 elementary) Malnutrition (<-3 SD)	Ordniانا 1
Gender: Physical signs that are identified by the respondent and carried since birth	Question-naire	Interview	Female Man	Nomi-nal
Mother's Education: The last educational status pursued by Mother	Question-naire	Interview	High (have a minimum college diploma S1) Low ((Does not have a minimum college diploma S1)	Ordinal
Father's Education: The last educational status pursued by fathers	Question-naire	Interview	High (have a minimum college diploma S1) Low ((Does not have a minimum college diploma S1)	Ordinal

## Data Processing and Analysis

The data processing in this study uses computer statistical processing software with the following stages:

### A. Editing Data

Editing data namely correcting the answers that have been filled out by respondents, correcting the nutritional status check sheet, checking the results of development screening checks with DDST if there is incorrect data or not being completed immediately.

1. *Data coding* which is coding some variables that will be examined, with the aim to make it easier when conducting data analysis and also to speed up data entry. After all questionnaires, IMT results and DDST examination results are collected, it is assessed to get the score of each respondent for every variable. obtained all scores of each answer from each respondent, in the search for the mean (average). Then the data is grouped based on the mean value obtained, where for child development variables are categorized as either in code (1) for scores above or equal to the mean of child development, and less coded (2) for scores below the mean.

The internal, external and supporting factors are calculated by the mean according to birthweight sub variable divided into LBW and not LBW, parenting is divided into working and non-working mothers, nutritional status is divided into good nutrition and malnutrition, PAUD is divided into participating and not participating, mother's education and father's education are divided into high and low categories, respectively in the score code (1) for the category that is considered good, and coded (2) for the score not good. The sex variables are coded (1) for women and in kade (2) for men.

2. *Entry Data*, is entering data in a sheet variable by using a computer. After each score is coded, it is entered into the computer into the SPSS program.

3. *Data Cleaning*, is then carried out cleaning data to prevent errors that might occur, in this case missing values are not included in the analysis and data that is not appropriate or outside the study range are not included in the analysis.

4. *Processing* after the data is entered into the SPSS program, then an analysis is carried out, univariate by getting frequency tables, then bivariate analysis by chi square test of each sub variable to find out the relationship between independent and dependent sub-variables, and multivariate analysis with Regression Simple Logistics to find the most influential or dominant sub-variables and whether there are interactions between these influential variables on the dependent variable

#### B. Univariate Analysis

Univariate analysis is used to describe descriptively to find out the frequency distribution and the proportion of each variable studied, both the independent variable and the dependent variable, then the results of this univariate analysis are presented in tabular form and described the meaning of the data obtained.

#### C. Bivariate Analysis

This analysis is used to test the hypothesis by determining the relationship between the independent variable and the dependent variable through the Chi-Square Statistical Test because the data analyzed is categorical with categorical data. The Chi-Square testing process uses computer software for processing statistical data. To see the significance of statistical calculations between the dependent variable and the independent variable the 95% confidence level is used.

1. *If the p value obtained is less than 0.05*, it means that the two variables (independent and dependent) studied have a meaningful relationship.

2. *If the p value is greater than 0.05*, it means that between the two variables (independent and dependent) under study do not have a meaningful relationship.

Bivariate analysis was performed 7 times, which is according to the number of independent variables. Then the p value obtained is compared with the value  $\alpha = 0.05$  to find out whether there is a relationship between the dependent variable and each independent.

#### D. Multivariate Analysis

Multivariate analysis was carried out to determine the magnitude and close relationship between the dependent and independent variables, and see which variable was the most dominant. This analysis was chosen because the data is continuous data. The statistical test used in this multivariate analysis is the logistic regression test. The steps are as follows:

1. *Perform a bivariate analysis between each independent variable with the dependent variable with a simple logistical test.* Selection of variables related to child development (dependent variable). Next, do a multivariate analysis by including the pvalue variable  $<0.25$ .
2. *The expenditure of independent variables which is carried out in stages one by one starts from the variable with the highest p value.*
3. *Expenditure of independent variables is carried out until all variables have a value of  $p <0.05$ .*
4. *Determination of the most dominant variable is done through the OddRatio (OR) value, the variable that has the highest OR, then it is called the most dominant variable related to child development (Sutanto Priyo Hastomo, 2006).*

### III. RESULTS AND DISCUSSION

#### A. General description

The geographical location of the Air Kuti Subdistrict is an inner area in Lubuklinggau Timur I District, Lubuklinggau City, which is in the east with an area of  $\pm 612,369$  ha and a population of  $\pm 1,854$  inhabitants. West side is bordered by Sido Mulyo Suburb, in the east it is bordered by Watervang Sub-district, north is bordered by Perumnas sub-district, and in the south it is bordered by Megang Outline. Kindergarten and PAUD

An-nida early childhood education was established in 2012. It is an early childhood education institution (PAUD) located in the Air Kuti sub-district of Lubuklinggau Timur I in Lubuklinggau City which is precisely next to the Lubuklinggau Islamic High School. Those who have facilities, namely their own building, there are 9 classrooms for learning namely Beginner class for children aged 2.5 to 3 years, intermediate classes 1 and 2 for children aged 3 to 4 years. The Kindergarten class for children aged 4 to 6 years consists of 6 classes named Excellen 1 to 6. There is one office room that is partitioned for the principal's office, teacher's room, administration room and living room. An-Nida Kindergarten and PAUD teachers have indoor and outdoor play areas. With the educational objectives applied are: 1) Students have faith and devotion to God Almighty and noble. 2) Students have the principles / basis of knowledge, ability and ability to continue their education at a higher level. 3) Students are physically and

mentally healthy. Students are creative, skilled and work to be able to develop themselves continuously, know and love the nation, society and culture.

### 1. Child Development

**Table 2**  
**Frequency Distribution of Respondents According to Development in Class B Kindergarten and PAUD IT An-Nida Lubuklinggau in 2016**

No	Child development	amount	percentage
1	Advanced	64	59,3
2	Normal	44	40,7
	Total	108	100

Based on Table 2 that most of the development tasks of respondents are in the advanced category

### 2. Child Development

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### 3. PAUD participation

**Table 3**  
**Frequency Distribution of Respondents According to PAUD Participation in Class B Kindergarten and PAUD IT An-Nida Lubuklinggau in 2016**

No	To participate in PAUD	amount	Percentage
1	Joint	67	62,0
2	Not Joint	41	38,0
	Total	108	100

Based on Table 3 that the majority of respondents attend Early Age Education.

### 4. Birth Weight

**Table 4**  
**Frequency Distribution of Respondents by Birth Weight**

No	Birth weight	amount	Percentage
1	Enough	58	53,7
2	Less	50	46,3
	Total	108	100

Based on table 4 that most respondents weighed in the adequate category even though they only have differences that are not too far away

**Table 5**  
**Frequency Distribution of Respondents Based on Parenting in Class B TK and PAUD IT An-Nida Lubuklinggau City in 2016**

No	Parenting	amount	Percentage
1	mother does not work	57	52,8
2	working mother	51	47,2
	Total	108	100

Based on table 5 that parenting at home is mostly done by mothers, because most of the 52.8% (57) people are not working.

### 5. Nutritional Status

**Table 6**  
**Frequency Distribution of Respondents by Nutrition Status in Class B Kindergarten and IT PAUD An-Nida Lubuklinggau City in 2016**

No	Nutritional status	amount	Percentage
1	Good	51	47,2
2	Enough	57	52,8
	Total	108	100

Based on table 6 that most respondents have sufficient nutritional status

### 6. Gender

**Table 7**  
**Frequency Distribution of Respondents by Gender in Class B Kindergarten and PAUD IT An-Nida Lubuklinggau in 2016**

No	Gender	Amount	Percentage
1	Female	55	50,9
2	Male	53	49,1
	Total	108	100

Based on table 7 that most respondents were female

### 7. Mother's Education

**Table 8**  
**Frequency Distribution of Respondents by Mother's Education in Class B Kindergarten and PAUD IT An-Nida Lubuklinggau in 2016**

No	Mother's Education	amount	Percentage
1	High	55	50,9
2	Low	53	49,1
	Total	108	100

Based on table 8 that most mothers have high education

### 8. Father's Education

**Table 9**  
**Frequency Distribution of Respondents by Father's Education in Class B Kindergarten and PAUD IT An-Nida Lubuklinggau in 2016**

No	Father's Education	Amount	Percentage
1	High	37	34,3
2	Low	71	65,7
	Total	108	100

Based on table 9 that most respondents have fathers with low education.

## B. Bivariate Analysis Results

### 1. PAUD Participation with Child Development

**Table 10**  
Distribution of the Relationship between PAUD Participation and Children Development in Class B Kindergarten and PAUD IT An-Nida Lubuklinggau in 2016

PAUD Participation	Child development				Total		OR (95% CI)	P Value
	Advance		Normal		N	%		
	N	%	n	%				
Participate	57	85,1	10	14,9	67	100	(9,639 - 79,523)	0,000
Un Participate	7	17,1	34	82,9	41	100		
Total	64	59,3	44	40,7	108			

Based on table 10 it can be explained that most of the respondents who participated in PAUD had an Advance category (85.1%). While the majority of respondents who did not attend PAUD had normal development (82.6%).

Statistical test results obtained p value = 0,000 and the Odds Ratio (OR) value of 27,686 (95% CI = 9,639 - 79,523). With a value of  $p < 0.05$ , the research hypothesis is accepted, which means that there is a meaningful relationship between PAUD participation in child development. Odds Ratio (OR) value obtained at 27,686 indicates that children who attend PAUD have an opportunity to have an advanced development 27.668 times greater than children who do not attend PAUD.

Distribution of Birth Weight Relationship with Child Development in Class B Kindergarten and PAUD An-Nida Lubuklinggau City in 2016

### 2. Birth Weight with Child Development

**Table 11**

Birth Weight	Child development				Total		OR (95% CI)	P Value
	Advanced		Normal		n	%		
	N	%	n	%				
Enough	48	82,8	10	17,2	58	100	(4,130- 25,189)	0,000
Less	16	32,0	34	68,0	50	100		
Total	64	59,3	44	40,7	108			

Based on table 11, it can be explained that children with sufficient birth weight experience the most development in the Advance category (82.2%). Meanwhile, most children with underweight birth experienced development in the normal category (68.0%).

Statistical test results obtained p value = 0,000 and Odds Ratio (OR) value of 10,200 (95% CI = 4,130 - 25, 189). With a value of  $p < 0.05$ , the research hypothesis is accepted, which means there is a significant relationship between a child's weight and its development at preschool age. Odds Ratio (OR) of 10,200 indicates that children with sufficient weight have the opportunity to experience development in the advanced category 10,200 times greater than children with underweight birth.

**Table 12**

	n		%		N	%	4,388
	n	%	n	%			
Mother Doesnt Work	43	75,4	14	24,6	57	100	(1,930- 9,976)
Working Mother	21	41,2	30	58,8	51	100	
Total	64	59,3	44	40,7	108		

Based on table 12 it can be explained that of the children whose mothers do not work most have developments in the advanced category (75.4%). Whereas for children whose mothers work, most with normal development (58.8%).

Statistical test results obtained p value = 0,000 and Odds Ratio (OR) value of 4,388 (95% CI = 1,930 - 9,976). With a value of  $p < 0.05$ , the research hypothesis is accepted, which means there is a significant relationship between parenting with the development of pre-school children in kindergarten and PAUD IT An-nida Lubuklinggau. Odds Ratio (OR) value of 4.388 shows that children who have mothers who do not work have the opportunity to experience growth in the advanced category 4.388 times greater than children whose mothers work

### 3. Nutrition Status with Child Development

**Table 13**  
Distribution of Relationship between Nutrition Status and Development in Children in Class B Kindergarten and An-Nida City PAUD Lubuklinggau in 2016

Parenting	Child development				Total		OR (95% CI)	P Value
	Advanced		Normal		n	%		
	N	%	n	%				
Good	44	75,4	14	13,7	51	100	(4,4 - 30,5)	0,000
Working Mother	20	35,1	37	64,9	57	100		
Total	64	59,3	44	40,7	108			

Based on table 13 it can be explained that of the children who have good nutritional status most of them have advanced category development (86.3%). Whereas of the children with

sufficient nutritional status, most of them with normal development (64.9%).

Statistical test results obtained  $p = 0,000$ . With a value of  $p < = 0.05$ ), the research hypothesis is accepted, which means that there is a significant relationship between nutritional status in children with pre-school age development in kindergarten and PAUD IT An-Nida Lubuklinggau City. OR value = 11.662 which means that children with good nutrition have a 11.662 times chance to have development in the advanced category.

#### 4. Gender with Child Development

**Table 14**

**Distribution of Sex Relationship with Child Development in An-Nida IT Kindergarten and PAUD in Lubuklinggau City in 2016**

Gender	Child development				Total	OR (95% CI)	P Value
	Advanced		Normal				
	N	%	n	%			
						2,730	
Female	39	70,9	16	29,1	55	10 (1,235 0 -6,036 )	0,000
Male	25	47,1	28	52,8	53	10 0	
Total	64	59,3	44	40,7	108		

Based on table 14 it can be explained that most of the female children have advanced development (70.9%). While most male children have normal development (52.8%).

Statistical test results obtained  $p$  value = 0.021. With a value of  $p < = 0.05$ ), the research hypothesis is accepted, which means that there is a meaningful relationship between the sex of the child and the development of children in kindergarten and PAUD IT An-Nida Lubuklinggau

#### 5. Mother's Education with Child Development

**Table 15**

**Distribution of Mother's Educational Relationship with Development in Children in Class B Kindergarten and PAUD An-Nida Lubuklinggau in 2016**

Mother's Education	Child development				Child developm ent	OR (95 % CI)	P Valu e
	Advanced		Normal				
	N	%	n	%			
High	26	70,3	11	29, 1	37 0	10 0	
Low	38	53,3	33	46, 5	71 0	10 0	0,140
Total	64	59,3	44	40, 7	108		

Based on table 15 it can be explained that of children who have highly educated mothers who have advanced development (70.3%). Meanwhile, most children with low-educated mothers have advanced development (53.5%).

Statistical test results obtained  $p$  value = 0.140, with a value of  $p > = 0.05$ ), then the research hypothesis was not accepted, which means there was no significant relationship between mother's education with the development of pre-school age children in kindergarten and PAUD IT An-Nida, Lubuklinggau.in 2016.

#### 6. Father's Education with Child Development

**Table 16**

**Distribution of Father's Educational Relations with Child Development in Kindergarten Class B and PAUD An-Nida IT Lubuklinggau in 2016**

Father's Educa tion	Child development				Total	OR (95 % CI)	P Value
	Advanced		Normal				
	N	%	n	%			
High	24	58, 3	17	41, 5	41	100	1,000
Low	40	59, 7	27	40, 3	67	100	
Total	64	59, 3	44	40, 7	108		

Based on table 16 it can be explained that of the children whose father is highly educated, most have Advanced development (58.5%). Whereas of the children whose fathers had low education, most also had advanced development (59.7%).

Statistical test results obtained  $p$  value = 1,000 with a value of  $p > = 0.05$ ), then the research hypothesis was not accepted, which means there was no significant (significant) relationship between father's education and development in preschoolers in kindergarten and early childhood IT An-Nida Lubuklinggau City.

## IV. CONCLUSION

There are many significant influence among PAUD participation, birth weight, parenting, nutritional, sex, and father's education with the development of preschool children. Meanwhile there is no significant influence between mother's education and the development of preschool age children.

## V. SUGGESTION

It is necessary to increase the knowledge of parents, PAUD teachers and the community about factors related to the development of preschool age children. Further research needs to be done using a cohort study design.

## VI. ACKNOWLEDGMENT

This work was supported by the Ministry of Health of the Republic of Indonesia. Palembang health polytechnic and thanks to the Director of Poltekes Palembang and PAUD An Nida Lubuklinggau City

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# Difference of Regulatory T Cells, Interleukin 10, Interleukin 6, Interferon (IFN) $\gamma$ , and Indoleamin Dioksigenase (IDO) Levels in Women With High and Low ASA: A Research Article

1<sup>st</sup> Nani Sari Murni  
Department of Biomedical Science  
University of Indonesia  
Jakarta, Indonesia  
Email: syauqi0809@gmail.com

2<sup>nd</sup> Indra Gusti Mansur  
Department of Biology  
University of Indonesia  
Jakarta, Indonesia  
Email: mansur.indra@gmail.com

Corresponding author: syauqi0809@gmail.com

**Abstract** - Unexplained infertility can be caused by various factors, including genetic, immunological, and idiopathic. One of the immunological factors that play a role in unexplained infertility is antisperm antibodies (ASA). About 10-30% of infertile couples are caused by ASA. This study wanted to analyze differences in cellular specific immune components namely regulator T cells and humoral immune components (cytokines IL10, IL6, IFN $\gamma$ , and IDO) in women with high ASA and low ASA. Samples with high and low ASA were examined ASA titres using the husband's sperm auto-agglutination test (HSAaT) method. Each group of 6 samples were analyzed, so that the total is 12 samples. Tregs were evaluated using flow cytometry with the human forkhead box P3 (FoxP3) staining kit of Biotech and Device. Serum IL10, IL6, and IFN $\gamma$  was determined using an Abcam ELISA kit. Serum IDO was determined using an RnD ELISA kit. The data were analysed using the Mann-whitney tests. There are differences in the Tregs population ( $p = 0.004$ ), IL10 ( $p = 0.002$ ), IFN $\gamma$  ( $p = 0.002$ ) and IDO ( $p = 0.041$ ) but there is no difference IL6 levels ( $p = 0.240$ ) in women with high and low ASA. High ASA affects the Tregs population, IL10, IFN $\gamma$ , and IDO but has no effect on IL6 cytokines.

**Keywords** - ASA, Tregs, IL10, IL6, IFN $\gamma$ , IDO

## I. INTRODUCTION

Immunity problems that occur in infertility are due to excessive immune response. Around 186 million people in the world experience infertility and 8-12% are partners of reproductive age. Conditions that cause infertility from a wife factor are 40-55%, from a husband factor of 30-40%, a combination of a husband and wife factor of 10%, and unexplained 10-25% [1], [2]. In infertility that is not explained there are genetic, immunological and idiopathic factors [3], [4]. Immunological factors that play a role in infertility that is not explained one of the indications that arises is the presence of antisperm antibodies (ASA). It is proven that ASA is one of the causes of infertility and miscarriage [5]. About 10-30% of infertile couples are caused by ASA [2]. ASA affects fertility, before or after the

fertilization process. ASA inhibits sperm movement, capacitation, fertilization, and inhibits embryo implantation [6].

Immunological factors play a role in pregnancy. Non-specific and specific immune responses can be humoral and cellular immune responses. Cell-specific immune responses are mediated by T cells, while humoral-specific immune responses are mediated by B cells. However, the two immune responses cannot be viewed separately, both of which have close collaboration [7], [8]. T cells cooperate with B cells through a CD4<sup>+</sup> subpopulation called Helper T cells (Th). Th1 cells secrete IFN $\gamma$  [9]. IFN $\gamma$  is also an inducer indoleamin 2,3 dioxygenase (IDO). IDO is induced by IFN $\gamma$  in large numbers, especially in macrophages in inflammatory and dendritic cells so as to produce IDO with its metabolites. Metabolites work on effector T cells and regulatory T cells [10]. Cooperation between regulator T cells and IDO enzymes will induce tolerance for pregnancy [11]. Th2 cells enhance the humoral immune response by secreting a large portion of IL10. Increased IL-0 and decreased pro-inflammatory cytokines such as TNF $\alpha$ , IL1 $\beta$  and IL6 occur during pregnancy [9], [12]. The maternal immune system requires tolerance for conception to occur. It is not only the balance of T helper (Th)1/Th2 that plays a role in pregnancy, but also the regulatory T cells (Tregs) that regulate the important role in pregnancy [12]. CD4<sup>+</sup>CD25<sup>+</sup>Foxp3<sup>+</sup> immune cells are known as regulatory T cells to regulate alloreactive Th1 cells [13]. Regulatory T cells identified by FoxP3 expression have an important role in the success of gestation and implantation [14]. The aim of this study was to analyse difference of regulatory T cells, IL10, IL6, IFN $\gamma$ , and IDO levels in women with high and low ASA.

## II. METHOD

This research method was observational. The study group consisted of 6 married women with ASA titres  $\leq 1:128$  and 6 married woman with ASA  $\geq 1:262,144$  who came to Sayyidah Mother and Child Hospital in Jakarta from July 2018 to April 2019 with unexplained infertility problems, total 12 married women were enrolled. The study was approved by the Research Ethics Committee of Faculty of Medicine University of Indonesia (Number: 0437/UN2.F1/ETIK/2018), and all 12 participants signed an

informed consent before enrolment. Each patient was examined for ASA titres using the husband's sperm auto-agglutination test (HSAaT) method.

### III. RESULTS

The results for the 12 study group samples are shown in Table 1. Significant differences in regulatory T cells populations were found in women with high and low ASA ( $p = 0.004$ ), IL10 ( $p = 0.002$ ), IFN $\gamma$  ( $p = 0.002$ ) and IDO ( $p = 0.041$ ) however there is no difference IL6 levels ( $p = 0.240$ ). Univariate analysis illustrates that the median regulator T cell population in low ASA is higher (9%) compared with high ASA women (3.35%). Median levels of IL10 (93.51 pg/ml) in women with high ASA are higher than that of low ASA (1.45 pg/ml). Median levels of IL6 (2.25 pg/ml) in women with low ASA are higher than that of high ASA (1.51 pg/ml). Median levels of IFN $\gamma$  (9.61 ng/ml) in women with low ASA are higher than that of high ASA (3.69 ng/ml). Median IDO levels (5.11 ng/ml) in women with low ASA are higher than high ASA (0.54 ng/ml).

**Table 1. Difference of regulatory T cells, IL-10, IL-6, IFN $\gamma$ , and IDO levels in women with high and low ASA**

	Group	n	Median (min-max)	p
Regulatory T cells (%)	High ASA	6	3.35 (1.5-4.8)	0.004
	Low ASA	6	9 (4.1-22.6)	
IL-10 levels (pg/ml)	High ASA	6	93.51 (9.02-298.85)	0.002
	Low ASA	6	1.45 (0.71-2.81)	
IL-6 levels (pg/ml)	High ASA	6	1.51 (0.93-4.90)	0.240
	Low ASA	6	2.25 (1.8-5.4)	
IFN- $\gamma$ levels (ng/ml)	High ASA	6	3.69 (3.50-5.62)	0.002
	Low ASA	6	9.61 (7.12-48.85)	
IDO levels (ng/ml)	High ASA	6	0.54 (0.22-41.55)	0.041
	Low ASA	6	5.11 (2.77-42.85)	

\*data normality and Mann-whitney test

### IV. DISCUSSION

A significant difference ( $p = 0.004$ ) the regulatory T-cell population, IL10 ( $p = 0.002$ ), IFN $\gamma$  ( $p = 0.002$ ) and IDO ( $p = 0.041$ ) were found between women with high and low ASA, but no significant difference ( $p = 0.240$ ) the IL6 levels was found between women with high and low ASA (Table 1). The low regulatory T cell population in women with high ASA compared to low ASA, this shows that ASA affects the development of the regulator T cell population. As we know that regulatory T cells are known to play a role in protective immune responses through increases in Th1 or Th17 responses [15]. Regulatory T cells serve as immunoregulators and induce immune tolerance. About 5–10% of CD4+ T cells are regulatory T cells that express CD25+FoxP3+(14). Regulatory T cells inhibit the proliferation and production of cytokines by CD4+ and CD8+ cells [16]., the production of immunoglobulins by B cells, the cytotoxic activity of natural killer (NK) cells and dendritic cell maturation. These responses then lead to immune tolerance [17]. However, besides cytokines (in this case, IL10), other factors, such as adipokines, pregnancy hormones and seminal fluid, also have immunoregulatory activity and influence the success of pregnancy by increasing

the number and activity of regulatory T cells [18]. Univariate analysis illustrates that the median regulator T cell population in low ASA is higher (9%) compared with high ASA women (3.35%) showed that the development of regulator T cell population in women with low ASA was better than in high ASA, this supports the possibility of pregnancy for women with low ASA.

A significant difference IL10 ( $p = 0.002$ ) in women with high and low ASA, median levels of IL10 (93.51 pg/ml) in women with high ASA are higher than that of low ASA (1.45 pg/ml) show that IL10 as an anti-inflammatory cytokine produced by Th2 cells will inhibits the action of pro-inflammatory cytokines such as IL1, IL6, IL12 and TNF. IL10 also inhibits APCs by inhibiting major histocompatibility complex (MHC) class II expression and inhibiting the action of co-stimulator molecules, such as CD 80 and CD 86. Biologically, IL10 binds to the IL10R1 and IL10R2 receptors that specifically initiate cascade signals. IL10 activates the Janus kinase (JAK) and STAT pathways. In a normal pregnancy, IL10 increases during trimesters I and II, but not in trimester III [19], [20], [21]. In the absence of a high serum level of IL10, regulatory T cells will decrease if ASA increases, whereas a high serum level of interleukin 10 can inhibit this increase in the regulatory T cell population, this will inhibit the occurrence of maternal tolerance for pregnancy.

No significant difference ( $p = 0.240$ ) IL-6 levels was found between women with high and low ASA, median levels of IL6 (2.25 pg/ml) in women with low ASA are higher than that of high ASA (1.51 pg/ml) shows that the inflammatory response occurs in both high ASA and low ASA. Increased IL6 is often seen in cytokine profiles of unexplained infertility cases, recurrent miscarriages, preeclampsia and preterm labor. The excess of IL6 will inhibit of regulatory T cells [22]. The increase in antibodies produced by B cells as a means of self-defense against antigens also increases the signal against proinflammatory cytokines, IL6. IL6 is a key cytokine that blocks the development of regulatory T cells and induces differentiation of Th 17 cells[17]. IL6 is a proinflammatory cytokine and antibody produced by B cells and acts as an important link in several cellular reactions. A coordinated immune response involves cues between the various leukocytes and tissue cells that play a role in that response [23], [24].

A significant difference IFN $\gamma$  ( $p = 0.002$ ) between women with high and low ASA, median levels of IFN $\gamma$  (9.61 ng/ml) in women with low ASA are higher than that of high ASA (3.69 ng/ml) shows that at the beginning of the decline in ASA there is an immune response to tolerance in the maternal body. Increased of IFN $\gamma$  as a response to tolerance from high anti-inflammatory when ASA is high in maternal. The theory explains that IFN $\gamma$  activates macrophages to kill foreign cells and stimulate the further development of Th1 and inhibit the development of Th2 and Th17 cells. IFN $\gamma$  will increase polarization response in the Th1 subset [25]. IFN $\gamma$  is one of the cytokines produced by Th1 and plays a role in failure of implantation and recurrent miscarriage [26]. Significant differences IDO ( $p = 0.041$ ) in women with high and low ASA, median IDO levels (5.11 ng/ml) in women with low ASA are higher than high ASA (0.54 ng/ml) showed that similar to the response IFN $\gamma$  which increased at the onset of decreased ASA in response to tolerance in the maternal body. IDO connection with IFN $\gamma$  because IDO inducing compounds are IFN $\gamma$ . IFN $\gamma$  stimulate macrophages/

dendritic cells produce IDO with its metabolites. Metabolites work on effector T cells and regulatory T cells [27], [28], [29], [30]. IDO under IFN $\gamma$  transcription control catalyzes and limits tryptophan degradation. Tryptophan is an important stimulus for effector T cell proliferation. If tryptophan is limited, apoptosis will occur [31]. IDO plays a role in maternal tolerance by controlling the presence of tryptophan in situ T cells in the uterine microenvironment [32]. Changes in tryptophan concentration and IDO activity are associated with pregnancy outcomes, including pregnancy failure and preeclampsia [33], [34]. The first functioning APC is dendritic cells. Dendritic cells are very heterogeneous and become part of stimulation that activates T cells, and tolerogenic dendritic cells express CD8 $\alpha$  and IDO. IDO plays an important role in inducing apoptosis activated by effector T cells, such as Th1 and Th17 [14]. As previous research has found that IDO protects the fetus from the maternal immune response through two mechanisms, namely: 1) IDO reduces the availability of tryptophan as an essential amino acid. The amount of tryptophan in the maternal circulation decreases during pregnancy, and 2) IDO produces a series of kinurenin pathway metabolites that support the proliferation and differentiation of regulatory T cells [27], [28], [29], [30].

ASA stimulates cellular specific immune response and humoral immune response, this is indicated by the results of univariate analysis that regulatory T cells, IL6, IFN $\gamma$ , and IDO levels are higher in women with low ASA compared to high ASA. Bivariate analysis did show significant differences between regulatory T cells, IL10, IFN $\gamma$ , and IDO levels in women with high and low ASA.

## V. CONCLUSION

High ASA stimulates cellular immune response, that is, regulatory T cell population, and has effect on humoral immune responses, namely cytokines IL10, IFN $\gamma$ , and IDO but no effect on IL6.

## VI. ACKNOWLEDGMENT

This project was supported by Beasiswa Unggulan Dosen Indonesia-Lembaga Pengelola Dana Pendidikan (BUDI-LPDP) 2016.

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# Anuloma Viloma in Reducing Labor Pain First Stage

1<sup>st</sup> Nesi Novita  
 Department of Midwifery  
 Poltekkes Kemenkes Palembang  
 Palembang, Indonesia  
 Email: nesi\_burlian@yahoo.co.id

2<sup>nd</sup> Riska Susanti Pasaribu  
 Department of Midwifery  
 Poltekkes Kemenkes Palembang  
 Palembang, Indonesia  
 Email: Riskaasusaantii@yahoo.co.id

3<sup>rd</sup> Deby Cyntia Yun  
 Department of Midwifery  
 Poltekkes Kemenkes Palembang  
 Palembang, Indonesia  
 Email: [Cyntiaadeby@yahoo.co.id](mailto:Cyntiaadeby@yahoo.co.id)

Corresponding author: nesi\_burlian@yahoo.co.id

**Abstract** - Efforts to apply maternal care for mothers include supporting mothers who will be giving birth by guiding mothers in relaxation techniques, one of which is breathing technique. At present there are still many problems with labor wherein women experience fears about the obvious or the unclear, tension and hyperventilation caused by the mother breathing deeply and quickly, so that the pain during contractions increases. According to several studies of mothers in the first stage, they experienced more pain in the waist and back, so the purpose of this study was to determine the effectiveness of anuloma viloma in reducing pain in the first stage of labor. This study was a quasi experiment nonequivalent control group. The dependent variable in this study was first stage labor pain and the independent variable was the viloma anuloma technique. The number of samples in this study were 28 people. Statistical tests using the two-sample T-test, the dependent sample t-test, then multivariate analysis, namely linear regression. Independent t-test results show that pregnant women who are older than 35 years slower 0.44 experience labor pain compared to pregnant women who are less than or equal to 35 years old. Statistical test results obtained that there is no relationship between maternal age during pregnancy and experiencing labor pain. This shows that there is no significant difference between labor pain in high-risk pregnant women and low-risk pregnant women (p value = 0.858).

**Keywords** - Anuloma Viloma, Labor Pain, First Stage

## I. INTRODUCTION

One of the problems faced by the Indonesian people, especially in the field of health and preparation of the future generations of the Indonesian nation is the high morbidity and mortality rates for mothers and children. The government has launched the Making Pregnancy Safer (MPS) program by emphasizing the provision of quality and cost-effective maternal and neonatal services, one of which is the delivery of assistance by health workers [1].

Labor is a complex interplay of psychological and physiological drives in women. The purpose of labor is to maintain survival and provide a high degree of health for mothers and their babies through integrated and complete efforts, but with minimal intervention so that the principle of safety and quality of service can be maintained [2].

Childbirth care is care that aims to provide adequate services during the delivery process in an effort to achieve clean and safe delivery assistance by paying attention to aspects of caring for the mother. Efforts to implement mother's caring care include

supporting mothers by guiding mothers in relaxation techniques, one of which is breathing [3].

According to [4]. labor problems are fears about the obvious or the unclear, tension and hyperventilation that can be caused by the mother breathing deeply and quickly, pain during contractions. The [5]. states that the factors that cause labor pain are uterine contractions, fear and anxiety, stretch of the birth canal including the waist and back.

The [6]. study of 30 female patients who experienced chronic back pain and low back pain in the age group 18-45 years who were given pranayama therapy for 8 weeks stated that there was a significant decrease in back pain and low back pain and could also improve quality significant life both physically, psychologically, socially, and environmentally.

The Research [7]. of 60 women who experience body pain and the quality of life of women with multiple sclerosis, a case group doing exercises to reduce pain with yoga (pranayama, hatha, king of yoga). Over a 3-month period of 90 minutes and a control group without any intervention. After doing yoga therapy in the case group showed that there was a significant decrease in pain and an increase in quality of life compared to the control group. The results showed that yoga techniques can reduce body pain and improve the quality of life of patients with multiple sclerosis.

According to [8]. pranayama is one of the most important parts of traditional yoga practice. Different pranayama techniques will show different effects as well, slow breathing breathing techniques that provide a record of improvements in the vascular system and can be used to prevent and repair damage to the blood vessel system. There are some drawbacks to respiratory nostril results and the mechanism of pranayama variations. Therefore there is a need for research on pranayama to explore the effects of the underlying mechanism.

The practice of yoga always refers to the breath (pranayama). In yoga practice pregnant women are clearly guided when to inhale and when to exhale. Synchronization between movement and breathing does not only apply to exercise during pregnancy and to face labor, but is a necessity for any yoga practice. In addition slow and deep breathing taught in yoga has a calming effect that is needed by maternity mothers [9].

According to [4], the predisposing factors for pain in labor are weight gain, rapid posture changes, repeated stretching, multiple stretches, many children, pregnancy distance, and relaxin levels tall one. Pain arises during labor due to anxiety, fear due to having heard irresponsible information about childbirth, to avoid pain during labor should think calmly and positively in the easiest way that is by breathing (pranayama). Besides basic maternal needs, among others, can reduce pain with non-pharmacological techniques, namely relaxation and breathing techniques [4], [9]. Some research on techniques to reduce pain in the first stage of labor has been done, but research on "the effectiveness of aniloma villoma in reducing pain in the first stage of labor" has never been done.

## II. METHOD

This research is an experimental research that examines the relationship between variables that are focused on the effect of changes that one variable has on another variable. [10] The design of this study is a quasi experiment nonequivalent control group design that is the experimental group and the control group are formed in such a way that there is no opportunity for differences between the variables to influence the results. The dependent variable in this study was first stage labor pain and the independent variable was the villoma anuloma technique. Observation was carried out twice, namely before the experiment (O1) is called the pretest and after the experiment (O2) is called the posttest.

The study population was all mothers in the first stage of latent phase in the Independent Practice Midwife Palembang. The sample in this study were all women in the first stage of latent phase in the Independent Practice Midwife amounting to 28 people. The sampling technique was non probability sampling by accidental sampling with inclusion criteria as follows: normal delivery mothers, birth mothers who had never had an aniloma viloma, latent phase Kala I, multigravida, birth mothers who had no disease accompanying in pregnancy and childbirth, willing to be a respondent.

The number of samples in this study based on the number of samples that met the inclusion criteria from October to November 2018 obtained as many as 28 people, with details of 14 people having aniloma viloma and 14 people not doing anuloma viloma.

This research was conducted in October until November 2018 at the Independent Practice Midwife (BPM) of the city of Palembang. This type of research data is primary data in the form of data about the characteristics and data of pain in maternity in accordance with the study inclusion criteria. As well as blood tests for prostaglandin examination and secondary data, namely data on the number of third trimester pregnant women who have estimated parturition between October and November 2018.

Systematic research that is taking care of research permission to the Independent Practice Midwife, looking for third trimester pregnant women recorded in the examination book of pregnant women, especially pregnant women whose delivery dates in October and November 2018 obtained a number of 34 respondents. Then drawn to determine the intervention group

and the control group, train aniloma viloma in TM III pregnant women who are the intervention group, collect research data and find obstacles that are trained mothers who are not willing to take blood, the husband of the respondent is not willing his wife is taken blood, there is BPM who are not willing to have blood drawn from their respondents.

Data analysis is univariate data performed on each variable and the results of research in general in this analysis only produces the distribution and percentage of each variable. In this research, the independent variable is aniloma viloma and the dependent variable is labor pain when I am. Bivariate analysis is performed on two variables that are suspected to have an influence to determine the effectiveness of the two variables. The data obtained were then analyzed to test the effectiveness of anuloma viloma in reducing labor pain in the first stage. The average labor pain before and after the treatment was processed and statistically tested withusing a two sample T test that is

Variable	Intervention group		Control group	
	n	%	n	%
<b>Age</b>				
High risk (>35 tahun)	1	7,1	1	7,1
Low risk (≤35 tahun)	13	92,9	13	92,9
Mean (range)	27,60 (20-37)		26,00 (21-36)	
<b>Pendidikan</b>				
SD	1	7,1	3	21,4
SMP	0	0	0	0,0
SMA	9	64,3	11	78,6
S1	3	21,4	0	0,0
S2	1	7,1	0	0,0
<b>Job Status</b>				
Housewife	9	64,3	10	71,4
Labor	2	14,3	1	7,1
Trade	1	7,1	1	7,1
General Employees	1	7,1	2	14,3
Civil servants	1	7,1	0	0,0
<b>Parity</b>				
Lots	0	0,0	1	7,1
Less	14	100,	13	92,9
Mean (range)	1,43 (0-2)		1,71 (1-3)	
<b>Pregnancy</b>				
Primigravida	2	0,0	0	0,0
Multigravida	12	100,	14	100,
Mean (range)	2,36 (1-3)		2,79 (2-4)	
<b>Pregnancy Distance</b>				
Far	13	100,	14	100,
Close	1	0	0	0
Mean (range)	4,00 (0-7)		4,43 (3-6)	
<b>Weight getting before pregnant</b>				
Mean (range)	61,40 (50-68)		61,80 (55-68)	
<b>Weight Now</b>				
Mean (range)	73,10 (67-82)		73,80 (68-80)	
<b>Age of pregnancy</b>				
Mean (range)	38,60 (38-39)		38,50 (38-39)	
<b>Opening of the birth</b>				
Mean (range)	2,10 (1-3)		2,00 (1-3)	
<b>Total</b>	10	100	10	100

dependent sample t-test.

### III. RESULTS

Table 1. Responden Characteristics

Labor Pain Intensity Score	Pre-Test		Post-Test	
	Intervension	Control	Intervens ion	Control
Mean (range)	2,20 (2-4)	2,40 (2-4)	2 (2)	2,80 (2-4)

Can be seen that the intervention and control groups showed that most of the respondents in the low risk group were less than or equal to 35 years old, more than 50% of respondents had a high school education, more than 50% were housewives, more than 80% had children less than or equal to 2 children, 100% of pregnancies are multigravida, 100% have a wide range with previous pregnancies, the average weight before pregnancy is 61 kg and the average weight. Body now 73 kg means up 12 kg of body weight before pregnancy.

Table 2. Average of Labor Pain Intensity

Table 2 shows that the average labor pain score in the intervention group respondents decreased from 2.20 to 2 after the post-test.

Table 3. Different of Mean in Respondent Labor Pain

Labor Pain Score	Mea n	SD	SE	pvalue	n
<b>Intervension Group</b>					
Pre Test	2,20	0,632	0,200	0,343	10
Post Test	2,00	0,000	0,000		
<b>Control Group</b>					
Pre Test	2,40	0,843	0,267	0,168	10
Post Test	2,80	1,033	0,327		

Table 3 uses paired t-test shows that in the two groups that were given intervention and the control group there was no significant difference where the pvalue > 0.05

Table 4. Distribution of Mean of Respondent Labor Pain Based on Respondent Groups

Labor Pain Score	Mean	SD	SE	pvalue	n
<b>Pre-Test</b>					
Case (Intervension)	2,20	0,632	0,200	0,333	20
Control	2,40	0,843	0,267		
<b>Post Test</b>					
Case (Intervension)	2,00	0,000	0,000	0,327	20
Control	2,80	1,033	0,327		

Table 4 is known that to know the average change in the value of labor pain scores according to the group of respondents ie the case group (intervention) and the control group there is no significant difference in the average value of labor pain scores where pvalue > 0.05

Table 5. Distribution of Average Science of Respondent Labor Pain Based on Respondent Characteristics

Labor Pain Score	Mean	SD	SE	pvalue	N
<b>Age</b>					
High Risk (>35 tahun)	2,00	0,000	0,000	0,858	20
Low Risk ( $\leq$ 35 tahun)	2,44	0,856	0,202		
<b>Education</b>					
High	2,00	0,000	0,000	0,338	20
Low	2,73	1,009	0,304		
<b>Profession</b>					
Work	2,86	1,069	0,404	0,359	20
Does not Work	2,15	0,555	0,154		
<b>Parity</b>					
Lots	4,00	0,000	0,000	0,69	20
Less	2,32	0,749	0,172		

The results of bivariate analysis using the Independent t-test show that pregnant women who are older than 35 years slower 0.44 experience labor pain compared to pregnant women who are less than or equal to 35 years old. Statistical test results obtained that there is no relationship between maternal age during pregnancy and experiencing labor pain. This shows that there is no significant difference between labor pain in high-risk pregnant women and low-risk pregnant women (p value = 0.858). The results of the analysis show that pregnant women with high education are slower by 0.73 experiencing labor pain compared to pregnant women with low education. Statistical test results obtained that there is no relationship between maternal education during pregnancy with labor pain. This shows that there is no significant difference between labor pain in pregnant women with high education and pregnant women with low education (pvalue = 0.338).

The analysis shows that pregnant women who work faster 0.71 experience labor pain compared to pregnant women who do not work. The results of statistical tests found that there is no relationship between maternal work during pregnancy with labor pain. This shows that there is no significant difference between labor pain in pregnant women who work and pregnant women who do not work (p value = 0.359). The results of the analysis show that pregnant women who have many children 1.68 more quickly experience labor pain compared to pregnant women who have fewer children. Statistical test results obtained that there is no relationship between the number of children with labor pain. This shows that there is no significant difference between labor pain in pregnant women who have many children and pregnant women who have few children (p value = 0.690).

### IV. DISCUSSION

The results of the study stated that the average labor pain score in the intervention group respondents decreased from 2.20 to 2 after the post-test. Based on the results of the analysis note that the average labor pain score in the control group respondents increased from 2.40 to 2.80 after the post-test. According to [2], childbirth is a complicated interplay between psychological and physiological drives in women. The main physiological strength during labor is uterine contractions. Uterine contractions in labor are unique due to physiological muscle contractions that cause pain in the body. During pregnancy there is a balance between the levels of progesterone and estrogen in the blood, but at the end of pregnancy or 1-2 weeks before parturition there is a decrease in progesterone so that it arises which can cause labor pain [12]. This study is in line with the study of Attanayake (2010) states that the therapeutic effect is assessed subjectively and objectively. Specific scores taken for the yoga group (asanas and pranayama included in the Anuloma Viloma) and the control group were analyzed individually before and after treatment and values were compared using standard statistical protocols. Yoga interventions revealed 79% of help in subjective and objective parameters (that is, 7 of the 14 parameters showed a result of P < 0.01 which was very statistically significant, whereas 4 showed a significant result of P < 0.05). The comparative effect of the yoga group and the control group shows a 79% reduction in subjective and objective parameters. The cause of back pain is understood to be multifactorial. The very successful

management of multifactorial disease depends on a multi-focus treatment approach. Because yoga is a holistic method, yoga is complemented by a multi-target approach [11].

Based on the results of the study found that in the intervention group there was no difference in the average value of labor pain scores between the Pre-Test and Post-Test was 0.20 with a standard deviation of 0.632. The statistical test results obtained a value of 0.343, it can be concluded that there is no significant difference between the scores of labor pain scores of pregnant women before and after the intervention of Anuloma Viloma Respiration. This study is not in line with Marwa's research (2017) which states that there is an effect of physical exercise in the form of yoga which includes anuloma viloma on the scale of labor pain in the first stage. According to [5]. women or expectant mothers will feel pain that arises slowly. This pain will come and go, then it will feel more often and reach a climax when labor is almost happening. Pain that occurs can affect the mother's condition in the form of fatigue, fear, worry and stress. Stress can cause weakening of the uterine contractions and result in prolonged labor.

Women who are in a state of fear and do not know what is happening to them and are not prepared with relaxation and breathing techniques to overcome uterine contractions will cry and move uncontrollably in bed just because of mild contractions. On the other hand, women who have been prepared for childbirth will not show loss of control or cry even in severe contractions [2].

According to [13]. with breathing can help mothers get peace because of adequate breathing can increase the flow of oxygen, nitrogen and spinal fluid to the brain. Thus the fetal brain development will develop rapidly. Breathing exercises are done by breathing seven times, then holding it, and exhaled on the count of three. In yoga practice including anuloma viloma pregnant women are clearly guided when to breathe and when to exhale. Synchronization between motion and breath does not only apply to exercise during pregnancy, but is a necessity for every yoga practice. Besides slow and deep breathing taught in yoga has a calming effect that is needed by pregnant women and mothers who want to give birth [9]. The benefits of anuloma viloma technique are optimizing the function of both sides of the brain; means the creativity and logic sides are balanced which is useful for calming the mind and nervous system [14]. Breathing techniques with awareness that make breathing slower and smoother. By way of exhaling a long breath and provide a pause between inhaling and exhaling that can help in controlling the mind and concentration [15].

## V. CONCLUSION

After performing anuloma viloma, there was a decrease in labor pain in the first stage. Statistically there was no difference in the pain in the first stage of labor in women before and after the viloma anuloma. This method can be used as an alternative that is non-pharmacological in reducing labor pain at the first stage. Suggestion there is furthermore research with another variable.

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# The Effect of Addition of Pumpkin Yellow Seed Flour on Characteristics and Acceptance of Roll Cake

1<sup>st</sup> Elliza

Nutrition of Health,  
Polytechnic of Health  
Palembang

Palembang, Indonesia

2<sup>nd</sup> Risma Royanda

Nutrition of Health,  
Polytechnic of Health  
Palembang

Palembang, Indonesia

3<sup>rd</sup> Maisela Suciati

Nutrition of Health,  
Polytechnic of Health  
Palembang

Palembang, Indonesia

4<sup>th</sup> Tiara Anggraini

Nutrition of Health,  
Polytechnic of Health  
Palembang

Palembang, Indonesia

Corresponding author: eliza\_limar@yahoo.co.id

**Abstract** - Yellow pumpkin (*curcubita moschata*) is a plant whose meat is often used by the community as food, whether it is only processed through the steaming process or as an additional ingredient in various preparations. In addition to pumpkin flesh, there are pumpkin seeds which can also be used as food. The purpose of this study was to determine the effect of adding pumpkin seed flour to the characteristics and acceptability of roll cake. This type of research used in this study is an experimental study using a Static Group Comparison research design with 4 treatments 100%: 0% (P0), 75%: 25% (P1), 50%: 50% (P2) and, 0%: 100% (P3). Computerized dataprocessing is presented in the form of narration and tables. Data analysis was performed by SPSS. The results of this research show that P2 is the panel's most preferred sample with a hedonic assessment score of 4,55 color, taste 4,34, texture 4,48, aroma 4,24 while the nutritional value of the sample consists of water content, ash content, fat content, protein content, and carbohydrate content respectively 44.37%; 1.22%; 10.97%; 10.39%; and 33.06%. The effect of adding pumpkin seed flour to organoleptic characteristics in the manufacture of roll cake has a very significant effect such as; color, taste, texture, flavour. Roll cake with the addition of pumpkin seed flour with a percentage of 50%: 50% has the highest level of preference over organoleptic parameters compared to other roll cake products.

**Keywords:** Pumpkin seed flour, Roll cake, Nutritional value.

## I. INTRODUCTION

Roll caked was a sponge cake baked in a shallow pan, filled with jam or buttercream and rolled. The roll itself is made from flour, sugar, margarine, chicken eggs and elmusifier.<sup>1</sup>

The potential of the flour market in Indonesia is still very high. Currently the average consumption of flour in Indonesia reaches 25 kilograms / year per capita. One important factor that increases the level of consumption of wheat flour is because it is very easy to be processed into a variety of foods. Such as noodles, bread, biscuits, cake, martabak, etc. so that the ease of processing flour is able to stimulate the food industry both large and small, especially UKM's sector.<sup>2</sup>

Efforts to reduce the consumption of wheat flour in

Indonesia are classified as high, namely by replacing or substituting wheat flour with local food. Purchasing wheat flour with

local food will have an impact on the quality of the product that is made, thus preventing flour without a significant reduction in product quality by substituting wheat flour with local food ingredients. The benefits of the composition / nutrients in food can be added to the product. Potential local food as a substitute for wheat flour between potatoes, cassava, sweet potatoes, yam and pumpkin.<sup>3</sup>

Yellow pumpkin (*Cucurbita moschata*) is a type of spreading plant that is classified in the type of annual plants that are widely found in Indonesia, especially in the highlands. Pumpkin has a feature that has a sweet taste, aroma and attractive color. Pumpkin can only be processed into vegetable compote.<sup>4</sup> Pumpkin contains fairly complete nutrition containing protein, protein, pro vitamin A, vitamin B1 and vitamin C. The chemical composition of pumpkin is 32 kcal energy, protein 1.1 g. Carbohydrates 6.6 g, vitamin B1 0.08 mg, and vitamin C 5.2 mg.

Apart from the use of pumpkin flesh, pumpkin seeds which are often used as waste and are not used can also be made into a product that is rich in benefits. Traditionally the seeds of *C. moschata* Duch ex Poir are used as medicine for intestinal worms. Yellow pumpkin seeds have long been used in traditional medicine in Chinese and Indian communities in America as *antihelminthic* against *ascariasis*, *cestodiasis*, and *schistosomiasis*.<sup>5</sup> Pumpkin seeds are also used for demulsions, diuretics (art facilitators) and tonics. Other information states that since time immemorial pumpkin seeds are used to treat prostate disorders, namely enlarged prostate glands (prostatic gland hypertrophy) in elderly men.<sup>6</sup>

Nutrient content contained in pumpkin seeds include rare amino acids such as m- carboxyphenylalanine, pyrazolalanina, aminobutyric acid, ethylparagine and citrulline. There are also amino acids that are needed by the prostate gland, namely alanine, glycine, and glutamate acid. It also contains curcubidine, which is a 3-amino carboxypyrolidine which has uses as a worm medicine. There are also Zink elements that are very important for the health of the reproductive organs, including the prostate gland.

Magnesium which is also important for prostate gland health. The main fatty acids, namely linoleic acid (43.56%) and oleic acid (24.38%). Vitamin E or tocopherol, namely  $\beta$ -tocopherol and  $\gamma$  tocopherol. Carotenoids, namely lutein and  $\beta$ -carotene. Data from the United States Department of Agriculture (USDA), every 2 tablespoons of pumpkin seeds (about 28 grams) contains 163 calories, 4 grams of carbohydrates (including 2 grams of fiber and less than 1 gram of sugar), 8 grams of protein, 8% daily iron needs.<sup>7</sup>

Based on the explanation above it is very clear that this pumpkin seed have many health benefits, therefore, in this study we chose a product target more focused on children because as we know that worms are more often found in children although adults can also get worms. However, this product is also best consumed by elderly men who have a risk of prostate gland hypertrophy. If in the previous explanation the pumpkin seeds were only consumed directly without being processed, then in this study the pumpkin seeds will be made into pumpkin seed flour and substituted with wheat flour so that they can produce a new product that is processed "pumpkin seed flour roll cake"

From this background, we are interested in conducting research on the Effect of Addition of Pumpkin Seed Flour to on Characteristics and Acceptance of Roll cake.

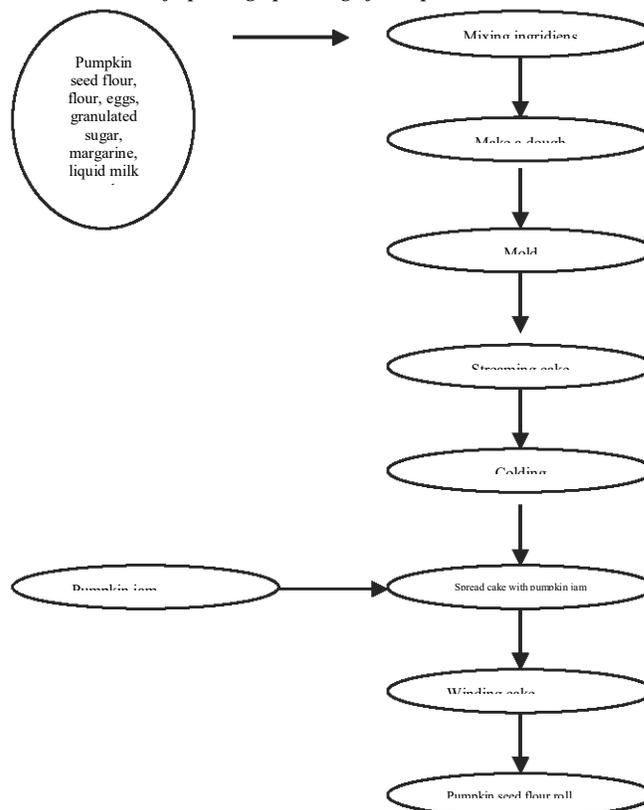
## II. RESEARCH METHODOLOGY

This research was an experimental study using a non-factorial Completely Randomized Design (CRD). Formula used: 1. P0 (ROLL CAKE) = 0 g pumpkin seed flour + 40 g wheat flour; P1 (ROLL CAKE) = 10 g pumpkin seed flour + 30 g wheat flour; 3. P2 (ROLL CAKE) = 20 g pumpkin seed flour + 20 g wheat flour and 4. P3 (ROLL CAKE) = 40 g pumpkin seed flour + 0 g wheat flour

The research was carried out at the Nutrition Technology Laboratory at Polytechnic of Health Palembang. The equipment used are stoves, pans, silk, stainless steel spoons, mixers, strainer, bowls, dough basins, plates, knives, digital scales, plastic gloves, blenders, questionnaire forms, stationery and proximate analysis tools.

Steps of Research. The flowchart of making the modified roll sponge looks like in the Figure below :

Picture: Process of Spinning Spreading of Pumpkin Seed Flour Roll Cake



## III. RESULTS AND DISCUSSION

The formulation of pumpkin powder flour roll cake that has been made subsequently goes through the organoleptic test stage to determine its acceptability. Organoleptic test is a sensory analysis of a product which includes taste, texture, color and flavor.

Organoleptic test is carried out using a 1-5 score scale with the category from the smallest to the largest namely very dislike, dislike, rather not like, like and really like. Organoleptic test was carried out on the three formulas of pumpkin roll flour, namely P1, P2, and P3.

### 1. Result of Organoleptic Test Based on Taste Criteria

Table 1. Result of Organoleptic Test Based of Taste Criteria

Organoleptic	P1		P2		P3	
	n	%	n	%	n	%
Very dislike	0	0	0	0	0	0
Dislike	0	0	1	3,4	1	3,4
Rather not like	3	10,3	5	17,2	5	17,2
Like	12	41,4	6	20,7	8	27,6
Really Like	14	48,3	17	58,6	15	51,7
	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>

Based on Table 1 it can be seen from the total score of the three treatments in the organoleptic test on texture, the roll cake that has the highest total percentage is 48.3% with criteria very fond of P1 treatment, while the roll cake that has the lowest total percentage is 3.4 % with very criteria do not like the treatment of P2 and P3. This shows that the majority of panelists preferred the sponge texture in P1 treatment compared to P2 and P3 treatments.

Food taste is an assessment factor for the results of the incorporation of material formulations in making a food product that is assessed with the tongue, by measuring sweetness, acidity, salty, bitter or other combinations and is a determinant of the level of preference for food products. The taste in the three treatments of roll cake is influenced by the use of basic ingredients namely flour substitute for pumpkin seed flour. From the results of the organoleptic test it was found that the roll cake with P1 treatment was preferred over P2 and P3. This is thought to be caused by the percentage of pumpkin seed flour addition which is only slightly compared to the flour, so the flavor arising from the pumpkin seed flour itself does not greatly affect the taste of the roll cake. Whereas in P2 and P3 the percentage of the addition of pumpkin seed flour was more than P1, it was the effect on the assessment of the taste of the roll cake because the panelists had just tasted food made from pumpkin seed flour.

## 2. Result of Organoleptic Test Based on Texture Criteria

**Table 2. Result Of Organoleptic Test Based On Texture Criteria**

Organoleptic	P1		P2		P3	
	n	%	n	%	n	%
Very dislike	0	0	0	0	1	3,4
Dislike	0	0	0	0	0	0
Rather not like	6	20,7	4	13,8	7	24,1
Like	11	37,9	7	24,1	10	34,5
Really Like	12	41,4	18	62,1	11	37,9
<b>Total</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>

Based on Table 2, it can be seen from the total score of the three treatments in the organoleptic test on texture, the roll cake that has the highest total percentage is 62.1% with criteria very fond of P2 treatment, while the roll cake that has the lowest total percentage is 3.4 % with very criteria do not like the treatment of P3. This shows that the majority of panelists preferred the sponge texture in P2 treatment compared to P1 and P3 treatments.

Food texture, is an assessment factor determined by the senses of the centuries or by touch by measuring the hardness or consistency of food products. Texture is influenced by all the ingredients that comprise flour, sugar, fat, milk, eggs. Food texture is determined by water content, fat content, carbohydrates and protein. The greater the protein content, the greater the water absorption.

Pumpkin seed flour is a source of high protein which increases water absorption so that the resulting sponge roll texture is more robust.<sup>8</sup>

Evidenced by the formula P2 roll cake that is more 50%: 50% addition of pumpkin seed flour with flour so that the texture is solid but still soft and fluffy well. Whereas in the P1 roll the flour is used more than the pumpkin seed flour which is 75%: 25% with the resulting texture is also dense and soft and well developed. But in the P3 roll cake with all the main ingredients using yellow pumpkin seed flour, the resulting texture remains soft but does not expand properly.

## 3. Result of Organoleptic Test Based on Colour Criteria

**Table 3. Result Of Organoleptic Test Based On Colour Criteria**

Organoleptic	P1		P2		P3	
	n	%	n	%	n	%
Very dislike	0	0	0	0	0	0
Dislike	0	0	0	0	3	10,3
Rather not like	4	13,8	2	6,9	6	20,7
Like	6	20,7	9	31	10	34,5
Really Like	19	65,5	18	62,1	10	34,5
<b>Total</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>

Based on Table 3 above, it can be seen from the total score of the three treatments in the color organoleptic test, the roll cake

that has the highest total percentage is 93.1% with the criteria for like and really like to the P2 treatment, while the roll cake that has the lowest total percentage is 10.3% with the criteria of not liking P3 treatment. This shows that most of the panelists preferred the color of the roll cake in the P3 treatment.

The color of the roll cake can be influenced by the addition of various concentrations of raw materials used, and the process of steaming the sponge roll. This roll cake is a blend of pumpkin seed flour which produces greenish. In P1 rolls the color produced is paler due to the use of a small pumpkin seed flour so that the color of the pumpkin seed flour is inferior to the white color of the dough produced by the flour.<sup>9</sup>

In P2 sponge the resulting color is balanced not too thick and not too pale due to the composition of the main ingredients namely flour and yellow pumpkin seed flour. While the P3 roll sponge has a slightly thicker green color than the two previous formulas because the P3 sponge material the main used is only pumpkin seed flour. In increasing the level of interest of the panelists we also added a little food coloring to make the motif on the roll cake.

#### 4. Result of Organoleptic Test Based on Flavour Criteria

**Table 4. Result Of Organoleptic Test Based On Flavour Criteria**

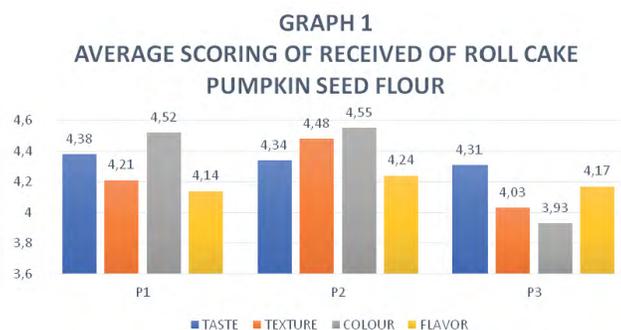
Organoleptic	P1		P2		P3	
	n	%	n	%	n	%
Very dislike	0	0	0	0	0	0
Dislike	1	3,4	1	3,4	2	6,9
Rather not like	6	20,7	4	13,8	5	17,2
Like	10	34,5	11	37,9	8	27,6
Really Like	12	41,4	13	44,8	14	48,3
<b>Total</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>	<b>29</b>	<b>100</b>

Based on Table 4 above, it can be seen from the total score of the three treatments in the organoleptic test for flavour, the roll cake which has the highest total percentage of 82.7% with the criteria for like and really like to the P2 treatment, while the roll cake which has the lowest total percentage is 3.4% with the criteria of not liking treatment P1 and P2. This shows that most of the panelists preferred the flavour of roll sponge in P2 treatment compared to P1 and P3 treatments.

There was no significant difference in the flavour in the three treatments of kissed roll cake. This is because one of the basic ingredients in the production of pumpkin flour rolls is not much different between treatments. The distinctive aroma of pumpkin seed flour is very dominating and due to the presence of other basic ingredients such as milk, vegetable oil, so the resulting aroma is balanced.

The scent is a flavour that is difficult to measure so that it usually causes different opinions in assessing the quality of the aroma. Differences in opinion can be caused by everyone having different smells, although they can distinguish scents, but each person has different preferences.<sup>10</sup>

#### 5. Graph Average Scoring of Received of Roll Cake



#### Pumpkin Seed Flour

The graph above shows that the type of formula most favored by panelists from all aspects of evaluation is the P2 roll cake with the main ingredient being 20 grams of flour and 20 grams

of pumpkin seed flour. Although the average difference is very small from the results of the graph. That way this graph shows the results that the addition of pumpkin seed flour in making roll cake can still be accepted by the community, this is very good where in the future the use of wheat flour can be reduced.

#### 6. Result of Proximate Analysis of Roll Cake Pumpkin Seed Flour

**Table 5. Result of Proximate Analysis of Cake Pumpkin Seed Flour**

No	Cod e	Water (%)	Ash (%)	Fat (%)	Protein (%)	Carbohy drate (%)
1.	P1	44,37	0,61	10,39	10,39	33,67
2.	P2	37,95	0,61	10,44	10,44	40,04
3.	P3	37,74	0,59	10,36	10,36	40,58
		40,02	0,60	10,39	10,39	38,09

Based on Table 5 above, it is known that the proximate analysis results of roll cake pumpkin seed flour tested on the three formulas used obtained formula P1 (per 100 grams), protein 10.39%, fat 10.97%, carbohydrate 33.67% , Ash 0.61%, and Water 44.37% and then formula P2 (per 100 grams), protein 10.44%, fat 10.97%, carbohydrate 40.04% , Ash 0.61%, and Water 37.95% and formula P3 (per 100 grams), protein 10.36%, fat 10.73%, carbohydrate 40.58% , Ash 0.59%, and Water 37.74%.

#### 7. Target of Production

Based on the explanation above it is very clear that this pumpkin seed has many health benefits, therefore, in this study we chose a product target more focused on children because as we know that worms are more often found in children although adults can also get worms. However, this product is also best consumed by elderly men who have a risk of prostate gland hypertrophy.

### IV. CONCLUSION

From the results of the study concluded that the best roll formula according to the assessment of the organoleptic test was P2 roll cake (20 grams of flour, 20 grams of pumpkin seed flour). The results of the proximate analysis of the best pumpkin seed flour roll formulation were 291.93 Kcal (per 100 grams), protein 10.39%, fat 10.89%, Carbohydrate 38.09%, Ash 0.60%, and Water 40.02%. From the analysis results, the fat content exceeds the standards in SNI 01-3840-1995.

### V. RECOMMENDATION

It is necessary to reduce the high fat content in the roll cake by looking for a better composition of ingredients with the same functional and lower fat content.

Further research needs to be carried out on the chemical analysis of the levels of tannin and curcubidine in pumpkin roll flour products as an antihelmintic. And the effect of the administration of pumpkin flour roll is for the treatment or prevention of intestinal worms in children.

### VI. ACKNOWLEDMENT

The researcher expressed his highest appreciation to the Director of Palembang Health Polytechnic, Mr. Muhammad Taswin, S, Si., Apt., M.M., M.Kes., for the opportunity to carry out this research.

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# Factors That Associated with Good Corporate Governance (GCG) to Non Medic Employee Performance at Islamic Hospital Khadijah Palembang 2019

1<sup>st</sup> Aannisah Fauzaania  
 Departement of Public Health  
 Institute of Health Science Bina Husada Palembang  
 Palembang, Indonesia

2<sup>nd</sup> Dian Eka Anggreny  
 Departement of Public Health  
 Institute of Health Science Bina Husada  
 Palembang Palembang, Indonesia

Corresponding author: dianeka\_82@yahoo.co.id

**Abstract** - Republic of Indonesia Law Number 44 of 2009 concerning hospitals in Article 33 paragraph 1 states that Every hospital must have an effective, efficient and accountable organization. The purpose of this research is to know the factors related to the performance of employees at Siti Khadijah Palembang Hospital 2019. The population in this study was 217 employees with a sample of 68 non-medical employees chosen by accidental sampling. Data collection was done by questionnaire in May 2019, then analyzed using chi square test with  $\alpha = 5\%$  and multivariate analysis with logistic regression test. The results obtained p value of accountability ( $p = 0.001$  and  $OR = 7.292$ ), transparency ( $p = 0,000$ ,  $OR = 11,840$ ) and fairness ( $p = 0.004$ ,  $OR = 5,630$ ). The results of multivariate analysis obtained the most dominant variable is transparency ( $p = 0.005$ ) and has probability value 8.98%, which means that employees who feel that accountability, transparency, and fairness of hospitals are good, may also have a good performance 8.98%. The conclusion is there is a relationship between accountability, transparency, and fairness in good corporate governance on the performance of non-medical employees. It is suggested that the Siti Khadijah Palembang Hospital to implement the GCG better.

**Keywords:** Performance, Good Corporate Governance, Employee

## I. INTRODUCTION

The concept of good corporate governance (GCG) in hospitals referred to as good hospital governance (GHG) or in Indonesian is referred to as a good hospital governance system. The concept of good hospital governance (GHG) is the same as the concept of corporate governance in general, but has adjusted its application to the type of business, namely health services. Republic of Indonesia Law Number 44 of 2009 concerning hospitals in Article 33 paragraph 1 states that "Every hospital must have an effective, efficient and accountable organization". The organization of hospitals was established with the aim of achieving the vision and mission of the hospital by implementing good corporate governance and good clinical governance. This shows the urgency of implementing a hospital governance system in each hospital to serve the most important public health needs. (Nur, Yusup. 2017: 2)

When referring to the world bank and UNDP programs, the orientation of public sector development is to create good governance. Understanding good governance is often interpreted by good governance. Meanwhile, world bank defines good governance as an implementation of solid and responsible development management that is in line with the principles of democracy and efficient markets, avoidance of misappropriation of investment funds, and prevention of corruption both politically and administratively, implementing budgetary discipline and creating legal and political framework for the growth of business activities. (Mardiasmo, 2009: 18)

The opening of the free market in the ASEAN region as of January 1, 2016, which was marked by the influx of goods and services from various countries in the ASEAN region including China, Japan and South Korea would be more free to enter Indonesian territory. Indeed, MEA is an opportunity and challenge for Indonesia. but all depends on the preparedness of this new chapter. To face competition in the ASEAN region, companies especially in Indonesia should improve themselves. This effort is in order to win market competition in the ASEAN region. Companies in Indonesia must be able to run business governance properly. Governance or Good Corporate Governance (GCG) is a term used in general. (Hamdani, 2016: 3)

It is hoped that the implementation of good corporate governance in public organizations, banks, and SOEs can restore public confidence, in anticipation of intense competition in the free market era, corporate social responsibility and business ethics. The application of good corporate governance cannot be separated from the morals and ethics of business people, which should be set forth in a standard in each company called the corporate code of conduct. (Sedarmayanti, 2012: 62)

GCG is needed in order to create efficient, transparency, accountability, responsibility, independence, fairness and fairness for all stakeholders. The business world has a role to improve the quality of management structures and work patterns of the company based on the principles of GCG on an ongoing basis. (Hamdani, 2016: 3-4)

The results of the Juairiah study in 2016 stated that the performance of employees at Siti Khadijah Hospital was not fully optimal. Information is also obtained about giving the same salary to both

high-performance employees and low-performing employees. In addition, if there are no sanctions against employees who are underperforming or have bad behavior, they have the same rights, resulting in the lack of professional performance of employees at the Siti Khadijah Islamic Hospital Palembang.

With the data that has been presented, the question arises to the author, namely what are the factors associated with Good Corporate Governance on employee performance. For this reason, the writer wants to examine the "Factors relating to Good Corporate Governance (GCG) Against the Performance of Non-medical Employees of Siti Khadijah Palembang Hospital in 2019" to find out what factors are related and have a scientifically significant relationship.

### 1.1. Related Work

Jayanti et al (2016) with her research about The Effects of Good Corporate Governance on performance (study of employees of PT. Pos Indonesia (Persero) Tuban). This type of research is explanatory research or explanatory research through quantitative approaches. Data collection techniques Through the distribution of questionnaires and taking documentation. The results of this study indicate that partially fairness, transparency, accountability, and responsibility have a significant positive effect. Simultaneously that GCG which consists of variables of transparency, accountability, and responsibility, fairness has a significantly positive effect.

In the other case, Chandra's research on (2016) explain about Implementation of Good Corporate Governance Principles in Hospitals. This research uses descriptive qualitative method. In this study using descriptive qualitative methods because research with a qualitative approach emphasizes more on the analysis of deductive and inductive inference processes and on the analysis of the dynamics of the relationship between observed phenomena, using scientific logic.

From the principle of transparency, research subjects are still not carried out thoroughly because the financial statement information is not entirely known by the director. From the principle of accountability, the research subjects have carried out it well. From the principle of responsibility, research subjects have not implemented it thoroughly, due to employee salaries that are not in accordance with the District Minimum Wage. In terms of independency carried out by the research subject, it still has not been implemented well, because there are still employees who work not in accordance with the job description.

### 1.2. Our Contribution

This paper presents the factors related to good corporate governance to the performance of employees at the Islamic hospital Siti Khadijah Palembang. Employees are one of the important assets for the development and progress of an organization or company. Therefore, companies must know some things that can affect the productivity of the performance of their employees. Through performance measurement methods using indicators of the principles of good corporate governance that we have carried out through

multivariate analysis, the results of the most influential factor are transparency of company. After doing research, then we publish it at the hospital which is the location of the study. Then, the management then gets a reference to be more transparent in carrying out leadership governance in his organization.

### 1.3. Paper Structure

The rest of the paper is organized as follows. Section 1 was introduction with background that explain why performance of employee was being an urgent issue to be discussed. Section 1 was also include about Related work, our contribution, and paper structure. Then Section 2 was explain about the result and analysis of this research. We use three types of analysis there are Univariate analysi, bivariate analysis, and multivariate analysis. Furthermore, Section 3 discussed about conclusion and the last section contains the reerences that we used.

## II. RESULTS AND DISCUSSION

### 2.1. Univariate Analisis

Table 1. Gender

Gender	f	%
Male	37	54,4
Female	31	45,6
Total	68	100,0

Based on table 1 shows that of 68 respondents with male gender as many as 37 respondents (54.4%), more than respondents with female gender as many as 31 respondents (45.6%).

Table 2. Age

Age	f	%
17-25	34	50,0
26-35	15	22,1
36-45	19	27,9
Total	68	100,0

Based on table 2 shows that of 68 respondents aged 17-25 years as many as 34 respondents (50%), respondents aged 26-35 years 15 as many respondents (22.1%) and respondents aged 36-45 years as many as 19 respondents (27.9%).

Table 3. Level of Education

Level of Education	f	%
High ( $\geq D3$ )	38	55,9
Low ( $< D3$ )	30	44,1
Total	68	100,0

Based on table 3 shows that of 68 respondents with a higher education level as many as 38 respondents (55.9%), more than respondents with a low education level of 30 respondents (44.1%).

**Table 4. Length of Employment**

Length of Employment	f	%
Old ( $\geq 3$ Tahun)	55	80,8
New ( $< 3$ Tahun)	13	19,2
Total	68	100,0

Based on table 4 shows that of 68 respondents with a relatively long working period of 55 respondents (80.8%), more than respondents with a relatively new work period of 13 respondents (19.2%).

**Table 5. Accountability**

Accountability	f	%
Good	41	60,3
Less good	27	39,7
Total	68	100,0

Based on table 5 shows that of 68 respondents as many as 41 respondents (60.3%) felt that hospital accountability was good, more than respondents who felt that hospital accountability was not as good as 27 respondents (39.7%).

**Table 6. Transparency**

Transparency	f	%
Good	42	61,8
Less good	26	38,2
Total	68	100,0

Based on table 6 shows that of 68 respondents as many as 42 respondents (61.8%) felt that hospital transparency was good, more than respondents who felt the transparency of hospitals was not as good as 26 respondents (38.2%).

**Table 7. Fairness**

Fairness	f	%
Good	47	69,1
Less good	21	30,9
Total	68	100,0

Based on table 7 shows that of 68 respondents as many as 55 respondents (69.1%) felt that the fairness of rights for employees from the hospital was good, more than the respondents who felt the fairness rights for employees from hospitals were not as good as 21 respondents (30, 9%).

**Table 8. Performance**

Performance	f	%
Good	47	69,1
Less good	21	30,9
Total	68	100,0

Based on table 8 shows that of 68 respondents as many as 47 respondents (69.1%) had good performance, more than the respondents whose performance was still not as good as 21 respondents (30.9%).

## 2.2. Bivariate Analysis

**Table 9. Accountability**

Accountability	Performance				P-value	OR
	Good		Less good			
	n	(%)	n	(%)		
Good	35	85,4	6	14,6	0,001	7,921
Less good	12	44,4	15	55,6		
Total	47	69,1	21	30,9		

Based on table 9, the results of the analysis of the relationship of accountability with the performance of non-medical employees, it was found that out of 68 respondents who felt good hospital accountability, 35 respondents (85.4%) had good performance but 6 respondents (14.6%) had poor performance. While from 68 respondents who felt that hospital accountability was not as good as 12 respondents (44.4%) had good performance and 15 respondents (55.6%) had poor performance. The Chi-Square test results obtained  $p = 0.001 < \alpha (0.05)$  and OR 7.292, it can be concluded that there is a significant relationship between accountability and the performance of non-medical employees at Siti Khadijah Palembang Hospital in 2019, as well as respondents who feel accountability hospitals have a high chance of 7,292 times greater to have good performance compared to employees who feel that hospital accountability is less good.

**Table 10. Transparency**

Transparency	Performance				P-value	OR
	Good		Less good			
	n	(%)	n	(%)		
Good	37	88,1	5	11,9	0,000	11,840
Less good	10	38,5	16	61,5		
Total	47	69,1	21	30,9		

Based on table 10, the results show that most employees who have good performance state that the transparency of RSI Siti Khadijah has also been good with the number of respondents as many as 37 respondents (88.1%). While some of the employees who had poor performance stated that the transparency of Siti Khadijah Hospital was also still less good with the number of 16 respondents (61.5%).

The results of the analysis of the relationship between performance and transparency using the Chi-Square test obtained  $p$  value = 0,000

$<\alpha$  (0.05) and OR = 11,840), it can be concluded that there is a significant relationship between transparency and the performance of non-medical employees at Siti Khadijah Hospital Palembang in 2019, and based on OR results, respondents who felt that the transparency of the hospital had a high chance of 11,840 times greater to have a good performance compared to employees who felt transparency from the hospital was less good.

**Table 11. Fairness**

Fairness	Performance				P-value	OR
	Good		Less good			
	n	(%)	n	(%)		
Good	38	80,9	9	19,1	0,004	5.630
Less good	9	42,9	12	57,1		
Total	47	69,1	21	30,9		

Based on table 11, the results obtained that of 68 respondents feel fairness of the employees of the hospital has good value as many as 38 respondents (80.9%) had a good performance but nine respondents (19.1%) had a poor performance. Whereas from 68 respondents who felt that fairness or employees from hospitals was worth less than 9 respondents (42.9%) had good performance and 12 respondents (57.1%) had poor performance. The Chi-Square test results obtained a value of  $p = 0.004 <\alpha$  ((0.05), and OR 5,630)

So, it can be concluded that there is a significant relationship between fairness and fairness with the performance of non-medical employees at Siti Khadijah Palembang Hospital in 2019, and based on OR results, respondents who feel the fairness of hospital committees is 5,630 times more likely to have good performance compared to employees who feel that fairness and justice from the hospital are less good.

### 2.3 Multivariate Analisis

**Table 12. Selection of candidate models**

Variable	P value
Accountability	0,001
Transparency	0,000
Fairness	0,004

Based on table, the results of multivariate model candidate analysis were obtained with p value  $<0.25$ , namely accountability (0,000), transparency (0,000) and fairness funds (0,002). These variables are then included in the multivariate model.

**Table 13. Multivariate modeling**

Variable	Beta	P value	OR	95% CI
Accountability	-0,881	0,324	0,414	0,072-2,384
Transparency	-1,939	0,005	0,144	0,038-0,551
Fairness	-0,389	0,655	0,678	0,123-3,735
Constant	0,894			

Based on table, the results show that variables with a value of  $p > 0.05$  are accountability variables (0.324) and fairness (0.655). Based on these results the fairness variable is excluded from the model because it has the largest p value.

Variable	OR	OR after fairness outed	Change of OR
Accountability	0,414	0,320	69,1
Transparency	0,144	0,141	73,5

Based on table, the results show that after the fairness variable is issued there is a calculation of changes in the value of  $OR > 10\%$ , then the fairness variable is put back into the model. Furthermore, accountability variables are issued in modeling and revisited changes in their OR values. After that, the final results of multivariate modeling are obtained in the following table:

Variable	Beta	P value	OR	95% CI
Accountability	-0,881	0,324	0,414	0,072-2,384
Transparency	-1,939	0,005	0,144	0,038-0,551
Fairness	-0,389	0,655	0,678	0,123-3,735
Constant	0,894			

Based on table, the results of multivariate analysis showed that the most dominant variable related to the performance of non-medical employees was the transparency variable with a value of  $p = 0.005 <\alpha$  (0.05).

Its Logistic Regression Model:

$$y = 0,894 + (-0,881) + (-1,939) + (-0,389)$$

$$y = -2,315$$

$$\text{Good performance probability} = 0.0898 = 8.98\%$$

This means that non-medical employees at Siti Khadijah Palembang Hospital, who feel that hospital accountability, transparency and fairness are good, may also have a good performance of 8.98%.

According to the United Nation Development Program (UNDP) the principles developed in Good Governance are one of them is transparency. Transparency must be built within the framework of freedom of information flow of various processes, institutions and information must be freely accessible by those who need it and must be able to be provided adequately and easily understood so that it can be used as a monitoring and evaluation tool.

According to the researchers themselves, company transparency is a capital in moving employees or workers to be able to carry out their respective duties in achieving the target according to the target. Because when a company system runs transparently, the bad dynamics that might occur in a company due to miscommunication can be minimized.

By implementing transparency in its entirety, employee trust will also increase. When trust is inherent, the employee will not feel burdened when he / she is actually getting a double duty, or there is a new policy that has the opportunity to cause pros and cons. Things that can lead to internal conflicts such as mutual suspicion between employees, or concerns that there are rights and obligations that have been overlooked can be avoided and employees can carry out their duties according to their duties and awareness. In addition, corporate integrity will also increase.

To be able to improve employee performance, company transparency needs to be continuously improved. Because, in addition to influencing employees, the application of transparency can also improve the company's image for consumers who receive services.

### III. CONCLUSION

Based on the results of research conducted at Siti Khadijah Palembang Hospital in the performance of non-medical employees, conclusions can be taken was 68 respondents with male gender as many as 37 respondents (54.4%), more than respondents with female gender as many as 31 respondents (45.6%). The 68 respondents aged 17-25 years as many as 34 respondents (50%), respondents aged 26-35 years 15 as many respondents (22.1%) and respondents aged 36-45 years as many as 19 respondents (27.9%) Of 68 respondents with a high education level of 38 respondents (55.9%), more than respondents with a low education level of 30 respondents (44.1%). Of the 68 respondents with a long term work period of 55 respondents (80.9%), more than respondents with a relatively new work period of 13 respondents (19.1%)

There is a significant relationship between hospital accountability and the performance of non-medical employees with a value of  $p = 0.001 < \alpha (0.05)$  at Siti Khadijah Palembang Hospital in 2019. There is a significant relationship between hospital transparency and the performance of non-medical employees with a value of  $p = 0,000 < \alpha (0.05)$  at Siti Khadijah Palembang Hospital in 2019. There is a significant relationship between fairness of employee rights and the performance of non-medical employees with a value of  $p = 0.004 < \alpha (0.05)$  at Siti Khadijah Palembang Hospital in 2019. The most dominant variable related to performance is the transparency variable with a value of  $p = 0.005 \alpha \alpha (0.005)$  with an 8.98% probability value at Siti Khadijah Palembang Hospital in 2019.

### IV. ACKNOWLEDMENT

This research was supported by Institute of Helath Science Bina Husada.

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# Functional Foods for Reducing the Risk of Various Chronic Diseases

1<sup>st</sup> D A Shabayek  
IPB University of Community  
Nutrition Department  
Faculty of Human Ecology  
West Java, Indonesia

2<sup>nd</sup> Rimbawan  
IPB University of Community  
Nutrition Department  
Faculty of Human Ecology  
West Java, Indonesia

3<sup>rd</sup> S Budiyanto  
IPB University of Community  
Nutrition Department  
Faculty of Human Ecology  
West Java, Indonesia

4<sup>th</sup> TC. Maigoda  
IPB University of Community  
Nutrition Department  
Faculty of Human Ecology  
West Java, Indonesia

Corresponding author: dina7258@gmail.com

**Abstract** - Global epidemic of obesity is growing at an unprecedented pace and has become one of the world's most important public health issues. Obesity contributes to multiple metabolic conditions, such as respiratory problems, elevated blood pressure, and diabetes. Obesity is a disease often induced by bad eating and an unhealthy lifestyle. Globally more than 650 million obese and 1.9 billion overweight people. It is necessary to have an alternative food that is fast and practical in its preparation but meets the standard nutritional requirements for healthy living. Breakfast is important for the body because it can restore blood glucose levels so that improve memory and concentration level well. Regardless of the benefits of breakfast, people's busy schedules in recent times have resulted in ignoring breakfast. For this reason, this Study shows health benefits of some plant based functional food to reduce the risk of various chronic diseases (Obesity).

**Keywords:** Functional Food, chronic diseases, Brown Rice, Chia seeds, Ginger, Red kidney beans, Obesity

## I. INTRODUCTION

The global epidemic of obesity is growing at an unprecedented pace and has become one of the world's most important public health issues. It is predicted that by 2030, 38 % of the world's adult population would be overweight without effective intervention[14]. There are several influences correlated with obesity and metabolic disorders, including genetics and physiological differences (gender and age), living environments and habits (diet, stress, smoking, alcohol and exercise)[14]. Obesity contributes to multiple metabolic conditions disorders, such as pathologies linked with inflammation, cardiovascular diseases, hypertension, coronary problems, obesity and diabetes mellitus. For the management of obesity, a dietary change and herbal solutions may be used to prevent their adverse effects, instead of medications. The prevention or management of chronic diseases is a major health care priority since they account for nearly 60% of all deaths worldwide (WHO). Thus nutrition, through functional foods is an attractive therapeutic alternative to deliver dietary components capable of managing chronic disease, especially in light of the increasing cost of health care [23].

Breakfast is one of the most important meals of the day it can restore blood glucose levels so that improve memory and concentration level well. Regardless of the benefits of breakfast, people's busy schedules in recent times have resulted in ignoring breakfast. For this reason, it is necessary

to have an alternative food that is fast and practical in its presentation but meets the nutritional standard requirements [19]. Breakfast flakes (BMF)

is a popular product and can be produced anywhere in the world. It is consumed by all ages and at all times because it is a delicious meal and ready-to-eat. The breakfast flakes on the markets are produced from cereals and contain high percentage of carbohydrates [19]. Other sources of ingredients such as rice and kidney beans which contain both carbohydrates and good amount of protein can also be used to enrich the protein content of the food. The worldwide increase in the awareness about public health has necessitated so that, the search for functional foods with multiple healthy benefits and capable of acting on various biochemical targets with limited toxicity to reduce diseases and nutrition improvement [9]. This Study shows health benefits of some plant based functional food to reduce the risk of various chronic diseases (Obesity).

The concept of functional foods was proposed by a Japanese academic society in the early 1980's, and the legislation for the functional foods was first implemented as FOSHU, which means "Foods for Specified Health Use". The Functional Food Center, USA (FFC) previously defined functional foods as scientifically proven benefits towards improving overall health and mitigating the effects of chronic disease. Functional foods are based on attribution of a health benefit so that, Health benefits range from supporting the immune system to infections, such as the latest COVID-19, and applications in improving mental health to improving public health and treating chronic diseases and their symptoms such as obesity, type 2 diabetes, etc. As is evident in the definition by the FFC, It is important that the development of functional food has a rigorous, legitimate, and audited process focused on improving the health of billions of people [1]. The European Food Safety Authority (EFSA) defines functional foods as: "A food, which beneficially affects one or more target functions in the body, beyond adequate nutritional effects, in a way that is relevant to either an improved state of health and well-being or reduction of risk of disease. Although there is no clear definition of functional foods so that, conventional foods, modified foods, and food ingredients are the primary categories of functional foods definitions [2].

Whole foods that may be functional due to the bioactive compounds it contains [2].

1. Modified foods: considered to be functional foods have been modified through factors involved in food production or

processing to modify the type, content, bioaccessibility or bioavailability of bioactive compounds [2].

2. Food ingredients that may be isolated and/or synthesized bioactive components that are used in food products to confer a functional effect [2].

#### I. SCIENTIFIC BASIS FOR FUNCTIONAL FOODS :

Functional effects and potential mechanisms may be evaluated through basic research (cell and animal studies) or clinical research (human studies). Typically requires a foundational knowledge of food, nutritional, and biological sciences to develop functional foods and identify mechanisms by which potential functional foods and functional effects to improve health and reduced chronic disease risk [2]. A functional food can be a natural food or a food to which a component has been added or removed by technological or biotechnological means [3]. These are not only well known yoghurts but also soft drinks, juices, sorbets, bread, cold meats, sausages, etc [4].

- Nowadays most popular functional food ingredients worldwide are:
  1. Probiotics, prebiotics and symbiotic
  2. Dietary fiber
  3. Omega 3 fatty acids, oleic acids and phytosterols
  4. Phytoestrogens
  5. Phenolic compounds

#### *Brown rice*

Brown rice is a rich source of various bioactive compounds, such as -oryzanol, tocopherol, tocotrienol, amino acids, dietary fibres and minerals. Inositol hexaphosphate is a naturally- occurring molecule found in brown rice. This compound has demonstrated anti-cancer Properties.

Selenium is a trace mineral, which is found abundantly in brown rice. The function of selenium is to induce DNA repair and combine in damaged cells to promote apoptosis, which is the self-destruction of the cells in the body to remove damaged and worn out cells. It also serves as a rich source of magnesium. Magnesium plays an important role in our body, as it works as a cofactor of more than 300 enzymes. About 21% of the daily value of magnesium can be obtained by consuming a cup of brown rice. It contains a high amount of dietary fiber and has a lower glycaemic index compared to white rice. Also it has vitamin E, mainly in two types of structure, which are tocopherols and tocotrienols. The function of vitamin E is antioxidant activity, maintenance of membrane integrity, DNA repair, immune support and metabolic processes [5].

1. Epidemiological studies suggest a strong association between increased consumption of whole-grain foods and reduced risk of diabetes and cardiovascular disease [7].
2. Colored rice varieties have been demonstrated to possess anti-inflammatory and antioxidant properties thus presenting rice as a potential candidate for nutraceutical and/or functional food alternatives. It has therapeutic characteristics that have been attributed to the presence of polyphenols that a subclass of

phytochemicals. Incorporation of polyphenols into diets through rice consumption could be as a potential complementary alternative for reducing the incidence of metabolic syndrome and its associated risk factors such as obesity [8].

3. Many studies have reported that brown rice also has anti-dyslipoproteinemia and cholesterol lowering effects in animal models. In a clinical study involving sixty Vietnamese women (aged 45–65 years) with impaired glucose tolerance, the impact of germinated brown rice intake on blood glucose and lipid profile was evaluated and observed an improvement in blood glucose and lipid level in brown rice diet group [5].

#### *Chia seeds*

Chia seeds are ‘functional food’ owing to the presence of  $\alpha$ -linolenic acid (ALA), an essential precursor fatty acid of physiologically significant polyunsaturated fatty acids (PUFA). It also a promising source of antioxidants due to the presence of polyphenols, chlorogenic and caffeic acids, myricetin, quercetin, kaempferol as well as essential fatty acids, dietary fiber, lipids, protein, phenolic compounds, minerals and omega-3 fatty acids that play a key role in preventing the formation of clots and plaques in the arteries and so help to prevent cardiovascular diseases, maintaining healthy serum lipid and glucose levels [9].

The United States Department of Agriculture (USDA) has reported that chia seed contains 42.12% total carbohydrates (including 34.4% total dietary fiber), 30.74% total lipids, 16.54% protein, 5.8% moisture, and 4.8% ash. In addition, the seed contains high amounts (335–860 mg/100 g) of calcium, phosphorus, potassium, and magnesium, with lesser amounts (4.58–16 mg/100 g) of sodium, iron, and zinc [10].

1. The study showed a decrease in weight gain in experimental groups supplemented with ground chia seeds and its extracts. This indicates that chia seeds can be a good candidate for weight loss if executed with other therapeutic life changes such as reducing intake of foods and food products rich in saturated fats and trans-fatty acids; increasing intake of foods high in omega-3 fatty acids and dietary fiber including fruits and vegetables, reducing intake of sodium to less than 2400 milligrams per day and reducing physical inactivity [7].
2. The clinical studies suggest that chia seeds exert effects such as reducing postprandial glycemia, appetite, waist circumference, and cardiovascular risk factors. Such effects may be the result of their composition: chia seeds are a rich source of dietary fiber, which reduces the hunger sensation, and the omega-3, which is essential for the emulsification and absorption of the liposoluble vitamins A, D, E, and K. A (Toscano et al.2015). [11].
3. Chia seed diet in rats, reduced dyslipidemia and visceral adiposity. The chia diet caused lower triacylglycerol levels, increased HDL cholesterol and linolenic and it derived fatty acids in rat serum. Dietary chia seeds prevented the onset of dyslipidemia and insulin resistance (IR) in the rats fed with the sucrose-rich diet. Dietary chia seed also reduced the visceral adiposity [9].
4. Chia seeds capable of inhibiting pancreatic lipase an enzyme responsible for digestion of dietary fat. There is possibility of slowing down the digestion of fats after consumption of chia seeds/extract hence their release through feces. Inhibition of this enzyme is thought to improve dyslipidemia. Pancreatic lipase inhibitors are considered valuable therapeutic

### *Ginger*

Ginger is an ancient medicinal plant of the family Zingiberaceae, formally recognized as *Zingiber officinale* Rosc and endemic to South-East Asia [12]. This is one of the oldest known treasured spices regarded as a therapeutic blessing from Allah, its pungency and aroma. Fresh ginger has been used for the treatment of nausea, cold-induced disease, colic, asthma, cough, heart palpitation, swellings, dyspepsia, loss of appetency and rheumatism. Medicinal properties associated with ginger are anti-inflammatory properties, anti-thrombotic properties, cholesterol-lowering properties, blood pressure-lowering properties, anti-microbial properties, anti-oxidant properties, anti-tumor properties, and hypoglycemic properties. Consumption of ginger also has beneficial effects on heart disease, cancer, hypertension, obesity, diabetes, osteoarthritis, and bacterial infections [13].

1. There is increasing evidence and studies showing that ginger have beneficial effects against obesity and related metabolic syndromes [14].
2. Dietary Ginger has shown beneficial effects against obesity and related metabolic disorders, and prevents body weight gain by remodeling whole-body energy metabolism and inducing browning of white adipose tissue [15].
3. Addition of dried lemon, ginger and cumin at certain levels 200mg/kg, respectively to the high fat diet decreased the body weights, in addition to significant decrease in the mean values total lipids profile, serum glucose level, and liver enzymes in all treated groups. The dried lemon, ginger and cumin are rich in antioxidants such as phenols and Flavones which plays an important role in reducing the level of lipids profile, serum glucose, and liver enzymes and are considered natural anti-obesity [16].

### *Red beans*

- Red beans are known as a plant protein source. Red bean protein content is quite high, which is around 21-27% per 100 g of material [17]. It has a glycemic index value low. The glycemic index is an index (level) of food according to its effect in increase blood sugar levels. Glycemic value at kidney beans namely 26. A low glycemic index value is good for obesity and diabetes mellitus sufferers due to increased levels sugar in the blood is slow and peak low sugar content [18]. Fiber in kidney beans is a water soluble fiber that can reduce cholesterol levels and blood sugar levels [19]. Red kidney bean has alpha-glucosidase and alpha-amylase inhibiting activity which delays carbohydrate digestion [20]. Hence the selection of beans red is a good source of protein used for substitution in the manufacture of ready to- eat cereal or flakes [18].
- Red kidney bean flakes and red palm oil as ready-to - eat breakfast for patients with diabetes. Recommend that the drug produced should be viewed as an ideal breakfast for diabetic patients, as it exhibits possible hypoglycemic and antioxidant properties as well as having high fiber content and the energy and macronutrients needed. Red kidney bean has alpha-

glycosidase and alpha-amylase inhibiting behavior that slows the absorption of carbohydrates while red palm oil has antioxidant activity that can neutralize oxidative stress in patients with diabetes [20].

### *Grains and legumes*

Grains and legumes in general play an important role in human nutrition. Grains are low in protein, fat and dietary fiber, but rich in starch. Legumes are rich in nutrients, as they are high in protein and fiber and low in fat. They are excellent sources for carbohydrate digestion and slow absorption and are an important source of vitamins and minerals, although pulses and grains are deficient in some essential amino acids. A mixture of legumes and some grains such as rice, one of the major cereal crops worldwide, provide a balanced protein with a high biological value. It is a good alternative in manufacturing products for obese, celiac patients, vegetarian diets and a consumer who understands the importance of a healthy diet [21]. Moreover, health organizations such as the Food and Agriculture Organization of the United Nations (FAO) recommend pulses as staple foods to fulfill the basic protein and energy requirements of the human diet [22].

## II. FUNCTIONAL FOODS IN YOUR DIET

Including an abundance of plant foods as well as healthy protein and dairy foods in your diet is a sure way to increase your intake of functional foods. Consider these tips:

1. Fill most of your plate with plant foods :  
Fill half of your plate with fruits , vegetables and whole grains, beans, nuts, and soy. Phytochemicals are specific type of bioactive compounds that are found in plant foods such as fruits, vegetables, nuts, and whole grains, so by consuming more of these foods on a regular basis, will help to increase consumption of health promoting phytochemicals [2].
2. Choose a variety of colors  
Foods with the most vibrant colors that have the most abundant source of beneficial phytochemicals. However, white and colorless foods such as garlic and onions are rich in health- promoting phytochemicals. By consuming many different colors of plant foods, the more likely it is that you will consume a larger variety of phytochemicals[2].
3. Select a variety of foods  
Choose a variety of foods within each food group (fruits, vegetables, whole grains such as rice, wheat, quinoa, and oats). Vary proteins in your diet including fish, poultry, soy, beans, and nuts. Dairy: milk, yogurt, cheese, and kefir [2].
4. Make foods in a variety of ways
  - a. Different preparation techniques can have different impacts on foods and their nutrients. For example,;
  - b. Vitamin C is sensitive to high heat, and some may be destroyed when heated.
  - c. Vitamin A is more stable to heat and may increase in availability when heated [2].
5. Lower Intake of Highly Processed Foods  
Highly processed foods are low in vitamins, minerals, and bioactive compounds, but high in refined sugar, sodium, and saturated fat. Balance is the key to enjoying eating, while at the same time providing the body with the nutrients it needs to stay healthy and reduce the risk for disease[2].

Remember that there is no “magic bullet” when considering what to eat and how to best support health. No one food can provide all the essential nutrients needed to sustain life. The most benefits will come from eating a variety of foods, as they will provide a variety of essential nutrients and bioactive compounds [2].

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# Pineapple Fruit and Stem Chewing Prevents Dental Plaque pH Drop after Meals

1<sup>st</sup> Nanning Nur Handayatun  
Dental Nursing Department  
PoltekkesKemenkes Jambi  
Jambi, Indonesia

2<sup>nd</sup> David Rudi  
Dental Nursing Department  
PoltekkesKemenkes Jambi  
Jambi, Indonesia

3<sup>rd</sup> Karin Tika Firriah<sup>1</sup>  
Dental Nursing Department  
PoltekkesKemenkes Jambi  
Jambi, Indonesia

Corresponding author: karin.tikafirria@gmail.com

**Abstract** - Eating Fruit has long believed given good benefit not only for the body but also for dental health. Any sugar contact with the teeth after meals will make a pH drop in dental plaque which can lead to enamel demineralization and tooth decay in a period of time. Pineapple has Bromelain as antibacterial agent and mostly found in the stem and at small amount in the fruit. This research conducted to assess the effect of Pineapple chewing to the dental plaque pH and to compare the effect of pineapple fruit and stem chewing on dental plaque pH. We recruited 10 subjects (aged 19-22 years) with free carries to chewed 100 grams of pineapple fruit and 2 grams of pineapple stem after eating plaque inducer meals. Dental plaque were collected at 4 consecutive time (before chewing pineapple, 25 minutes after chewing, 50 minutes after chewing and 75 minutes after chewing) followed by pH measurement of the dental plaque. Our finding showed that the Dental plaque pH drop from 6.1 to 5.7 for control while for pineapple fruit group the pH drop from 6.35 to 6.04 and for Pineapple stem group were 6.20 to 6.09. When compared the Dental plaque pH after Pineapple chewing between the 100 grams of fruit and 2 gram of stem, no significant difference were found. But when compared with control (without Pineapple chewing), significant difference were found at 25 minutes after pineapple stem ( $p=0.021$ ) and at 75 minutes after Pineapple fruit ( $p=0.005$ ) and Pineapple stem ( $p=0.012$ ) chewing. Chewing fruit was effective to prevent the Dental plaque pH drop after eating meals. Chewing 2 grams of pineapple stem showed no significant difference with chewing 100 grams of pineapple fruit.

**Keywords:** Pineapple fruit; pineapple stem; dental plaque, pH

## 1. INTRODUCTION

Dental plaque is a sticky soft layer surrounding the teeth and oral mucosa[1]. Diverse community of microorganism are living and colonized in the dental plaque[2]. Dietary sugar-fermenting bacteria were involved in dental carries pathogenesis[3]. *S. mutans* is one of the bacteria that can ferment sucrose and other sugars to produce ATP and lactic acid as a waste product[4]. Frequent exposure to fermentable carbohydrates can lead to excessive acid production and acidification of the dental plaque environment [5]. [6]. The

critical pH drop that needed to demineralized the dental enamel was below 5.5 [7].

The saliva act as natural buffer to protect human teeth from environmental hazard such as the acid from oral bacterial fermentation [8]. But it takes time to recover to normal pH and when the sugar contact linger on dental teeth, the dental plaque pH will still drop [7]

Eating healthy such as fruit and vegetables has been promoted to increase good oral health[9]. One of the fruit that very common in Indonesia is pineapple (Ananasscomus Linn.). As a tropical fruit that belongs to the Bromeliaceae family, pineapple has many benefit for health [10]. It is a common fruit yet affordable for people in Indonesia and has not only been valued for its sweet taste but also has been used for centuries to treat digestion problems and inflammation[11]. Pineapple contains considerable amount of potassium, calcium, vitamin C, carbohydrate, crude fibre, water and different minerals that helps in balanced nutrition [10]. 80 % of the protein in pineapple has proteolytic activity due to a protease known as Bromelain[12].

Bromelain in pineapple effectively used for achieving healthy digestion, stimulates the immune system, improves cardiovascular conditions, and accelerates wound healing[13].

The bromelain can found in any part of the pineapple, mostly found in high amount in the stem of pineapple, but in small amount can also be found in the fruit body [12], [14].

The Bromelain found in pineapple is currently being used to treat and reduce swelling, bruising, inflammation and swelling from surgeries[15]. Previous study also found that bromelain extract showed sensitivity at low concentration against potent oral pathogen [16]. Due to the beneficial properties for oral health, pineapple consider as a phytotherapeutic agent, herbal products that can used effectively as a therapeutic agent [17].

A study at Medan, North Sumatera in 2020 has found that pineapple chewing were effectively reducing the dental plaque amount [11] and has been proven effectively against oral pathogenic bacteria [15]. But there were no evidence in the effect on dental plaque pH. The aim of this study was to assess the effect of pineapple chewing on dental plaque pH and to compare the effect of pineapple fruit and stem chewing on dental plaque pH.

## II. RESEARCH METHODOLOGY

This was a quasi-experimental study with pre and post test control group design. Subjects aged 19-22 years were examined

and all with dental caries and calculus free were included, while orthodontic appliance user were excluded. A total of 10 subjects were selected for the study, and informed consent was obtained from all the subjects prior understanding the study protocol that have been explained.

The experiment was conducted on 3 part. Part I was for control, part II was pineapple fruit chewing and part III was pineapple stem chewing.

This research used ripe pineapple grown at local pineapple farm at Jambi. The Pineapple were peeled, washed, divided between the fruit and the stem and weighted. 100 grams of pineapple fruit and 2 grams of pineapple stem were prepared.

Dental plaque was collected using pre-weighted dental plaque scraper and put in pre-weighted plastic cup. The amount of the dental plaque was noted and the dental plaque pH was measured using a pH-meter.

Each subject was asked to brush their teeth until 0 plaque score, followed by eating plaque inducer meals. The dental plaque were collected from index teeth 10 minutes later and tested for pH1 control, pH1 pineapple fruit and pH1 pineapple stem.

For control, the dental plaque were collected again and measured for pH for 3 times at 25 minutes, 50 minutes and 75 minutes after the pH1 measurement.

For part II and III, after the first pH measurement, the subject asked to chew the Pineapple fruit (part II) or pineapple stem (part III) for 1.5 minutes followed by dental plaque collecting and pH testing at 25 minutes, 50 minutes and 75 minutes after the chewing.

The pH value were collected and tabulated using MS Excel sheet and statistically analysed using IBM Spss statistics version 19.0. Normality of the data were tested using Shapiro-Wilk test. Comparison of pH score within the group was obtained using Friedman test followed by Post hoc Wilcoxon test. Wilcoxon test was also used to compare the pH score between groups with a p-value <0.05 to be considered statistically significant.

## III. RESULTS

The mean score of dental plaque pH of all groups were stated in table 1.

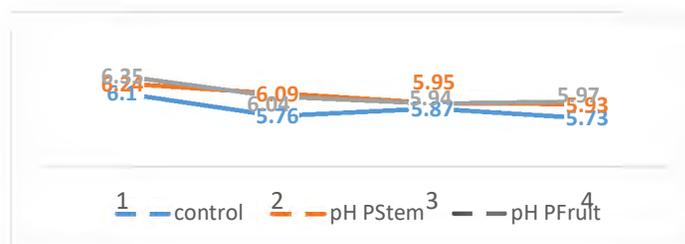
**Table 1.**  
**Statistical analysis of pH measurement of Dental plaque within group**

	N	Mean	SD (min-max)	p-value
<b>Control Group</b>				
pH1 control	10	6.10	0.53 (5.6-7.2)	0.186
pH2 control	10	5.76	0.33 (5.4-6.3)	
pH3 control	10	5.87	0.19 (5.6-6.2)	
pH4 control	10	5.73	0.09 (5.6-5.9)	

<b>Chewing Pineapple fruit Group</b>				
pH1 PFruit	10	6.24	0.30 (6.0-7.0)	0.345
pH2 PFruit	10	6.09	0.12 (5.9-6.3)	
pH3 PFruit	10	5.95	0.15 (5.7-6.2)	
pH4 PFruit	10	5.93	0.12 (5.8-6.2)	
<b>Chewing Pineapple Stem Group</b>				
pH1 PStem	10	6.35	0.67 (5.5-7.3)	0.012
pH2 PStem	10	6.04	0.42 (5.6-6.5)	
pH3 PStem	10	5.94	0.15 (5.7-6.2)	
pH4 PStem	10	5.97	0.12 (5.8-6.2)	

Friedman test

The lowest pH score among all measurement were at control group from 25 minutes (pH 5.76), 75 minutes (pH 5.73) and 50 minutes (5.87) after eating plaque inducer snacks. Although there were pH drop below the pH 6 at control group, but no significant difference were found within the control group (*p value* = 0.186) and the pineapple fruit group (*p value* = 0.345). While significant difference were found within the Pineapple stem group (*p value* = 0.012).



**Picture 1.** The drop of pH at 1(10 minutes after eating); 2 (25 minutes later or after chewing Pineapple); 3 (50 minutes later or after chewing Pineapple); 4 (75 minutes later or after chewing Pineapple)

The graphic showed that after eating snacks, the pH of the dental plaque of all group was drop. From the graphic can be seen that the lowest drop of acidity below pH 6 in dental plaque was in control group. While the other two groups the pH measurement showed the score above pH 6.

**Table 2.**  
**Statistical analysis of pH measurement dental plaque between group**

	Variable	p value*
pH 1	Control >> P Fruit	0.514
	Control >> P Stem	0.475
	P Fruit >> P Stem	0.683
pH 2	Control >> P Fruit	0.067
	Control >> P Stem	0.021 <sup>†</sup>
	P Fruit >> P Stem	0.624
pH 3	Control >> P Fruit	0.348
	Control >> P Stem	0.403
	P Fruit >> P Stem	0.887
pH 4	Control >> P Fruit	0.005 <sup>†</sup>
	Control >> P Stem	0.012 <sup>†</sup>
	P Fruit >> P Stem	0.465

\*Wilcoxon test

<sup>†</sup> Significant p value

Statistical analysis showed in table 2 that no significant difference at baseline pH measurement. After Chewing Pineapple, even there was a pH drop, but no significant difference was found between the pineapple fruit and pineapple stem at 25 minutes ( $p$  value = 0.624), 50 minutes ( $p$  value = 0.887) and 75 minutes ( $p$  value = 0.465) after chewing the pineapple.

At 25 minutes after chewing pineapple, significant difference was found between pineapple stem and control group ( $p$  value = 0.021). While pineapple fruit has no significant difference compared to control. At 75 minutes after chewing pineapple, both pineapple fruit and stem showed significant difference compared to control with  $p$  value = 0.005 and  $p$  value = 0.012 respectively.

#### IV. DISCUSSION

Based on the result, there was a significant difference between chewing Pineapple fruit and control and between pineapple stem with control. Pineapple known for the Bromelain properties which is a proteolytic enzyme that effective in defeating the oral microbes [18]. Antibacterial activity of the Bromelain was effective against both anaerobic and aerobic microorganism such as *E coli*, *Porphyromonasgingivalis* and *Aggregatibacteractinomycetemcomitans*[14].

From graphic at picture 1, it showed that for all groups there were pH drops from time to time. After meals, the bacteria in dental plaque will fermenting the sugar and produce lactic acid as the waste product. Fermentable carbohydrate substrate plays the important role in dental caries pathogenesis[9]. Frequent sugar intake leads to pH drop of the dental plaque and a longer period of acid attack of the enamel can caused demineralization of the tooth structure[19]. This acidity can make the dental plaque drop and when it reach below critical pH of 5,5 it will start to dissolve the dental structure [3], [7].

The drop of the pH at Table 1 showed that the control group was the lowest compared to the Pineapple chewing group. The proteolytic enzyme of Bromelain in pineapple is proven as an antibacterial agent, antifungal agent. The antibacterial properties of the bromelain had effectively against cariogenic microorganism such as *S.mutans* and *S.sanguinis*[15].

Previous study were compared between Apple, guava and pineapple found that pineapple even has the strongest antimicrobial agent against pathogenic bacteria such as *S.aureus*, *Klebsiella* and *E. faecalis* compared to the other fruits [20].

Pineapple extracted Bromelain has widely used as a therapeutic agent. In vivo and in vitro studies showed the anti-inflammatory effect by modulating the cell surface molecules and has been used to treat patient with bone fracture to reduce pain and swelling in a clinical trial[21].

Our study showed that 25 minutes after chewing pineapple, the pH drops were higher and significantly different compared with the control group. Previous study found that Bromelain extracted from pineapple stem can break the bond

of bacterial protein that can inhibit the growth of bacteria [14]. Bacteria is the main reason of pH drop in dental plaque as the waste product of sugar fermenting bacteria [22]. A previous study on a Karen population with low caries experience suggest that the population has low intake of sucrose since the village located very remotely and only having natural growth food [4].

The highly valuable Bromelain has used in many ways for oral health. A study showed that a dentifrice containing Papain, Bromelain, Miswak and Neem has anti-plaque and anti-gingivitis effect compared to control dentifrice [23]. Another study also showed that Bromelain Enzyme from pineapple peel waste that used as a mouthwash with different concentration was effective in restricting the growth of *Streptococcus mutans* compared to chlorhexidine 0.1% as positive control [24]. The proteolytic enzyme, catalase and polyphenol peroxidase of the Pineapple even used as boosting the result of the standard dental bleaching agent even with lower bleaching agent concentration [25].

The effect of chewing 2 grams of pineapple stem has no significant difference compared to chewing 100 grams of pineapple fruit. This can be answered by the amount of bromelain in pineapple stem was much higher than in the fruit. The stem bromelain is more alkaline and be the most abundant protease in pineapple tissue, while the fruit bromelain is an acidic protein [12].

#### V. CONCLUSION

The present study suggest that the pineapple chewing can prevent dental plaque pH drop after eating snacks. No significant difference were found between chewing 2 grams of pineapple stem and 100 grams of pineapple fruit.

#### VI. ACKNOWLEDMENT

This research supported by Risbinakes program 2019 of the Health Ministry of Indonesia.

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# The Effect of Giving Garcinia Formula as An Alternative Food to Increase Weight and Hemoglobin Levels of Pulmonary Tuberculosis Patients

1<sup>st</sup> Susyani*Nutrition Department**Politeknik Kesehatan Kemenkes Palembang*  
Palembang, Indonesia

Email: susyani@poltekkespalembang.ac.id

2<sup>nd</sup> Nur Sabrina Ismah*Nutrition Department**Politeknik Kesehatan Kemenkes Palembang*  
Palembang, Indonesia

Email: nursabrinainmah@poltekkespalembang.ac.id

3<sup>rd</sup> Eddy Susanto*Nutrition Department**Politeknik Kesehatan Kemenkes Palembang*  
Palembang, Indonesia

Email: eddysusantoo@poltekkespalembang.ac.id

Corresponding author: susyani@poltekkespalembang.ac.id

**Abstract** - Pulmonary tuberculosis is an infectious disease caused by *Mycobacterium Tuberculosis* which attacks the lungs. Patients with pulmonary TB can be cured with OAT therapy which is consumed regularly for 6 months. There are side effects that cause symptoms such as nausea, vomiting, etc., which causes a little intake of nutrients so that it affects weight loss, and deficiency of protein and iron due to lack of nutrient intake causes hemoglobin levels to decrease. Management of weight loss and hemoglobin levels in patients with pulmonary tuberculosis includes pharmacological and non-pharmacological therapies that can be supported through supplementary feeding such as *Formula Garcinia*. Objectives: To determine the effect of giving *Garcinia Formula* as additional food for gaining body weight and hemoglobin levels for pulmonary tuberculosis patients in the Pulmonary Specialty Hospital in South Sumatera. Research Design is a quasi-experiment with a pretest and posttest study design, analysis of data used is the Wilcoxon and Mann Whitney tests. Results. In the Wilcoxon test results were obtained if the treatment group or comparison both had an effect on gaining body weight and hemoglobin levels. Based on the Mann Whitney test showed that there was a significant effect in the administration of the *Garcinia Formula* for gaining body weight and hemoglobin levels ( $p = 0,000$ ,  $p = 0,008$ ) Conclusion. There is an effect of giving *Garcinia Formula* as additional food for gaining body weight and hemoglobin level for pulmonary tuberculosis patients in the Pulmonary Specialty Hospital in South Sumatera

**Keywords:** Pulmonary Tuberculosis, Body Weight, Hemoglobin Level, *Formula Garcinia*.

## I. INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*, which attacks the lungs more often, but can attack other organs. The pathogenesis of TB is multifactorial and includes oxidative stress. In TB patients there is hyperactivation of macrophages due to *Mycobacterium tuberculosis* infection [1].

The discovery of pulmonary TB cases in Palembang has decreased and increased, in 2010 it was 0.07% and increased to 0.14% in 2011, then decreased in 2012 which was equal to 0, 08% and fell back to 0.07% in 2013, then in 2014, there

was an increase again of 0.08% In 2015 the discovery of new TB cases in Palembang 0.08% or 1,324 cases [2]. Results of the study all patients could theoretically be cured, as long as you are diligent in taking medicine until the treatment phase is complete. However, there are side effects resulting from the administration of these drugs, which can cause symptoms such as; nausea and vomiting, diarrhea, joint pain, gastrointestinal disorders, and insomnia, this causes decreased appetite in sufferers which will have an impact on weight loss [3].

Research in 2018 stated that there was a significant relationship between initial nutritional status and current nutritional status with clinical symptoms of pulmonary TB patients. A decrease in nutritional status is often found in patients suffering from TB [4].

Malnutrition in TB patients if not treated promptly will lead to more serious health problems, such as an increase in mortality [5]. Lack of nutrients that play a role in the immune system, such as protein and iron, makes a person susceptible to infectious diseases [6]. Tuberculosis patients with poor nutritional status have lower hemoglobin levels than patients with good nutritional status. Deficiency of iron and other nutrients and the presence of chronic diseases such as tuberculosis can cause anemia.

Increasingly developing science, with various findings such as fruits that contain various kinds of nutrients needed by the body. The findings that have been published have made many people know about the benefits of food ingredients produced by nature, one of which is mangosteen (*garcinia mango stone*). The combination of mangosteen fruit and mangosteen rind can be used as traditional food. This food formula is called the *Garcinia Formula*. *Garcinia formula* is a food additive in the form of pudding made from mangosteen fruit and mangosteen rind as the main ingredient which contains a number of nutritional values, such as Energy 465.8 kcal, Protein 10.1 g, Fat 19.3 g, KH 75.4 g, Fe 3.5 mg, Vit C 48.9 mg, Xanthone 63.9 mg, which helps in the influence and increase of hemoglobin and body weight in patients with pulmonary tuberculosis.

## II. METHOD

This research was a quasi-experiment with a pretest and posttest design with a control group. The independent variable in this study

was the provision of Garcinia formula twice a day and the dependent variable was an increase in body weight and hemoglobin levels.

The subjects of this study were patients with pulmonary tuberculosis who had low body weight and low hemoglobin levels who were outpatients at the Special Hospital for the Lung of South Sumatra. The study was conducted in January - March 2019. The inclusion criteria for this study were aged > 19 years, low body weight, low hemoglobin levels, receiving OAT therapy from the hospital.

The determination of the respondents was done by using the purposive sampling method. The number of respondents each 25 for each group. The treatment group received the Garcinia formula 200 grams/cup 2 times a day for 7 days of administration and consumed OAT from the hospital, while the control group received no treatment but still consumed OAT from the hospital.

Bodyweight and hemoglobin levels before the intervention, body weight measurements, and hemoglobin levels were checked, then measured again after being given the intervention for 7 days. Weight data can be obtained using anthropometric measurements, and hemoglobin levels using a hemoglobin meter, while data on respondent characteristics can be obtained using the respondent's identity form by direct interview.

The normality test used the Kolmogorov-Smirnov test. Respondent characteristics were analyzed using descriptive analysis. Differences in body weight, hemoglobin levels before and after the intervention of the two groups were analyzed using the Wilcoxon and Mann Whitney statistical test.

### III. RESULTS

Respondent characteristics consist of gender and age are presented in Table 1

**Table 1. Characteristics of Respondents**

Characteristics of Respondent	Treatment		Control	
	n	%	n	%
Gender				
Male	16	64	17	68
Female	9	36	8	32
Age				
Late Youth	6	24	8	32
Early Adult	5	20	3	12
Late Adult	2	8	8	8
Early Elderly	6	24	6	24
Late Elderly	6	24	6	24

The frequency distribution based on nutrient intake during the intervention, consisting of energy, protein, fat, carbohydrates, Fe, vitamin C, is presented in table 2.

**Table 2. Frequency of nutrient intake**

Intake	Perlakuan		Kontrol	
	n	%	N	%
Energy				
Good	18	72,0	14	56,0
Not good	7	28,0	11	44,0
Protein				
Good	8	32,0	7	28,0
Not good	17	68,0	18	72,0
Fat				
Good	15	60,0	15	60,0
Not good	10	40,0	10	40,0
KH				
Good	21	84,0	15	60,0
Not good	4	15,0	10	40,0
Iron				
Good	17	68,0	5	20,0
Not good	9	32,0	20	80
Vit C				
Good	13	52,0	3	12,0
Not good	12	48,0	22	80,0

The mean body weight and hemoglobin levels before and after the intervention are presented in table 3.

**Table 3. Differences in Average Body Weight and Hemoglobin Levels Before and After**

Group	Initial Mean ± SD	Final Mean ± SD	P
Treatment	45,072 ± 5,1998	46,108 ± 5,2647	0,000
<b>BB</b>			
Control	45,792 ± 6,1455	46,672 ± 5,2806	0,000
Treatment	11,564 ± 0,8256	12,148 ± 0,9129	0,000
<b>HB</b>			
Control	11,396 ± 0,7882	11,652 ± 0,8412	0,000

The effect of giving Garcinia formula on the increase in body weight and hemoglobin levels is presented in table 4.

**Table 4. The effect of giving Garcinia formula on increasing body weight and hemoglobin levels**

	Group	Mean rank	p
<b>BB</b>	Treatment	34,08	0,000
	Control	16,92	
<b>HB</b>	Treatment	30,94	0,008
	Control	20,06	

### IV. DISCUSSION

The characteristics of the respondents in this study were mostly male and included in the early elderly and late elderly categories.

This is because men smoke more and consume alcohol and men's habits are outside which can reduce immunity so that they are more susceptible to pulmonary TB [7]. Results Prediction of the risk of getting pulmonary tuberculosis lies in the productive age and the elderly [8]. In the age group classified as the elderly tend to have decreased immunity along with the aging process, all organ functions have decreased, the ability to fight Microbacterium Tuberculosis is weak so that young germs enter the body of the elderly.

The results showed that body weight increased in both the treatment and comparison groups. The mean increase in body weight in the treatment group was 1.0360 kg and the mean increase in body

weight in the comparison group was 0.8800 kg. The results of the test (Mann Whitney test) found that the p-value in the treatment group and the comparison group  $<0.05$ , namely 0.000, so it can be concluded that there is an effect of giving Garcinia formula along with regular OAT consumption on weight gain in the treatment group and there was an effect of routine OAT consumption on weight gain in the comparison group.

This is in line with research in [9]. which stated that the results of the nonparametric analysis of the Wallis Crucifix with a significance value (p-value) of 0.000 so that it was concluded that there was an effect between giving mangosteen peel extract on the bodyweight of mice infected with *M. Tuberculosis* H37Rv which were given isoniazid. As for the comparison group, [10]. stated that there was an increase in body weight by an average of 2.3 kg after more than 4 weeks of treatment.

The results of the study proved that both giving Garcinia formula along with routine OAT consumption in the treatment group or only consuming OAT routinely in the comparison group can both increase body weight.

From the two groups, the increase in the treatment group was more influential and significant when compared to the comparison group who only consumed OAT regularly. This happens because the ingredients for the Garcinia formula consist of coconut milk and brown sugar which contain high calories and the addition of eggs adds to the protein value in the Garcinia formula accompanied by the respondent still consuming OAT regularly.

This study is in line with a study conducted by [11]. in which the study compared pulmonary TB patients who received OAT therapy and high-energy and protein supplements with pulmonary TB patients who received OAT therapy without being given high-energy and high-calorie supplements. The results of his research showed that there was an increase in body weight by an average of 2.6 kg and 0.8 kg for 6 weeks. Abnormal nutritional status is one of the effects of pulmonary tuberculosis.

The nutritional status of pulmonary tuberculosis patients is related to body weight, weight loss due to mycobacterium tuberculosis infection will reduce the nutritional status of these patients.

In addition to the additional intake of Garcinia Formula, the intake that comes together with the consumption of Garcinia formula after a 1x24 hour recall for 7 days shows that macro intake such as Energy, Fat, and Carbohydrates can be said to be good, while protein intake is still somewhat less good, this is because the level of protein consumption is still low, even if using animal and vegetable side dishes only in small portions.

The increase in body weight in respondents can be influenced by the presence of additional food from the Garcinia Formula

and balanced with the consumption of energy, fat, and carbohydrate intake from other food sources.

The provision of Garcinia Formula as an additional food is expected to help improve the nutritional status of patients with pulmonary tuberculosis by increasing body weight. In this study, the Garcinia formula, apart from containing food ingredients from mangosteen and mangosteen rind, also added coconut milk and brown sugar, which added to the energy value of this formula feeding.

Garcinia formula has high energy and protein nutritional value, namely; energy 465.8 kcal and protein 10.1 g in 1-time administration. This is in accordance with the principles of the TKTP diet which is intended for patients with infection or those who have a bodyweight that is less than normal standards.

Respondents were given Garcinia Formula 2 times a day for 7 days so that in 1 day the respondent received a nutritional intake of 931.6 kcal of energy, and 20.2 g of protein a day from consumption of Garcinia formula. can increase body weight by an average of 1.0360 kg for 7 days.

However, in this study, the increase in body weight was not necessarily due to the consumption of the Garcinia formula, this was because the level of energy intake of the respondents could be categorized as sufficient, so there was a contribution from the consumption of foods other than the Garcinia formula.

The rapid weight gain in this study was thought to be due to edema which was not examined by the investigators. It is suspected that the edema occurs in respondents due to the side effect of this type of OAT, namely Rifampin.

The Garcinia formula which is given for 1 week by the researchers has not seen the impact of the changes so this administration within 1 week is an effort to reduce the symptoms and pain caused by this disease, if the symptoms that have appeared have decreased, efforts to increase the weight the body can be done because the intake that is consumed and absorbed by the body will focus on increasing fat and muscle mass. The Garcinia Formula can be continued in the following week until the impact of increasing body weight is seen.

The test results (Mann Whitney test) found that the p-value in the treatment group and the comparison group  $<0.05$ , so it can be concluded that there was an effect of giving Garcinia formula and OAT consumption on the increase in hemoglobin levels in the treatment group and there was an effect of OAT consumption. routinely to increased hemoglobin levels in the comparison group.

This is in line with research [12] in his research the results of the One Way Anova analysis had a p-value of 0,000 which stated that there was an effect of mangosteen peel extract on increasing hemoglobin levels in mice. Whereas in the comparison group, according to [13]. there was a relationship between the length of time taking anti-tuberculosis drugs in pulmonary TB patients to anemia, in their research OAT consumed by patients with pulmonary TB had side effects on hematological levels such as hemoglobin at the start of treatment. However, after entering treatment at month 6 there was an increase in hemoglobin levels,

from 12.73 g / dl at month 2 and increased to 13.28 g / dl at month 6.

The increase occurred because the frequency of taking the drug was not as frequent as in the first and second months. In this study, most respondents had entered the 4th to 5th month of treatment [14]. This study is in line with [13], where there can be an increase in hemoglobin in patients with pulmonary TB during the treatment period. Either giving Garcinia formula accompanied by routine OAT consumption in the treatment group or only consuming OAT regularly in the comparison group can both increase hemoglobin levels.

From the two groups, the increase in the treatment group was greater and more significant when compared to the comparison group who only consumed OAT regularly. This is in line with [12], in her research the results of the One Way Anova analysis had a p-value of 0.000 which stated that there was an effect of mangosteen peel extract on increasing hemoglobin levels in mice.

This happens because the ingredients for making Garcinia formula consist of mangosteen peel extracted and mangosteen fruit which contains 63.9 grams of xanthenes. Xanthenes are powerful antioxidants, which are needed to balance pro-oxidants in the body, known as free radicals [15].

Xanthone compounds contained in mangosteen peel have high antioxidants and are immunomodulators that can stabilize cells in the body and can also help in the process of forming erythrocytes and Hb [16]. In addition, there are additional ingredients from eggs in the Garcinia formula to enrich the nutritional value of protein at feeding this formula.

The increase in hemoglobin in the respondents, apart from coming from Formula D'garcinia, was caused by a good intake of Fe and Vit C. An increase in body weight in respondents is the effect of an increase in hemoglobin levels.

Low hemoglobin levels in chronic diseases such as TB have atypical clinical symptoms. In general, anemia in TB patients is found in one-third of cases, namely microcytic hypochromic anemia, which indicates chronic iron deficiency [16].

The process of iron absorption is so low that it requires additional vitamin C to help absorption by changing the form of ferric to ferrous in the small intestine so that it is easily absorbed [17].

The Garcinia formula contains 63.9 mg of Xanthone, 3.5 mg of iron, and 43.9 mg of vitamin C contained in the Garcinia formula. In this study, respondents received the Garcinia formula 2 times a day for 7 days. From the research that has been done, the Garcinia formula accompanied by continuing to consume OAT can increase hemoglobin by an average of 0.580 g / dl.

## V. CONCLUSIONS

Giving Garcinia Formula 2 times a day for 7 days shows that there is an effect on the increase in body weight and hemoglobin levels in patients with pulmonary tuberculosis, but the increase is not necessarily due to the provision of Formula Garcinia, this is the intake of other nutrients to support it. resulting in an increase in body weight and hemoglobin levels in patients with pulmonary TB.

## VI. SUGGESTIONS

It is hoped that the next researchers will be able to research in the long term and examine other factors that can support this research so that the impact of giving Formula Garcinia can be described.

## VII. ACKNOWLEDGMENTS

Thank you to the South Sumatra Special Lung Hospital for giving permission to my research.

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# Utilization of Home Care Using Standard Acupuncture and Post Particular Painting Intensity to Reduce Post Sectio Cesarea Pain Intensity in Hospital

## Mitra Sejati Medan

1<sup>st</sup> Siska Suci Triana Ginting  
Department of midwifery  
STIKES Mitra Husada Medan  
Medan, Indonesia  
Email: sergiojayden@yahoo.co.id

2<sup>nd</sup> Lisa Putri Damanik  
Department of midwifery  
STIKES Mitra Husada Medan  
Medan, Indonesia  
Email: LisaDmnik@yahoo.co.id

3<sup>rd</sup> Herna Rina Yanti Manurung  
Department of midwifery  
STIKES Mitra Husada Medan  
Medan, Indonesia  
Email: hryantiii2@gmail.com

4<sup>th</sup> Zulkarnaen Batubara  
Department of midwifery  
STIKES Mitra Husada Medan  
Medan, Indonesia  
Email: Zulkarnaenn30@gmail.com

Corresponding author: sergiojayden@yahoo.co.id

**Abstract** - The mortality rate in cesarean section is 40-80 per 100,000 live births. This figure shows a 25x greater risk than labor through vaginal delivery. One Day Care service prevents patients from nosocomial infections because patients do not need to be treated long in the hospital so they can reduce costs incurred by patients. The purpose of this research is to gain more knowledge and understand about health care at home (home care) with standardized acupuncture and puerperal care techniques to reduce the intensity of post sectio pain in the area. Pre and post test research methods. The technique of measuring the decrease in pain intensity in this study was the researcher went to the Sectio Caesarea postoperative mother on the first day and intervened on postoperative pain and pain measurement, then the researcher performed acupuncture. The results of the study have the effect of the use of acupuncture therapy on pain reduction in post partum SC mothers.

**Keywords:** Home care, Acupuncture Technique, Standard Postpartum Care, Post Partum Pain Intensity, Post Cesarean Sectio

### I. INTRODUCTION

Cesarean delivery can indeed facilitate the labor process so that many pregnant women who prefer to choose this path even though they can actually give birth normally. But the fact is, the death rate in cesarean section is 40-80 per 100,000 live births. This figure shows a 25x greater risk compared to labor through vaginal delivery. Even for one case because the infection has a figure 80x higher than vaginal delivery.

The specific target carried out in this study focuses on post partum patients with sectio caesarea who often experience disorders such as frequent resistance (numbness), spinal pain, or pain in the abdomen. The problem in this research is that there is

no treatment method for post sectio cesarean postpartum patients so that research needs to be done with the aim to find out the benefits of Home Care treatment, namely acupuncture techniques in post sectio cesarean postpartum patients. With

the results obtained, it will reduce mortality and infection in postpartum mothers. Republic of Indonesia Ministry of Health's study in 2000 showed that 97.7% stated that it needed to be developed at home health services, 87.3% said that standardization of personnel, facilities and services was needed, and 91.9% stated that the management of health care at home needed an operational permit [1]. Most post sectio cesarea patients are worried about complaints being addressed, because all of these complaints can basically be anticipated and overcome. Of course all of these problems can be overcome with proper and intensive care and handling. One Day Care service prevents patients from nosocomial infections because patients do not need to be treated long in the hospital so they can reduce costs incurred by patients. In addition to One Day Care, in Indonesia also known as Home Care.

Home health services are programs that already exist and need to be developed, because they have become the needs of the community. One form of health services that is appropriate and popular and touches the needs of the community through health care services at home or Home Care.

So far the forms of health services known to the public in the health service system are inpatient and outpatient services. On the other hand, many members of the public who suffer from illnesses due to various considerations have to be treated at home and not admitted to health care institutions. Factors that encourage the development of health care at home are terminal illness cases that are considered ineffective and inefficient if treated at health care institutions. For example, in end-stage cancer patients, there is no medical effort that can be done to achieve recovery.

Many people feel that hospitalization in a health care institution limits human life, because a person cannot enjoy life optimally because it is bound by the rules set, the environment at home turns out to be more comfortable for some patients compared to hospital treatment, so that it can speed healing [2].

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One Day Care service or a day care service that is a treatment in the short term (relatively short), which is 1 day or 24 hours. According to research almost 70% of Indonesian hospitals implement a one day care system. One Day Care service prevents patients from nosocomial infections because patients do not need to be treated long in the hospital so they can reduce costs incurred by patients. In addition to One Day Care, in Indonesia also known as Home Care. Home Care is a service that aims to increase, maintain or maximize the level of independence and minimize the consequences of disease.

Based on the results of the assessment that many people and health program managers stated that Home Care health care services need to be developed.

## II. METHOD

This study used an experimental study with a pre-experimental design research design. While the design of this research design used One-Group pre-post test design, because pre-experimental did not require any control.

This data was obtained directly by means of observation and measurement of the pre and post test methods. The technique of measuring pain reduction in this study was that the researcher went to the Sectio Caesarea postoperative mother on the first day and intervened on postoperative pain and pain measurement, then the researcher performed acupuncture.

## III. RESULTS AND DISCUSSION

In this study a significant effect was seen where mothers who had acupuncture and standard puerperal care to reduce the intensity of post partum post-caesaria pain at the Mitra Sejati hospital in Medan in 2018 had less pain than the control group who only performed relaxation techniques. In line with research [3]. where before therapy is done the intensity of pain is on an average scale of 5 and the highest is 9 whereas after being given therapy the intensity of pain decreases on an average of 4 being the lowest scale 1 so that there is a difference in pain intensity after sc after administration of therapy with a t value of 9,000 ( $t_{count} > 2,042$ ) and Asymp. sig (2-tailed) of 0.001 ( $p < 0.05$ ). Physical action of SC causes pain in the abdomen. Pain originating from a surgical wound [4]. SC deliveries have a higher pain of about 27.3% compared to normal deliveries which are only about 9%. Generally, pain is felt for several days. The pain increases on the first day post SC surgery. psychologically SC actions have an impact on fear and anxiety over pain felt after analgesics disappear. It also has a negative impact on the mother's self-concept. Because the mother loses the

experience of giving birth normally and the self-esteem associated with changes in body image due to surgery [5].

## IV. CONCLUSION

1. Mothers who were made into the control group felt strong pain
2. Post partum mothers undergoing acupuncture intervention experienced a decrease in pain
3. There is an influence of the use of acupuncture therapy to reduce pain in post partum mothers SC ( $P=0,000; < 0,05$ ).

## V. SUGGESTIONS

It is expected that in collaboration with the Health Office in providing acupuncture therapy to reduce pain and launch breast milk to postpartum mothers and the need for providing adequate information for postpartum mothers about acupuncture therapy.

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# Implementation of Therapeutic Communication Nurse to Patient at the wards of Ernaldi Bahar Hospital in South Sumatra Province

1<sup>st</sup> Raden Surahmat  
Nursing Department  
High School of Health Sciences Bina Husada  
Palembang, Indonesia  
Email: radensurahmat28@gmail.com

2<sup>nd</sup> Ayu Devita Citra Dewi  
Nursing Department  
High School of Health Sciences Bina Husada  
Palembang, Indonesia  
Email: ayudevita00@gmail.com

3<sup>rd</sup> Mareta Akhriansyah  
Nursing Department  
High School of Health Sciences Bina Husada  
Palembang, Indonesia  
Email: [akhriansyahmareta@gmail.com](mailto:akhriansyahmareta@gmail.com)

Corresponding author: radensurahmat@gmail.com

**Abstract** - Therapeutic communication is an important process in the treatment process for ODGJ, at this time mental illness sufferers are increasing, but there are some obstacles in the implementation of therapeutic communication. This study aims to determine the implementation of therapeutic communication by nurses at Ernaldi Bahar Hospital in South Sumatra Province in 2019. This research was conducted on 9 February-18 July 2019, using descriptive methods. a sample of 40 nurses using a questionnaire. The results obtained by the data that the implementation of therapeutic communication in the good category (62.5%) with details (1) nurses need to prepare themselves before communicating (63%), nurses have made an interaction plan (97%), (3) say hello when starting communication (70%), (4) introducing themselves to patients (67%), (5) asking the patient's condition (70%), (6) asking the patient's name (67%), (7) listening to therapeutic communication actively and fully attention (67%), (8) summarizing the results of communication (67%), (9) asking the patient's feelings after interacting (67%), (10) making further interaction contracts (60%). Based on the results of the study it can be concluded that the implementation of therapeutic communication by nurses to patients is in the good category, but there needs to be an increase again especially in the final stages of interaction. That is, by contracting further activities so that therapeutic communication can be carried out continuously throughout the patient nurse process while in the hospital. It is recommended to use therapeutic communication in accordance with the stages in order to establish a trusting relationship between nurses and mental patients and facilitate nurses in handling, caring for, and fostering mental patients.

**Keywords** - Therapeutic communication, nursing process, mental disorders

## I. INTRODUCTION

Mental health problems are still one of the significant health problems in the world, including in Indonesia. According to World Health Organization data there are around 35 million people affected by depression, 60 million people affected by bipolar disorder, 21 million affected by schizophrenia, and 47.5 million affected by dementia. Based on the 2013 Riskesdas Data, the prevalence of mental emotional disorders as indicated by symptoms of depression and anxiety for the age of 15 years and over reached around 14 million people or 6% of the total population of Indonesia. While the prevalence

of severe mental disorders, such as schizophrenia reaches around 400,000 people or as much as 1.7 per 1,000 population [1].

According to Rosdahi, the definition of mental health is a condition where a person who continues to grow and maintain harmony in self-control, and limited from serious stress [2]. Mental Health is a condition where an individual can develop physically, mentally, spiritually, and socially so that the individual is aware of his own abilities, can deal with pressure, can work productively, and is able to contribute to his community [3].

Therapeutic communication is the basic modality of the main intervention consisting of verbal and non verbal techniques that are used to form relationships between nurses and clients in meeting needs [4]. Therapeutic communication is important in the implementation of the mental nursing process, especially in the assessment process where at this stage effective communication skills are needed from nurses, which literally triggers the nursing process in relation to collecting data directly on individuals and other sources [5].

Based on the results of research conducted Angkestareni in his research the implementation of nurses' therapeutic communication in the pre-reaction phase with the results of 58 people 89.2% doing very well, in the orientation phase with the results of 55 people 84.6% categorized very well, in the work phase with results 64 98.5% of people are categorized very well, and in the last phase of termination with the results of 62 people 95.4% are categorized very well [6].

Based on the results of research conducted by Putri, V.S, the results showed that there was a significant effect of therapeutic communication therapy in overcoming the problem of violent behavior in schizophrenic patients with a p-value of 0.013 (p-value <0.05) [7].

According to Meliza, C.P and Anisah, N in their research During the application of therapeutic communication nurses use verbal and non verbal communication as well as several techniques to achieve their goals. Nurses also experience internal and external barriers in implementing therapeutic communication originating from the

patient, namely resistance or refusal to interact and deny, from the nurse's self that is mood, multi-role and language [8].

Based on preliminary studies conducted by researchers in 6 inpatient rooms (cempaka room, cananga room, pigeon room, asoka room, stork room, and paradise room) at Dr. Hospital. Ernaldi Bahar obtained information that nurses said they understood the importance of therapeutic communication, nurses' attitudes in conducting therapeutic communication, there were some differences, especially in dealing with certain patients in each room, and the techniques used were still not done or there were differences affecting the implementation of therapeutic communication. from every nurse.

Based on the description of the problems above, researchers intend to conduct research on the implementation of therapeutic communication in six inpatient hospitals. Ernaldi Bahar, South Sumatra Province 2019.

#### A. Work Related

Angkestareni, in her research the implementation of nurse therapeutic communication in the pre-interaction phase with the results of 58 people 89.2% did very well, in the orientation phase with the results of 55 people 84.6% were categorized very well, in the work phase with the results of 64 people 98.5 % is categorized as very good, and in the last phase namely termination with the results of 62 people 95.4% are categorized as very good [6]. Based on the results of research conducted by Putri, V.S, et al, the results showed that there was a significant effect of therapeutic communication therapy in overcoming the problem of violent behavior in schizophrenic patients with a p-value of 0.013 (p-value <0.05) [7].

Other studies conducted by Meliza, C.P and Anisah, in their research During the application of therapeutic communication nurses use verbal and non verbal communication as well as several techniques to achieve their goals. Nurses also experience internal and external barriers in implementing therapeutic communication originating from the patient, namely resistance or refusal to interact and deny, from the nurse's self that is mood, multi-role and language [8].

#### B. Our Contribution

This paper presents the implementation of nurses' therapeutic communication in the inpatient room of the Ernaldi Bahar Hospital in the Province of South Sumatra to the patients detailed in the analysis of each question used. The implementation of therapeutic communication is the most important thing for nurses to handle and treat mental patients in the healing process.

Interpersonal communication that is done by nurses in handling and treating mental patients using therapeutic communication.

Communication is very necessary in carrying out a job from an agency or institution.

One of them is the hospital, where in the hospital communication is very necessary to provide information or convey a message made by the medical in the hospital. Communication at the hospital is also needed by Nurses and Patients in recovering and caring for Patients. Communication plays an integral role. in the nursing profession. Communication is also a vehicle for nurses to realize the goal of providing quality care services to patients. Therefore, the hospital must know the extent to which the application of communication carried out by nurses to patients can be done through measurement methods using questionnaires that we have done through descriptive methods and analysis of each question measured. After conducting research, we were disseminated at the hospital which is the location of the study. Then, the hospital management gets input for improvement in measuring nurse performance

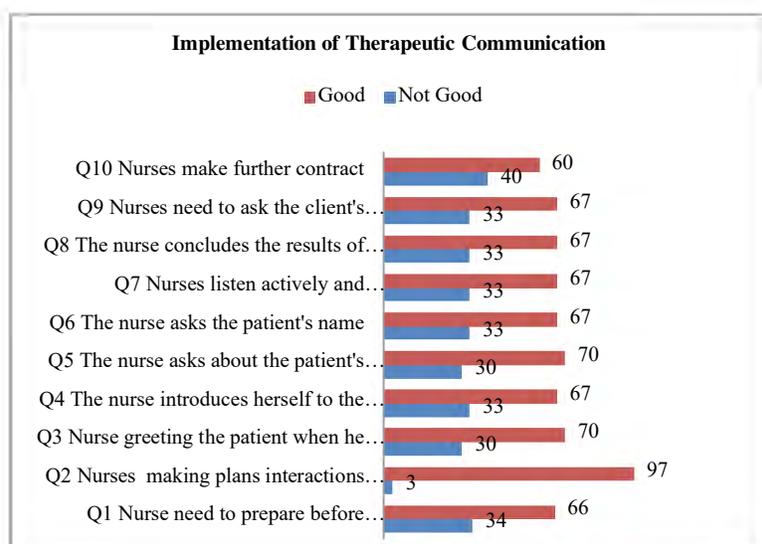
## II. METHOD

The remainder of this paper is organized as follows. Part 1 is an introduction to the background that explains the importance of therapeutic communication as well as some problems in the implementation of therapeutic communication from the results of the analysis of several research results and preliminary studies which are interesting topics to be discussed. Part 1 also covers work related to our contributions, and the structure of the paper. Then Part 2 explains the results and analysis of this study. We use descriptive analysis. Next, Section 3 discusses conclusions and the last section contains references that we use.

## III. RESULTS AND DISCUSSION

### A. Univariate Analysis

Implementation of therapeutic communication	Frequency (f)	Percent (%)
Nor Good	15	37.5
Well	25	62.5
Total	40	100.0



Based on the results of research on the implementation of therapeutic communication variables most respondents were respondents with a good therapeutic communication implementation, amounting to 25 respondents (62.5%), while 15 respondents (37.5%) with therapeutic communication implementation were less good than 40 respondents. The results of the analysis of each question related to the implementation of therapeutic communication show that only interaction planning is best done by the nurse while the implementation process until the next contract is still not optimal.

According to Kusumawati & Hartono in his book entitled Textbook on mental nursing the implementation of therapeutic communication or the nurse-client therapeutic relationship can be divided into four phases, namely pre-action phase, orientation phase, work phase and termination phase [2].

Based on the research of Umairah and Nurbaiti, the pre-interaction stage is the stage where the nurse prepares before the nurse meets the patient, the orientation phase is the stage where the nurse meets the patient to interact, then the work phase is where the nurse performs actions in accordance with the nursing plan for the patient's own healing, and the termination stage is the stage of separation or the final stage where the nurse ends the interaction and meeting temporarily and meets again at the agreed time between the nurse and the client [9].

Based on the results of the research, supporting theory and related research researchers argue that the better the structured stages of each communication process used, the more effective communication will be so that it facilitates the implementation of therapeutic communication by nurses to patients.

#### IV. CONCLUSIONS

The implementation of therapeutic communication by nurses to patients in the inpatient room at the Ernaldi Bahar Hospital is in the good category (62.5%). However, it is necessary to optimize each communication phase in the orientation phase, work phase, and termination, especially in the final stages of interaction, namely by contracting further activities so that therapeutic communication can be carried out on an ongoing basis during the patient nurse process while in the hospital.

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# Patient Satisfaction of Health Services In The Hospital

1<sup>st</sup> Ita Riani  
Nursing Departement  
Stikes Muhammadiyah Palembang  
Palembang, Indonesia  
itariani123@gmail.com

2<sup>nd</sup> Muliyadi  
Nursing Department  
Poltekkes Kemenkes Palembang  
Palembang, Indonesia  
muliyadi@poltekkespalembang.ac.id

3<sup>rd</sup> Sri Yulia  
Nursing Departement  
Stikes Muhammadiyah Palembang  
Palembang, Indonesia  
sriyulia0310@gmail.com

Corresponding author: muliyadi@poltekkespalembang.ac.id

**Abstract** - Patient satisfaction is one indicator of service quality. This Study aims to the description of patient satisfaction for health care on Hospital Palembang. This research was a quantitative descriptive study with a descriptive survey design. The research sample was 154 respondents, selected through cluster sampling. Data collection was done through the HCAHPS questionnaire. Univariate analysis used in this study. The results showed that the average percentage of patient satisfaction from six aspects was 85.37 %, with the highest percentage of satisfaction in the aspect of doctor services 92.37% followed by Nursing services 90.22%, hospital services 86.20%, patient experience services at the Hospital 82.68%, and aspects of providing information 80.86% and the lowest percentage of satisfaction in the aspect of hospital rank 79.92%. **Conclusion** A number of satisfaction aspects have not met the minimum service standards and require improvement efforts

**Keywords:** Patient satisfaction, Hospital, HCAHPS

## I. INTRODUCTION

Patient satisfaction is one aspect of quality service, which directly or indirectly affect the quality of hospital services. The satisfaction of patients describes judgment, perception of customers for the performance of health professionals in the service, which is connected with expectations or his expectations of the service [1]. Suitable hospital services patients will be satisfied and ask for the opposite of low-quality services that give rise to a dissatisfied response. Higher satisfaction Determines high customer loyalty. Patients who are satisfied with the Hospital will have a positive impact, including using the Hospital that is needed the next day, asking other people to use the Hospital, and helping the Hospital if other people need health services [2]. Generally, patients who felt dissatisfied will propose (complaint) in hospitals. Complained that is not immediately handled will result in decline in patients with a satisfactory quality of health services in the Hospital [3].

Survey HCAHPS (Hospital Consumers Assessment Healthcare Provision and Systems) explained that the aspect of satisfaction in health services relating to services nursing, medical doctors, environment the Hospital, experiences a patient in a hospital (administering medication and assistance officer), providing information, hospital rank. These aspects show nursing service is the aspect of that is essential for in survey in order to determine the extent to which satisfaction

patients toward the system health services. Nursing service is shown in friendliness when nurse treats patients, the ability of a nurse to overcome complaints patients, the ability of nurses to provide us with information to the patient, and preparedness nurses when patients need some help. Doctor services can be seen from physician friendliness, the ability of doctors to explain or provide information, and ability doctors to respond to patient complaints. Patient satisfaction influenced by the regulation of medical services and the attitudes and behaviour of doctors in communication [4]. The scope of the hospital condition of rooms that are neat, clean, not noisy and comfortable for patients is significant to increase patient comfort and satisfaction [5]. The experience of patients in hospitals (drug administration and assistance of officers) officers explain what drugs are given, the function and work of the drug and the side effects that will be caused and the attitude of the officer in helping patients when needed. Providing information discharge planning is based on a health worker explanation of what the patient is doing while in the Hospital until leaving the Hospital.

Patients who are satisfied with the hospital services where they are treats will provide recommendations, thus influencing the attitudes and beliefs of others to visit the Hospital. The survey results in the USA regarding patient satisfaction with hospital health services showed that 10% of patients expressed dissatisfaction and 90% of patients expressed satisfaction [6]. Proportional to patient satisfaction in Indonesia, based on research conducted by of 34.2 % of patients expressed satisfaction with the health services provided by public and private hospitals in Indonesia. Preliminary studies conducted by researchers on february 2019 using observation and interviews obtained information that *medical record* data, there were 5811 patients , 78% were satisfied with health service.

Patient satisfaction with health services is influenced by a number of aspects such as doctor, nurse, hospital environment, hospital experience, information provision, and hospital ranking. This study aims to obtain a description of patient satisfaction in hospital services

## II. METHOD

The research is descriptive quantitative research with a design the survey descriptive the satisfaction of patients at the Hospital consists of nursing service, medical doctors, the hospital environment patient experiences at the Hospital (administering medication and support officer), providing information and hospital rank. This study used 154 respondents, through cluster sampling. Data collection in this study used a modified HPSHPA questionnaire with a reliability value of 0.85, and a validity value more than 0.40. This study data analysis with the statistics univariate which includes nursing service, medical doctors, the Hospital environment, experience hospital patient, providing information, and hospital rank. Analysis univariate used analytics central tendency by present its mean, median, standard deviation and maximum-minimum for every aspect of and cumulative all aspects.

## III. RESULTS

### A. Respondent characteristics

TABLE 1. Age of the Respondent

Katagiri	n	Mean Median	SD	Min- Max	95% CI
Umur	154	39.31 40.50	16.80 9	25 -78	36.64 – 41.99

Table 1. show that the Age of respondents is in the age mean of 39,31 years, with the range age of 25-78 years.

TABLE 2. Respondents based on gender, education, Work and source of financing

Characteristic	Frequency	Percentage
Gender		
Male	72	46.8
Female	82	53.2
Education		
Low education level	54	34.4
Higher education level	101	65.6
Work		
Does Not Work	84	54.6
Already working	70	45.5
Source of financing		
private	16	10.4
BPJS	138	89.6

Table 2 shows that most of the respondents are female, higher education, do not work and BPJS financing

### B. Pasien Satisfaction with Health Service in the Hospital

TABLE 3. Patient Satisfaction with Health Service in the Hospital

Variabel Satisfaction	Mean	SD	Min- Max	95% CI
Satisfaction for six aspects	85.38	5.11	80-92	80.01-90.74
Nursing Service	90.22	14.56	31-100	87.90-92,54
Doctor services	92.37	11.07	42-100	90,61-94,13
The hospital environment	86.20	16.43	25-100	83,59-88,82
Experience at the Hospital	82.68	17.58	25-100	79.88-85.48
Providing Information	80.86	9.24	47-95	79,39-82,33
Hospital rankings	79.92	14.21	29-100	77,65-82,18

Table 3. Show, the average percentage of patient satisfaction for service in the Hospital are 85,38% , with the highest satisfaction in the aspect of doctor services is 92.37%, followed by Nursing Services is 90.22%, while the lowest in the aspect of hospital rankings is 79.92% and aspects of providing information is 80,86%.

## IV. DISCUSSION

Based on the results of the study of 154 participants, it was found that the average percentage of patient satisfaction from six aspects is 85.38% . This result have not met the minimum service standards of patient satisfaction (90%) are the hospital environment, experience in the hospital, providing information and hospital ranking. The highest satisfaction on aspects of doctor services and nursing care

### A. Satisfaction aspects of nursing service

Service to the aspects of nursing with a percentage of satisfaction of (90.21%) shows that patient satisfaction with nursing services has been maximal towards nursing care received. This nursing service is the most important factor for satisfaction received by patients. Nursing services are indicated by nurse friendliness when caring for these patients [7]. The results of this study get better results, patients had a variable experience of nursing care; 45 % patients were satisfied with care provided, while 55 % were partially dissatisfied [8]. The importance of nursing services for patients because nursing staff involved in health services always provide continuous and consistent service for 24 hours. Nursing service was given because there are several factors, namely: (a) inability (b) lack of unwillingness (c) The lack of knowledge in meeting the basic needs are being disturbed.

### B. Satisfaction aspects of doctor Services

Services against aspects of the doctor with a percentage of satisfaction of (92.37%) showed patient satisfaction with the service of the doctor in good value by the patient. Doctor services are the elements that have the most significant influence in determining the services provided to patients. The

hospital doctor team that provides good service, is polite and does not speak high, and wants to spend time talking with patients and families is the most important factor in medical services [4]. Patient satisfaction influenced by the regulation of medical services and the attitudes and behavior of doctors in communication.

#### C. Satisfaction aspects of Hospital Environment

Patient satisfaction on aspects of the hospital environment (86,20%). This condition explains that there needs to be an improvement in the hospital environment. The standard of hospital environmental service based on the cleanliness of the care room and the calmness of the patient at night so that the patient can rest well. The condition of inpatient rooms is one of the support factors to improve patient satisfaction [9]. Hospital environment services also play a role in increasing patient satisfaction, because a clean, comfortable environment can make patients feel calm and comfortable while in Hospital.

#### D. Satisfaction aspects of experience in hospitals

Patient satisfaction aspects of experience in hospitals 82.68%, shows that service experience in hospitals is valued by patients. Someone choosing a particular hospital as a place to look for health services is influenced by two things, namely the experience of the patient before entering the Hospital and the patient view of the Hospital. Patient experience can be an effective way of offering health services to improve service quality improvement [7].

#### E. Satisfaction aspects of providing information

Patient satisfaction on aspects of providing Information (80.86%), this indicates that the providing information service has gone well. Providing information is part of the service to patients and families. The process of implementation started since the stage of assessment and is said to be effective if it includes a study of sustainable access to comprehensive information about the needs of patients who change, the statement nursing diagnosis, planning to ensure the needs of patients following what is done by health care providers, treatment planning until there is an evaluation of the patient's condition during treatment at the Hospital [10]. The successful implementation of discharge planning is not only influenced by three contributing factors, namely 1) The role and support of other health personnel, patients, families 2) communication between nurses and patients 3) the time owned by nurses to carry out discharge planning. Providing information is carried out to reduce recurrence, and exchange information between patients as recipients of service with nurses during hospitalization until discharge from Hospital [11].

#### F. Satisfaction aspects of the hospital ranking

Patient satisfaction on aspects of hospital rankings (79,91 %), indicates that the services received are not maximal. Hospital is one of the agencies authorized to provide health services to the broader community. This can increase the ranking of the Hospital. One guideline for patients satisfied with the services provided by hospitals is the willingness of patients to recommend hospitals where they are treated to others [6]. Patients who are satisfied with health services will be happy

to recommend the hospital to relatives and friends can increase the rank of the hospital itself and indirectly increase the hospital income.

## V. CONCLUSION

A number of satisfaction aspects have not met the minimum service standards and require improvement efforts are the hospital environment, experience of the hospital, providing information and hospital ranking.

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# Printed Material Model as a Drug Information Services For Patient Refer-Back in National Insurance of Health

1<sup>st</sup>Sarmalina Simamora<sup>1</sup>  
Pharmacy Department,  
Health of Polytechnic  
Palembang, Indonesia  
sarmalina@poltekkespalembang.ac.id

2<sup>nd</sup>Ratnaningsih  
Pharmacy Department  
Health of Polytechnic  
Palembang, Indonesia  
ratnaningsih\_plg@yahoo.co.id

3<sup>rd</sup> Tedi  
Pharmacy Department,  
Health of Polytechnic  
Palembang, Indonesia  
tedibantong@yahoo.co.id

Corresponding author: sarmalina@poltekkespalembang.ac.id

**Abstract** - Each drug has a dose, administration, frequency, even different usage times. The incorrect usage can reduce its effectiveness even can make it more dangerous general, when dispensing at the pharmacy, the provision of information is made by writing simple rules of use called the label and is equipped with a little verbal information. Moreover, this may not be remembered by the patient if the patient receives many items of medicine. A study has been designed by providing posters and brochures of some diabetes drugs that are often used in JKN participants to measure the blood glucose level before and after an intervention. This is intervention research with pre and post-test group designs. Thirty respondents received oral anti-diabetes or injections without comorbidities. The assessment is carried out on the respondent's knowledge and its impact on the blood glucose level. The printed material model is given in A4 size poster and smaller size brochure according to the name of the drug received by the patient. The impact of providing printed information on respondents' knowledge was measured with the t-test, comparing before and after being given an intervention after 30 days later. The results showed significant differences ( $p < 0.05$ ) in knowledge and blood glucose levels of respondents before and after being given posters and drug information brochures. **Conclusion:** providing adequate drug information through printed materials can improve knowledge and positively impact people's blood glucose levels with diabetes.

**Keywords:** drug information, brochures, diabetic

## I. INTRODUCTION

The provision of drug information to patients based on writing by the pharmacy is given through an etiquette or label when delivery of drugs requested by prescription. A label is a small piece of paper that contains a little information such as the rules for using drugs (taken before or after meals), the frequency of use (how many times in a day), and also the doses (one teaspoon, one drop or other doses). This etiquette helps the patient use the medicine according to the doctor's rules in the prescription. However, the other information is still needed to support drug use accuracy, especially for people with chronic diseases that have not been listed on the label. Pharmacists have a strategic position in drug use because it can explain the efficacy of treatment, safety, and lifestyle that patients must live. This was stated in a 21 referrals review that wrote about a collaboration between pharmacists and nurses in improving patient compliance [1]. However, not all pharmacists do their part correctly to improve patient

compliance. In general, drugs are delivered by a Pharmaceutical Technician (PT) who works to help pharmacists. When delivering medicine, they usually communicate with a patient or their family or read out the drug label's information. PT has limitations in knowledge and authority in providing information about the drug. Surabaya's study showed that the drug information given to patients was mostly about taking medication (60.3% and 64.7%), the time to use the drug (12.8% and 12.9%), and the number of drugs used for medication. Each use (7.7% and 30.6%). The information is already written on the label, while other information beyond that is not provided. This study was conducted explicitly for respondents who were prescribed metformin and glibenclamide[2]. On the other hand, there is some information needed by patients so that the resulting therapeutic effect can be more optimal because patients need information about the rules of use and other things related to the drug.

According to the Regulation of Minister of Health No.73/2016, information can be provided by answering questions, orally, or in writing[3]. It can also be done by distributing bulletins, brochures, or leaflets and providing counselling. A study of 14 people with type 2 diabetes mellitus who were given information orally, given brochures, and reminded by sending short messages proved to improve blood glucose levels by 16.01% and improve HDL levels by 6.73%.[4]

Pharmaceutical manufacturers have included drug information brochures in their drug packaging, but these brochures are rarely given to patients. Brochures from the pharmaceutical industry may be too difficult to understand because there are still pharmaceutical or medical terms that are difficult for the average patient to understand. In some studies, it is proven that brochures can improve understanding of something. A study on the effectiveness of brochures was once conducted. The respondents were families of chronic disease patients who had critics. They were given brochures to understand the condition of patients with critical and consequent chronic illnesses. As a result, their understanding improved after reading the brochure stipulated.[5].

For this reason, a written information model was created in the form of a simple, informative, and practical brochure. This brochure can be submitted by TTK when delivering drugs to patients to complete drug information, especially for patients with chronic diseases such as diabetes who use drugs for an extended period.

## II. MATERIAL AND METHODS

This type of research is intervention research with a pre and post-test group design. The respondents were JKN participants who received oral and injection anti-diabetes drugs without comorbidities of 30 participants. The assessment was conducted on the respondent's knowledge and its impact on the respondent's clinical indicator, namely the respondent's blood glucose level. The printed

material model provided is a brochure containing information related to diabetes drugs and a brochure for each drug, namely diabetes medication received by patients. The impact of providing printed information on respondents' knowledge was measured using the t-test, before and after the intervention. The next step is to measure the blood glucose level of each group.

## III. RESULT

The development of a printed information model in brochures was tested on diabetic patients who were JKN participants and took their medicines at several pharmacies in collaboration with BPJS Kesehatan in Palembang. The brochure was shared by TTK when the patient took medicine to the pharmacy. Previously, patients who were respondents had their blood glucose levels measured and their knowledge identified.

### A. Respondents' Knowledge before the Distribution of Brochure

The questionnaire is made in the form of a right or false statement. Several statements were made incorrectly in order to avoid respondents choosing answers arbitrarily. The data presented describe the percentage of correct or correct answers for each item of the statement. Details are presented in the following table.

TABLE 1. Knowledge Of Oral Drugs Diabetes Respondents Before Being Given A Brochure

No	Statement	Correct Answer (%)
1	Uncontrolled high blood glucose levels can cause complications	27
2	Diabetes medicine must be taken even though the blood glucose level when checking is within normal limits	27
3	There are diabetes drugs that cause gastrointestinal side effects, so they are recommended to be used after meals	66
4	People with diabetes are advised to have their kidneys checked regularly at least once every three months	16
5	Oral diabetes medications should be swallowed using boiled water	83
6	Diabetes drugs that have rules for use before meals should be used thirty minutes before meals	83

7	One of the symptoms of hypoglycemia is palpitations	11
8	Taking diabetes medications can cause drug dependence	11
9	Oral diabetes medications can be stored / placed in a place exposed to sunlight	16
10	The number of carbohydrates eaten affects blood glucose levels	83

TABELII .Knowledge Of Diabetes Drug Injection Respondents

No	Statement	Correct Answer (%)
1	Injectable antidiabetic drugs are substitutes for insulin	75
2	Injectable antidiabetic drugs are injected regularly according to the dosage recommended by the doctor	75
3	Used syringes can be thrown in the trash	25
4	Injecting Novorapid long before meals can result in hypoglycemia	25
5	One of the characteristics of hypoglycemia is that the hands and feet feel stiff	0
6	The drugs Levemir and Lantus are injected at the same time every day	58
7	After being used, the injection drug must still be stored in the refrigerator (2-8o Celsius)	0
8	The injection location does not need to be moved, it can be done in one place continuously	83
9	Syringes should ideally be used only once	0
10	After being used, injectable drugs can still be used after three months, if they have not run out	83

Drug Information Service is one form of clinical pharmacy service at a pharmacy. The implementation must be supported by the availability of pharmaceutical resources, facilities, infrastructure, and human resources oriented to patient safety [5]. Besides, there is a pharmaceutical technician who helps pharmacists in carrying out their duties, providing information that should be provided by pharmacists. However, if there is only one pharmacy pharmacist, this drug information service activity will also not run optimally. If the patient is not informed well, this will affect their knowledge.

### B. Development of Print Materials

The printed material is presented in the form of a brochure, which contains the following information.

For oral diabetes medicine

1. Controlled blood glucose levels can prevent complications, namely heart and blood vessel disorders, kidney, eye, and nerve disorders, therefore take medication regularly and always on time.
2. Drink medication irregularly, sometimes they drunk but sometimes stops causing sugar levels to be uncontrolled; it accelerates complications
3. Diabetes drugs are generally taken 30 minutes before meals because the results will be maximum; it is useless if taken after meals.
4. There are also drugs that are taken with food to prevent more carbohydrates from being absorbed.

5. For drugs that are taken simultaneously as food, swallow the medicine with boiled water after the first bite, then continue eating as before.
6. Specifically for Metformin, it has been used after meals to reduce the risk of gastrointestinal disorders such as diarrhoea.
7. The head can get dizzy after taking medicine because there is a decrease in blood glucose levels, but for a long time, they will get used to it
8. The drug acarbose can cause diarrhoea or fart, but if you do not feel disturbed, the drug can be continued because the condition will return to normal after getting used to it. However, if you feel uncomfortable, ask your doctor to prescribe another medication.
9. Acarbose is taken before meals because it works to inhibit the absorption of starch or sugar from food. This medicine is less effective if taken after meals.
10. Kidney health needs to be checked in the laboratory at least every six months after using diabetes drugs.
11. Do not forget to exercise or do physical activity for at least 30 minutes every day, keep the food balanced, avoid eating much starch, and increase the fibre from vegetables and fruits that are not too sweet.
12. Store the medicine in a cool and dry place, do not expose it to sunlight and heat.
13. Pay attention to the expiration date of the drug.

For injection diabetes medicine

1. The usage of injection (insulin) is to control blood glucose level that increases while eating
2. Insulin is not narcotics, so the usage is not caused by drug dependency.
3. An injection is happened before eat with short-haul time from eating time to avoid hypoglycemia (the symptoms are weakness, trembling, and dizzy eyes)
4. Do the injection with the right dose according to the doctor's instruction.
5. For injectable drugs used at night (for example, Levemir or Lantus), it is recommended to inject at the same time every night, for example, every nine at night.
6. Syringes for insulin should only be used one time; use a new syringe for the next injection.
7. If the medicine does not flow, it may be a blockage at the tip of the syringe; this is because there is insulin drying at the tip of the needle, so the needle must be replaced.
8. The best conditions are injecting and eating at the same time every day.
9. When the sugar levels are under control, let the doctor know to readjust the insulin dose you are using.
10. Insulin medicine that has been used does not need to be stored in the refrigerator; its use is effective for 28 days. After that, even if there is still anything left, it should be discarded.
11. Dispose of used insulin syringe by burying them in the ground. If this is not possible, you can collect them and hand them over to a
12. pharmacy or Primary Health Care for medical waste disposal.

The printed material model that was made next was a drug brochure, namely the drug metformin, glimepiride, acarbose, fast-acting insulin (Novorapid), and long-acting insulin

(Levemir). This brochure design is simple, lightly coloured to attract people to read it. Brochures were given according to the medicinal items used by the respondents.

This brochure's distribution does not intend to replace the pharmacist's role in providing oral information directly during drug delivery. However, it is intended to complement and remind patients always to be obedient to using the medicine. Drug information is a patient's need because if the patient gets the correct information, they will use the information for his health.

After the brochure is given when the patient picks up the drug at the pharmacy, a few days later, a knowledge measurement is taken by distributing the same questionnaire used before the distribution of the brochure. It was done to assess the impact of the brochures provided. Measurement of diabetes respondents' knowledge was carried out pre and post-test without a control group because the number of respondents was few. There is no difference in treatment for patients who receive oral drugs or injection drugs because what is checked is the sugar. The results are as follows:

Table 3. Diabetics Respondent Knowledge Before And After Distribution Of Brochures

Category	N	Asymp. Sig
Drugs Oral	18	0.000
Drug Injection	12	0.002

Because the number of diabetes respondents without comorbidities is small, the data distribution is not normally distributed; therefore, a two-related sample test of the Wilcoxon Method was used. The results show that Ho is rejected (Asymp.siq. 0.000 for oral drugs and 0.002 for injection drugs), meaning that there is a difference in knowledge before and after giving brochures. The provision of brochures in this study is statistically proven to increase the knowledge of the respondents.

*C. The impact of knowledge on blood glucose levels*

In addition to measuring knowledge, to assess the impact of increasing knowledge after the respondent received the drug information brochure, a diabetes respondent measured blood glucose levels. Measurements were made twice, namely at the beginning of the study, before giving the brochure, and at the end of the study, namely three months after giving the brochure. The following are the measurement results.

Table 4. Blood Glucose Levels Of Diabetics Respondent Diabetic Respondent Before And After Being Given Brochures

Measurement	Guocse blood level (mg/dL)	Standart Devices	Sig
Before being given Brochures	219,37	80,309	0,000
After being given Brochures	199,03	76,801	

There was a significant difference in blood sugar levels before respondents received the brochure compared to their average blood sugar levels after receiving and reading the brochure. Clinically the average blood sugar level is currently still above normal sugar levels. The standard deviation is quite large because the respondent's blood sugar level variation is also quite considerable. The spread of respondents' blood sugar levels ranged from 145 - 457 mg/dL in the initial measurement to 138 - 425 mg/dL in the next measurement. Good knowledge does not necessarily change behaviour for good because several factors influence behaviour, such as economic circumstances, environment, culture, and habits. One of the correct but intricate knowledge followed by respondents is the use of disposable insulin syringes. The syringe price strongly affects this since the syringe is not included in the treatment claimed by the PRB pharmacy. Research at a hospital in Porto Alegre, Brazil, showed that 75% of respondents still used recurrent syringes with frequencies from 2 to 21 times [6]. The small number of samples caused the respondent's blood sugar level data to be distributed abnormally, so the testing was conducted on a non-parametric level even though the data type ratio. The standard deviation of sugar levels in this study was considerable because the respondents' variation in blood sugar levels ranged very far from 145 - 457 mg/dL. The measurement of blood sugar levels was taken during the day, 15:00 until 17:00. It was expected that the respondent was about 2 to 3 hours after lunch during that hour. However, it did not close the possibility of respondents consuming exciting foods. The provision of brochures as a complement to drug

#### IV. DISCUSSION

In this study, PT did provide information regarding dosage, the rules for use, and how to use the drug, but other information that could affect the accuracy and adherence to therapy was not provided. It can be seen from respondents' answers in the questionnaire; for example, there are still almost 50% of respondents who forgot to take medicine also experienced problems due to drug use. Respondents' incorrect answers indicate their lack of knowledge about matters relevant to their treatment. In Surabaya, a study showed that the most information given was about the frequency of taking medication, time to use the drug, and the least information was the number of drugs for each use [2]. It condition occurs in many places, where the information provided at the time of drug delivery is limited to what is written on the drug label. If they know that they had to take medication regularly every day because of the risk of increased blood pressure, if they did not take medicine, the patient would be more obedient to taking medicine. A study on the knowledge of paracetamol drug use has been conducted among students from the faculties of medicine, pharmacy, nursing, and physiotherapy. These students are considered to have sufficient knowledge related to medicine because they are health education students. However, it turns out that from 87 respondents, there are still 30% who do not have adequate knowledge [7]. Suppose health students still do not have a good knowledge regarding the drugs they use. In that case, even more, chronic disease

patients such as hypertension and diabetes, who do not have a background in health education, and also if they are in advanced age, of course, they have lack of knowledge. A study about communicating risk was conducted on Health Care Professionals, and the result showed that the group received brochures (86.4% to 96.6%) was able to answer five survey questions more correctly than those who had not (51.5% to 97.0%) [8]. Information brochures that have been designed in such a way have also been proven to be useful in improving the understanding of families of chronically ill patients who are already critical so that they can accept the condition of that critical patient [4]. In some situations, brochures prove useful, although sometimes other media such as video, can become more effective, as was once done in a cross-sectional survey among people with diabetes in Hyderabad related to the behaviour and compliance of conducting diabetic neuropathy screening [9]. In a study of 45 hypertensive patients, 23 people were given information, and 22 people were not; the results caused respondents who were given information to have higher adherence to their drug use [10]. Another study using calculating the remaining medication for diabetic patients showed that 54.35% of respondents were declared non-compliant because they did not finish the drug [11]. Most patients are afraid to take medication every day because they are worried about side effects and dependency effects, as stated by respondents in this study. They do not take drugs as recommended. Regarding conditions like this, it is necessary to explain to patients that it will be more dangerous for their health if they do not take medicine regularly. Blood pressure can soar and can cause a stroke, while for people with diabetes, uncontrolled blood glucose levels will accelerate the occurrence of complications [12].

#### V. CONCLUSION

Brochures made simple and equipped with the type of drugs used have increased the knowledge of respondents who use diabetes mellitus drugs. Knowledge severing has a significant impact on blood sugar levels, even if they have not reached normal levels as expected.

#### ACKNOWLEDGMENT

This research was funded by DIPA POLTEKKES

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# The Effect Of Elderly Gym With Brain Gym To Improvement Of Cognitives In Elderly At The Simalingkar Puskesmas In 2020

1<sup>st</sup> Eva Ratna Dewi

Midwifery Diploma Three Study Program  
STIKes Mitra Husada Medan  
Medan, Indonesia  
evaratna.dewi87@gmail.com

2<sup>nd</sup> Eka Falentina Tarigan

Program Studi Bachelor Midwifery Program  
STIKes Mitra Husada Medan  
Medan, Indonesia  
ekafalentina5@gmail.com

3<sup>rd</sup> Nur Azizah

Midwifery Diploma Three Study Program  
STIKes Mitra Husada Medan  
Medan, Indonesia  
azizahlubis243@gmail.com

Corresponding author: @gmail.com

**Abstract** - Elderly is characterized by a biological decline experienced it can be seen by physical deterioration, one of which is cognitive decline. Cognitive function is related to physical activity that affects its structure and function. Every physical movement that is made by provides an impression to the brain. Elderly gym and brain gym doing regularly have a positive impact on improving organs and brain function. The research objective was to determine the effect of elderly gym with brain gym to improvement of cognitives in elderly at the simalingkar puskesmas in 2020. This kinds of research is a quasi-experimental research and the design used is a pre-test post-test research design with a control group design. The research subjects consisted of 15 elderly in the control group and 15 elderly in the intervention group. The instrument measurement used to assess cognitive function is the Mini Mental State Examination. The bivariate analysis used was the Wilcoxon test and the Mann-witney test. The effect of elderly gym on cognitive improvement with the Wilcoxon test resulted in the value of  $p = 0.000$ , the effect of brain gym in the intervention group obtained results for a value of  $p = 0.000$ . Elderly gym and brain gym have an impact on cognitive enhancement. As well as the difference in the effect of elderly gym and brain gym on cognitive enhancement in the elderly with the Mann Witney test, the result is that the value of  $p = 0.948$ .  $H_0$  is accepted and  $H_a$  is rejected so that it can be concluded that it has the same effect of elderly gym and brain gym on cognitive enhancement in the elderly at Simalingkar Health Center.

**Keywords:** Elderly Gym, Brain Gym, Cognitive

## I. INTRODUCTION

The aging process of the population has an impact on various aspects of life, be it social, economic, and especially in health. The function of body organs will decrease both due to natural factors and because disease increasing age. Elderly is a process by increasing individual age which is characterized by decreased cognitive function.

Old age is characterized by experiencing a biological decline, such as physical deterioration, such as sagging skin, wrinkles, reduced vision, fatigue, slow movement, and cognitive decline such as forgetfulness, deterioration of orientation to space, and not easy to accept new ideas / things.

Cognitive function is related to physical activity, every physical movement made provides an impression to the brain, because the brain has properties plasticity where if the stimulus continues to be given its function will be stay awake and vice versa if the stimulation is less orno, the plasticity process does not occur and the brain will

experienced decline in structure and function, therefore the decline in cognitive function can be slowed down and can even be maintained properly by continuing to train the brain (modules). Gymnastic for the elderly and brain gym that is done regularly has a positive impact on improving body organs and increasing cognitive power.

Cognitive function is influenced by changes in the structure and function of brain organs, decreased function of the musculoskeletal system and reproductive system. Atrophy that occurs in the brain due to aging causes a decrease in inter-nerve connections, shrinks the sensory nerves so that response time and reaction time slows down, memory deficits, hearing, sight, smell, and tactile problems. Decreased hearing power in the inner ear, especially in high notes, unclear voices, difficulty understanding words, 50% occurred in people over the age of 65.

A preliminary study survey conducted on 10 elderly people, 8 of them stated that they experienced cognitive decline, one of which was dementia. Based on the background, the authors are interested in knowing the effect of elderly gym and brain gym on the cognitive improvement in public health centers for maximum years.

## II. METHODOLOGY

This research is a quasi experimental study and the design used is a pre-test post-test research design with control group design, which is a research design to analyze the effect of elderly exercise with brain gym on the elderly on cognitive improvement between the intervention group and the control group<sup>2</sup>.

The research subjects in this study were the elderly with a total of 30 babies, namely in the control group 15 elderly people will be given elderly gym while for the intervention group 15 elderly are given brain gym intervention, both groups were given intervention every week 2 times for 6 months. The influence of elderly exercise in the control group and the effect of brain gym on the intervention group will be analyzed by the Wilcoxon test. The difference in the effect of elderly gym in the elderly with brain gym on cognitive improvement was analyzed by using the Mann Witney test.

**Tabel 4.1**  
**Table of Cognitive Distribution in Elderly Before and After Elderly Gym**

Cognitive Criteria	Pre-test		Post-test	
	Frequency	%	Frequency	%
Normal	7	46.7	13	86.7
Cognitive Probable	7	46.7	2	13.3
Cognitive disruption	1	6.7		
Definite Cognitive disruption				

	Value	Value
Mean	1.60	1.13
Median	2.00	1.00
SD	0.63	0.35

Table 4.1 The results showed that elderly exercise in improving cognitive before and after doing elderly exercise in the control group majority experienced normal cognitive 7 (46.7%) as well as probable cognitive impairment as much as 7 (46.7%), while the minority experienced definite cognitive impairment as much as 1 (6.7%).

**Tabel 4.2**

**Table of Cognitive Distribution in Elderly Before and After Brain Gym**

Cognitive Criteria	Pre-test		Post-test	
	Frequency	%	Frequency	%
Normal Cognitive	4	26.7	12	80.0
Probable Cognitive	8	53.3	3	20.0
Definite Cognitive	3	20.0		

	Value	Value
Mean	1.93	1.20
Median	2.00	1.00
SD	0.70	0.41

Table 4.2 The results showed that the Brain gym in improving cognitive before and after doing the Brain gym in the intervention group, the majority experienced probable cognitive impairment as much as 8 (53.3%), while the minority experienced definite cognitive impairment as much as 3 (20.0%). the intervention group will be analyzed by the Wilcoxon test. The difference in the effect of elderly gym in the elderly with brain gym on cognitive improvement was analyzed by using the Mann Withney test.

### III. RESULT

This research is about the effect of elderly gym with brain gym on the elderly on cognitive improvement at the Simalingkar Health Center in 2020. This research has been conducted from April to September 2020 for exactly 6 months. This research is in the form of data before (pre) and after (post) elderly exercise as well as data before (pre) and after (post) brain gym.

The assessment of cognitive function in elderly gymnastics is categorized into normal cognitive function, probable cognitive impairment, and definite cognitive impairment. The full research results are presented in the table as follows:

**Table 4.3. The Effect Elderly Gym to Improve Cognitive in Elderly Result of Wilcoxon Test**

Criteria	Value	Asymp.Sig	Conclusion
Pre-Post Elderly Gym	4.812	0.000	HO Rejected

Table 4.3 the results of the study show that the effect of Elderly Gymnastics in improving cognitive in the elderly and using the Wilcoxon test, the pre-post exercise results for the elderly in the Asimp column were carried out. Sig is equal to 0.000, here it is obtained a probability value below 0.05 (0.000 < 0.05), it can be concluded that there is a difference before (pre) and after (post) implementing elderly exercise in cognitive enhancement.

**4.4 The Effect Brain Gym to Improve Cognitive in Elderly Result of Wilcoxon Test**

Criteria	Value	Asymp.Sig	Conclusion
Pre-Post Elderly Gym	4.812	0.000	HO Rejected

Table 4.4 of the results of the study shows that the effect of brain gym on improving cognitive in the elderly and the Wilcoxon test was carried out, the pre-post exercise results for the elderly in the Asimp column. Sig is equal to 0.000 here, the probability value is below 0.05 (0.000 < 0.05) so it can be concluded that there is a difference between before (pre) and after (post) doing a brain gym in cognitive enhancement. The difference in the effect of exercise in the elderly and brain gym on cognitive enhancement in the elderly can be solved by the Mann-Witney test further in the following table.

**4.5 The Difference Effect of Giving Elderly with Brain Gym to Improving Cognitive in Elderly with Mann-Witney Test**

Criteria	Value	Asymp.Sig	Conclusion
Gymnastics for the elderly – Brain Gym	4.802	0.948	HO be accepted

Table 4.5 the results of the study show that the elderly exercise with a brain gym is 0.948, so the probability value is above 0.05 (0.948 > 0.05) so that Ho is accepted, the elderly exercise group has similarities with the brain gym group in improving cognitive function.

## IV. DISCUSSION

4.1 Cognitive Distribution in the Elderly Before and After Gymnastics for the Elderly

The results of the cognitive distribution research in the elderly before and after exercise in the control group showed that the majority of cognitive improvements experienced normal cognitive and probable cognitive impairment.

4.2 Distribution of Cognitive Distribution in the Elderly Before and After Brain Gym

The results of the cognitive distribution research in the elderly before and after doing Brain gym in the intervention group showed that the majority experienced probable cognitive impairment.

4.3 The Effect of Gymnastics in the Elderly on Cognitive Improvement Before and After Being Given Treatment to The Elderly

The effect of elderly gym in cognitive improvement before and after The control group that was given elderly exercise showed the results of the value of P = 0.000, meaning p < 0.05, indicating that there was an effect of elderly gym in cognitive improvement.

4.4 The Effect of Brain Gym in Improving Before and After Giving Treatment to The Elderly

The results of the study in the intervention group that were given the brain gym treatment showed the value of P = 0.000, meaning that p < 0.05, stated that there was an effect of the brain gym on cognitive improvement.

Brain gym leads to improved coordination body function, motor, balance, and power of thought or memory someone. Decrease in bodily and cognitive functions as a result aging can be minimized with this therapy.

Based on this research, it is in line with Lutfiana's (2017) research on the elderly, it was found that there was an effect of brain gym on the cognitive function of the elderly. This happens because brain exercise can stimulate all parts of the brain to work so that it can improve cognitive abilities. Brain Gym Movement is a series of simple, fun

movements used to combine all parts of the brain that function to increase learning abilities, build self-esteem and togetherness. According to a brain gym expert from the United States Educational Kinesiology institute Paul E. Denission, Ph.D, brain exercise can facilitate learning activities and adaptation to tension and can optimize brain development and potential, brain exercise can increase blood flow and oxygen to the brain and stimulate both hemispheres into work.

#### 4.5 Differences in the Effect of Gymnastics in the Elderly with Brain Gym on Cognitive Improvement in the Elderly

The results of this study indicate that there is a difference in the effect of gymnastic in the elderly with brain gym on cognitive

enhancement in the elderly at Simalingkar Health Center. These results get the value of  $P = 0.05$ , meaning  $p > 0.05$ , so  $H_0$  is accepted, that the elderly exercise group has similarities with the brain gym group in cognitive enhancement in the elderly.

This has similarities with research conducted by Setyawan (2015) which states that elderly exercise and brain gym have similarities in improving cognitive function in the elderly.

### V. CONCLUSION

The effect of elderly exercise in cognitive improvement before and after being given elderly gym in the control group with the result of  $P = 0.000$ , meaning  $p < 0.05$ , so it can be concluded that there is an effect of elderly gymnastics on cognitive improvement.

The effect of the brain gym on cognitive enhancement before and after being given a brain gym in the intervention group with a value of  $P = 0.000$  meaning  $p < 0.05$ , stating that there is an effect of the brain gym on cognitive improvement.

The results of this study have the same effect of exercise in the elderly with brain gym on cognitive enhancement in the elderly at Simalingkar Health Center. all  $p$  values  $> 0.05$ , so that  $H_0$  is accepted and  $H_a$  is rejected.

### VI. AUTHOR'S CONTRIBUTIONS

1. It is hoped that the elderly are expected to be more active in participating in elderly gym and brain gym which is held in their area so that the problem of cognitive decline can be resolved by the elderly.

2. It is hoped that health workers should provide more counseling and motivate the elderly in increasing the use of elderly gym with a regular and organized brain gym so as to improve cognitive function.

### VII. ACKNOWLEDGMENT

The big thanks be delivered to STIKes Mitra Husada Medan and Puskesmas Simalingkar for giving permission to conduct research at the Simalingkar Health Center (Puskesmas).

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# Bradley and Hypnobirthing Models in an Antenatal Class to Overcome Anxiety for Pregnant Women at PMB and Puskesmas, Palembang City 2019

1<sup>st</sup> Heni Sumastri  
Midwifery Major  
Politeknik Kesehatan Kemenkes Palembang  
Palembang, Indonesia  
henisumastri@poltekkespalembang.ac.id

2<sup>nd</sup> Ellita Vasra  
Midwifery Major  
Politeknik Kesehatan Kemenkes Palembang  
Palembang, Indonesia  
Fikaaam.anakmama@gmail.com

Corresponding author: henisumastri@poltekkespalembang.ac.id

**Abstract** - Pregnancy and childbirth are natural processes that women experience in their life cycle. Obstruction induced by anxiety and pain at delivery can lead to artificial interventions such as a C-section (SC). In 2011, the percentage of SC increased dramatically to 30-80% in private hospitals in Indonesia. The bad impact of pregnant women anxiety triggers the stimulation of uterine contractions. The result of this condition can increase blood pressure so that it can trigger preeclampsia and miscarriage (Maharani, 2008 in Novriani, 2017). The purpose of this research is to see the effect of health education Hypnobirthing (done by officers) and the Bradley Method (husband - trained to do affirmations). Quasi experimental research design with pre and post methods. Research sites at PKM Pembina Palembang and BPM Husniyati Palembang. The population was all third trimester pregnant women and samples after the study for each intervention amounted to 22 for pre intervention and 22 for intervention pots so that the total sample was 44 respondents. The results showed that the age of respondents at low risk was 86.4%, low parity was 18 people (81.8%) and respondents who worked were 7 people (31.8%). There were significant differences before and after the intervention both Hypnoprenatal (: p value = 0, 000) and the Bradley method (p value = 0.024). There is no difference before and after Hypnoprenatal intervention: p Value = -0.069, Bradley Method: p Value = 0.418. The results of the correlation test on hypnoprenatal p value = 0.106 and the Bradley method p value = -0.183 means that there is no influence before and after the intervention. Suggestions are expected that after this research, the self hypnosis manual that the author has made becomes a reference or reference for mothers in doing hypnosis.

**Keywords:** Bradley Method, hypnobirthing, anxiety

## I. INTRODUCTION

When Pregnant Improper posture will force additional stretching and fatigue in the body, especially in the spine, causing pain or pain in the back of the pregnant woman. Low back pain is pain that is felt in the lower back area, it can be local pain (inflammation) or radicular pain or both. Labor pain is a response to nervous stimulation caused by uterine contractions and tissue damage during labor and vaginal delivery.

Labor and delivery are normal physiological events. Labor is the release and excretion of products of conception (fetus, amniotic fluid, placenta and amniotic membrane) from the uterus via the vagina to the outside world.

Perceptions of pain or pain tolerance vary depending on the individual, and the intensity of pain during labor affects the psychological state of the mother, delivery, and the well-being of the fetus. Pain is a sensation of discomfort that post partum mothers often complain about. Pain has a very complex impact on the care of post partum mothers, including: inhibition of early mobilization, inhibited lactation, inhibition of the bonding attachment process, feelings of fatigue, anxiety, disappointment due to discomfort, disturbed sleep patterns, and even if prolonged pain will increase the risk of post partum blues. The use of evidence-based practice methods provides more opportunities for nurses to think critically in order to make decisions and take appropriate actions according to the problem and the uniqueness of the patient.

Most (90%) of deliveries are accompanied by pain (Oxorn, DC). Pain during labor is common and is a process that involves the mother's physiology and psychology. Pain is a cause of frustration and hopelessness, so that some mothers often feel that they will not be able to go through labor (Niven & Gijsbers, 1994; Potter & Ann Griffin, 2006). Murray reported the incidence of pain in 2,700 mothers, 15% experienced mild pain, 35% with moderate pain, 30% with severe pain and 20% of deliveries with very severe pain (Murray, et al., 2002).

In Indonesia, there are 373,000,000 pregnant women who experience anxiety in the face of childbirth, as many as 107,000,000 people (28.7%). While the entire population on the island of Sumatra, there are 679,765 pregnant women who experience anxiety in facing childbirth 355,873 people (52.3%) (Depkes RI, 2008).

The bad impact of pregnant women anxiety triggers the stimulation of uterine contractions. The result of this condition can increase blood pressure so that it can trigger preeclampsia and miscarriage (Maharani, 2008 in Novriani, 2017). Low birth weight babies (LBW) and premature babies are also a negative impact of anxiety in pregnant women (Spitz, 2013). Age, parity of pregnant women, level of education, and occupation are factors that cause anxiety levels in primigravida pregnant women (Handayani, 2015).

In order to determine the availability of information for parents, providers, and childbirth educators in the most relevant natural methods, "natural birth education" was carried out. The most common types of classes are the Bradley, Lamaze, and hypnobirthing Method

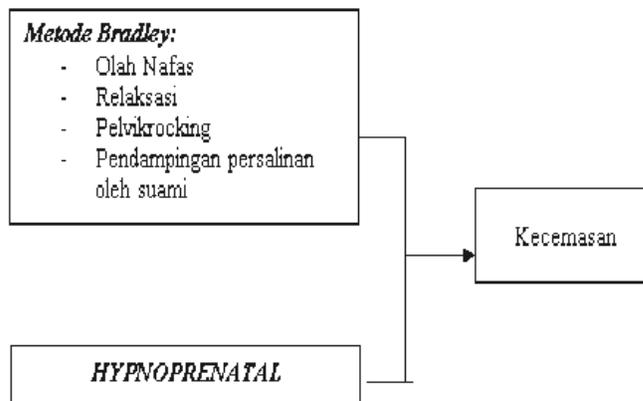
The bad impact of pregnant women anxiety triggers the stimulation of uterine contractions. The result of this condition can increase blood pressure so that it can trigger preeclampsia and miscarriage (Maharani, 2008 in Novriani, 2017). Low birth weight babies (LBW) and premature babies are also a negative impact of anxiety in pregnant women (Spitz, 2013).

The results of a preliminary survey that had been carried out in the working area of the Puskesmas Pembina, BPM Lismarini and the Independent Practice Midwives. The results of the interview show that both primigravida and multigravida mothers experience anxiety, the intensity of anxiety is more frequent when imagining the birth that they will undergo, whether the mother will give birth normally or not, and whether the fetus is normal or not. The number of pregnant women in November 2017 was 236 mothers with primigravida criteria as many as 647 pregnant women

The purpose of this study was to determine the effect of the Bradley method and prenatal hypno-prenatal anxiety in pregnant women

## II. RESEARCH METHODOLOGY

The research design used in this study was "One Groups Pretest-Posttest Design", a research design that contained a pretest before being treated and a posttest after being given treatment. and then to see the effect of treatment based on its significance is to analyze the difference test using statistical T-test



**Place:** Public of health and Midwifery Pracrice in Palembang City

**Implementation Time:** September - December 2019

### Population:

The population was all pregnant women who were in Puskesmas Pembinda and Midwife Practical Mandiri Husniyati Palembang with the following criteria for inclusion: Normal pregnant women, gestational age > 37 weeks. Next, the researchers determined the number of samples as many as 32 people. So that the number of samples for each group amounted to 11 pregnant women for pre and 11 people for the post group in 1 method so that the total number was 44 samples.

### Hypothesis:

There is an effect of Bradley's model and hypnoprenatal on anxiety in pregnancy

### Data processing :

Collecting and coding data (editing & coding), scoring (scoring), entering data (data entry), data tabulating

Data processing: The data is processed with a frequency distribution system and testing the relationship between variables with statistical tests. The statistical test formula used is: correlation test with chi square and to assess the difference with the T test with a significant degree if  $P < 0.005$ .

### Data analysis

Data analysis using the help of statistical analysis software used: Chi Square test to see the equality of respondent characteristics, T-test, namely: a statistical test that compares the mean of two groups of data is called the mean difference test and correlation test

## III. RESULTS

From the number of samples, it was determined that each group amounted to 22 before the intervention and 22 after the intervention so that the total sample was 44 samples. The study was conducted from October to December 2019 at the Puskesmas Pembina Palembang (antenatal class) and Bidan Husniyati and midwife lismarini.

The characteristics of pregnant women who were the subjects of the study consisted of age which was divided into 2 categories low (> 20 and <35 years) and high (<20 and > 35 years), parity was divided into 2 categories (low; 1 child and more high). of 1 child), the work is divided into 2 categories (working and not working)

**Table 1. Characteristics of pregnant women who were research subjects in the 2 study groups**

No	Karakteristik	n=22	%	
1	Age	- Low	19	86,4
		- High	3	13,6
2	Parity	- low	18	81,8
		- high	4	18,2
3	Work	- low	7	31,8
		- High	15	68,2

In table 4.1 above, it can be seen that the age of the respondents when the research was carried out was in the low risk category amounting to 86.4%, low parity amounted to 18 people (81.8%) and the respondents who worked were 7 people (31.8%)

**Table 2. Differences in the Characteristics of Respondents based on Age, Parity and Occupation with the Bradley method and antenatal class at Puskesmas Pembina and BPM Husniyati Palembang in 2019**

	Group				P value
	I		II		
	(n=11)		(n=11)		
Mothers Age					
High Risk	2	18,18	5	45,45	0,28
Low Risk	9	81,82	6	54,54	4
Number of Children					
High	9	81,82	5	45,45	0,00
Low	2	18,18	6	54,46	0
Work					
Work	6	54,54	3	27,27	0,00
Don't Work	5	45,46	8	72,73	0

Information :

- Group I: Antenatal Class
- Group II: Bradley Method

From table 4.2 above, it can be seen that maternal variables are normally distributed  $p \text{ value} > \alpha (0.005)$ , parity and work variables get  $p \text{ value} < \alpha (0.005)$ , which means the data is not normally distribute

The pain category in this study was divided into 3 categories, namely No Pain (<3) Mild Pain (3-4), moderate pain (4-6) and Severe (7-10).

**Table 3. Differences in levels of anxiety before and after the intervention of the Bradley Method and Hypnopenatal at the Community Health Center and the Palembang City Independent Practice Midwives in 2019**

Anxious Level	Group							
	Hypnopenatal class N = 11			Bradley Metode N = 11				
	Before		After	Before		After		
- Not	0	0	0	0	0	1	9,10	
- Light	7	63,64	5	45,45	7	63,64	7	63,63
- Moderate	4	36,36	6	54,55	4	36,36	3	27,27

Information :

- Hypnopenatal:  $p \text{ Value} = -0.069$
- Bradley Method:  $p \text{ Value} = 0.418$

From table 4.4 above, it can be seen that for hypnopenatal intervention, the anxiety felt by the mother was moderate before the intervention mild anxiety was 63.64% and after intervention there were 5 people 45.45% and before the intervention moderate anxiety was 36.36% and after intervention. intervention person 54.55% then for the Bradley method before the intervention mild anxiety amounted to 63.36% and moderate 36.64%, after the intervention there was a shift in anxiety without pain 9.10%, mild 63.36% and moderate 27.27%

**Table 4 : Differences Before and after Intervention based on Cortisol Levels in Community Health Centers and Independent Practicing Midwives of Palembang City in 2019**

No	Category	Mean	Standard deviation	p Value
1	Hypnopenatal class Before and After Intervention	-4,000	13,924 (-16,449-8,449)	0,490
2	Bradley Method Before and after the Intervention	-2,364	11,935 (-10,382-5,655)	0,526

Note: Paired T test

The results of the hypnopenatal correlation test showed that the results before and after the intervention  $p \text{ value} = 0.490$ , meaning that there was no effect before after the intervention and the Bradley correlation test method before and an internevisi  $p \text{ value} = 0.526$  also had no effect before and after the intervention

#### IV. DISCUSSION

The age of the respondents at the time of the study was in the low risk category, amounting to 86.4%, based on the previous theory that age has a very big influence on emotional maturity and depression mechanism of a person in dealing with problems including ongoing pregnancy, low parity of 18 people (81.8%) based on the previous theory, low parity increases the risk of experiencing pain greatly because in women with no experience, the risk of complications will be greater, pain causes many problems that lead to pathological problems for both pregnant and childbirth mothers while respondents who work have an emotional risk to increase anxiety in the end leads to very intense pain, feeling tired, and lack of rest. Pregnancy is a physiological thing that occurs in women of reproductive age. During pregnancy, changes occur in the mother, both physically and psychologically. In general, the physical changes during pregnancy are: amenorrhoea, enlarged breasts, changes in the shape of the uterus, changes in the work system of the organs, enlargement of the stomach, weight gain, weakening of the relaxation of the digestive tract muscles, sensitivity to sensation, and enlarged legs and arms ( Pieter & Lubis, 2010).

Almost all primigravida pregnant women experience worry, anxiety, and fear both during pregnancy, during labor and after delivery. The pregnant woman will have disturbing thoughts as a development of anxious reactions to the stories she has acquired. Concerns and worries for pregnant women if not handled seriously will have an impact and influence on physical and psychological, both the mother and the fetus.

Mothers who experience anxiety or stress, the signal travels through the HPA (Hypothalamus-Pituitary-Adrenal) axis which can cause the release of stress hormones including Adreno Cortico Tropic Hormone (ACTH), cortisol, epinephrine,  $\beta$ -endorphin, Growth Hormone (GH), prolactin and Lutenizing Hormone (LH) / Folicle Stimulating Hormone (FSH) (Suliswati, 2012).

Family support is the help or support that individuals receive from someone in their life and in the family environment such as husbands, parents, in-laws, which make the recipient feel

cared for, valued and loved, while those who receive family support understand the meaning of support provided by the family. Family support is very much needed for pregnant women, more so before the delivery period arrives.

The family support closest to a pregnant woman is from her partner (husband), in this case the husband can provide support in the form of giving encouragement and attention to his wife, fostering good relationships with partners, taking light walks while chatting, speaking softly, positively and etc. That way, the wife can be mentally strong to face everything during her pregnancy and also before her delivery.

Incorrect timing of working mothers increased to trigger stress and psychological disorders amounted to 7 people (31.8%). Work A job is an activity that a person does, especially to support his life and his family so as to generate income in the form of money (Narbuko, 2002). Work can generate income that will increase family finances, so that pregnant women are really ready to face the birth later. This is in accordance with the opinion of Purwatomoko (2001), that with an increase in income, health care and services can be guaranteed. A mother be able to find all the health information about her and the baby in her womb, so that she can have a safe and enjoyable 27 pregnancy and prevent anxiety. The occupation of pregnant women not only shows the socioeconomic level, but also shows the presence or absence of interaction of pregnant women in the wider community and active in certain organizations, with the assumption that working mothers will have higher knowledge and receive information more quickly than mothers who do not work.

Hypnoprenatal intervention before the mother's pain was 63.63% moderate and 36.37% severe. After the intervention, there was a shift in the mild category to 36.37% and moderate to 63.63%. This shows that distraction as a result of giving affirmations to the mother during the prenatal period as a distraction of pain that is often experienced by mothers until delivery can be overcome as long as the mother is willing to practice to always think positively and rationally so that whatever is experienced will not lead to problems that end in complications that occur. in the third trimester of pregnancy, childbirth and the puerperium are also breastfeeding. Pain that occurs in each mother will be felt according to the sensory system that applies to each individual, and can also be influenced by external factors such as previous birth experiences, family support and so on.

The Bradley intervention method before the intervention, the pain that was felt was 54.54% and 45.46% severe, while after the intervention there was a shift in pain to mild 36.36% being 54.54% and severe 9.10%. There is no significant shift but still progressively shows positive things that support from the husband, especially what is expected by the mother, the husband's attention is a form of partner's affection when the mother often feels discomfort, caresses or gently strokes her husband or partner giving the mother's emotional difference, calm, comfort and feeling. safe for partners during pregnancy, childbirth, postpartum and breastfeeding strongly supports the physiological changes that occur in mothers, the Bradley method is the basis of theory that upholds complete partner support during pregnancy, childbirth, postpartum, there have been many studies explaining the impact that comes with the presence of a husband as a couple.

After Hypnoprenatal anxiety felt by the mother was moderate before the intervention mild anxiety amounted to 63.64% and after intervention there were 5 people 45.45% and similarly before the intervention moderate anxiety was 36.36% and after the intervention mild people 54.55%. The hyno method is a method of exploring the problems of the mother's subconscious so that she can overcome worry, anxiety when exploring the mother's subconscious mind, she must be able to overcome the fear of anxiety that occurs.

Furthermore, for Bradley, the method before the intervention, mild anxiety was 63.36% and 36.64% moderate, after the intervention there was a shift in anxiety not anxious 9.10%, mild anxiety 63.36% and moderate 27.27%. The results of this study are very good but have not shown very significant results. Stress is a condition caused by a stressor. Stress can also be interpreted as a homeostatic disorder that causes changes in the physiological balance resulting from physical and psychological stimuli.

The types of stressors that can induce a stress response are: physical (trauma, surgery, intense heat or cold), chemical (decreased O<sub>2</sub> supply, acid-base imbalance), physiological (strenuous exercise, hemorrhagic shock, pain), infectious (bacterial invasion), psychological or emotional (anxiety, fear, sadness) and social (personal conflict, lifestyle changes).

The results of the correlation test on hypnoprenatal showed that the results before and after the intervention p value = 0.490 means that there is no effect before after intervention and Bradley correlation test method before and after internevsi p value = 0.526 also there was no effect before and after the intervention.

## V. CONCLUSION

- 1) Characteristics of the Respondents are age in the low risk category, low parity and respondents who work are still low
- 2) There are significant differences before and after the intervention both Hypnoprenatal and Bradley methods between pain and the intervention performed
- 3) There is no difference before and after the intervention
- 4) The results of the hypnoprenatal correlation test showed that there was no effect before after intervention and the Bradley correlation test method before and for an intervention p value = -0.183 also had no effect before and after the intervention

## VI. ACKNOWLEDMENT

- 1) Thank you to the Poltekkes Kemenkes Palembang for providing the opportunity for the author to do research
- 2) Respondents who have taken the time and place

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# The Facade Proportion of Three-*Bengkilas* Limas House in Palembang, South Sumatra, Indonesia

1 <sup>st</sup> Ibnu Aziz	2 <sup>nd</sup> Ari Siswanto	3 <sup>rd</sup> Ngakan Putu Sueca	4 <sup>th</sup> Dadang Hikmah Purnama
<i>Doctoral student,</i>	<i>Department of Architecture</i>	<i>Department of Architecture</i>	<i>Department of Sociology</i>
<i>Postgraduate Program,</i>	<i>Faculty of Engineering</i>	<i>Faculty of Engineering</i>	<i>Faculty of Social and Political Science</i>
<i>Faculty of Engineering</i>	<i>Sriwijaya University</i>	<i>Udayana University</i>	<i>Sriwijaya University</i>
<i>Sriwijaya University -</i>	<i>Palembang, Indonesia</i>	<i>Bali, Indonesia</i>	<i>Palembang, Indonesia</i>
<i>Department Architecture</i>			
<i>Palembang, Indonesia</i>			

Corresponding author: ibnuaziz0307@gmail.com

**Abstract** - The vernacular housing was built in certain proportions for various reasons ranging from practicality to aesthetics. This study aims to explore the proportion of the facade in a *limas* house with three *bengkilas* in Palembang City so that it can bring up certain ratios in determining the proportion of buildings. A total of eight types of *limas* houses were studied representing 30 *limas* houses in Palembang City. Measurements were made on the physical dimensions of the house such as length, width, and height in various variations. The results found that there was a 3:1 ratio for the width of the house compared to the height of the roof, a 1:1 ratio for the width of the house to the height of the house, a 5:1 ratio for the length of the house to the height of the back room, a 0.35 ratio for the height of the peak roof with the total buildings height, and a number of other ratios. These results contribute to the formulation of ratios in the proportion of *limas* houses in particular and other vernacular houses in general.

**Keywords:** facade, proportion, ratio, limas house, vernacular

## I. INTRODUCTION

The house is a place for people to protect themselves from the natural forces that surround them, while at the same time maintaining their benefits from the positive aspects of the environment. This applies to all houses of all ages, including vernacular architecture. According Mishra [1], vernacular architecture has a rational basis based on geography, climate, material availability, and cultural responses to these physical factors in creating buildings that are comfortable, inspiring, and in harmony with their environment. One of the communities that is unique in terms of the shape and proportion of vernacular buildings is the Palembang community in South Sumatra, Indonesia. Their house, called the *limas* house, has a rare characteristic found in vernacular architecture in Southeast Asia. *Limas* house has multilevel terraces (*bengkilas*) which makes this building has long distance to the back. In line with the shape of a long building, the *limas* house has a very extensive roof that it dominates the overall shape of the building. If it only refers to the

physical aspect, houses with multilevel terraces should only be found in sloping mountainous areas, but Palembang is a lowland area on the river bank. Likewise, extensive roofs should only be found in mountainous or coastal areas to protect residents from strong winds, but *limas* houses have been set up in the inland region of Sumatra. This emphasizes the unique status of the *limas* house as a vernacular house and the increasing importance to conserve the *limas* house.

The study of the proportion of *limas* houses is important to do considering the decreasing number of *limas* houses in Palembang, if this is not done, in the next one or two decades, Palembang will lose a local wisdom that has long been held up as a regional identity. Even if there is a construction of a new *limas* house to save identity, without sufficient research, the new buildings are only a 'haphazard' work and do not respect ancestors, which are likely to immediately get criticism from indigenous peoples, as has happened in efforts to build new *limas* houses for tourism destinations in Palembang at the moment [2].

One form of conservation efforts is to understand the proportions in *limas* house. An understanding of proportions allows buildings to be made in accordance with cultural characteristics which produce proportions along with socio-philosophical meanings contained therein.

## II. RESEARCH METHODOLOGY

### 2.1. Study Area and Dataset

The research was conducted in the city of Palembang, South Sumatra, Indonesia, in 30 three-*bengkilas* *limas* houses. Previous studies identified that these 30 houses can be grouped into eight types [3]. The characteristics of these eight types of *limas* are presented in the Table 1 below. The average age of the *limas* house studied is older than 150 years and is in 3-4 Ulu Village with a front width of 9-11 meters.

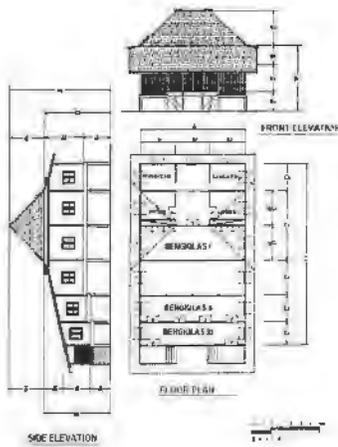


Figure 1. *Limas* House Plan under Study

Table 1.

Basic Parameter of the *Limas* House under Study [3]

Type	Total	Group
L08	1	L-8
L05	5	L-5, L-33, L-27, L-22, L-24
L03	16	L-3, L-35, L-38, L-40, L-39, L-41, L-42, L-34, L-19, L-20, L-28, L-12, L-24, L-26, L-29, L-30
L18	3	L-18, L-21, L-13
L09	2	L-9, L-25
L11	1	L-11
L04	1	L-4
L14	1	L-14

Measurements were made by identifying elements of height, length, and width of the house. Figure 1 shows the house plans while Table 2 shows the definitions of each measurement element. Table 3 presents the measurement values in meters.

Table 2. Element Definition of the *Limas* House under Study

Element	Parameter	Description
Width (front)	A	Front width of <i>limas</i> house
Length	C	Length from the front to the back of <i>limas</i> house
	C1	The length of <i>limas</i> house main building under the peak roof
Height	B1	Height of the back underneath area from the ground
	B2	Height of the back room from the back underneath area
	B3	Height of peak roof from the back room/lower roof
	B4	Height of the front underneath area from the ground
	B5	Height of the front room from the front underneath area
	B6	Height of lower roof from the front room
B	Height from the ground to the peak roof	
B'	Height of lower roof from the ground	

Table 3. Data of Element Measurement of *Limas* House under Study

	A	C	C1	B1	B2	B3	B4	B5	B6	B	B'
L08	2.4	4.8	1.4	0.5	1	0.8	0.3	0.5	0.7	2.3	1.5
L05	2.7	4.9	0.9	0.7	1	0.9	0.5	0.6	0.6	2.6	1.7
L03	2.7	4.7	0.9	0.7	1	0.9	0.5	0.7	0.5	2.6	1.7
L18	2.7	4.8	0.8	0.6	1	0.9	0.4	0.7	0.5	2.5	1.6
L09	2.7	4.8	0.8	0.6	1	0.9	0.4	0.6	0.6	2.5	1.6
L11	2.4	4.5	0.9	0.5	1	0.8	0.3	0.6	0.6	2.3	1.5
L04	2.1	4.9	1.2	0.7	1	0.7	0.5	0.6	0.6	2.4	1.7
L14	2.4	4.7	0.8	0.5	1	0.8	0.3	0.5	0.7	2.3	1.5

The definition of the ratio is based on a number of ranges to accommodate measurement errors. Ranges are made so that they do not overlap one another. Each range has an inverse so a ratio does not directly illustrate that the first element has the same value as the numerator element of the ratio. For example, a ratio of 1:4 in the comparison between B1 and B4 does not mean that B1 is 1 and B4 is 4 because it can also mean B4 is 1 and B1 is 4. This can be seen from the exact ratio reported along with the type of ratio. The following table shows the definition of the ratio group and the measurement error tolerance range.

Table 4. Definition of the Ratio and Measurement Tolerance Range

Ratio	Exact Value	Inverse	Range (<1)	Inverse Range (>1)
1:5	0.20	5	0.19-0.21	4.91-5.09
1:4	0.25	4	0.24-0.26	3.91-4.09
1:3	0.33	3	0.32-0.34	2.91-3.09
2:5	0.4	2.5	0.39-0.41	2.44-2.56
1:2	0.5	2	0.48-0.52	1.91-2.09
3:5	0.6	1.67	0.59-0.61	1.64-1.69
Greek Ratio	0.62	1.62	0.62-0.64	1.55-1.63
2:3	0.67	1.5	0.65-0.67	1.49-1.54
Chinese Ratio	0.71	1.41	0.68-0.73	1.36-1.48
3:4	0.75	1.33	0.74-0.76	1.32-1.35
4:5	0.8	1.25	0.79-0.81	1.23-1.27
1:1	1	1	0.91-1.09	0.91-1.09

### 2.1. Analysis

Data analysis was performed by calculating a number of ratios related to the exterior and interior parameters of the *limas* house. The ratio is calculated in two groups. First, compare the length and width elements with each height element. This means that the ratio is calculated by comparing A, C, and C1 with B1, B2, B3, B4, B5, B6, B, and B'. The total ratio is  $3 \times 8 = 24$  comparisons. Because there are eight types of *limas* houses, the total ratio calculation is  $24 \times 8 = 192$ . Second, compare between combinations of high elements. This means that height element is compared to every other height element. The ratio between the height element is made up of a ratio between the eight height elements, so a  $7 \times 8$  ratio or 56 ratio

is obtained for each *limas* house. Because there are 8 pyramid houses, the total calculation is  $8 \times 56 = 448$  calculations.

Each ratio obtained is identified based on the ratio range (Table 3). Ratios that are not included in the ratio range are expressed as special ratios. A ratio is said to be dominant if at least five of the eight types of *limas* houses contain that ratio.

Based on the results obtained, the ratios are then matched in such a way that they can be used to construct a housing model that contains ratios that are consistent with taking the most dominant starting ratios. If there are two conflicting ratios due to the existence of two different measurement ratios as a consequence of the establishment of previous ratio, then the more dominant ratio takes precedence. This might have happened because the ratio taken was partly not complied with 100% *limas* houses

### III. RESULTS AND DISCUSSION

#### 3.1. Relation of Length and Width with Height

The width of the front of the *limas* house has a very uniform ratio with B2, B3, B and B'. In comparison with B2 (height of back room), it was found that half of the types of pyramid houses follow the 2.70 ratio. This ratio is not included in the simple ratio category or the golden ratio. Even so, other *limas* houses do not show any ratio close to the 2.70 ratio.

Table 5, Result of Calculation of House Width Ratio (A)

	B1	B2	B3	B4	B5	B6	B	B'	B1	B2	B3	B4	B5	B6	B	B'
L084	8.02	4.03	0.008	0.004	8.03	4.31	0.041	6.01	1 : 5	1 : 3	1 : 5	1 : 1	GR			
L053	8.62	7.03	0.005	4.04	5.04	5.01	0.041	5.91	4	1 : 3		1 : 1	GR			
L033	8.62	7.03	0.005	4.03	8.65	4.01	0.041	5.91	4	1 : 3	1 : 4	1 : 1	GR			
L184	5.02	7.03	0.006	7.53	8.65	4.01	0.081	6.9		1 : 3	1 : 4	1 : 13	5			
L094	5.02	7.03	0.006	7.54	5.04	5.01	0.081	6.9		1 : 3		1 : 13	5			
L114	8.02	4.03	0.008	0.004	0.004	0.001	0.041	6.01	5	1 : 3	1 : 41	41	1	GR		
L043	0.02	1.03	0.004	2.03	5.03	5.00	0.881	2.41	3	1 : 3					4 : 5	
L144	8.02	4.03	0.008	0.004	8.03	4.31	0.041	6.01	5	1 : 3	1 : 5	1 : 1	GR			

Note: CH = chinese ratio, GR = greek ratio

The comparison of A with B3 (peak roof height) shows an overall ratio of 1:3. This is surprising because it means that the pyramid house architect consciously determined that the width of the house must be three times the height of the roof. Moreover, five of the six *limas* houses follow a simple 1:1 ratio rule in the ratio of the width of the house to the overall height of the pyramid house (B). Because  $B = B3 + B'$ , it can be assumed that there is a special ratio between the width of the house and B' (height under the roof). Even so, the comparison with B' is not too strict. Five of the eight *limas* houses followed the Greek ratio (1.62 or 0.62) while two followed the 3:5 ratio and one followed the 4:5 ratio. This is more due to the narrow range definition in the 1.5-1.7 region. However, this shows that there is a fairly firm ratio between the width of the house and the height of the lower roof, the

height of the peak roof, and the height of the house as a whole.

Table 6. Calculation Result of House Length Ratio (C)

	B1	B2	B3	B4	B5	B6	B	B'	B1	B2	B3	B4	B5	B6	B	B'
L08	9.60	4.80	6.00	$\frac{16.0}{0}$	9.60	6.86	2.09	3.20	1 : 5							
L05	7.00	4.90	5.44	9.80	8.17	8.17	1.88	2.88	1 : 5							
L03	6.71	4.70	5.22	9.40	6.71	9.40	1.81	2.76		1 : 5						
L18	8.00	4.80	5.33	$\frac{12.0}{0}$	6.86	9.60	1.92	3.00	1 : 5							1 : 3
L09	8.00	4.80	5.33	$\frac{12.0}{0}$	8.00	8.00	1.92	3.00	1 : 5							1 : 3
L11	9.00	4.50	5.63	$\frac{15.0}{0}$	7.50	7.50	1.96	3.00							1 : 2	$\frac{1}{3}$
L04	7.00	4.90	7.00	9.80	8.17	8.17	2.04	2.88	1 : 5							1 : 2
L14	9.40	4.70	5.88	5.67	9.40	6.71	2.04	3.13								1 : 2

Note: CH = chinese ratio, GR = greek ratio

In the ratio component of the house length with height, found the dominance of the ratio of 1: 5 in the ratio of the house length with the height of the back room (B2). Five of the eight *limas* houses tend to follow the ratio of 1:5 with a house length between 4.8-4.9 times the height of the back room.

Table 7. Calculation of the Length Ratio of Limas House Main Building (C1)

	B1	B2	B3	B4	B5	B6	B	B'	B1	B2	B3	B4	B5	B6	B	B'
L08	2.80	1.40	1.75	4.67	2.80	2.00	0.61	0.93	CH						1 : 3 : 1 : 2 : 5 : 1	
L05	1.29	0.90	1.00	1.80	1.50	1.50	0.35	0.53		1 :	2 :	2 :				
L03	1.29	0.90	1.00	1.80	1.29	1.80	0.35	0.53		1 :						
L18	1.33	0.80	0.89	2.00	1.14	1.60	0.32	0.50	$\frac{3}{4} :$	$\frac{4}{5} :$	1 :	G	1 :	1 :		
L09	1.33	0.80	0.89	2.00	1.33	1.33	0.32	0.50	$\frac{3}{4} :$	$\frac{4}{5} :$	1 :	3 :	3 :	1 :	1 :	
L11	1.80	0.90	1.13	3.00	1.50	1.50	0.39	0.60			1 :	2 :	2 :	2 :	3 :	
L04	1.71	1.20	1.71	2.40	2.00	2.00	0.50	0.71			1 :	1 :	1 :	C		
L14	1.60	0.80	1.00	2.67	1.60	1.40	0.35	0.53	GR	$\frac{4}{5} :$	1 :	G				
												R				

Note: CH = chinese ratio, GR = greek ratio

The results of the calculation of the length ratio of the main building with the height elements do not show any consistent pattern. No special ratios were found to be adhered to in relation to the construction of the length of the main building with the height elements.

#### 3.2. Ratio Between Height Elements

The following table shows the calculation results for element B1 with respect to the other height elements. That is, this calculation compares the height of the back underneath area of *limas* house with other height elements. From 56 calculations, 18 did not find any suitable ratio, so the ratio obtained was  $\frac{38}{56} = 68\%$ . Even so, there is no certain ratio that is consistently shown in each *limas* house (row) or every comparison (column). There is also no specific ratio that is dominant (more than 50%) for each comparison. Indeed, the comparison between B1 and B5 shows that half the types of *limas* houses follow the 1:1 ratio. B5 is the height of the front area of

*limas* house calculated from the front *bengkilas* floor with the top of the door. That is, half of the three-*bengkilas limas* house type has the same measurement of the height of back underneath area with the height of front *bengkilas*.

**Table 8. Calculation Results of the Height Ratio of the Back Underneath Area in *Limas* House (B1)**

	B2	B3	B4	B5	B6	B	B'	B2	B3	B4	B5	B6	B	B'
L08	0.50	0.63	1.67	1.00	0.71	0.22	0.33	1:2	GR	3:5	1:1	CH		1:3
L05	0.70	0.78	1.40	1.17	1.17	0.27	0.41	CH		CH				2:5
L03	0.70	0.78	1.40	1.00	1.40	0.27	0.41	CH		CH	1:1	CH		2:5
L18	0.60	0.67	1.50	0.86	1.20	0.24	0.38	3:5	2:3	2:3				1:4
L09	0.60	0.67	1.50	1.00	1.00	0.24	0.38	3:5	2:3	2:3	1:1	1:1	1:1	4
L11	0.50	0.63	1.67	0.83	0.83	0.22	0.33	1:2	GR	3:5				1:3
L04	0.70	1.00	1.40	1.17	1.17	0.29	0.41	CH	1:1	CH				2:5
L14	0.50	0.63	1.67	1.00	0.71	0.22	0.33	1:2	GR	3:5	1:1	CH		1:3

Note: CH = chinese ratio, GR = greek ratio

The height ratio calculation of the back of *Limas* House shows a pattern of dominance of the 3:5 ratio. This dominance was particularly found in the results of comparisons with B5 and B6 where the 3:5 ratio reached 50% of the *limas* house type. B5 is the height of the front room of *limas* house while B6 is the height from the bottom part of the roof to the slope starting point of the lower roof. In all cases, the height of the back room of *limas* house is 1.67 times the height of front room and 1.67 times the height of the lower roof. Another ratio found was 1.11 which appeared in 50% of the type of *limas* house for the comparison of the back room of *limas* house with peak roof height (B3). Furthermore, this ratio was found in the same *limas* house in pairs, namely L05, L09, L11, and L04.

**Table 9. Calculation Results of the Height Ratio of the Back Room in *Limas* House (B2)**

	B1	B3	B4	B5	B6	B	B'	B1	B3	B4	B5	B6	B	B'
L08	2.00	1.25	3.33	2.00	1.43	0.43	0.67	1:2	4:5		1:2	CH		2:3
L05	1.43	1.11	2.00	1.67	1.67	0.38	0.59	CH		1:2	3:5	3:5		
L03	1.43	1.11	2.00	1.43	2.00	0.38	0.59	CH		1:2	CH	1:2		
L18	1.67	1.11	2.50	1.43	2.00	0.40	0.63	3:5		2:5	CH	1:2	2:5	GR
L09	1.67	1.11	2.50	1.67	1.67	0.40	0.63	3:5		2:5	3:5	3:5	2:5	GR
L11	2.00	1.25	3.33	1.67	1.67	0.43	0.67	1:2	4:5		3:5	3:5		2:3
L04	1.43	1.43	2.00	1.67	1.67	0.42	0.59	CH	CH	1:2	3:5	3:5		
L14	2.00	1.25	3.33	2.00	1.43	0.43	0.67	1:2	4:5		1:2	CH		2:3

Note: CH = chinese ratio, GR = greek ratio

The top of the pyramid house is shown to have no dominant ratio when compared to the height of the other facades. There are few ratios obtained can be included in the golden ratio category (China or Greece) or simple ratios. Although they do not have a golden ratio or a simple ratio, there are certain dominant ratios. The 0.90 ratio is the congruent ratio of B2 described above (the inverse of 0.90 is 1.11). Another ratio that appears is 0.35 which is in five of the eight *limas* houses

in the comparison with the total height of *limas* house from the ground to the top (B). In fact, two of the three remaining *limas* houses were only at 0.01 disputes, amounting to 0.36. The same phenomenon also occurs in the ratio with the height of the underneath area + facade (B'), which is 0.53 in as many as 5 of the 8 types of *limas* houses. Moreover, this ratio is found in the same *limas* house. Five of the eight *limas* houses follow a consistent ratio for B and B'.

**Table 10. Calculation Results of the Height Ratio of the Peak Roof in *Limas* House (B3)**

	B1	B2	B4	B5	B6	B	B'	B1	B2	B4	B5	B6	B	B'
L08	1.60	0.80	2.67	1.60	1.14	0.35	0.53	GR	4:5		GR			
L05	1.29	0.90	1.80	1.50	1.50	0.35	0.53						2:3	2:3
L03	1.29	0.90	1.80	1.29	1.80	0.35	0.53							
L18	1.50	0.90	2.25	1.29	1.80	0.36	0.56	2:3						
L09	1.50	0.90	2.25	1.50	1.50	0.36	0.56	2:3					2:3	2:3
L11	1.60	0.80	2.67	1.33	1.33	0.35	0.53	GR	4:5				3:4	3:4
L04	1.00	0.70	1.40	1.17	1.17	0.29	0.41	1:1	CH	CH				
L14	1.60	0.80	2.67	1.60	1.14	0.35	0.53	GR	4:5		GR			

Note: CH = chinese ratio, GR = greek ratio

The front underneath area of *limas* house does not seem to get special attention from the architect of *limas* house in relation to the height of the facade or the roof. There is no particular ratio that is dominant, be it a golden ratio, a simple ratio, or a typical ratio based on a comparison with certain height, or based on the type of *limas* house.

**Table 11. Calculation Results of the Height Ratio of the Front Underneath Area in *Limas* House (B4)**

	B1	B2	B3	B5	B6	B	B'	B1	B2	B3	B5	B6	B	B'
L08	0.60	0.30	0.38	0.60	0.43	0.13	0.20	3:5			3:5			1:5
L05	0.71	0.50	0.56	0.83	0.83	0.19	0.29	CH	1:2					1:
L03	0.71	0.50	0.56	0.71	1.00	0.19	0.29	CH	1:2		CH	1:1		1:
L18	0.67	0.40	0.44	0.57	0.80	0.16	0.25	2:3	2:5				4:5	1:4
L09	0.67	0.40	0.44	0.67	0.67	0.16	0.25	2:3	2:5		2:3	2:3		1:4
L11	0.60	0.30	0.38	0.50	0.50	0.13	0.20	3:5			1:2	1:2		1:5
L04	0.71	0.50	0.71	0.83	0.83	0.21	0.29	CH	1:2	CH				1:
L14	0.60	0.30	0.38	0.60	0.43	0.13	0.20	3:5			3:5			1:5

Note: CH = chinese ratio, GR = greek ratio

The height ratio of the front room of *limas* house shows another special ratio at 50% of the *limas* house in addition to the 3:5 ratio previously discussed. This ratio appears in two types for comparison with B6 (lower roof height), namely the China ratio and the 1:1 ratio. It should also be noted that the 1:1 ratio can also be considered the ratio of China although it can also be interpreted as an Islamic ratio. This shows that half of the three-*bengkilas limas* house have the front room height equal to the lower roof height, while the other half has a ratio of 1.4 or 0.7 so that two of the *limas* house have a front room 1.4 times higher than the lower roof and two have a

lower roof with height 1.4 times the front room. However, because of these two Chinese ratios, it can be said that this ratio is less consistent than the 1:1 ratio.

**Table 12. Calculation Results of the Height Ratio of the Front Room in *Limas* House (B5)**

	B1	B2	B3	B4	B6	B	B'	B1	B2	B3	B4	B6	B	B'
L08	1.0	0.5	0.6	1.6	0.7	0.2	0.3	1:	1:	GR	3:	CH		1:3
L05	0.8	0.6	0.6	1.2	1.0	0.2	0.3		3:	2:		1:		
L03	1.0	0.7	0.7	1.4	1.4	0.2	0.4	1:		CH		CH	CH	
L18	1.1	0.7	0.7	1.7	1.4	0.2	0.4			CH			CH	
L09	1.0	0.6	0.6	1.5	1.0	0.2	0.3	1:	3:	2:	2:	1:	1:	
L11	1.2	0.6	0.7	2.0	1.0	0.2	0.4		3:	3:	1:	1:		2:5
L04	0.8	0.6	0.8	1.2	1.0	0.2	0.3		3:			1:	1:	
L14	1.0	0.5	0.6	1.6	0.7	0.2	0.3	1:	1:	GR	3:	CH		1:3

Note: CH = chinese ratio, GR = greek ratio

Apart from the dominance of the 3:5 ratio in the comparison with B2 and the 1:1 ratio in the comparison with B5, both of which have been discussed above, there is no longer a prominent ratio between the lower roof of *limas* house with total height (B) or height without roof (B'). This can be observed in the table below.

**Table 13. Calculation Results of the Height Ratio of the Lower Roof in *Limas* House (B6)**

	B1	B2	B3	B4	B5	B	B'	B1	B2	B3	B4	B5	B	B'
L08	1.40	0.70	0.88	2.33	1.40	0.30	0.47	CH	CH			CH		
L05	0.86	0.60	0.67	1.20	1.00	0.23	0.35		3:5	2:3		1:1		
L03	0.71	0.50	0.56	1.00	0.71	0.19	0.29	CH	1:2		1:1	CH	1:5	
L18	0.83	0.50	0.56	1.25	0.71	0.20	0.31		1:2		4:5	CH	1:5	
L09	1.00	0.60	0.67	1.50	1.00	0.24	0.38	1:1	3:5	2:3	2:3	1:1	1:4	
L11	1.20	0.60	0.75	2.00	1.00	0.26	0.40		3:5	3:4	1:2	1:1		2:5
L04	0.86	0.60	0.86	1.20	1.00	0.25	0.35		3:5			1:1	1:4	
L14	1.40	0.70	0.88	2.33	1.40	0.30	0.47	CH	CH			CH		

Note: CH = chinese ratio, GR = greek ratio

The total height of the *limas* house appears to have a special ratio that is quite consistent with the height of the house without a roof. Five of the eight types of *limas* house have a ratio of 2:3 with a combined height of the facade and underneath area. The total height of a *limas* house tends to be 1.53 times the combined height of the facade and underneath area. Moreover, two to three remaining *limas* houses tend to show a ratio of 1.56 which is only 0.03 adrift from the ratio of 1.53.

**Table 14. Calculation Results of the Height Ratio of the Total Height in *Limas* House (B)**

	B1	B2	B3	B4	B5	B6	B'	B1	B2	B3	B4	B5	B6	B'
L0	4.60	2.30	2.88	7.67	4.60	3.29	1.53							2:3
L0	3.71	2.60	2.89	5.20	4.33	4.33	1.53			1:5				2:3

L0	3.71	2.60	2.89	5.20	3.71	5.20	1.53							1:5	1:5	2:3	
L1	4.17	2.50	2.78	6.25	3.57	5.00	1.56	1:4	2:5						1:5	GR	
L0	4.17	2.50	2.78	6.25	4.17	4.17	1.56	1:4	2:5					1:4	1:4	GR	
L1	4.60	2.30	2.88	7.67	3.83	3.83	1.53									2:3	
L0	3.43	2.40	3.43	4.80	4.00	4.00	1.41							1:5	1:4	1:4	CH
L1	4.60	2.30	2.88	7.67	4.60	3.29	1.53										2:3

Note: CH = chinese ratio, GR = greek ratio

Although the results of the 7x8 comparison have been described above, the following table is given to show the relationship between the height of the facade and the underneath area of the *limas* house to other height components.

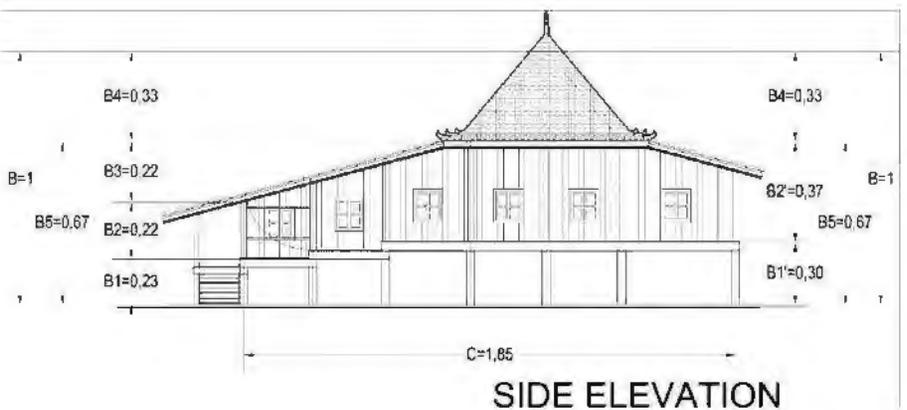
**Table 15. Calculation Results of Height Ratio of the Façade + Underneath Area in *Limas* House (B')**

	B1	B2	B3	B4	B5	B6	B	B1	B2	B3	B4	B5	B6	B	
L08	3.00	1.50	1.88	5.00	3.00	2.14	0.65	1:3	2:3			1:5	1:3	2:3	
L05	2.43	1.70	1.89	3.40	2.83	2.83	0.65							2:3	
L03	2.43	1.70	1.89	3.40	2.43	3.40	0.65							2:3	
L18	2.67	1.60	1.78	4.00	2.29	3.20	0.64		GR		1:4			GR	
L09	2.67	1.60	1.78	4.00	2.67	2.67	0.64		GR		1:4			GR	
L11	3.00	1.50	1.88	5.00	2.50	2.50	0.65	1:3	2:3			1:5	2:5	2:5	2:3
L04	2.43	1.70	2.43	3.40	2.83	2.83	0.71							CH	
L14	3.00	1.50	1.88	5.00	3.00	2.14	0.65	1:3	2:3			1:5	1:3	2:3	

Note: CH = chinese ratio, GR = greek ratio

### 3.3. Model Construction of the Three-Bengkilas *Limas* House

The results above show that there are a number of special ratios used by *limas* house architects to build *limas* house designs. Half of the three-bengkilas *limas* houses show a ratio of 2.70 for the ratio of width to height of the back room. The ratio between the width of the house to the height of the peak roof is always 3:1, while the ratio of the house width to the overall height of *limas* house is almost always 1:1. The ratio of the house width to the lower roof height is always between 1.5-1.7. The ratio of the house length to the back room height follows the ratio of 5:1. Half the *limas* house also shows a ratio of 1:1 in the ratio of the underneath area height to the front room height. A ratio of 5:3 is followed for the ratio between the back room height to the lower roof and front room height in 50% of the *limas* houses. A special ratio of 0.35 is found in almost all *limas* house in the ratio of the peak roof height to the total height of the building. Meanwhile, the 0.53 ratio is adopted in 50% of the *limas* house in the ratio of the peak roof height to the lower roof height. In addition, 50% of *limas* houses show a ratio of 1:1 in the ratio of the front room height to the lower roof height. Five of the eight *limas* houses showed a 2:3 ratio between the height of the house without roof to the total height.



**Figure 2.** Model Height of Three-Bengkilas Limas House

Based on the above findings, we can determine an ideal proportion of the exterior of a three-bengkilas limas house by looking at the strongest ratios. If the house width is set at 1 unit, then the length of the house is 1.85 and the total height of the limas house is 1 unit as well. The height of the peak roof of limas house is 0.33 because it follows the ratio of 1:3 to the house width. Since the total height is set by 1 unit and the height of the peak roof is 0.33, the height from the ground to the lower roof is 0.67. At the front, the lower roof and front room height has a ratio of 1:1 and 3:5 to the back room of limas house. The back room of the limas house itself follows a ratio of 1: 5 to the length of the house so that the size is 0.37 units. In line with this, then underneath area of limas house has a height of 0.30 to match the height of B of 0.67. Meanwhile, for the height of the front room, it becomes 0.22, the same as the lower roof height. The remaining underneath area have a height of 0.23 to match the value of B'. A picture of limas house constructed in this way is shown in Figure 2.

From the model in Figure 4, it can be seen that the ratio of limas houses is 2:3 for the lower roof height with the total height of the house. The peak roof height is 1:3 from the total height of limas house. The ratio of the lower roof height to the front room and underneath area is 1:1:1. The ratio of the height of the back room to the back underneath area is 0.37: 0.30. This means that there is an increase of 0.07 units from the forefront to the deepest bengkilas at limas house.

### 3.4. Discussion

Although not all elements have a fixed ratio, the three-bengkilas limas house seems to follow a number of simple ratios that allow the construction of limas house model with exact parameters, especially on the ratio of peak roof height. The existence of this simple ratio seems to be due to efforts to build uniformity and ease, as well as efforts to produce symmetry, composition, balance, regularity, unity, harmony, and rhythm [4].

The existence of a special ratio also implies an effort to maintain the symmetry lost from the side of the limas house. In contrast to palaces in the Malay region which generally contains a symmetrical front area [5,6] or the West and Chinese architecture [4], limas house architecture only has symmetry on the front and back area. The existence of symmetry, especially bilateral symmetry, in vernacular houses is something that reflects nobility because of the high degree of difficulty in symmetrical facade construction as well as formalities that are highly valued by noble groups [7]. Alternatively, the presence of symmetry reflects the individualism of the homeowner [8]. As the party who spent the most resources and stayed the longest in the house, residents felt entitled to reflect their individuality on the appearance of the house. This individuality is shown by how the occupants try to display the rules of rigid customs so that visitors cannot be careless in doing something at the house. With the existence of fixed and simple proportions, the architect of limas house creates an impression of regularity and formality in a different way by showing ratios that tend to be consistent in the construction of limas house.

However, the priority of formality reflects the priority of general appearance over the details [9]. It is said so because parts of the house must be adjusted to the ratio rather than function. The function of the building must be adjusted according to rigid rules to maintain the ratio.

Asymmetry in the side facade of limas house arises because of the presence of bengkilas and the roof that peaks at the back. That is why the front and back underneath area height of limas house is different. If the interpretation of individualism is taken, then this asymmetry reflects collectivism and how function takes precedence over regularity. Collectivism is provided by the limas house with the extension of bengkilas that extend longer to the front and by placing the center of the house slightly backward. That is, with the arrival of guests, the owner is willing to retreat far enough back in order to respect guests who visit.

Asymmetry of the side facade of limas house which arise from the presence of bengkilas emphasizes a new meaning which is repetition. Malay sculptors and engravers use symmetry combined with repetition to emphasize infinity [10]. Infinity is a characteristic of God in Islam so it is shown in repetitive symmetrical patterns in Malay houses. Repetition can be found in the symmetrical patterns of limas house. Symmetrical repetition can be found on the tenggaling fence in the front facade where the fence poles repeatedly symmetrically to cover the outer terrace. Meanwhile, asymmetrical repetition can be found in a rows of bengkilas. As a result, on the front and side facades, there are meanings about God's infinity.

#### IV. CONCLUSION

The proportion of the facade of three-*bengkilas limas* house shows the dominance of simple and special ratios - suggesting that some principle of proportion is needed to produce a beautiful and functional building. Future studies are needed to identify the proportion of the facade in the *limas* house with other amount of *bengkilas* to find the universality of the ratios found in the proportion of the facade in general. Perhaps the greatest message of this study is to remind the reader that proportion is not a single thing, especially in the design of complex buildings. There are various ratios that must be used in the building facades to improve the aesthetics and functionality of building designs. As this study has found, these ratios include simple ratios of 1:1, 2:3, 3:1, 5:1, and 5:3 and special ratios of 7:20, 53:100, 8:5, and 27:10.

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# The Effect of Family-Based Education on Exclusive Breastfeeding to Optimize Child Development in the Golden Period

1<sup>st</sup> Tetti Seriati Situmorang  
Department of Midwifery  
STIKes Mitra Husada Medan  
Medan, Indonesia  
Email: seriaticetti@gmail.com

2<sup>nd</sup> Riska Susanti Pasaribu  
Department of Midwifery  
STIKes Mitra Husada Medan  
Medan, Indonesia  
Email: RiskaS@gmail.com

3<sup>rd</sup> Deby Cyntia Yun  
Department of Midwifery  
STIKes Mitra Husada Medan  
Medan, Indonesia  
Email: Cyntiaadeby@yahoo.co.id

4<sup>th</sup> Isyos Sari Sembiring  
Department of Midwifery  
STIKes Mitra Husada Medan  
Medan, Indonesia  
Email: Isyossariiii@gmail.com

Corresponding author: seriaticetti@gmail.com

**Abstract** - During golden period, the brain experienced the fastest development in the history of its life, up to 80%. Breast milk is the best food in early life. Exclusive breastfeeding coverage has not been achieved. Several reasons are the cause, namely: the length of time when the milk comes out the first time you feed, the family /community perception that the cause of the baby crying after being breastfed is because there is not enough milk so that it needs to be given formula milk. This study aims to identify the effect of family-based education on exclusive breastfeeding. The research design used a quasi experiment, pre test and post test with control group design. Starting with pre-test on both groups of respondents, then in the intervention group family-based education was carried out (involving the husband/1 other family member) about exclusive breastfeeding for 3 meetings. The third stage carried out a post test in both groups. The number of respondents was 30 people each group of 15 breastfeeding mothers. Data analysis used Wilcoxon test and Mann Whitney test. The results showed that there was a significant influence between family-based education on exclusive breastfeeding (p value = 0.028). Naturally, healthy newborn babies can breastfeed, the more frequent breastfeeding of breast milk products will increase so that exclusive breastfeeding is possible to achieve, the knowledge and attitudes of mothers and their families need to be improved. It is recommended that family-based education be implemented to increase the achievement of exclusive breastfeeding.

**Key Words** - family, education, exclusive breast milk.

## I. INTRODUCTION

The golden period or golden period lasts from the time the child is in the womb to the age of two. In this period the brain has experienced rapid development in its life history, namely up to 80%. After birth, the brain nerve cells do not increase anymore, but the number of connections between the brain nerves continues. One brain nerve cell can establish connections with 20,000 other brain nerve cells. The more the number of nerve cell connections, the smarter the brain is [1]. The number of connections between brain nerve cells is determined by nutrition and stimulation. The failure of nutritional intake during this period has difficult, even irreversible, long-term effects [2].

Nutritional problems for infants in North Sumatra: thin babies who receive additional food (36.7%). Coverage of exclusive breastfeeding (33.0%), IMD <1 hour (30.3%), breastfeeding up to 5 months (48.6%). The prevalence over malnutrition and malnutrition is at the national prevalence. Infants and toddlers aged 0-23 months are malnourished (2.8%), malnourished (8.6%), aged 0-59 months, malnutrition (3.1%), malnutrition (10.1%) (BB / U indicator). Nutritional status with the TB / U index shows the incidence of stunting, at: 0-23 months of age, very short (8.0%), short (11.1%), aged 0-59 months, very short (9.3% ), short (15.1%). Nutritional status with a weight loss index / TB age 0-23 months is very thin (5.2%), thin (9.3%), aged 0-59 months is very thin (4.3%), thin (7.7%) . Stunting in early life will have a negative impact on health, cognitive, and functional as adults [3].

Breast milk is the best food at the beginning of life (0-6 months), then breast milk plus complementary foods until the age of two years. The coverage of exclusive breastfeeding at Medan Johor Health Center has not been achieved. Several things are the cause, namely: When the milk comes out the first time you feed, the family / community's perception that the cause of the baby crying after being breastfed is because there is not enough milk so that formula milk is needed.

Healthy Indonesia program with a family approach that the family approach is the love of the program. Family-based education can increase the intention to change health behavior [4]. Family-based educational interventions about offering exclusive breastfeeding to comply with exclusive breastfeeding to optimize child development in the golden period need to be done.

## II. METHOD

This research is a quantitative study using quasi-experimental pre-test and post-test with a control group design, to analyze the effect of family-based education on offering exclusive breastfeeding. Researchers will provide family-based education about exclusive breastfeeding to the intervention

group and the control group will not be given family-based education as in the intervention group. Prior to the intervention, the intervention and control groups were carried out before the test, then carried out family-based education. After 3 times family-based educational activities with 2 month intervals were carried out, then a post test was carried out on both groups using the same questionnaire instrument as the pre test and measuring exclusive breastfeeding.

### III. RESULTS

#### A. Univariate Analysis

##### 1) Respondent's Characteristics

The sample in this study was 30 people consisting of 2 groups, namely 15 breastfeeding mothers who were given family-based education about exclusive breastfeeding by researchers who were the intervention group and 15 breastfeeding mothers who were not given family-based education about exclusive breastfeeding which was the control group.

**Table 1. Frequency Distribution of Respondent Characteristics**

Characteristics	Group (n=30)		Intervention		Control	
	Total n	%	n	%	n	%
Age (years):						
<20	2	13,33	0	0	2	6,67
20-35	11	73,34	13	86,67	24	80
>35	2	13,33	2	13,33	4	13,33
Total	15	100	15	100	30	100
Education:						
Primary School	1	6,67	2	13,33	3	10
Junior High School	7	46,67	3	20	10	33,33
Senior High School	4	26,66	6	40	10	33,33
College	3	20	4	26,67	7	23,34
Total	15	100	15	100	30	100
Profession:						
Work	5	33,33	7	46,67	12	40
Does not work	10	66,67	8	53,33	18	60
Total	15	100	15	100	30	100
Parity:						
1	4	26,67	5	33,33	8	26,67
2	6	40	3	20	9	30
>2	5	33,33	7	46,67	13	43,33
Total	15	100	15	100	30	100

The age characteristics of the two groups were dominated by 20-35 years, as many as 11 people (73.34%) in the intervention group and 13 people (86.67%). Educational characteristics in the intervention group were dominated by the junior high school category, namely as many as 7 people (46.67%), then the high school category was 4 people (26.67%), then the PT category was 3 people (20%) and 1 person (6.67%) SD category. In contrast to the control group, education was dominated by the SMA category, namely 6 people (40%), followed by the PT category as many as 4 people (26.67%), then the SMP category 3 people (20%) and SD as many as 2 people (13, 33%). There were also differences in job characteristics, the intervention group was dominated by the non-working category as many as 10 people (66.67%), 5 people who worked (3.33%) while in the control

group the difference in the number of respondents who worked and did not work a little, namely 8 people (53.33%) who did not work and 7 people (46.67%) who worked. Parity characteristics in the intervention group were dominated by parity category 2, namely 6 people (40%), then the parity > 2 category was 5 people (33.33%) and the least parity category 1 was 4 people (26.675), while in the control group Parity characteristics were dominated by parity > 2, namely 6 people (46.67%), then parity 1 was 5 people (33.33%) and parity 2 was 3 people (20%). From the description above, the distribution of respondents appears to be even in each characteristic.

##### 2) Result of Pre Test and Post Test of Knowledge and Attitude of Respondents

**Table 1. Distribution of Pre-Test and Post-Test Frequency of Knowledge and Attitudes in Groups Intervention and Control Groups**

Variable	PRE TEST				POST TEST			
	groups (n=30)		Groups (n=30)		Intervention		Control	
	n	%	n	%	n	%	n	%
Knowledge:								
Well	6	40	8	46,77	13	86,67	7	46,67
Less	9	60	15	100	15	100	15	100
Total	15							
Attitude:								
Positive	10	66,67	6	40	14	93,33	10	66,67
Negative	5	33,33	15	100	15	100	15	100
Total	15							

There was an increase in the percentage of good knowledge in the intervention group, from 40% in the pre test to 86.67% in the post test, while in the control group there was no change in knowledge at all, the percentage was still 46.67% during the pre test and post test. There was an increase in positive attitudes in the intervention group and the control group. The percentage increase in positive attitudes in the intervention group from 66.67% in the pre test to 93.33% in the post test, this is greater than the control group, namely 60% in the pre test to 66.67% in the post test.

**Table 2. Exclusive breastfeeding in the intervention and control groups**

No	Exclusive Breastfeeding	Intervention		Control	
		N	%	N	%
1	Exclusive	12	80	6	40
2	Not exclusive	3	20	9	60
	Total	15	100	15	100

The percentage of the intervention group that gave exclusive breastfeeding was up to two times that of the control group.

#### B. Bivariate Analysis

##### 1) Differences in Knowledge and Attitudes of Pre-Test and Post-Test in the Intervention Group

**Table 4. The results of the test for differences in knowledge and Attitudes of Pre-test and Post-test in the Intervention Group Using the Wilcoxon Test**

Group	Variable	Pre Test	Post Test	Z-Test	p value
		Mean Runk	Mean Runk		
Intervention	Knowledge	4,00	0,00	-2,646	0,008
	Attitude	2,50	0,00	-2,000	0,046
Control	Knowledge	1,50	1,50	0,000	0,378
	Attitude	4,00	4,00	1,000	0,705

The data table above illustrates the test of differences in knowledge and attitudes pre-test and post-test in the intervention group using the Wilcoxon test. It is known that the p value of the knowledge variable is 0.008 and the attitude is 0, 046 ( $<0.05$ ), which means that there are significant differences in the knowledge and attitude variables in the pre-test and post-test in the intervention group before and after being given family-based education about exclusive breastfeeding.

## 2) Differences in Knowledge and Attitudes of Pre Test and Post Test in the Control Group

**Table 5. The results of the test for differences in knowledge and attitudes of pre-test and post-test in the control group using the Wilcoxon test**

Variable	Pre Test	Post Test	Z-Test	p value
	Mean Runk	Mean Runk		
Knowledge	1,50	1,50	0,000	0,378
Attitude	4,00	4,00	1,000	0,705

The data table above illustrates the test of differences in knowledge and attitudes pre-test and post-test in the control group using the Wilcoxon test. It is known that the p value of the knowledge variable is 0, 378 and the attitude is 0, 705 ( $>0.05$ ), it means that there is no significant difference in the knowledge variable and the attitude variable in the pre-test and post-test in the control group.

**Table 6. Test results of differences in exclusive breastfeeding in the control and intervention groups using the Mann Whitney Test.**

Variabel	Kontrol	Intervensi	Z-Test	p value
	Mean Runk	Mean Runk		
Exclusive Breastfeeding	12,50	18,50	-2,198	0,028

The data table above illustrates the difference test of exclusive breastfeeding in the control and intervention groups using the Mann Whitney Test. It is known that the p value is 0.028 ( $<0.005$ ), which means that there is a significant effect of family-based education on exclusive breastfeeding.

## IV. DISCUSSION

Exclusive breastfeeding is giving only breast milk, without the addition of other fluids such as formula milk, honey, tea water and without other food additives such as bananas, papaya, biscuits, porridge, rice and team [5].

The results showed the Wilcoxon test in the intervention group for knowledge there was p value = 0.008 and an attitude of 0.046 ( $<0.05$ ) meaning that there were significant differences in the knowledge and attitude variables in the intervention group before and after being given family-based education about exclusive breastfeeding. Whereas in the control group the p value was obtained for the knowledge variable 0, 378 and the attitude 0, 705 ( $>0.05$ ) meaning that there was no significant difference in the knowledge and attitude variables in the pre test and post test in the control group.

In the pre-test, the percentage of mothers with good knowledge in the intervention group was 6 people (40%) less than the control group as many as 7 people (46.67%), but in the post test there was a significant increase where the percentage of respondents in the intervention group with Good

knowledge category became 13 people (86.67%) while in the control group there was no change. In the intervention group there was an increase of 46.67%, in the control group 0%.

There was also a significant increase in the percentage of positive attitudes in the intervention group, namely from 10 people (66.67%) in the pre test to 14 people (93.33%) in the post test. In the control group, there was also an increase in positive attitudes but the percentage was very small, from 9 people (60%) in the pre test to 10 people (66.67%) in the post test.

Education on exclusive breastfeeding is carried out on a family basis, namely providing education to breastfeeding mothers accompanied by one of the mother's closest relatives. The mindset of mothers and their families is directed that the first 1000 days of life (from pregnancy until the baby is 2 years old) is an urgent period, a period that greatly determines the quality of children's resources in the future. Breast milk is the best food that cannot be replaced and is very economical and practical.

Assistance is a form of real support for mothers in the process of giving exclusive breastfeeding. The participation of family members in providing this education becomes meaningful participation for mothers to solve problems that mothers experience in breastfeeding so that they are able to carry out their role optimally.

This is in accordance with the research of [6], which revealed that the decision making in giving exclusive breastfeeding by mothers was influenced by the role (support) of the family. Support to breastfeeding mothers is an integral part of the family role. The importance of the role of the family has been recommended at the High Level Conference on Child Welfare (1990), that all families (especially husbands) know the importance of supporting women in breastfeeding tasks only in the first 4 to 6 months of the child's life [5].

During the breastfeeding process, the two groups experienced problems commonly experienced by breastfeeding mothers, among others, blistered nipples, insufficient breast milk. Mothers in the intervention group have known that chafed nipples can occur due to inappropriate breastfeeding techniques and insufficient breast milk can be increased by providing mothers with nutritional intake that can increase milk production such as katuk leaves, suppressing stress levels that mothers experience, helping mothers feel as comfortable as possible during the breastfeeding period. With correct and sufficient knowledge, the mother's attitude when dealing with problems or obstacles in the breastfeeding process, the mother is calmer and knows what to do. There are also family members who remember and help them to overcome the existing problems in order to have adequate nutritional intake for their children.

This is in accordance with the research of Albernaz (2008) that lactation counseling (education) and breastfeeding can prevent early arteries and are effective in increasing exclusive breastfeeding [5].

## V. ACKNOWLEDGMENT

To The Ministry of Research and Technology and Higher Education who has funded this research

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# The Potential Goat Milk and Goat Milk Yogurt in Increase Sod Level on Malaria Infections

1<sup>st</sup> Merinta Sada  
Departemen of Nutrition  
Politeknik Kesehatan Kemenkes Sorong  
Papua, Indonesia  
smerinta@yahoo.com

2<sup>nd</sup> Anang M Legowo  
Departemen of food technology  
*Diponegoro University*  
Semarang, Indonesia

3<sup>rd</sup> Gemala Anjani  
Food and Nutrition sciences  
*Diponegoro University*  
Semarang, Indonesia

Corresponding author smerinta@yahoo.com

**Abstract** - Protein in goat milk is the main source of active biopptides that can produce antioxidants. One of the processed products of fermented goat milk is goat milk yogurt. Yogurt contains bioactive peptides and has antioxidant activity. Yogurt contain lactic acid bacteria. Plasmodium infection will cause an imbalance of antioxidant and make SOD enzyme level decreasing. Goat milk dan yogurt goat milk have potential to increase SOD enzyme level. This research is true experimental study with a post-test only group design. Thirty five female Balb/c mice were divided into: K- (control negative group), K+ (infected malaria), K+DHP (malaria, DHP drug), X1 (malaria, goat milk), X2 (malaria, goat milk, DHP), X3 (malaria, goat milk yogurt), X4 (malaria, goat milk yogurt, DHP). Inoculation of Plasmodium was given as much as 10<sup>7</sup>/0.2 ml. The intervention was given 24 days. SOD enzyme level data collection was performed on the seventh day post inoculation. Dose of goat milk and goat milk yogurt is 0.5 ml/20gBw. Data was analyzed using Kruskal-Wallis with Post Hoc Mann-Whitney. The result showed a significant increase on SOD level (p <0.05). The mean SOD level in each group: 20,9 ng/ml (K-); 5,67 ng/ml (K+); 17,85 ng/ml (K+DHP); 9,03 ng/ml (X1); 12,11 ng/ml (X2); 10,84 ng/ml (X3); 18,22 ng/ml (X4). The administration of DHP drugs and Yogurt goat milk (X4) is most effective in increasing SOD levels. Giving DHP drugs and Yogurt goat milk (X4) is more effective in increasing SOD levels than only administering DHP drugs (K+DHP). Giving goat milk yogurt with a dose of 0,5 ml / 20g Bw and DHP drugs can be considered to increase SOD levels in malaria infections.

**Keywords:** Goat milk; Goat milk yogurt, Malaria, SOD level

## 1. INTRODUCTION

Goats milk is one of the solutions for cow's milk allergy. Cow's milk allergy is common in infants and young children. Goat's milk has been shown to have a positive effect on biological functions and easily digested by the body (Yanglar F, 2013; Aristya AL, Legowo AM, Al-baari AN, 2013; Banjare K et.al, 2017). Protein in goat milk is the main source of active biopptides that can produce antioxidants (Young Park, 2010; Alyaqoubi S, Abdullah A, Addai ZR,

2014; Alyaqoubi S, et.al, 2014). Goat milk contains antioxidant-forming substances superoxide dismutase (SOD). The protein in goat milk also has anti-inflammatory properties that function as part of the immune system. Protein in goat milk is an important source of angiotensin-converting enzyme (ACE) which functions as an antihypertensive peptide and can also help control infections from pathogenic microbes (Afarahma AI, Widiyho RBB, 2015).

One of the processed products of fermented goat milk is goat milk yogurt. Yogurt contains bioactive peptides and has antioxidant activity (Anggraeni RH, Legowo AM, Al-Baari AN, 2013; Gahrue et.al, 2015; Nguyen L, Hwang ES, 2016). The antioxidant activity of goat milk yogurt is higher than that of cow's milk yogurt (Munianty P, Shori AB, Baba AS, 2016; Fardet A, Rook E, 2017). Increased antioxidant activity in goat milk yogurt caused from the activity of the lactic acid bacteria (LAB) contained therein. Several studies have shown the effects of LAB in responding to oxidative stress (Padaga MC, et.al., 2018; Nakagawa H, Miyazaki T, 2017). The potential of LAB for human health is a stimulant system that can balance intestinal flora, reduce cholesterol, have anti-aging and antioxidant activity (Nakagawa H, Miyazaki T, 2017; Grazyna C, et.al; 2017). LAB produces exopolysaccharides (EPS) which specifically have immunostimulatory activity and can increase the colonization of the digestive tract (Polak et.al, 2013). LAB can hydrolyze casein a bioactive peptide that has various biological functions Based on previous research, casein in milk yogurt can reduce serum SOD levels and increase Malondialdehyde (MDA) (Nakagawa H, Miyazaki T, 2017).

Malaria is an infectious disease and causes oxidative changes due to plasmodium infection. Plasmodium infection will cause an imbalance of antioxidant (Khalid M et.al, 2013; Gomes QBA, Da-Silva LFD, Gomes QAR, 2015; Fabbri C, De-Cássia MNR, Lalwani P, 2013). In the blood plasma of individuals who experience malaria there will be a decrease in the number of antioxidant enzymes such as superoxide dismutase (SOD), catalase (CAT) and glutathione peroxidase (GPx). SOD is the main antioxidant that catalyzes superoxide radicals into intracellular hydrogen peroxide (Gomes QBA, Da-Silva LFD, Gomes QAR, 2015; Li Y et.al, 2018). In malaria infection there will be a decrease in the SOD enzyme. Under these conditions, the use of antioxidants is expected to help prevent oxidative damage and prevent further development of malaria (Gomes QBA, Da-Silva LFD, Gomes QAR, 2015).

Scientific hypothesis: Goat milk and goat milk yogurt can increase levels of SOD enzymes in mice infected with malaria.

## II. RESEARCH METHODOLOGY

### Research Design And Experimental-Animals

The research design used in this study is true experimental with a post-test only randomized control group design. This study used female Balb / c mice which were inoculated by P. berghei ANKA (PbA). The study was conducted by dividing 7 groups: 3 control groups and 4 treatment groups. K group (negative control group that is given standard feed); K + (positive control group fed standard, inoculated PbA and not treated); K (+) DHP (positive control group fed standard, inoculated PbA and receiving anti-malaria therapy (DHP)); X1 (treatment group 1, mice that were inoculated PbA , and given goat milk X2 (treatment group 2, mice that were inoculated PbA, received anti-malaria therapy (DHP) and were given goat milk; X3 (treatment group 3, mice that were inoculated PbA and given goat milk yogurt); X4 (X4 (mice) treatment group 4, mice that were inoculated with PbA, received anti-malaria therapy (DHP) and were given goat milk yogurt. SOD data collection was performed on the seventh-day post-inoculation. Dose of goat milk and goat milk yogurt is 0.5 ml / 20gBw.

Research location for making yogurt, analysis of protein content and antioxidant activity of goat milk and goat milk yogurt was conducted at the Integrated Laboratory of Diponegoro University, Semarang. The location of mice maintenance, malaria inoculation, and measurement of SOD were carried out at the Integrated Biomedical Laboratory (IBL) Faculty of Medicine, Sultan Agung Islamic University Semarang (FK-UNISSULA). The goat milk used was obtained from the Kuncen Farm Farmers Group located in the Bubakan Village, Mijen District, Semarang City. This study was approved by the Health Research Ethics Commission of the Sultan Agung University School of Medicine with No. 196 / III / 2019 / Bio-commission.

### Intervention Goat Milk And Yogurt Goat Milk

Goat milk and yogurt goat milk are given orally using a sonde. The dosage given is based on the maximum volume of gastric mice that is 1 ml / 20 g BW (Jumilawaty E, Hutahaean S , 2012; Ngatidjan, 2006). The ideal solution volume given is 0.25-0.5 ml and the solution volume on this research using 0.5 ml/20g BW/ day. Goat milk is given for 24 days, which is 21 days before inoculation and 3 days after inoculation.

### Measurement of SOD Enzymes Level

Measurement of SOD enzyme levels was measured in the liver of mice. Mice will be euthanasia then dissected by making an incision in the abdomen. The liver of mice used for examination of superoxide dismutase (SOD) enzyme levels was washed first using NaCl. The liver sample is wrapped in aluminum foil and then after that, it is put in a plastic clip that has been labeled with paper and stored at -80 ° C until inspection. Then the liver homogenate is made. Examination of SOD enzyme levels using the Enzyme-linked Immunosorbent Assay (ELISA) method (Setianingrum A,2017).

### Statistic analysis

Results were expressed as mean  $\pm$ SD (for normally distributed data) otherwise it expressed as median (min-max). Statistical difference was analyzed by using a one-way analysis of variance (ANOVA) followed by post hoc Bonferroni for normally distributed data, otherwise, Kruskal-Wallis test followed by Mann-Whitney test was used (SPSS 21). Statistical analyses were done by the computer.

## III. RESULTS AND DISCUSSION

The normality of SOD enzyme test results using the Saphiro-Wilk test obtained p-value  $<0.005$  ( $p = 0.00$ ) it shows that the SOD enzyme data levels were not normally distributed. Then the Kruskal-Wallis test is performed. Based on Table 1, there are statistically significant differences in SOD enzyme levels where the value of  $p = 0.024$  ( $p <0.05$ ). Giving goat's milk and goat's milk yogurt or a combination of both with DHP drugs affects the SOD enzyme. Next, the Post-Hoc Mann-Whitney test is carried out.

**Table 1. Statistical Analysis of SOD Enzyme Levels**

Kelo mpok Perla kuan	Kadar Enzim SOD (ng/ml)	$p^a$	$p^b$						
			K	K+	K+D HP	X1	X2	X3	X4
K-	20,90 $\pm$ 1,60	0,024*	-	0,17	0,754	0,602	0,675	0,602	0,917
K+	5,67 $\pm$ 1,49		-	-	0,009*	0,028*	0,009*	0,009*	0,009*
K+ DHP	17,85 $\pm$ 4,38		-	-	-	0,028*	0,117	0,028*	0,054
X1	9,03 $\pm$ 2,67		-	-	-	-	0,347	0,251	0,117
X2	10,64(8,13-21,37)		-	-	-	-	-	0,754	0,465
X3	10,84 $\pm$ 1,39		-	-	-	-	-	-	0,530
X4	18,22 $\pm$ 1,12		-	-	-	-	-	-	-

Information :

$a$  = Kruskal Wallis

$b$  = Post Hoc Mann-Whitney

\* = p value  $<0.005$  (significantly)

K<sup>-</sup> = Control Group Negative, Healthy

K<sup>+</sup> = Control Group Positive, Infected Malaria

K<sup>+</sup> DHP = Control Group, Infected Malaria and DHP Drug Administration

X1 = Treatment Group, Goat milk- Infected Malaria- Goat milk

X2 = Treatment Group, Goat milk - Infected Malaria- Goat milk and DHP

X3 = Treatment Group, Goat milk Yogurt- Infected Malaria- Goat milk Yogurt

X4 = Treatment Group, Goat milk Yogurt- Infected Malaria- Goat milk Yogurt and DHP

Based on the results of the Post-Hoc Mann-Whitney test, there were significant differences in SOD enzyme levels between the K + group and the X1, X2, X3, X4 groups. The administration of goat milk intervention and goat milk yogurt provides a protective effect against malaria infection. There were significant differences in SOD enzyme levels between the K + DHP group with group X1 and group X3. This shows that giving goat milk or goat's milk yogurt alone cannot provide the same therapeutic effect with DHP drugs, so that goat milk or goat's milk yogurt alone cannot be the primary therapy for malaria.

There was no significant difference in SOD enzyme levels ( $p < 0.05$ ) in the K + DHP group with X2 and X4 groups. This shows statistically, there were no significant differences in SOD enzyme levels in the groups with the addition of goat's milk or goat's milk yogurt consumed as a companion to the DHP drug. For more details, the difference in average SOD enzyme levels per group can be seen in Figure 1.

Figure 1, shows that the highest SOD enzyme was found in the K- group (20.9 ng / ml) which was a healthy control without malaria inoculation and the lowest SOD enzyme was in the K + group (5.67 ng / ml) which was the group who were inoculated with malaria without providing any intervention. The superoxide dismutase (SOD) enzyme which is an endogenous antioxidant will catalyze the reaction of superoxide anion ( $O_2^-$ ) free radical dismutase to hydrogen peroxide ( $H_2O_2$ ) and oxygen molecules so that superoxide anion ( $O_2^-$ ) cannot attack body cells. Malaria infection causes an increase in oxidative stress so that the body experiences a decrease in SOD enzyme levels (Fabbri C, De-Cássia MNR, Lalwani P, 2013; Tahro F, Ushio M, 2011). This is consistent with the results of this study in which the K + group had lower SOD enzyme levels than the K- group.

Based on Figure 1, the K group had the highest SOD enzyme level because it was a healthy group, with no malaria infection. The group that had the lowest SOD enzyme levels was the K + group. K + group is a group infected with malaria without any intervention. Low levels of SOD enzymes due to malaria infection without any intervention (Fabbri C, De-Cássia MNR, Lalwani P, 2013).

The K + DHP group had higher SOD enzyme levels than the K +, X1, X2, X3 groups. This shows that the administration of DHP drugs is effective in treating malaria. Group X4 had a higher SOD enzyme level than K + DHP. This shows that the administration of goat milk yogurt with DHP drugs is more effective in increasing SOD enzyme levels than with DHP drugs alone. This proves the existence of good interactions between DHP drugs with food ingredients in this case goat milk yogurt. Goat milk yogurt has potential as an adjuvant therapy for malaria sufferers. Yogurt generally contains probiotics which can enhance the immune system by reducing oxidative stress through various mechanisms. Among them is through increased levels of antioxidant enzymes which are the body's natural antioxidants, but also yogurt can reduce oxidative stress that occurs in the intestine, flushing superoxide and hydroxyl radicals, and lower low-density lipoprotein levels and will reduce the redox ratio of glutathione in the blood and intestinal mucosa (Pihlanto, A, 2006; Fodor SI, et.al, 2017).

Groups X1, X2, X3, and X4 had higher SOD enzyme levels than the K + group. This shows that the provision of goat milk and goat milk yogurt can increase SOD enzyme levels. High levels of the SOD enzyme because in milk and yogurt contain casein and whey which can boost the immune system (Fodor SI, et.al, 2017).

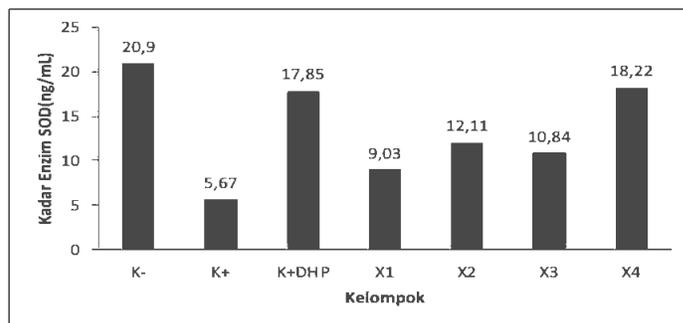


Figure 1. Graph of Mean SOD Enzyme Levels

Information :

K<sup>-</sup> = Control Group Negative, Healthy

K<sup>+</sup> = Control Group Positive, Infected Malaria

K<sup>+</sup> DHP = Control Group, Infected Malaria and DHP Drug Administration

X1 = Treatment Group, Goat milk- Infected Malaria- Goat milk

X2 = Treatment Group, Goat milk - Infected Malaria- Goat milk and DHP

X3 = Treatment Group, Goat milk Yogurt- Infected Malaria- Goat milk Yogurt

X4 = Treatment Group, Goat milk Yogurt- Infected Malaria- Goat milk Yogurt and DHP

Casein has antioxidant activity including radical scavenger and cation chelator which can inhibit lipid oxidation. They contains essential amino acids and a high concentration of branched amino acids such as leucine, isoleucine, and valine. They protein has an important role in the regulation of the immune system. They protein also contains the amino acids cysteine and methionine, which can enhance immune function through intracellular conversion into glutathione. Glutathione plays an important role in the stability of lysosomal and cell membranes and protects cells from the influence of free radicals (Fodor SI, et.al, 2017; Mahdi et.al, 2018).

Based on Table 1, Group X1 and Group X3 had higher SOD enzyme levels than the K + group. This relates to the content of goat milk and goat milk yogurt which can boost the immune system. Group X3 had higher SOD enzyme levels than group X1. The provision of goat milk yogurt is more effective in increasing the average SOD enzyme level. This is related to lactic acid bacteria contained in goat milk yogurt. Goat milk yogurt contains probiotics that can stimulate the immune system. According to Mahdi's research (2018), goat milk yogurt can reduce MDA and TNF- $\alpha$  levels. Goat milk yogurt contains biopeptides which can induce cellular immune systems and induce anti-inflammatory activity. Goat milk yogurt also contains lactoferrin, lactoferrin can inhibit proinflammatory cytokine production (IL-1, TNF- $\alpha$ , IL-6, iNOS). In Mahdi's study (2018), the administration of goat milk yogurt therapy with a dose of 600 mg/kg BW was able to reduce MDA levels and therapy with a dose of 900 mg/kg BW was able to reduce the expression of TNF- $\alpha$  in animal models of hypercholesterolemia rats (; Mahdi et.al, 2018)

SOD enzyme levels in group X4 were higher than group X2. This is probably due to the content of lactic acid bacteria in goat milk yogurt. Goat milk yogurt in this study used the bacteria *S. thermophiles* and *L. bulgaricus*, *L. Acidophilus* and *Bifidobacterium*. *Lactobacillus bulgaricus* bacteria have the advantage of being able to increase macrophages and activate

phagocytes so that they can improve the immune system after being infected with malaria (Denny, Joshua E, 2018).

Antioxidant defense mechanisms can be divided into 4 categories: prevention of active oxidant formation; removal of active oxidants; repair damage and excretion of toxic oxidation products; and adaptive response to ROS. Lactic acid bacteria can show antioxidant activity in different ways. 85 Lactic acid bacteria have two antioxidant pathways in boosting immunity. The first pathway is the enzymatic defense system with SOD and GPx enzymes. To prevent excessive oxidative stress a nonenzymatic defense system is needed by having the ability to reduce metal ions and the capacity to "chelating of metal ions". In addition to the ability to increase levels of SOD enzymes, Lactobacillus has the ability to chelating metal ions, the ability to chelating metal ions is higher than its ability to increase levels of SOD enzymes. Research by Zhang et al (2011) shows that Lactobacillus can produce antimicrobial compounds such as organic acids, bacteriocin, and hydrogen peroxide (Zhang et.al, 2011).

Yogurt undergoes a fermentation process, the process will release bioactive peptides from the main protein of milk. The fermentation process will produce antioxidant peptides consisting of 5-11 hydrophobic amino acids. Hydrophobic amino acids include proline, histidine, tyrosine or tryptophan. These amino acids will prevent the formation of free radicals and inhibit the process of lipid peroxidation (Legowo, A. M., Kusrahayu dan S. Mulyani, 2009). During the fermentation process of lactose decomposition, lactose is broken down into glucose and galactose by LAB. Then glucose will be converted into lactic acid, diacetyl and CO<sub>2</sub> so that the resulting yogurt with sour aroma, fresh and has a thick viscosity. The yogurt fermentation process involves lactic acid bacteria Gjorgievski N, et.al, 2015; Kumalasari DEK, Legowo MA, Al-Baarri AN, 2013). Lactic acid bacteria have antioxidant activity and can reduce the accumulation of ROS during the digestion process of food and have the ability to degrade superoxide anion and hydrogen peroxide (Legowo, A. M., Kusrahayu dan S. Mulyani, 2009).

#### IV. CONCLUSION

Giving goat milk and goat milk yogurt can increase the SOD enzyme levels of mice infected with malaria.

#### V. ACKNOWLEDMENT

This research funding by BPPSDM Ministry of Health Republic Indonesia. Public health office Jayapura City contributed DHP drug.

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# Color, Microstructure and Crystallinity of Red Rice Flour with Differences in Drying Times and Temperatures

1<sup>st</sup> Merynda Indriyani Syafutri  
 Departement Agricultural Technology  
 Faculty of Agriculture,  
 Universitas Sriwijaya  
 South Sumatera, Indonesia  
 misyafutri@gmail.com

2<sup>nd</sup> Friska Syaiful  
 Departement Agricultural Technology  
 Faculty of Agriculture,  
 Universitas Sriwijaya  
 South Sumatera, Indonesia  
 friska\_ipn@yahoo.com

3<sup>rd</sup> Eka Lidiasari  
 Departement Agricultural Technology  
 Faculty of Agriculture,  
 Universitas Sriwijaya  
 South Sumatera, Indonesia  
 elidiasari@gmail.com

4<sup>th</sup> Dela Pusvita  
 Departement Agricultural Technology  
 Faculty of Agriculture,  
 Universitas Sriwijaya  
 South Sumatera, Indonesia  
 dellapusvita98@gmail.com

5<sup>th</sup> Erlita Indah Astari  
 Departement Agricultural Technology  
 Faculty of Agriculture,  
 Universitas Sriwijaya  
 South Sumatera, Indonesia  
 erlitaindah.astari@gmail.com

Corresponding Author : misyafutri@gmail.com

**Abstract**— *One effort to develop red rice as food is to process it into flour. Drying is one of the stages in the flour processing that must be considered to get flour with good physicochemical characteristics. Time and temperature of drying are some of the factors that influence the physicochemical characteristics of dried food products. This research aimed to study the color changes, microstructure and crystallinity properties of red rice flour which were dried with different times and temperatures. The factors were drying time (1 hour, 2 hours, and 3 hours) and drying temperature (50, 55, and 60 °C). The results showed that interaction of drying time and drying temperature significantly increased lightness and yellowness, but reduced the redness of red rice flour. Granular morphology images and crystallinity pattern showed that differences in drying time and temperature did not affect the shape of the granules and type of starch of red rice flour. Based on the crystallinity pattern, red rice flour was classified as A- type.*

**Keywords**—color, crystallinity, drying, microstructure, red rice flour

## I. INTRODUCTION

Red rice (*Oryza nivara*) is one variety of rice in Indonesia, besides white and black rice. The differences in color of rice are due to the process of polishing and the content of phytochemical compounds as natural pigments found in the pericarp, sees coat, and aleuron [1][2]. The red color in red rice is caused by anthocyanin compounds found in the pericarp [1]. The function of anthocyanin are as natural pigment, and antioxidant [2]. The anthocyanin content of red rice ranges from 6.79 to 12.23 mg per 100 g [3].

Processing red rice into flour is one of alternative products because the flour will be more resistant to storage, makes it easier when mixing with other ingredients (composites), can be enriched with nutrients (fortification), and accelerates in subsequent processing. The flour product will be in accordance with the demands in life with high mobility that is very practical [4].

Drying is one of the stages in flour processing. Drying is the process of reducing the water content of a material to a certain amount [5]. If heating occurs in every part of the material so that all the moisture contained in the material will evaporate when drying takes place [4]. Temperature and drying time are several factors that influence the drying process. The temperature and drying time will be directly proportional to the rate of evaporation of water. The higher the temperature and the longer the drying time can cause faster the rate of evaporation of water, but will affect the quality of the material produced. Drying will cause changes in physical, chemical, and sensory characteristics of material [6][7]. Previous research on drying red rice flour stated that red rice flour with drying treatment for 2 hours had the best physical, chemical, and sensory characteristics [4]. Therefore it is necessary to conduct research on the effect of drying time and drying temperature (using an oven) on the color, structure of the granules and the crystallinity of red rice flour.

## II. METHODS

### A. Material

Red rice obtained from a supermarket in Palembang, Indonesia.

### B. Method

This study consisted of 2 factors, namely (A) the drying time (1 hour, 2 hours, 3 hours) and (B) the drying temperature (50 °C, 55 °C, 60 °C). Red rice sorted to separate deformed or not intact. Red rice was dried using an oven with a temperature and drying time according to treatment, then it milled using a blender for ± 3 minutes. The next step was sieving (80 mesh) to obtain red rice flour [4].

Parameters observed were color (lightness, redness, and yellowness) [8], microstructure (granular morphology) [9], and crystallinity pattern [10] of red rice flour. Data of microstructure

(granular morphology) and crystallinity pattern of red rice flour were presented in image. Color parameters used a Randomized Block Design factorial and repeated three times. Data of color (lightness, redness, and yellowness) were evaluated using analysis of variance (ANOVA) and honestly significant difference (HSD) test at the 5% level.

### III. RESULTS

#### A. Color

The measurement of red rice flour color consisted of lightness ( $L^*$ ), redness ( $a^*$ ), and yellowness ( $b^*$ ). The results showed that the average values of  $L^*$ ,  $a^*$ , and  $b^*$  of red rice flour ranged from 73.92% to 76.96%, +2.44 to +4.2, and +15.16 to +18.26, respectively (Table 1).

Table 1. Average Values of Lightness, Redness, and Yellowness of Red Rice Flour

Treatments	Lightness (%)	Redness	Yellowness
A1B1 (1 hour; 50 °C)	73.92 <sup>a</sup>	4.29 <sup>a</sup>	15.16 <sup>a</sup>
A1B2 (1 hour; 55 °C)	74.90 <sup>ab</sup>	3.92 <sup>ab</sup>	16.30 <sup>b</sup>
A1B3 (1 hour; 60 °C)	75.16 <sup>ab</sup>	3.93 <sup>ab</sup>	16.52 <sup>b</sup>
A2B1 (2 hours; 50 °C)	74.83 <sup>ab</sup>	3.96 <sup>ab</sup>	16.66 <sup>b</sup>
A2B2 (2 hours; 50 °C)	76.40 <sup>b</sup>	3.47 <sup>b</sup>	16.83 <sup>bc</sup>
A2B3 (2 hours; 60 °C)	77.23 <sup>bc</sup>	2.92 <sup>bc</sup>	17.08 <sup>bc</sup>
A3B1 (3 hours; 50 °C)	75.89 <sup>b</sup>	2.85 <sup>c</sup>	16.36 <sup>b</sup>
A3B2 (3 hours; 55 °C)	78.18 <sup>c</sup>	2.75 <sup>c</sup>	17.86 <sup>c</sup>
A3B3 (3 hours; 60 °C)	78.96 <sup>c</sup>	2.44 <sup>c</sup>	18.26 <sup>c</sup>

Numbers followed by the same letter in the same column mean different

#### B. Granular Morphology

Analysis of granular morphology aimed to investigate the microstructure of red rice flour with differences in drying times and drying temperatures. The morphology of red rice flour granules was analyzed using SEM (Scanning Electron Microscopy). The results showed that red rice flour with differences in drying times and drying temperatures had same granule shape. Granular morphology of red rice flour presented in Fig. 1.

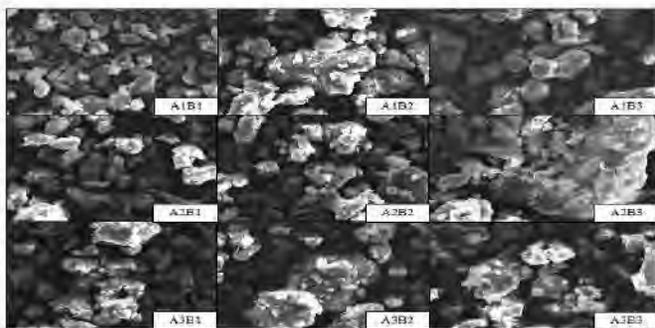


Fig. 1. Granular morphology (microstructure) of red rice flour with differences in drying times and drying temperatures

#### C. Crystallinity Pattern

The crystallinity pattern of red rice flour was determined by X-ray Diffraction (Fig. 2). The results of X-ray Diffraction analysis or crystallinity pattern showed that red rice flour was a A-type starch.

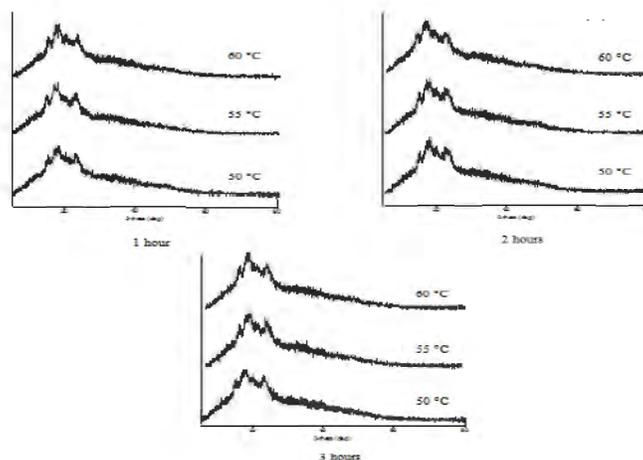


Fig. 2. Crystallinity pattern of red rice flour with differences in drying times and drying temperatures

### IV. DISCUSSION

The  $L^*$  value shows the brightness of a material and its value ranges from 0 to 100. The  $L^*$  value that approaches 0 indicates that the sample has a low brightness value (dark), whereas the  $L^*$  value approaches 100 indicates that the sample has a high level of brightness (white) [11]. Redness ( $a^*$ ) value shows the red to green color of a product. Redness values range from 0 to +80 for red and 0 to -80 for green [12]. Yellowness ( $b^*$ ) value indicates yellow to blue in a product. Yellow has a range of values from 0 to +70, while blue has a range of values from 0 to -70 [13].

The results of analysis of variance showed that drying time, drying temperature, and interaction of both had significant effects on the  $L^*$ ,  $a^*$ , and  $b^*$  values of red rice flour (Table 1). The higher drying time and drying temperature would increase  $L^*$  and  $b^*$  values of red rice flour, but decrease  $a^*$  value of red rice flour. Previous study stated that drying time had significant effects on increasing of brightness and reducing of red color in red rice flour [4]. Increased temperature and drying time would make red rice flour brighter, which was indicated by increasing of  $L^*$  value and decreasing of  $a^*$  value. It was caused by the anthocyanin pigment being damaged with higher temperatures and longer drying times.

Temperature has a very important role and influence on the stability of anthocyanin [14]. The presence of oxygen and high temperatures can damage the anthocyanin pigment even though its degradation is not very affected by oxygen, but is greatly influenced by heat accumulation [15]. Anthocyanin is a compound which in alkaline, high temperature, light, and oxygen conditions is unstable [16]. Based on the previous study, decreasing of anthocyanin levels in black glutinous rice occurred at temperatures above 30 °C. The increasing of temperature to 70 °C for more than 30 minutes caused anthocyanin damage up to 50% [17].

The increasing of yellow color in red rice flour was caused by decreasing of red color due to long drying time and high

temperature. The higher temperature and the longer drying time caused decreasing of the red color concentration of red rice flour. According to previous research, the heating process could increase the value of  $b^*$  in red bean flour [18]. Other research stated that the higher temperature that used in the processing would cause the anthocyanin was damaged and would form chalcone compound (yellow) [19].

Based on granular morphology of red rice flour, the differences in drying times and drying temperatures did not affect the shape of granules of red rice flour. Increasing of drying time and drying temperature did not change the red rice flour starch granules. The drying process in this study used an oven. Previous study stated that oven drying did not significantly affect the morphology and fine structure of the starches [20].

The results of this research showed that red rice flour was a A-type starch. Starches derived from cereals or grains such as corn starch and wheat starch were classified in A-type. Starches derived from tubers such as potatoes and banana starch were classified in B-type, while root-derived starches such as cassava starch and starch derived from legumes were classified in C-type [21].

The results showed that red rice flour had a strong peak at  $16^\circ$ ,  $17^\circ$ ,  $18^\circ$ ,  $19^\circ$ ,  $20^\circ$ ,  $22^\circ$ , and  $23^\circ$  ( $2\theta$ ). The XRD pattern of A-type starches has peaks at  $15^\circ$  and  $23^\circ$  ( $2\theta$ ), and imperfect peaks at  $17^\circ$  and  $18^\circ$  ( $2\theta$ ) [22]. Increasing of drying time and drying temperature did not change the type of starch of red rice flour (A-type). The starch exhibited the A-type crystalline diffraction pattern which was not affected by drying temperature in the range of  $40\text{-}60^\circ\text{C}$  [23].

A-type had amylose with smaller molecular weight, shorter amylopectin branches and higher crystallinity, whereas B-type had amylose with greater molecular weight, longer amylopectin branches and lower crystallinity [24][25]. A-type starch had a double helical chain in the middle of the granule [26].

## V. CONCLUSION

The interaction of drying time and drying temperature had significant effects on increasing of lightness and yellowness values, and also had significant effect on reducing of redness value of red rice flour. Differences in drying time and drying temperature did not affect the shape of the granules (microstructure) and type of starch of red rice flour. Based on the crystallinity pattern, red rice flour was classified as A-type.

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# Effect of the Marnet Technique towards the smoothness of breast milk Expression for the mother post partum in BPM Palembang City

1<sup>st</sup> Murdiningasih

*Department of Midwifery,  
Politeknik Kesehatan Kemenkes Palembang*  
Palembang, Indonesia  
Murdi.ningsih1957@gmail.com

2<sup>nd</sup> Rohaya

*Department of Midwifery,  
Politeknik Kesehatan Kemenkes Palembang*  
Palembang, Indonesia  
rohayayakkub@yahoo.co.id

Corresponding author: Murdi.ningsih1957@gmail.com

**Abstract** - Data of Public Health Service in Palembang revealed that the coverage of giving Exclusive breastmilk in Palembang in the year of 2015 was 72,91%. In Plaju District, the coverage of exclusive breastmilk production was 77%. This coverage was still below the target that was 80%. The amount of breastmilk production in the first day after the childbirth was very small. It was caused by the lack of two vital hormones in milk production, prolactine hormone and oxytochin hormone stimulus. This problem could be overcome by using the Marnet Technique. The aim of this research was to figure out the effect of the Marnet Technique towards the breast milk expression for the mother postpartum. The research designs used in this research were Pre-Experiment and One Group Pre-test Post-test. To collect the data, purposive sampling techniques was employed with the total of sample 30 respondents. Based on the result of univariate analysis, before the Marnet Technique in the smoothness of breastmilk expression was given, the result was 19 respondents (63,3%). On the other hand, after the treatment was applied, there are 15 respondents (50%). As for the result of bivariate analysis,  $p$  value: 0,000 whilst ( $\alpha=0,05$ ) which meant that the result was significant. It could be summarised that the Marnet Technique influenced the smoothness of breast milk expression.

**Keywords:** Marnet Technique, the smoothness of breast milk expression.

## I. INTRODUCTION

Childbirth is a natural event experienced by every mother after pregnancy until the time. After the delivery is complete, each mother must immediately prepare for another task, namely breastfeeding. In normal labor, breastfeeding initiation can be done immediately after the baby is born [1], [2].

Marnet technique is a way to manually express milk and express let down reflexes (LDR). Reflex let down stimulation at the beginning of the milking process can produce 2-3 times as much milk as compared without using this technique. Let down reflexes are the same as stimulation that occurs if the nipples are inhaled by the baby and after a while suddenly the breasts will

tighten and the milk will come out so heavily that the baby must accelerate the rhythm of sucking milk, more or less like that if we get the let down reflex effect [3]. The technique of milking milk by way of marnet aims to empty the milk from the lactiferous sinus which is located below the areola so that it is hoped that emptying the milk in the lactiferous sinus will stimulate prolactin release. Expenditure of the hormone prolactin is expected to stimulate mammary alveoli to produce breast milk [4].

Based on data from the Palembang City Health Office the coverage of exclusive breastfeeding for Palembang City in 2015 was 72.91%. In the sub-district of Plaju the coverage of exclusive breastfeeding was 77.0%.

### A. Formulation of the problem

Is there any influence of marnet technique on the smooth delivery of breast milk for first and second day post partum mothers at BPM Husniati, BPM Choirul Mala Husin and BPM Rachmi Palembang City in 2018?

### B. Research purposes

#### 1. General Purpose

It is known that there is an influence of marnet technique on the smoothness of breast milk in the first and second day post partum mothers at BPM Husniati, BPM Choirul Mala Husin and BPM Rachmi Palembang City in 2018.

#### 2. Special Purpose

- learned the smooth release of ASI before the first and second day post partum mother marnet technique
- learned the smooth release of breast milk after the marnet technique was performed on the first and second day post partum mothers

### C. Benefits of Research

#### 1. For Researchers

By doing this research, it is expected to be an alternative to increase the success of mothers in providing exclusive breastfeeding to their babies

**A. Theoretical Basis**

**1. Breast Physiology**

During pregnancy, the prolactin hormone from the placenta increases but breast milk has not come out because it is still inhibited by high estrogen levels. On the second or third day postpartum, estrogen and progesterone levels drop dramatically, so that the influence of prolactin is more dominant. By opening the nipple stimulation occurs earlier, the formation of pituitary prolactin, so that the secretion of breast milk more smoothly. Two reflexes in the mother that are very important in the process of lactation are prolactin and flow reflexes[5], [6].

**a. Prolactin Reflex**

When the baby suckles, the nerve endings of the touch found in the nipple are stimulated. These stimuli by afferent fibers are carried to the hypothalamus at the base of the brain, then stimulate the anterior pituitary to secrete the hormone prolactin to stimulate glandular cells (alveoli) to produce milk. The amount of prolactin that is secreted and the amount of milk produced is related to the sucking stimulus, which is the frequency, intensity and length of time the baby sucks[4].

**b. Flow Reflexes (Let Down Reflex)**

Stimulation caused by the baby when feeding is delivered to the back of the pituitary gland which will release the hormone oxytocin into the blood. Oxytocin will stimulate the smooth muscles that surround the alveoli and ductuli contract so they squeeze milk from the alveoli, ductuli, and sinuses into the nipple[3].

**a. Breast Volume**

According to Kent, the following is a guide to the average amount of milk they give to babies during breastfeeding:

Table I. Volum ASI

When born	Up to 5 ml ASI	first breastfeeding
In 24 hours	7-123 ml/day ASI	3-8 breastfeeding
between 2-6 days	395-868 ml/day ASI	5-10 breastfeeding
One month	395-868 ml/day ASI	6-18 breastfeeding
Six month	710-803 ml/day ASI	6-18 breastfeeding

Source: Pollard,2015[7]

It is interesting to note that each breast produces a different amount of milk. In 7 out of 10 mothers it was found that the right breast was more productive. Kent also found that babies empty their breasts only once or twice per day with an average of only 67 percent of available milk being consumed with an average volume of 76 ml each time breastfeeding. Low milk production is a result of:

- a) Breastfeeding less or breastfeeding less frequently
- b) If the baby cannot suck breast milk effectively due to the wrong attachment technique
- c) Hypoplastic breast tissue
- d) Abnormalities of metabolism or digestion of infants so that they cannot digest breast milk
- e) Lack of maternal nutrition [3].

**b. How to do the Marmet Technique**

According to Bayu (2015), before blushing, do a simple massage and warm compresses to the breast so that the mother feels comfortable also for the expenditure of breast milk[8], [9]. A simple massage is performed in a circular / circular motion to the breast outside the areola and nipple area, from the base of the breast to the areola skin border[8]. This is to destroy the possibility of milk stoppers in the breast ducts.

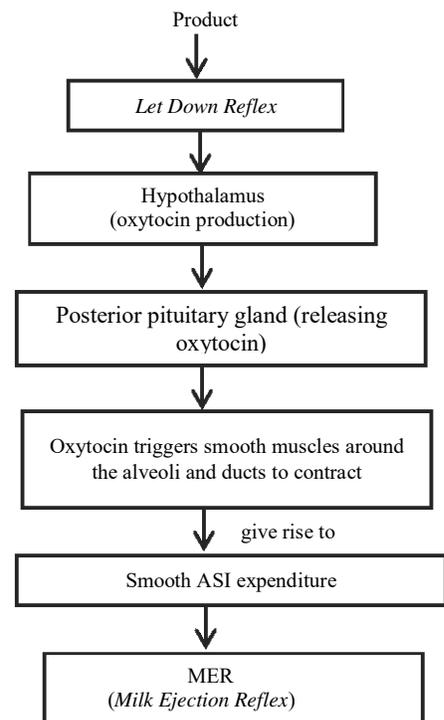
1. Place two fingers (index and thumb) outside the areola near the boundary between the skin and the areola as forming the letter C in an upright position.
2. Bring and press the fingers to the chest like stretching fingers (for mothers with large breasts the bottom of the breast can be supported with the other palm).
3. Slowly, push both fingers towards the front, such as massaging / pushing milk collected in the mammary glands located under the two fingers.
4. Repeat the above movements regularly for about 2-3 minutes.
5. Do the other breast
6. Avoid pressing movements of the breasts, pulling the nipples and pushing the breasts.

**2. Related Research Results**

The Effect of Marmet Technique on Breast Milk Production in Post-Partum Mothers at PKU MuhammadiyahGamping Hospital [8]. Chi Square statistical test results obtained significance value (p) of 0.025

**B. Theoretical Framework**

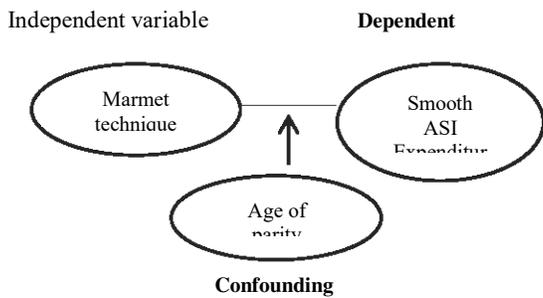
A theoretical framework is a set of theories that underlie research topics [10]. The theoretical framework used in this study is as follows:



**C. Concept Framework**

Conceptual framework is a description and visualization of concepts and variables to be studied[11]. The

conceptual framework of the research to be carried out is in the following figure:

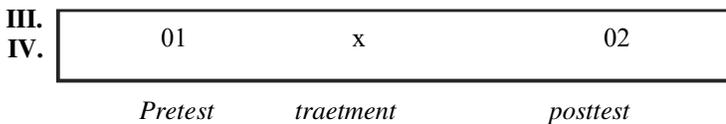


**D. Hypothesis**

The hypothesis of this study is that there is an influence of marmet technique on the smooth delivery of breast milk in postpartum mothers at BPM Palembang City in 2018.

**II. RESEARCH METHODOLOGY**

This research is a quasi-experimental research with the design used is One Group Pretest-Posttest. This design is no comparison group (control). The intervention group was given Marmet Engineering intervention from first day to third day.



Information:

- 01 → before the intervention
- x → intervention (marmet technique)
- 02 → after the intervention

In general, this experimental study only uses a relatively small sample, when compared to the size of the population. Therefore, the results of this experimental research are processed and analyzed with a careful statistical test so that adequate generalization can be carried out [11].

**A. Research Time and Place**

1. Research Time

The study was conducted in March to May 2019.

2. Researc Sites

The research was conducted at BPM Husniati, BPM Choirul Mala Husin and BPM Rachmi.

**B. Popuation and Sample**

1. Research Population

The study population was the first day post-partum mothers at BPM Husniati, BPM Choirul Mala Husin and BPM Rachmi.

2. Research Samples

The population in this study was post-partum mothers in 3 BPM Palembang City and obtained samples in Husniati BPM as many as 14 respondents, in Choirul Mala Husin BPM as many as 7 respondents and in BPM Rachmi as many as 9 respondents. So the total sample is 30 respondents

a. Inclusion criteria

- 1) Mother's first day postpartum
- 2) Do not give formula milk to the baby

- 3) Post partum mothers who are willing to do the marmet technique
- 4) Mothers who give birth to term
- 5) Mothers who give birth to babies with normal birth weight
- 6) Mothers who give birth normally

b. Exclusion Criteria

- 1) Post-partum mothers who have abnormalities in milk nipple
- 2) Mother with LBW baby (Low Birth Weight)
- 3) Mothers with chronic complaints
- 4) Mother who gave birth by Caesarean section (SC).

In this study, the variables used are the dependent variable and the independent variable. Which includes the dependent variable is the smoothness of ASI expenditure while the independent variable is the Marble Technique.

**V. RESULTS**

1. Overview of Research Locations

This research was conducted at 3 BPM Palembang City, namely Husniati, Choirul Mala Husin and Rachmi.

2. Univariate Analysis

This data analysis was performed to determine the frequency distribution and the percentage of research variables. The smoothness of ASI expenditure is divided into 3 categories, namely lack (score 1-3), adequate (score 4-6) and lots (7-8). Data is presented in tabular and text form below:

- 1) Frequency distribution of respondents before and after being given the technique marmet.

**Table 4.1**  
Frequency Distribution of Smooth ASI Expenditures Before and after Granting Marmet Engineering at BPM Palembang City in 2018

No	Smooth ASI Expenditures	Before Marmet Technique		After Marmet Technique	
		n	%	n	%
1	less	19	63,3	6	20
2	enough	11	36,7	15	50
3	lots	0	0	9	30
amount		30		100	

Based on table 4.1. above, it can be seen that from 30 respondents, before and after the technique of marmet, respondents with smooth ASI expenditure decreased from 19 (63.3%) to 6 people (20%), while ASI expenditure increased quite before and after the marmite technique, ie from 11 (36) 7%) to 15 (50%) and for breastmilk expenditure increased considerably from 0 to 9 (30%).

**Bivariate Analysis Results**

The next test is bivariate analysis, bivariate analysis is done to identify the relationship between two variables. To see the smoothness of ASI release before and after the marmet technique was given to the paired groups (pre and post) using the

Wilcoxon Test. The results of the bivariate analysis can be seen in the table below (table 4.3).

**Table 4.3 Effect of Marmet Technique on Smooth Expenditures of Breast Milk Palembang city 2018**

	Smoothness of breastfeeding after Marmet technique				p value
	Less %	Enough %	Lots %	Total %	
Smoothness of breastfeeding after Marmet technique	6 (31,6)	12 (63,2)	1 (5,3)	19 (100,0)	0,000
	0 (0,0)	3 (27,3)	8 (77,7)	11 (100,0)	
<b>Total</b>	6 (20,0)	15 (50,0)	9 (100,0)	30 (100,0)	

## VI. DISCUSSION

This research was conducted at 3 BPM namely Husniati, Choirul Mala Husin and Rachmi and was carried out from March to May 2018. The population in this study was post-partum mothers at BPM Palembang City and obtained samples at BPM Husniati as many as 14 respondents, in BPM Choirul Mala Husin as many as 7 respondents and in BPM Rachmi as many as 9 respondents.

### 1. Characteristics of Respondents

From the analysis of characteristics based on the age of the post-partum mothers who were given the treatment of marmet techniques at BPM Husniati, BPM Choirul Mala Husin and BPM Rachmi, as many as 30 people (100%). Researchers divided into three age groups: respondents aged 19-25 years totaling 14 people (46.7%), respondents aged 26-30 years were 10 people (33.3%), and respondents aged 31-35 years as many as 6 people (20.0%).

Mother's age affects the production of breast milk[12]. Mothers who are younger are producing more milk than older mothers[13]. According to Biancuzzo (2003) that younger mothers or less than 35 years of age produce more milk than older mothers [14].

The results are consistent with research conducted by Hidayati, 2012, which says that the more age the level of maturity of a person to be more mature in thinking and acting, and therefore vulnerable age above 20 years and below 35 years is the age reproduction healthy and safe for pregnancy, labor and breastfeeding.

From the results of the analysis of characteristics based on parity of post-partum mothers who were given the treatment of marmet technique there were two groups, namely in primipara as many as 19 people (63.3%) and in multipara as many as 11 people (36.7%).

Proverawati (2010) states that the number of births ever experienced mothers provide experience in breastfeeding, and to know how to increase milk production so there is no problem for

the mother in breastfeeding[15]. Mothers who give birth for the first time and mothers who give birth more than twice often have problems in giving breast milk[16]. The more children born will affect the productivity of breast milk, because it is closely related to the health status of the mother and fatigue and nutritional intake. Parity is thought to have something to do with finding information in breastfeeding. This is related to the influence of one's own and other people's experiences[17], that the mother's experience influences the care of the child and also influences the knowledge about breastfeeding [18], [19].

Mothers who gave birth to their second child and rivals had more milk production compared to the birth of the first child [13]. While Loyalady (2005) stated that multiparous mothers showed more milk production compared to primipara on the fourth day of postpartum [14].

Mothers who have one child have more time to come to a health facility where their health facilities have the opportunity to obtain information related to breastfeeding practices that are good and right[20]. The number of children has not been able to guarantee the implementation of exclusive breastfeeding, because in addition to IMD, admission and other supporting variables, support from health workers plays a very important role through well-scheduled health education, so that respondents are able to know exactly the benefits of breastfeeding [19], [21].

### 2. Univariate Analysis

From the analysis of table 4.1 above it can be seen that from 30 respondents, before being given the technique of guinea pigs, respondents who experienced smooth ASI expenditure were less than 19 respondents (63.3%), ASI was enough as many as 11 respondents (36.7%) and ASI many did not exist.

According to the results of research conducted by Hamidah in 2016 at PKU Muhammadiyah Gamping Hospital, marmet technique can help reflexes milk by massaging, cells and ducts producing milk during circular movements similar to movements used in breast examinations[8].

In this study, when after being given the technique of guinea pigs, there were 6 respondents who still experienced a smooth flow of breast milk which was categorized as less. This possibility may occur because it is influenced by several factors, namely age, the average age of 6 respondents is in the range of 19-25 years and has just given birth to the first child. The smoothness of breast milk expenditure is also very dependent on psychology, with such age there may be some mothers who are not yet confident to breastfeed their babies as well as limited experience because they have just given birth to their first child and the next factor is there are some mothers who are less cooperative in trying and learning new things. given by researchers or health workers.

### 3. Bivariate Analysis

Bivariate analysis was performed to identify the relationship between the two variables. In this study there are 2 groups of paired data, ordinal scale but the data are not normally distributed so as to see the smoothness of ASI expenditure before and after the marmet technique was given to the paired groups (pre and post) using the Wilcoxon Test[11].

Based on the results of research that has been done in 3 BPM Palembang, namely Husniati, Chirul Mala Husin and Rachmi, the results of the influence of marmet technique on the smoothness of ASI expenditure in post-partum mothers. Based on table 4.3 above of 30 respondents, before being given treatment technique Marmet who have fluency spending ASI less as many as 19 people, after being given treatment technique Marmet respondents breastfed less to 6 people, respondents with enough milk as many as 12 people and respondents with ASI much is 1 person. Marmet technique before being given treatment that has the smooth spending enough milk that is 11 people, after being given treatment Marmet technique of respondents with less breast milk is not available, respondents with enough milk 3 people and respondents with ASI many are 8 people.

Based on the Wilcoxon statistical test, the  $p$  value is 0,000 and because the  $p$  value is  $0,000 < \alpha$  (0.05) which means that there are differences in the smoothness of ASI expenditure before and after the marmet technique in post partum mothers at BPM Palembang.

The results of the study are also in line with research conducted by Ilyas (2015) entitled The Effect of Marmet Technique on the signs of ASI adequacy in post Caesarean section mothers in Moewardi Hospital Surakarta, based on his research there were

changes in the signs of ASI adequacy in the intervention and control groups before and after treatment was given with  $\text{sig} = 0,000$  ( $p < 0.005$ ). There were differences in the signs of adequate milk in the control and intervention groups after being given a marmet technique with  $\text{sig} = 0,000$ [22].

Based on theory, research, and related research, investigators believe that the smooth spending ASI is a very complex interaction between mechanical stimuli, nerves and hormones and exerts Marmet technique can improve these three things. From the results of this study it was found that there was an influence on the smoothness of breast milk expenditure before and after the technique of marmet in post-partum mothers in BPM of Palembang city

## VII. CONCLUSION

Based on the results of research and discussion it can be concluded that there are significant before and after Marmet technique for the smooth expenditure on maternal breastfeeding postpartum in Husniati BPM, BPM and BPM Choirul Mala HusinRachmi Palembang.

## VIII. SUGGESTION

### 1. For researchers

By doing this research, it can increase insight, knowledge and research experience in applying the knowledge that has been obtained in educational institutions and is expected to be an alternative to increase the success of mothers in providing exclusive breastfeeding to their babies and as a final assignment requirements to obtain a Bachelor of Applied Midwifery degree.

### 2. For Respondents

It is expected to be able to add insight, knowledge, and be able to perform marmet techniques independently, also to facilitate

breastfeeding mothers must supplement it with good nutrition, adequate rest and apply a healthy lifestyle.

### 3. For Research Sites

The results of this study are expected to be information as well as a facilitator and motivator in health education for mothers that Exclusive breastfeeding is very important for the health of mothers and babies and this marmet technique can be applied to assist the smooth process of breastfeeding in postpartum mothers.

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# Power Analysis Received, Storage, Nutrition Content, Organoleptic Test and Jingga and Green Processing Processes For Balanced Nutrition Food 2018

1<sup>st</sup> Rohanta Siregar  
*Nutrition Department*  
*Politeknik Kesehatan Kemenkes Palembang*  
 Palembang, Indonesia  
 Email: rohantasiregar@poltekkespalembang.ac.id

2<sup>nd</sup> M. Yusuf  
*Nutrition Department*  
*Politeknik Kesehatan Kemenkes Palembang*  
 Palembang, Indonesia  
 Email: myusuf@poltekkespalembang.ac.id

3<sup>rd</sup> Susyani  
*Nutrition Department*  
*Politeknik Kesehatan Kemenkes Palembang*  
 Palembang, Indonesia  
 Email: susyani@poltekkespalembang.ac.id

Corresponding author: rohantasiregar@poltekkespalembang.ac.id

**Abstract** - Palembang's ethnic food quality in the form of pempek have a good nutritional content that can be increase its nutritional value in terms of the types of nutrients, namely by adding vitamin C, minerals, and fiber (many of which are found in vegetables and fruits) that have not been found in Palembang's ethnic Pempek food. The purpose of the research is to find out the acceptability and storage power, nutrient content, organoleptic test and proximate orange pempek and green toward balanced nutritional food. The research method is random sampling. The research activities included the determination of 60 panelists (Students of the Unsri Palembang Nutrition Study Program FKM) and 120 respondents from the academic capacity of the Unsri Palembang FKM nutrition study program, held on 22,23,24 October 2018 and 29,30,31 October 2018. While the analysis with univariate and Bivariate analysis. Univariate analysis was conducted to describe the data collected and grouped and analyzed with frequency distribution table. Bivariate analysis was used with Analysis Kruskal Wallis on the next 5% tarf if the results showed significantly different followed by the Duncans Multi Range Test (DMRT) test with a level of 5%. The result of this test showing that there are difference between

**Keywords:** pempek, carrot juice, spinach juice, nurition.

## I. INTRODUCTION

The food name Pempek was known around the 16th century when Sultan Mahmud Badarudin II triumphed in the Palembang Darussalam Sultanate. 67-year-old Apek (old man) did culinary development from abundant fish catches on the banks of the Musi river. With a mixture of fish formula with tapioca flour compared to 1: 1, be a new food, then sold by the musty around the city and the seller is called by consumers as Pak Pek then finally known as Pempek or Empek-Empek.

Pempek as a Palembang food needs to be carried out stage II culinary development after the first stage is done by musty Chinese descent. Kemas developed a food service mister with a partnership system approach since 2008. This preferred business has grown maximally. The results of stage II development by packing in the form of pempek sausage,

pempek keju. Through the online media website wong kito 19 Palembang ethnic food is also called fish meatball (ngohyang) which is served with a black sauce (cuko). The development of this Palembang ethnic culinary is also present in cuko which is from a spicy taste to sweetness so that it can satisfy / satisfy the appetite of the appetite [1].

According to [2]. pempek is a traditional food product that can be classified as a fish gel, as well as the brain-brain or kamaboko in Japan. The 1980 study showed that the percentage of hotels and restaurants in Palembang that served pempek was around 44.4% - 66.7% [2]. Along with the increasingly widespread acceptance of society, the number of food seller restaurants that are also icons of culinary Palembang City is increasing from time to time. Kompas.com News on September 22, 2008, titled "Palembang Sends 0.5 Tons of Pempek Per Day" Journalistic monitoring seen from the delivery of pempek packages via cargo to the Sultan Mahmud Badaruddin II International Airport in Palembang said that before Lebaran, 50,000 pempek a day before Lebaran out of town.

Save relatively low vegetable content at room temperature. When storing using freezer, its shelf life increases up to about four weeks. Likewise, by adding vacuum (vacuum) technique in the freezer, it can increase the durability of empek-empek up to 40. If more than 40 days of storage of pempek will experience dehydration and oxidation of the air entering the pempek. So that the appearance of Pempek becomes yellow, the texture is darker and harder.

Another way to extend the shelf life is to drain the water attached to the surface of the pempek with a sterile singap pempek technique that is completely dry and clean.

Palembang's ethnic food quality in the form of pempek is seen from nutritional value according to the organization's website [3]. that has good nutritional value in the form of energy of 182 kcal, 9.2 grams of protein, 27.8 grams of carbohydrates, 3.8 grams of fat, 401 calcium mg, phosphorus 116 mg, and iron 2.4 mg. In addition, Pempek contains 13 IU of vitamin A, 0.16 mg of vitamin B1 and 0 mg of vitamin C (eight kinds of nutrient sources) [4].

The quality of Palembang food pempek should be done by adding food ingredients from vegetables that contain important minerals such as vitamin B2, vitamin B6, vitamin C, vitamin Fe, zinc and

fiber foods. With the addition of carrot juice and spinach juice, it can be filled with other nutrients needed by the body. This shows that vitamin, mineral and fiber fortification in pempek food from carrot and spinach extracts shows that this supports the GERMAS program to promote a campaign to eat vegetables and fruits every day. This is important because 93.5% of Indonesians consume less vegetables and fruits. The 2013 Department of Agriculture's R & D data showed that fruit consumption was 34.55 kilograms per year and 40, 35 kilograms per hectare per year. This figure is far from the recommendations of the United Nations Food and Agriculture Organization, each of which recommends 25 kg per capita per year [5]. "The lack of consumption of vegetables and fruit is one of the causes of soaring non-communicable diseases in Indonesia in recent years," said fruits and vegetables containing vitamins A, C, E, folic acid, zinc, magnesium, potassium, and calcium that the body needs [6]. The proximate test to determine the nutritional content of orange and green pempek to convince the public that the orange pempek and green have been tested for their nutritional content and unit weight so that the nutritional amount can be known if a person consumes orange and green pempek.

The purpose of sensory testing is directly related to the tastes of each person in each region has a tendency to certain tastes. So that the product to be marketed must be tailored to the tastes of the local community. When associated with consumers, the target customer (food service) becomes one of the assessments, for example children or adults. In this case the researcher conducted this test in Nutrition Study Program FKM Unsri on 60 panelists and 120 respondents. The hedonic score has a value of 5 based on the Likert scale namely 5 SS (Strongly agree), 4 S (Agree), 3 RR (Doubtful), 2 TS (Disagree), 1 STS (Strongly disagree). The analysis used to process the favorite hedonic test data is analysis of variance or analysis of variance kruskall wallis if there are significant differences then a duncan further test is performed.

The storage method that is suitable for orange pempek and green is with frozen storage, it will extend the shelf life. Starting from the method of making pempek it must be clean (hygenis and sanitation). According to the Ministry of Health of the Republic of Indonesia, 1999 the basic principles of food and beverage health must pay attention to hygiene and sanitation, namely by using containers. The type of container that is good for freezing orange pempek and green is a special sealed airtight plastic bag. In this bag all the air inside is removed (vacuum) This container is quite effective if the storage of orange and green pempek is carried out with sterile action before storage.

## II. METHODS

### A. Design and Research Methodology

#### 1) Scope of Research

This research was conducted at FKM Nutrition Study Program / FKM Unsri Palembang. The time for September – November 2018. Pempek jingga and green production sites in Talang Putri Plaju Palembang.

#### 2) Preliminary Research

The results of this preliminary test are used as the basis for making the research design, so that in the preliminary test the appropriate formulation is obtained and approaching the formula that is in control.

#### 3) Research Design

This research is an experimental study with a completely randomized design method (CRD) using 5 levels of treatment namely 50 gram carrot juice, 100 gram carrot juice, 50 gram spinach extract, and 100 gram spinach extract. Each treatment was repeated 3 times to obtain 5 experimental units. It will be tested organoleptically by 60 panelists from the Unsri Palembang Nutrition Study Program FKM.

#### 4) Research Implementation

Making carrot and spinach sari is done by sorting carrots which have good quality, are not hollow, and fresh, and spinach used comes from fresh, rootless spinach leaves. Then washed and blended so that you get carrot and spinach extract. This juice is then mixed with the Pempek mixture as follows with the following formulations:

**Table 1. Formulation of Preliminary Tests for Pempek Jingga and Green**

Formula	Material					
	Tapioca flour (kg)	Fish (kg)	Ice water (ml)	salt (g)	carrot juice (g)	spinach juice (g)
A0	1	1	400	50	0	0
A1	1	1	350	50	50	0
A2	1	1	300	50	100	0
A3	1	1	350	50	0	50
A4	1	1	300	50	0	100

A1 and A3 are orange pempek formulas (from carrots) and green (from spinach) as for the A1 form can be pempek lenjer in the first organoleptic test, spinach small egg pempek (A3) while in the next research on the second organoleptic test A3 can be pempek telur small carrot and pempek lenjer from spinach (green). Formula A1 and A3 made from 100 gr carrots extracted 50 cc and 100 gr spinach extracted 50 cc (see table) mixed with fish and flour formula 1 to 1. A2 and A4 are orange pempek formulas (from carrots) and green (from spinach) while the A2 form can be pempek lenjer in the first organoleptic test, spinach small egg pempek (A4) while in the next study on the second organoleptic test A4, can be pempek small egg carrot and pempek lenjer from spinach (green). Formula A2 and A4 are made from 200 gr carrots extracted 100 cc and 200 gr spinach extracted 100 cc (see table) mixed with fish and flour formula 1 to 1.

The mixture is kneaded until smooth (not sticky in the hand or container) and made lenjeran, criticism and other forms that are in accordance with our wishes. Next, lenjeran is boiled for 15 minutes at 1000C until it floats in the cooking water. Pempek then drained for 60 minutes, sliced, and performed organoleptic testing.

From the calculation of nutrient composition by using the orange and green pempek preliminary test formulations, new nutritional values of balanced nutrition were obtained so that every consumer would consume balanced nutrition when consuming orange and green pempek, it was hoped that health would be better.

#### 5) Observation

Observations Organoleptic tests performed were hedonic quality tests and hedonic tests. The hedonic quality test is carried out on the taste, texture, and color of Pempek, and Aroma. While the hedonic test for overall acceptance. The organoleptic test involved somewhat trained panelists as many as 60 students from Unsri Palembang as panelists with the approval of Unsri Palembang's technical clearance.

#### 6) Population and Sample

##### a. Population

The population is all students of the Nutrition Study Program FKM and the Unsri Palembang FKM.

##### b. Sample

$$u = \frac{4pq}{d^2}$$

Lemeshow  
Slovin Formula  
Information :

p = proportion of students given orange and green pempek (8%)

q = 1-p (students not given orange and green pempek) 1-0.08

d = limit of error or absolute precision of 0.05.

Formula Or Called

#### B. Data Collection

##### 1) Data Type Primary

Data which is the result of testing is obtained through direct observation and research activities. The primary data included in this study are organoleptic storage data and added value.

##### 2) Data Collection Instrument

The instrument used to collect the data above is a questionnaire regarding the organoleptic test: the organoleptic tests carried out were proximate test, storage power test and nutrient survey calculation.

##### 3) How to collect data

The way to collect data is to make observations, conduct interviews and fill out questionnaires (attached).

##### 4) Organoleptic Test

The organoleptic test used is the test of preference. Receiving power (preference test) is basically an assessment that the panelists express spontaneous responses or without comparing with a standard sample, in the form of the likes and disadvantages of the material being tested. Preferred test assessments use untrained panelists who act as tools or instruments in giving an assessment of a product or testing the level of preference for using a product.

Panelists are students of the Unsri Palembang Nutrition Study Program FKM not in sick condition, and know the characteristics of Pempek Palembang in order to facilitate the testing process.

From the results of the organoleptic tests of the panelists, if a hedonic test was obtained with a value above the average, it was intended to know whether or not it was pleased with the nature of

the material being tested. This test is generally used to assess the reaction of consumers (respondents) to a material. Therefore respondents should be taken in large numbers.

##### 5) Nutritional Value

- Proximate Test is a method that does not describe the nutrient content in detail, but in the form of an estimated value (Soejono, 1990). How to collect data by laboratory tests to see energy, protein, fat, carbohydrates, water, potassium, calcium, magnesium, phosphorus, vit A, vit. C, B1, B2, B6.
- Nutri survey is a program that allows a nutrition professional to analyze the nutritional content of food and / or food recipes.

##### 6) Storability

The procedure for arranging, storing, maintaining food security in quality and quantity of pempek in place of food using tools, temperature using aluminum foil wrap is equipped with labels and using the FIFO (First In First Out) system.

#### C. Data Analysis

##### 1) Univariate Analysis

Analysis of data by organizing information that has been obtained through interviews and observations, filling in questionnaires from panelists, reading the whole information, making tabulations from panelists, grouping / combining data, making descriptions (Suwardji Edi et al, 2013).

Questionnaire data were analyzed by looking at univariate analysis. This is done to be able to find out how the description of the collected data is then grouped and analyzed with a frequency distribution table (Suwardji Edi et al, 2013).

##### 2) Bivariate Analysis

Data obtained from univariate analysis were continued using Kruskal wallis at the level of 5%. From the results of analysis of variance, if it is significantly different, it is continued with a comparison test of the Duncan Multiple Range Test (DMRT) at the level of 5% using the SPSS computer program application.

Kruskall wallis: The null hypothesis of the Kruskal Wallis test is that data is simple random from the same population so that it has the same expectation of mean and variance.

#### D. Proximate Test

Test laboratory tests on the nutritional content of orange pempek and traditional greens and pempek: energy, protein, fat, carbohydrates, water, potassium (K), calcium (Ca), magnesium (Mg), iron (Fe), phosphorus (P), Vit A, B1, B2, B6, B12, C, D, E.

#### E. Save Power Test

That is pempek quality inspection for storage for 15-30 days at save temperature – 180c and using the FIFO system.

#### F. Nutri Survey

Calculation of nutrient content in formulas A0, A1, A2, A3 and A4 using the 2007 nutrient survey method.

### III. RESULTS AND DISCUSSION

Making carrot and spinach juice and then mixing with plain pempek dough kneaded until smooth (not sticky in the hand or container) this is done twice on September 29 and October 06 2018 to get the orange and green pempek formula which will be used as organoleptic test material (hedonic test) / preference. Next, lenjer / pempek small eggs are boiled for 10 minutes at a temperature of 100

oc until lenjeran floats in the boiled water of Pempek and then sliced. Two pempek sari vegetable formulas were obtained 10% in carrots and spinach and 20% in carrots and spinach from the main ingredients.

With the number of panelists 60 on the 22nd, 23.24 October 2018 and respondents 120 29,30,31 October 2018, research was conducted. From the results of filling in questionnaires to the panelists and respondents, the tabulation for the Kruskal wallis test was carried out with a Free Sample Different K test on interval or ratio data that was not normally distributed or in ordinal data, using the crucifixial wallis test.

The Kruskal Wallis test is omnibus, meaning that it only measures differences or not between all groups. To determine where the difference is, between groups A and B, or between groups B and C, or between groups A and C, a post hoc test or further test is used. Further testing after the crucifixion wallis can use various types. In this case use dunn test because the SPSS version 23 program has been used automatically.

Different test is the comparison of data, in this case compared to 5 types or 5 variables, namely: Taste, Aroma, Color, Texture and preference. So the five variables become dependent variables which are tested for differences between treatment groups. Which one is treated is the type of pempek (pempek formula). K sample means the treatment group is more than 2. In this case there are 5 types of pempek (pempek formula) treatment, 5 types of pempek.

Free samples mean that between one group and another group are samples that are free or different from each other. In this case, for example, members of the type A pempek group differ from members of the Pempek type B group.

Below is the Kruskal Wallis Test to assess differences in each variable bound between 5 types of pempek.

Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Rasa is the same across categories of Pempek.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
2	The distribution of Aroma is the same across categories of Pempek.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
3	The distribution of Warna is the same across categories of Pempek.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
4	The distribution of Tekstur is the same across categories of Pempek.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.
5	The distribution of Kesukaan is the same across categories of Pempek.	Independent-Samples Kruskal-Wallis Test	.000	Reject the null hypothesis.

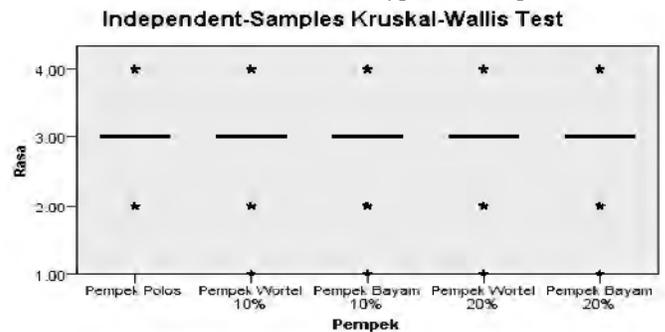
Asymptotic significances are displayed. The significance level is .05

It can be seen from the table above that the value of p value (GIS) of all the kruskal wallis tests is <0.05 so all accept H1 or which means that all vars are bound there are significant differences between the types of pempek. More details are explained below.

A. Taste

To assess the difference in taste using the Kruskal Wallis Test, the hypothesis is first seen, is there a difference in taste between the 5 types of pempek?

The graph below assesses the tendency of selecting answers by each panelist in each group of 5 types of pempek. It appears that most choose answer 3 for taste in 5 types of pempek. But although it tends to be the same, it can still be assessed further whether there are differences in taste between the types of Pempek.



Total N	1.800
Test Statistic	20.026
Degrees of Freedom	4
Asymptotic Sig. (2-sided test)	.000

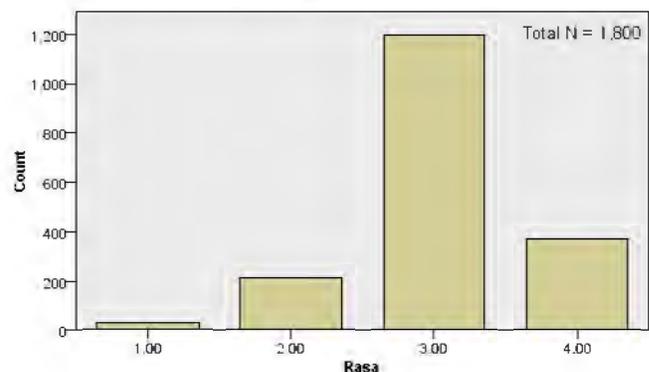
1. The test statistic is adjusted for ties.

1) Are there differences in the taste between the types of pempek? The answer:

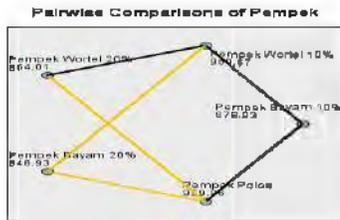
From a total of 1800 observations, the kruskal wallis value counted at 20.026 in the degree of freedom (DF) 4, the p value of the cruciferous wallis test was 0.000 <0.05 so that it accepted H1 or which means that there were significant differences in the types of pempek. To assess where the difference is, then use the dunn test below.

2) The number of panelists who choose answers 1, 2, 3 or 4. Where it appears most of them choose answers 3 and a small number choose answers 1.

Categorical Field Information



From the results of the panelists' magnitude, it still needs to be tested krustall wallis where the differences in the taste of the 5 pempek formulas. From the dunn test the results are as follows:



Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Pempek Bayam 20%-Pempek Wortel 20%	15.079	32.396	.465	.642	1,000
Pempek Bayam 20%-Pempek Bayam 10%	30.004	32.396	.926	.354	1,000
Pempek Bayam 20%-Pempek Wortel 10%	101.736	32.396	3.140	.002	.017
Pempek Bayam 20%-Pempek Polos	111.035	32.396	3.427	.001	.006
Pempek Wortel 20%-Pempek Bayam 10%	14.825	32.396	.461	.645	1,000
Pempek Wortel 20%-Pempek Wortel 10%	85.887	32.396	2.652	.007	.075
Pempek Wortel 20%-Pempek Polos	95.266	32.396	2.962	.003	.031
Pempek Bayam 10%-Pempek Wortel 10%	71.792	32.396	2.214	.027	.269
Pempek Bayam 10%-Pempek Polos	61.031	32.396	1.901	.052	.124
Pempek Wortel 10%-Pempek Polos	4.289	32.396	.132	.774	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided test) are displayed. The significance level is .05.

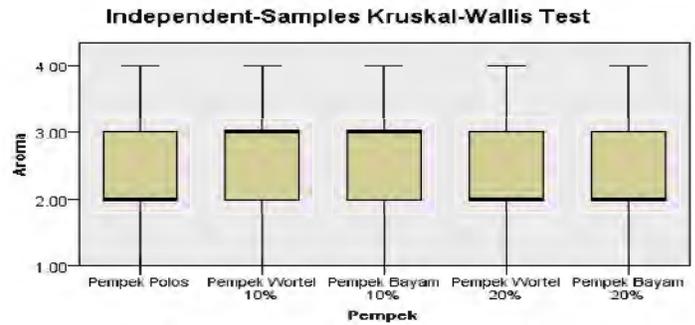
That the p value dunn test is of magnitude <0.05. The difference lies in:

- pempek spinach 20% with pempek carrot 10% (p-value 0.17)
- pempek spinach 20% with plain pempek (p-value 0,6)
- pempek carrot 20% with plain pempek (p-value 0.031).

**B. Aroma**

Wallis's Kruskal test for assessing AROMA differences. First seen the hypothesis is: Are there differences in AROMA between 5 types of pempek?

1) *The graph below assesses the tendency of selecting answers by each panelist in each type of pempek group.* It appears that most choose answers 2 and 3 for AROMA in all types of pempek. But even though it tends to be the same, it can still be assessed further whether there are differences in AROMA between 5 types of pempek.

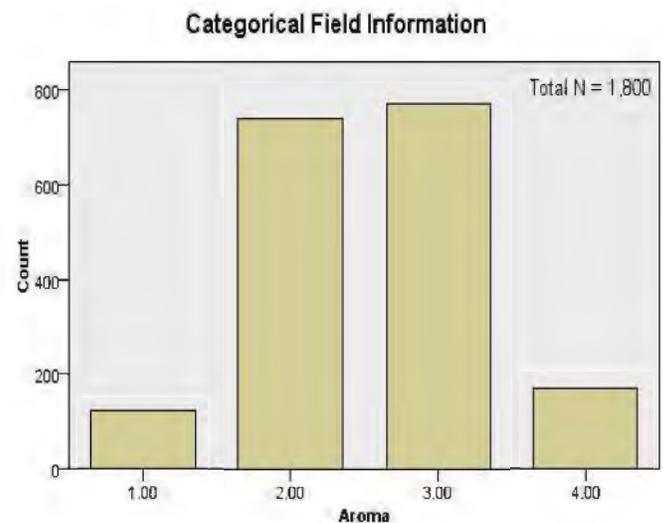


Total N	1,800
Test Statistic	27.355
Degrees of Freedom	4
Asymptotic Sig. (2-sided test)	.000

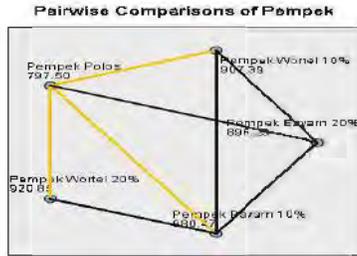
2) *Are there differences in AROMA between types of pempek?*  
The answer:

From a total of 1800 observations, the kruskal wallis value counted 27,355 in the degree of freedom (DF) 4, the p value of the cruciferous wallis test was 0,000 <0,05 so that it accepted H1 or which means there was a significant difference in AROMA between pempek types. To assess where the difference is, then use the dunn test below.

3) *Below shows the amount of panelists who choose answers 1, 2, 3 or 4.* Where it appears most of them choose answers 2 and 3 and a small number choose answers 1 and 4.



4) Tabel dunn test



Each node shows the sample average rank of Pempek.

Sample1	Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Pempek Polos	Pempek Bayam 20%	-98.782	35.751	-2.783	.008	.057
Pempek Polos	Pempek Wortel 10%	-109.890	35.751	-3.074	.002	.021
Pempek Polos	Pempek Wortel 20%	-123.346	35.751	-3.450	.001	.006
Pempek Polos	Pempek Bayam 10%	-182.961	35.751	-5.118	.000	.000
Pempek Bayam 20%	Pempek Wortel 10%	11.108	35.751	.311	.756	1.000
Pempek Bayam 20%	Pempek Wortel 20%	24.554	35.751	.697	.492	1.000
Pempek Bayam 20%	Pempek Bayam 10%	84.179	35.751	2.355	.019	.186
Pempek Wortel 10%	Pempek Wortel 20%	-13.456	35.751	-.376	.707	1.000
Pempek Wortel 10%	Pempek Bayam 10%	-73.071	35.751	-2.044	.041	.410
Pempek Wortel 20%	Pempek Bayam 10%	59.616	35.751	1.667	.095	.954

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

Based on the results of the Dunn test table above, it appears that the p value dunn test which is <0.05 is the difference between:

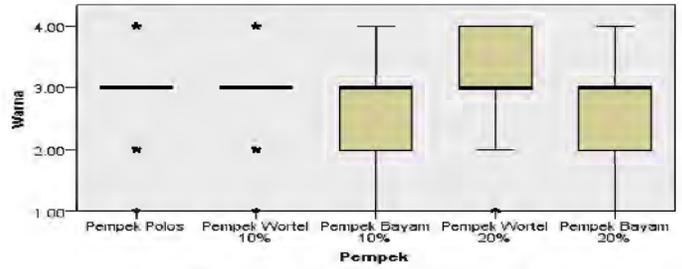
- plain pempek with carrot pempek 10% (0.021)
- plain pempek with carrot pempek 20% (0.06)
- plain pempek with spinach pempek 10% (0,00)

C. Color

Kruskall Wallis Test for assessing COLOR differences. First seen the hypothesis is: Are there different colors between the 5 types of pempek?

- 1) The graph below assesses the tendency of selecting answers by each panelist in each type of pempek group. It appears that most choose answer 3 for COLORS on the type of plain pempek and carrots 10%. While the 10% pempek spinach group and 20% pempek spinach chose 2 and 3. And in the 20% pempek carrot group many chose 3 and 4. To further assess whether there were differences in the color between the pempek types, the crucibal wallis test was used below.

Independent-Samples Kruskal-Wallis Test



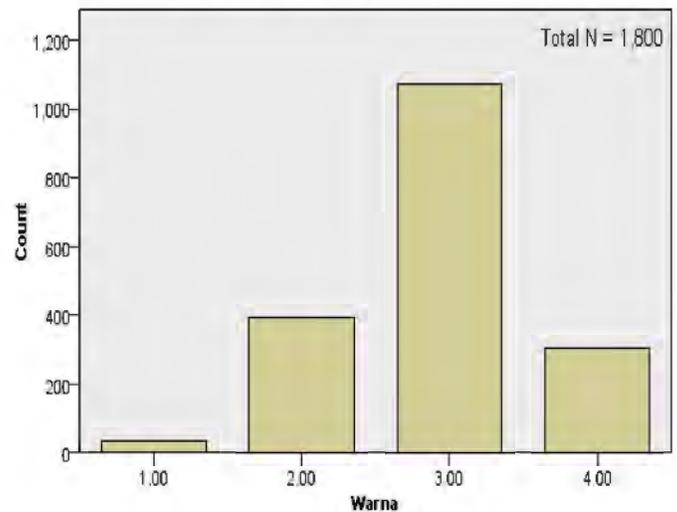
Total N	1.800
Test Statistic	144.701
Degrees of Freedom	4
Asymptotic Sig. (2-sided test)	.000

- 2) Is there a color difference between the types of pempek? The answer:

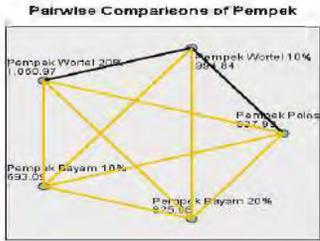
From a total of 1800 observations, the kruskall wallis value counted 144.701 in the degree of freedom (DF) 4, the p value of the cruciferous wallis test was 0,000 <0,05 so that it accepted H1 or which means there was a significant difference in color between pempek types. To assess where the difference is, then use the dunn test below.

- 3) Below shows the size of the panelist who chooses answers 1, 2, 3 or 4. Where it appears most of them choose answer 3 and a small part selects answer 1.

Categorical Field Information



4) Tabel dunn test



Each node shows the sample average rank of Pemppek

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
Pemppek Bayam 10%-Pemppek Bayam 20%	-132.584	34.078	-3.890	.000	.001
Pemppek Bayam 10%-Pemppek Polos	234.840	34.078	6.891	.000	.000
Pemppek Bayam 10%-Pemppek Wortel 10%	-301.748	34.078	-8.855	.000	.000
Pemppek Bayam 10%-Pemppek Wortel 20%	-367.875	34.078	-10.795	.000	.000
Pemppek Bayam 20%-Pemppek Polos	102.276	34.078	3.001	.003	.027
Pemppek Bayam 20%-Pemppek Wortel 10%	169.195	34.078	4.965	.000	.000
Pemppek Bayam 20%-Pemppek Wortel 20%	235.311	34.078	6.905	.000	.000
Pemppek Polos-Pemppek Wortel 10%	-88.908	34.078	-2.612	.050	.496
Pemppek Polos-Pemppek Wortel 20%	-133.035	34.078	-3.904	.000	.001
Pemppek Wortel 10%-Pemppek Wortel 20%	-66.126	34.078	-1.940	.052	.523

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significance (2-sided tests) are displayed. The significance level is .05

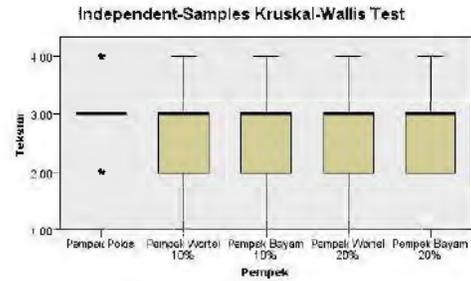
Based on the results of the Dunn test table above, it appears that the p value dunn test with a magnitude of <0.05 is almost all the differences except the difference between pemppek plain with 10% carrot sticks and 10% carrot pemppek with 20% carrot peel namely:

- Pemppek spinach 10% and pemppek spinach 20% (0.001)
- Pemppek spinach 10% and plain pemppek (0,000)
- Pemppek spinach 10% and pemppek carrot 10% (0,000)
- Pemppek spinach 10% and carrot 20% (0,000)
- Pemppek bayam 20% and plain pemppek (0.027)
- Pemppek spinach 20% and pemppek carrot 10% (0,000)
- Pemppek spinach 20% and pemppek carrot 20% (0,000)
- Pemppek plain and pemppek carrot 20% (0.001)

**D. Texture**

Wallis Kruskal Test to assess differences in TEXTURE. First seen the hypothesis is: Are there differences in TEXTURE between the 5 types of pemppek?

1) *The graph below assesses the tendency of selecting answers by each panelist in each type of pemppek group.* It appears that most choose answers 2 and 3 for TEXTURES for all types of pemppek except for the plain pemppek type, most of them choose only 3 answers. To further assess whether there is a difference in TEXTURE between the types of pemppek, the crucial wallis test is used below.

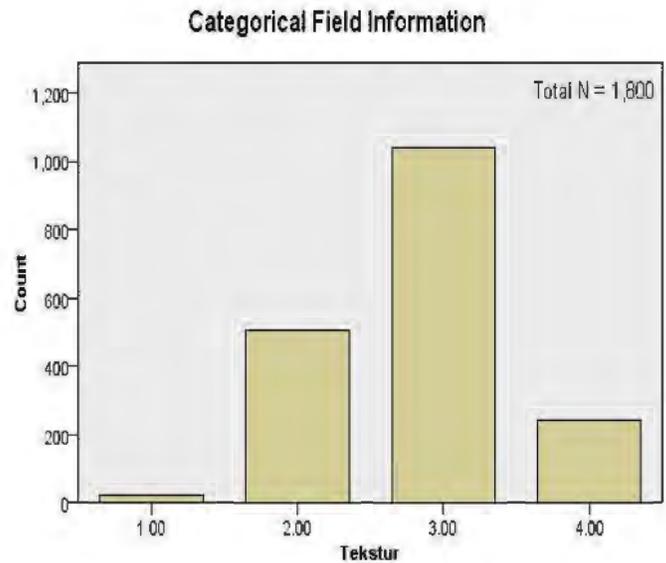


Total N	1,800
Test Statistic	39,488
Degrees of Freedom	4
Asymptotic Sig. (2-sided test)	.000

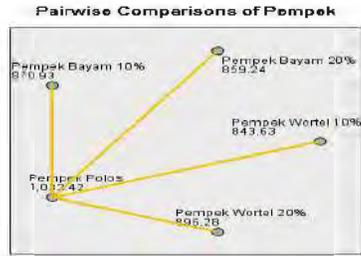
2) *Are there differences in TEXTURE between types of pemppek?*  
The answer:

From a total of 1800 observations, the kruskall wallis value counted 39,488 in the degree of freedom (DF) 4, the p value of the cruciferous wallis test was 0,000 <0,05 so that it accepted H1 or which means that there was a significant difference between the types of pemppek.

3) *Below shows the size of the panelist who chooses answers 1, 2, 3 or 4.* Where it appears most of them choose answer 3 and a small part selects answer 1.



4) *Tabel dunn test*



Each node shows the sample average rank of Pempek.

Sample1-Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj.Sig.
Pempek Wortel 10%-Pempek Bayam 20%	-15.608	34.302	-.456	.649	1.000
Pempek Wortel 10%-Pempek Bayam 10%	-27.393	34.302	-.796	.426	1.000
Pempek Wortel 10%-Pempek Wortel 20%	-52.653	34.302	-1.535	.125	1.000
Pempek Wortel 10%-Pempek Polos	198.786	34.302	5.804	.000	.000
Pempek Bayam 20%-Pempek Bayam 10%	11.697	34.302	.341	.733	1.000
Pempek Bayam 20%-Pempek Wortel 20%	37.047	34.302	1.080	.280	1.000
Pempek Bayam 20%-Pempek Polos	173.181	34.302	5.048	.000	.000
Pempek Bayam 10%-Pempek Wortel 20%	-26.350	34.302	-.769	.460	1.000
Pempek Bayam 10%-Pempek Polos	181.483	34.302	5.290	.000	.000
Pempek Wortel 20%-Pempek Polos	136.133	34.302	3.969	.000	.001

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

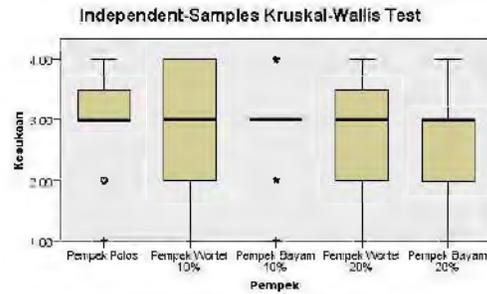
Based on the results of the Dunn test table above, it appears that the p value dunn test which is <0.05 is the difference, among others:

- Pempek carrot 10% with plain pempek (0,000)
- Pempek spinach 20% with plain pempek (0,000)
- 10% pempek spinach with plain pempek (0,000)
- Pempek carrot 20% with plain pempek (0.001)

**E. Success**

Kruskall Wallis Test to assess differences in OCCUPATIONALITY. First of all, the hypothesis is: Are there differences in SUCCESS between 5 types of pempek?

1) The graph below assesses the tendency of selecting answers by each panelist in each type of pempek group. It appears that in the plain pempek, most chose answer 3 for SUCCESS and a small number chose answer 4. Most of the 10% spinach group chose the answer 3. In pempek spinach 20% mostly chose answers 2 and 3. In the 10% portion of the carrot pempek the majority chose answers 2, 3 and 4. While for the carrot pempek 20% mostly chose answers 2 and 3 and a small number chose answer 4. To further assess whether there was a difference in SUCCESS between the types of pempek, the cruciferous wallis test below was used.



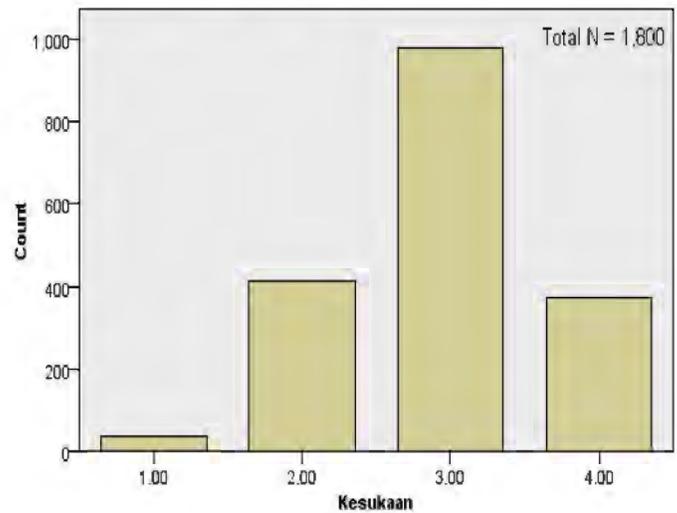
Total N	1,800
Test Statistic	74.433
Degrees of Freedom	4
Asymptotic Sig. (2-sided test)	.000

2) Are there differences in SUCCESS between the types of pempek? The answer:

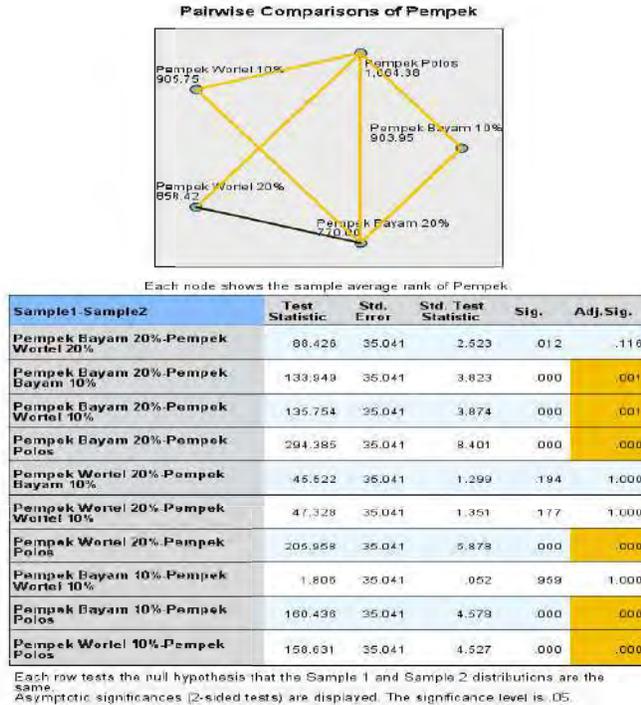
From a total of 1800 observations, the kruskall wallis value counted 74.433 in the degree of freedom (DF) 4, the p value of the cruciferous wallis test was 0,000 <0.05 so that it accepted H1 or which means there was a significant difference between the Pempek types. To assess where the difference is, then use the dunn test below.

3) Below shows the size of the panelist who chooses answers 1, 2, 3 or 4. Where it appears most of them choose answer 3 and a small part selects answer 1.

**Categorical Field Information**



## 4) Tabel dunn test



Based on the results of the Dunn test table above, it appears that the p value dunn test which is  $<0.05$  is the difference, among others:

- Pempek spinach 20% with spinach pempek 10% (0.001)
- pempek spinach 20% with 10% carrot paste (0.001)
- Pempek spinach 20% with plain pempek (0,000)
- Pempek carrot 20% with plain pempek (0,000)
- 10% pempek spinach with plain pempek (0,000)
- Pempek carrot 10% with plain pempek (0,000).

Whereas the value of p-value (GIS) in the crucial wallis test for panelists  $<0.05$  dependent variable had a significant difference (H1) between the types of pempek was taste (0.033), color (0,000) and preference (0,000) can be seen in the attachment of the panelist test results. Whereas the aroma and texture there is no difference between the types of pempek in a specific way (p-value, the crucial wallis test of  $0.421 > 0.05$  means that H0 is accepted).

In the texture of 900 panelist observations, it was obtained that the p-value of the crucial wallis test was  $0.483 > 0.05$  so that H0 was accepted ie there was no significant difference in texture between the types of pempek.

#### IV. CONCLUSION

There are significant difference between the 5 types of pempek including original pempek, pempek with 10% carrot, pempek with 20% carrot, pempek with 10% spinach, and pempek with 20% spinach. The difference are from the taste, color, and preference. Meanwhile, the texture and the aroma has no significant difference.

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# Relationship Of Family Support To Post Stroke Depression Levels In Outpatient Installation

## Dr. Kariadi Semarang

<sup>1st</sup>Saprianto  
Nursing Department  
Politeknik Kesehatan  
Kemenkes Palembang  
Palembang, Indonesia  
saprianto1967@gmail.com

<sup>2nd</sup>Lisa Rizky Amalia  
Nursing Department, Gadjah  
Mada University, Yogyakarta  
Yogyakarta  
email

<sup>3rd</sup>Faridah Aini  
Faculty of Nursing, Ngudi  
Waluyo University, Semarang  
Semarang  
email

<sup>4th</sup>Sukarno  
Faculty of Nursing, Ngudi  
Waluyo University, Semarang  
Semarang  
email

Corresponding author: saprianto1967@gmail.com

**Abstract - Introduction:** After stroke, patients have biological impact such as physical changes, and psychological changes such as post stroke depression (PSD). The impact of a psychological response caused by a loss reaction. Paralysis, stiffness of the limbs, and communication disorders decrease patients in functional ability. As a result, patients become unable to carry out activities independently and will be very dependent on the people around them. The closest people are those who live together with patients or the family. Method: The design of this study was descriptive correlational with a cross sectional design. The sampling technique used quota sampling as many as 60 respondents. The data were collected by questionnaire of respondents characteristics, family support, and Hamilton Depression Rating Scale (HDRS) questionnaire. The data were analyzed by Kendall Tau statistical test. Results: Good family support and no depression as many as 29 respondents (60%), Medium family support with mild depression level as many as 7 respondents (58%). Based on the results of the Kendall Tau test analysis, obtain p-value of 0.025 (<0.05). Conclusion: There is a significant correlation between family support toward post stroke depression levels in outpatient installation of RSUP Dr. Kariadi Semarang. Suggestion: Nurses can provide counseling and health education to families to prevent post stroke depression.

**Keywords:** Family support, post stroke, post stroke depression.

### I. INTRODUCTION

[1]stroke is the third most common disease that causes death in the world. According to the Indonesian Stroke Foundation, the number of stroke sufferers in Indonesia is in the first position as the country with the most strokes in all of Asia. According to [1], Central Java Province is ranked 10th with a stroke incidence rate of 12.3 per 1000 population. Data from the profile of the Central Java Provincial Health Office (2012) noted that the highest cases of stroke were in Semarang City, amounting to 4,516 (17.36%).

Data on stroke patients in Dr. Kariadi Semarang shows that the number of visits for stroke sufferers in 2015 was 1,483 visits, then in 2016 it was 3,105 visits, and in 2017 it referred to 5,901 visits (Medical Record Installation Data of Dr.

Kariadi Hospital Semarang). Some of the changes experienced by stroke patients include physical changes and psychological changes. Physical changes are the result of biological impacts. According to [2], the biological effects of post-stroke patients include paralysis in part of the body, stiffness in certain limbs, and / or communication problems. Meanwhile, psychological changes in stroke patients are due to mood abnormalities, sadness, depression, and self-blame.

According to [3], 54% of 100 stroke sufferers suffer from post-stroke depression (PSD). The impact of a psychological response can be caused by a loss reaction. Physical changes after a stroke make the patient experience a decrease in functional ability. As a result, the patient is unable to carry out activities independently and will be very dependent on the people around him or what is called family.

Other factors that cause post-stroke depression include age, gender, education, occupation, comorbidities, duration of a stroke, functional ability, period of stroke, family support, location of lesions, and size of infarction. Although the incidence of post-stroke depression is high, this complication is still not being considered. Low motivation and hope for a recovery of sufferers and lack of family support have the potential to create burdens and lead to stress.

According to [4], [5], [6] showed that patients with good family support tend to experience milder depression. However, in the same year, Outpatient Installation at Kediri Baptist Hospital got different results, more than 50% of patients with good family support and family support were experiencing the same level of depression. Based on the above phenomena, it can be concluded that there is a gap between theory and some research results. Therefore, researchers are interested in conducting further research on "The Relationship of Family Support to Post Stroke Depression Levels in the Outpatient Installation of Dr. Kariadi Semarang".

### II. METHOD

This type of research used in this research is a descriptive correlation with a cross-sectional approach. The population in this study were post-stroke patients with a diagnosis of non-hemorrhagic stroke who were undergoing outpatient treatment at Dr. Kariadi Semarang as many as 72 people and the sample size was determined

by the Slovin formula. The sampling technique of this research is quota sampling. The measuring instruments in this study were the questionnaire on respondent characteristics, family support, and the Hamilton Depression Rating Scale (HDRS) questionnaire. The hypothesis test used is the Kendall Tau test.

**III. RESULTS AND DISCUSSION**

**A. Univariate analysis**

**1. Family Support**

**Diagram 4.1 Frequency Distribution of Post-Stroke Patient Family Support in Outpatient Installation Dr. Kariadi Semarang**



Based on the results of the study (see diagram 4.1), it was found that the most family support of post-stroke patients was the classification of good family support, namely 48 people (80%) and moderate family support of 12 people (20%).

Good family support can be seen from the fulfillment of the four dimensions of family support, namely emotional support, instrumental support, informational support, and assessment support. Medium family support must meet at least 2-3 dimensions of family support. Meanwhile, less family support must fulfill 1 or less than 1 dimension of family support.

The most support received by patients is emotional support. Emotional support is a form of support where the family is a safe and peaceful recovery place to rest and helps psychologically stabilize emotions and control oneself. Family support, especially emotional support, will indirectly provide strength to a person [7].

The next most support is instrumental support at 24%. The instrumental support most patients feel is that the family plays an active role in every treatment and care of the patient's illness, finances the cost of treatment and medication, and the family is ready to help in carrying out daily activities.

Assessment support is the third most felt support for patients with good family support, with a percentage of 23%. According to [7] assessment support is support in the form of positive assessments, reinforcement (justification) for doing something, feedback, or showing comparisons that open up insight into someone who is sick.

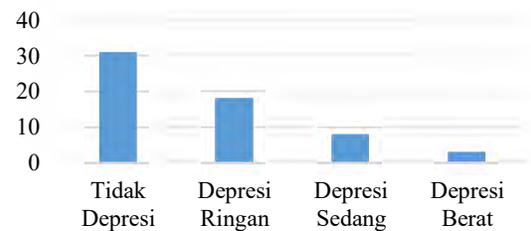
The lowest family support received by patients with good family support was informational support, namely 22.75%. Informational support that can be provided includes families seeking information on how to care for patients such as providing medical needs. According to [8], providing sufficient information allows patients to know about their disease so that they are motivated to carry out the treatment.

The results of this study are in line with the results of research [9] which states that someone with high family

support will be more successful in dealing with and overcoming problems than those without family support. According to Sit, Wong, Clinton, Li, and Fong, it is shown that family support for post-stroke patients can improve their ability to be better and with family support, psychosocial health status of post-stroke patients will improve.

**2. Post Stroke Depression**

**Diagram 4.2 Frequency Distribution of Post Stroke Depression Characteristics in the Outpatient Installation of Dr. Kariadi Semarang**



Based on the results of the study, it was found that there were 31 post-stroke patients (51.7%) who did not experience depression, while 29 patients (48.3%) had mild to severe depression. Patients are said to be not depressed if the HDRS questionnaire score is less than 17. In this study, depression is divided into three classifications, namely mild depression, moderate depression, and major depression.

According to the results of the study, it was found that 31 post-stroke patients did not experience depression (51.7%). Based on the results of the questionnaire, patients who are not depressed still experience several signs of depression, including feelings of sadness, feelings of guilt, and feelings of helplessness. This study did not find that early elderly age (46-55 years) was one of the causes of depression, but this study found that patients with late elderly age (56-65 years) had an increased risk of depression by 56.5%.

This study found that as many as 54.8% of male patients did not experience post-stroke depression. This focuses on the study [10] which states that the severity of depression in men depends more on the presence of physical disabilities because men are more concerned about work disability. Changing roles and decreasing social interactions and job losses can make men vulnerable to mental problems including depression.

Based on the results of the study, the period of stroke most of the patients was a stroke in the first attack, namely 51 people (86.4%). This study found that patients with first attack stroke and second attack stroke did not have a significant comparison in the incidence of depression. Also, this study found that 18 patients had mild depression (30%).

Increasing age is assumed to decrease the body's ability to adapt to environmental stress. changes in physical function, cognitive to psychosocial changes that will facilitate depression in the elderly.

This study found that 66.7% of patients with mild depression were patients whose lesions were located in the right hemisphere. In fact, according to several research articles, it was found that left hemisphere lesions were often associated with depression. This is because the lesions in the left hemisphere cause paralysis and motor

weakness of the right side of the body. While the majority of humans perform dominant activities with the right side of the body.

Based on the results of the study, it was found that patients who experienced severe depression were 2 female patients (66.7%). Other findings for a milder level of depression found more male patients. The severity of depression in women depends on hormonal stability, the effects of birth, psychosocial stress, and the behavioral model of hopelessness being studied.

This study found that major depression patients were patients with a late college education. Individual characteristic factors do not stand alone to produce post-stroke depression but these factors integrate with physical, mental, and social factors.

## B. Bivariate Analysis Result

### The Relationship between Family Support and Post Stroke Depression Levels in the Outpatient Installation of Dr. Kariadi Semarang

Family Support	Post-Stroke Depression					Total	r count	P value
	Non Depression	Mild Depression	Moderate Depression	Major Depression				
Good Family Support	F	29	10	7	2	48	0.255	0,025
	%	60.4%	20.8%	14.6%	4.2%	100%		
Moderate Family Support	F	2	8	1	1	12	0.255	0,025
	%	16.6%	66.8%	8.3%	8.3%	100%		
Total	F	31	18	8	3	60		
	%	77%	87.6%	22.9%	12.5%	100%		

Based on the results of the Kendall tau test, it is found that the tau correlation test is 0.255 with a p-value of 0.025 ( $\alpha = 0.05$ ), it can be concluded that there is a significant relationship between family support and the level of post-stroke depression in the Dr. Kariadi Semarang. This study found that out of 60 respondents, 29 people (60.4%) had good family support and did not experience depression. Meanwhile, 8 patients with family support experienced mild depression (66.8%).

According [11], family support is increasingly needed when someone is facing problems or illness, this is where the role of family members is needed to go through difficult times quickly. This is related to the weakening of the body after a stroke, especially at the beginning of the disease. According to [12] family support refers to the assistance that individuals receive from other people or groups around which make the recipient feel comfortable, loved, and appreciated and can have a positive effect on him/her [13].

This study found that patients with major depression are female and elderly patients. According [14], elderly women experience depression more quickly because the hormones in women are more volatile or cause depression and for recovery, it is also the slowest because women use feelings in dealing with any problems, both from their family and from themselves. According [15], the family plays a supportive role during the healing and recovery

period. The support provided by his extended family is not the same as one another. According to [11],[16] to understand the source of post-stroke depression, we must see this depression as an integration of several factors, both individual, physical, mental, and social factors, with analysis on a larger baseline.

## IV. CONCLUSION

Based on the results of the research and the results of the discussion above, it can be concluded that there is a significant relationship between family support and the level of post-stroke depression in outpatients at Dr. Kariadi Semarang with statistical test results using Kendall Tau obtained p-value 0.025 ( $\alpha = 0.05$ ). The tau correlation value is 0.255 and the direction of the positive relationship means that the less family support, the higher the level of post-stroke depression.

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# Digital Devide : An Analysis of the Socio-Economic Impact of Extended Internet Access to University Students During The COVID-19 Lockdown (A Case Study Of Yogyakarta State University

A N Ogbolu

Department of Economics Education, Faculty of Economics, Yogyakarta State University  
Yogyakarta, Indonesia  
anthonymnamdi.2018@student.uny.ac.id

Endang

Department of Economics Education, Faculty of Economics, School of Postgraduate Studies, Yogyakarta State University, Jl. Colombo No.1 Yogyakarta 55281, Indonesia

Corresponding author: anthonymnamdi.2018@student.uny.ac.id

**Abstract.** Across the globe, it has been reported that only a little over fifty percent of total households have internet connection. This situation is now being highlighted by the recent outbreak of the SARS CoV – 2 Coronavirus (COVID -19) which has sent the World's economy into a downward spiral. Its negative impact on education has seen schools and related businesses shut, while students are now compelled to study from the confines of their homes, many of whom do not have access to the internet. This study examines the socio-economic impact of the extended [free home-based] internet access provided by Yogyakarta State University, to her students during the COVID -19 lockdown. Convenience and snow-balling sampling techniques were used respectively in this study. Data was collected with the aid of an online questionnaire and descriptive statistics was employed in analyzing the data. The result confirms that the extended internet access provided to students during the COVID -19 lockdown was successful and had a positive impact on the socio-economic lives of the students. The findings from this study will be beneficial to all relevant educational institutions and authorities that may wish to implement similar projects in the future especially amidst a pandemic.

**Keywords:** Online learning; COVID -19; Internet Usage; Online Education; Coronavirus; Yogyakarta State University

## I. INTRODUCTION

As the SARS CoV – 2 Coronavirus (COVID -19) pandemic ravaged the world, various governments and companies responded to the evolving pandemic with the cancellations of public events and closure of offices, religious houses, educational institutions with the aim to curb the spread of the highly contagious pneumonia-like disease. This situation birthed the new slogan that seems to be on everyone lips including the elites “Work from home, Learn from home & Worship at home”. Among education communities, students are now compelled to study from the confines of their homes

via online learning, revitalizing the all important role of information technology (Internet) in education and the new knowledge economy.

In Indonesia, when the first two COVID-19 cases were reported in early March, the country quickly went into a panic state driving many educational, economic and social activities online. This positioned the internet as a crucial resource while simultaneously exacerbating the economic and social ruins of the household that cannot afford the internet or are cut off from the contemporary knowledge-based society. Information has been described as the lifeblood of the new knowledge economy [1]. The Internet which is a global network of computers over large distances has become an enormous part of people's daily lives [2]. Created by the United States of America's Military as a means of communication in the 1950s [3], and introduced to academic institutions as a tool to enhance students' academic experience in the mid 1990s [4], it has become a vital resource within academic communities especially at the higher levels of education. This wireless technology brought about the benefit of mobility into traditional educational activities [5], making it easier for students to obtain several amounts of up-to-date information quickly and effectively [6]. The Internet apart from being a tool for communication, now also serves as a tool for social interaction, education, business and many other purposes [6].

Generally, Information Communication Technology (ICT) enhances the way people think, live and interact with their environment. However, in most developing countries, ICT accessibility is only on a very limited scale, and this raises doubts about these countries' ability to participate in the potentials and benefits of a contemporary knowledge-based society [7]. This concern would even be made pronounced in the educational sectors of these developing nations especially during a pandemic like the COVID 19, as the model of online learning seems to be a more suitable alternative to keeping educational institutions open, posing health and safety risk for students and other educational staff alike. For students with access to the internet, information is readily available and can

be accessed easily and quickly via the Internet, anywhere and anytime however this does come at a cost.

Today, the world is approaching a tipping point where an inability to access to internet is likely to put a student at a competitive disadvantage and increases the educational gap between the have and have-nots, a situation which has been describe as the 'digital divide'. The term 'digital divide' was introduced in the 1990s and defined as the gap separating those who have access to new forms of information technology from those who do not [8]. This divide seems to be applicable in various fields and is potentially irreversible [9]. For this study, we align with [10], who uses the term 'digital divide' to describe situations in which there is a marked gap in access to or use of ICT devices measurable by the number of phone lines per inhabitant, the number of Internet users, or of mobile telephones in a particular population. The OECD [11], recognizes the digital divide and refers to it as the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regards to their opportunity to access information and communication technologies (ICTs) and their use of the Internet for a wide variety of activities. In this contemporary knowledge-based society, Internet access inequalities can indeed be considered an economic and social handicap. It is rather dishearten to find that some students do not have access to reliable internet at home, hence robbing them of a meaningful students' collegiate experience. These students' ability to seek information, conduct research, and other activities are limited. The digital divide has remained an important public policy debate, encompassing social, economic and political issues [8].

In Yogyakarta State University, the impact of Information technology has been greatly felt both in the classroom and on campus. From the availability of course materials online to large ranges of academic resources being at students finger tips. With recent happenings, students are not permitted or allowed to go to campuses during the COVID-19 imposed lockdowns, and are forced to adopt the alternative of moving to full online education from the traditional method. Some researchers have stressed the fact that essential aspects for online education such as internet coverage, availability of computers and smartphones among the students population need to be considered [12]. With the COVID-19 induced lockdowns where students are forced to study from home, it becomes quite a challenge to get reliable and affordable internet service given the dwindling financial fortunes of some households resulting from the massive job cuts, and cost reduction measures been carried out by some business enterprises in a bid to survive the economic crunch brought on by COVID- 19 pandemic. Although some educational Institutions across the globe are aiding and actively helping students transition smoothly to full online learning while also providing safety nets, students have reported several challenges, generally pertaining to personal stressors, technological, and pedagogical and learning issues [13].

### *1.1. Objective and Significance of study*

With the various programs being carried out by Yogyakarta State University to mitigate the effects this COVID- 19 pandemic, little or no study has been done to

evaluate the impact of these programs. This study is intended contribute in filling this gap in literature by evaluating students' satisfaction level with the free home-based internet access provided by Yogyakarta State University and how such program impacted on their social and economic lives during the COVID-19 induced lockdowns. The findings from this study will support education administrators at various levels of governance in public and private educational institutions, in formulating, developing, and implementing sustainable, adaptive, coherent, effective and equitable response measures to rapidly evolving crisis situations that could pose significant disruption to educational systems and opportunities at both national and international level.

### *Literature Review*

The COVID -19 pandemic is a rapidly evolving global health crisis and has caused governments world over to impose travel restrictions, quarantines, along with other stay at home measures. In developed economics like the US, a survey by the Pew Research Center conducted in April reported that more than half of U.S. adults (53%) agreed that the internet has been vital for them personally during the COVID 19 pandemic lockdowns [14]. This situation has rekindled debates about the digital divide, stressing that it may hinder individual's ability to complete everyday tasks including schoolwork [15]. An EDUCAUSE QuickPoll on 1st of April, 2020 that received responses from 267 higher education institutions found that the COVID-19 pandemic has greatly distorted higher education activities in the year 2020 and institutions are relying largely on digital alternatives to carry out operations [13].

#### *1.1. Internet Access and Students' Difficulties Transiting To Online Education*

Student's access to the Internet especially during pandemic scenarios is fundamental to achieving the vision for their future [16], and Institutions are now pursuing several tactics to help students transition smoothly to full remote access at the least possible cost, however this process has remained somewhat difficult [13]. In a survey by [13], 36% of institutions surveyed reported that their students were having moderate or extreme difficulty getting the internet bandwidth they need to continue their academic work while access to equipment or devices was next at 26%. A report from World Economic Forum [15], also revealed that as schools and office work transitioned online during the COVID-19 lockdown, billions of people are at a disadvantage due to lack of internet access. The 2019 State of Broadband report [17], put the global figure of households with an internet connection at just 54.8%. Unfortunately, the low -income countries seem to be hard hit with only 19% of households being connected when compared to 87% in developed countries [18]. Summarily these findings are worrisome, as the digital divide is almost at a 50-50% level among the world's population.

#### *1.2. Internet Access and Socio-Economic Development*

Information and communication technologies (ICTs), has been identified as a key potential factor for economic growth and social development [8]. The digital revolution that brought about Innovations such as the social media and online

marketplaces as well as the convergence of these innovations with virtually all existing human activity have permeated society and impacted on productivity, economic growth and business creation [19]. The internet stirs economic activities and facilitates provision and access to fundamental services. Although the Information and communication technologies (ICTs) has transformed the lives of many, a large portion of the world population still misses out on the tremendous political, social, economic, educational, and career opportunities created by the digital revolution due to the digital divide [1].

Amidst the several inequalities exposed by COVID-19 globally, the digital divide turns out to be the most pronounced [15]. In the OECD countries, various policies and programmes are been initiated to bridge the digital divide [11], among which include, pushing policies to make it easier for low-income households with school-age children to have broadband, while stressing that low-income students are at a disadvantage without online access to the internet [20]. With the COVID-19 lockdowns, the world has seen diminished economic activities and the hardest hit remains the most vulnerable populations such as students and low-income households [21], exacerbating these population's economic and social ruins.

### 1.3. Internet Access and Yogyakarta State University

Yogyakarta State University is ranked among top Indonesia Universities with all the necessary amenities, infrastructure and quality teaching services desirable by students, among which include on -campus wireless connectivity, aimed at furnishing students with a meaningful learning experience. In April, during the COVID -19 pandemic lockdowns and in order to facilitate students transition to fully online learning, Yogyakarta State University in collaboration with other relevant stakeholders offered monthly free internet packet directly to each student dedicated phone line usable from the confines of their home [22];[23]. This was with the intention to make the socio-economic life easier for students, lecturers, as well as parents who were experiencing various forms of challenges brought about by the COVID-19 pandemic.

## II. RESEARCH METHODOLOGY

This study was administered at Yogyakarta State University, Indonesia. The respondents comprise of undergraduates and graduate students across the various faculties of the University. Convenience and snow-balling sampling techniques were used respectively in this study. Data was collected with the aid of an online questionnaire sent to various students groups consecutively for two days and descriptive statistics was employed in analyzing the data. A total of thirty-eight questionnaires were completed. The demographic information of the study respondents are presented in Table 1 below.

**Table 1: Demographic Information of Study Respondents**

Parameter	Freq.
<b>Education Level</b>	
Bachelors	5
Masters	32
Doctorate	1
<b>Age</b>	
Below 18	0
18 - 22	3
23 - 27	24
Above 27	11
<b>Gender</b>	
Male	20
Female	18
<b>Marital Status</b>	
Single	31
Married	6
Divorced	1
<b>Religion</b>	
Islam	35
Christianity	2
Others	1
<b>Faculty</b>	
Language & Arts	2
Economics	10
Sport Science	1
Education	8
Social Sciences	5
Math & Natural Sci.	6
Engineering	6
<b>Nationality</b>	
Indonesian	28
Foreign	10

Total number of respondents is 38.

## III. RESULT AND DISCUSSION

Findings from this study show that the students of Yogyakarta State University are satisfied with the provision of the free internet packet by the University during the COVID-19 lockdown and the program positively impacted on their social and economic lives. The program was both timely and relevant especially as there has been a global call for education administrators to take the necessary steps to develop and implement strategies and programs that mitigate the adverse disruptions in the educational sector brought about by the COVID-19 Pandemic [21].

From this study, it was revealed that 76% of the respondents had signed up for the free Internet Packet and that they are satisfied with such provision. However, of the remaining 24% that did not sign up, 13% said that they were unaware of the program, 10% said they were not interested and 8% failed to mention a reason. While exactly half (50%) of the of respondents found the free internet packet to be helpful towards the continuation of their academics, 65% found it also helpful in the completion of other non- academic tasks such as seeking general purpose information, keeping up

with the news, and friends & family. In the same vein, 65% reported that they share the free Internet data packet with family and friends for various purposes. On the devastating effects of the COVID-19 Pandemic on the source of livelihood, 84% of the respondents reported that the COVID-19 Pandemic has negatively affected the source of livelihood of their friends and family members while 69% reported having the same experience personally.

Notably, this study has its limitations. Generalization of the results to the population should be done with caution due to the small sample size and the sampling techniques adopted therein.

#### IV. CONCLUSION

As educational activities transition fully to online medium, internet access has become a key resource however not every student is opportune to have such resource due to the ever present and growing digital divide. For internet access to be meaningful and fulfill its role of closing the educational opportunity gap during this COVID-19 lockdown, it must be reliable and affordable for students. The extended internet access provided to students by Yogyakarta State University during the COVID -19 lockdowns was successful and had a positive impact on the socio-economic lives of her students. The free internet packet program by Yogyakarta State University is not only making her students study smoothly during the Covid-19 lockdown, but by extension making the world a better place by ensuring inclusive and equitable quality education and learning opportunities for all irrespective of their economic and social background.

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# Plasma Absorbance As The Baseline: A Simple Method For Correcting The Results Of Blood Glucose Level On Hemolyzed Specimens

James Perdinan S  
 Medical Laboratory Technology Department  
 Health Polytechnic of Ministry of Health in Jambi  
 Jambi, Indonesia  
 james.p.simanjuntak@poltekkesjambi.ac.id

Tamrin  
 Medical Laboratory Technology Department  
 Health Polytechnic of Ministry of Health in Jambi  
 Jambi, Indonesia

Siti Sakdiah  
 Medical Laboratory Technology Department  
 Health Polytechnic of Ministry of Health in Jambi  
 Jambi, Indonesia

Dyah Eriska Pratiwi  
 Medical Laboratory Technology Department  
 Health Polytechnic of Ministry of Health in Jambi  
 Jambi, Indonesia

Corresponding author: james.p.simanjuntak@poltekkesjambi.ac.id

**Abstract.** Hemolysis on laboratory specimens can be caused by many factors, in vivo, and in vitro. Increased levels of free hemoglobin in the serum specimen can influence the measurement results of the various test. Hemolysis is often difficult to detect properly. Even for serum specimens that appear to be hemolyzed, the laboratory does not have a good protocol to avoid errors. This study aims to develop a simple approach that can be carried out in correcting the measured results of laboratory assays. A correction by calculating the plasma absorbance was applied to blood glucose results from hemolyzed specimens. The correction results were then compared with the levels from the same specimens that not hemolyzed. This study was carried out using the experimental method on blood specimens collected from 15 volunteers. Specimens were treated mechanically to produce some specific hemolysates by forced suppressing the blood through a syringe with 23G needle, in 0 to 6 times. In addition to measuring glucose levels, absorbance measurements were also carried out for each specimen diluted in a buffer solution to calculate the increase in light absorbance as the plasma absorbance. All measured data were analyzed using the Repeated Measure ANOVA. In this study, the increase in average levels was occurred according to the frequency of treatment given. The differences in the increasing results of each treatment before being corrected were statistically significant ( $p < 0.01$ ). However, after the measurement baseline was corrected by plasma absorbance, then the difference in all results turned out to be insignificant. ( $p > 0.05$ ). It can be concluded that the increase in light absorption due to free hemoglobin concentration is the cause of increased results from each hemolysate. However, the measurement of plasma absorbance has been proven as an appropriate procedure for

correcting the result of glucose level from hemolyzed specimens before being reported.

**Keywords:** hemolyzed specimens, correction, absorbance, glucose

## I. INTRODUCTION

Proper laboratory diagnosis is very important to get the best results from the examination. Much of the research that has been done in recent years aims to reduce errors in laboratory diagnoses. Diagnostic errors occur in laboratory testing, especially the pre and post-analysis phases, which occur more frequently than errors in the analytic phase. This shows that laboratories need to refocus their efforts on reducing errors in the whole testing process, not just the analytical phase. The research emphasized the importance of focusing on the use of appropriate tests and the interpretation of accurate results to reduce the risk of diagnostic errors related to the laboratory as an effort to improve patient care <sup>(1,2)</sup>.

Good specimen collection and processing techniques have been emphasized on laboratory staff to reduce errors in the pre-analytic stage. At present in accurate collection of specimens has been significantly reduced. However, the most recent data about errors in the pre-analytic phase, especially in the initial procedures that are partly not done in clinical laboratories, such as in the emergency department, or not under the control of laboratory staff. The data also shows an error in requesting the appropriate test parameters and the inadequacy of the specimen sent to the laboratory, such as hemolysis, due to inadequate specimen collection techniques <sup>(2,3)</sup>. In the post-analytic phase, the most common mistakes are excessive turn around times, errors in the result data entry and skipping corrections from incorrect findings.

Incompatible results are often found in laboratory diagnosis at the verification stage. Lack of knowledge and attention from laboratory staff in carrying out confirmation of diagnostic results is still a major problem in the delivery of services <sup>(4)</sup>.

Good specimen collection and processing techniques have been emphasized on laboratory staff to reduce errors in the pre-analytic stage. At present in accurate collection of specimens has been significantly reduced. However, the most recent data about errors in the pre-analytic phase, especially in the initial procedures that are partly not done in clinical laboratories, such as in the emergency department, or not under the control of laboratory staff. The data also shows an error in requesting the appropriate test parameters and the inadequacy of the specimen sent to the laboratory, such as hemolysis, due to inadequate specimen collection techniques <sup>(2,3)</sup>. In the post-analytic phase, the most common mistakes are excessive turn around times, errors in the result data entry and skipping corrections from incorrect findings. Incompatible results are often found in laboratory diagnosis at the verification stage. Lack of knowledge and attention from laboratory staff in carrying out confirmation of diagnostic results is still a major problem in the delivery of services <sup>(4)</sup>.

Hemolysis, as mentioned earlier is often encountered due to improper specimen collection techniques. This condition requires the laboratory to make good specimen selection, even refusing if it does not meet the required criteria. The presence of hemolysate significantly affected LDH and AST at almost undetectable hemolysis by visual inspection (i.e., free hemoglobin in plasma  $<0.5$  g/L). But the condition of hemolysis can also occur in patients with certain diseases such as hemolytic anemia, sickle cells, thalassemia, infectious diseases, and others. This sometimes causes the laboratory to continue to have an examination even though the hemolyzed specimens obtained can cause interference with the determination of the levels of some of the examination parameters <sup>(4,5)</sup>.

Based on research by Lippi Giuseppe, et al. (University study in Verona, Italy, 2006) which shows that the condition of hemolysis causes significant biases in many clinical laboratory test results. However, the differences in test results from hemolyzed specimens are still within acceptable limits in several test parameters, such as in measuring the activity of enzymes that are not contained in red blood cells <sup>(6)</sup>. The mechanism of these includes the release of the contents of intracellular to plasma/serum, increased absorption of light by hemoglobin, as well as the effect of the chemical on the contents in the blood <sup>(7)</sup>.

In metabolite level determinations, especially Trinder reaction-based assays such as glucose, hemolyzed specimens generally show a significant increase caused by the elevate in the rate of light absorption due to the high free hemoglobin content. It seems to be able to remove the effect by taking a separate measurement of the reading of the tested solution to the absorbance value of hemolysate. It is expected to prove that recording the results after considering the plasma absorbance rate of the hemolyzed specimen as a baseline for calculation is an easier, faster, and more precise action to improve examination results.

## II. RESEARCH METHODOLOGY

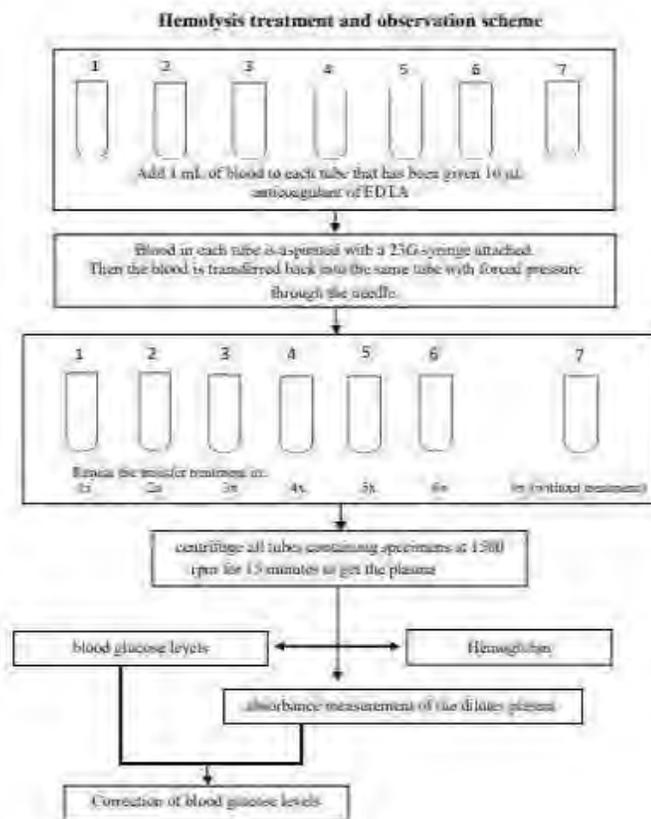
The study was conducted at the Chemical Clinical Laboratory of the Medical Laboratory Technology Department, Health Polytechnic of Ministry of Health in Jambi on August 2019. The examination was carried out on blood samples obtained from 15 healthy participants who were students of the academy. All participants volunteered to be involved in this study and each was asked to sign a consent form before conducting blood collection.

The blood specimens obtained from each participant were divided into 7 tubes, each containing 1 mL. The tubes had previously been added by EDTA anticoagulant in the amount of 1 mg each. The first tube was used as a control plasma, while each blood in the other six tubes was treated with hemolysis by a forced pressure transfer through a 23G syringe needle. The

transfers were performed repeatedly at 1 to 6 times in succession. Plasma separation was carried out by centrifugation at 1500 rpm for 15 minutes. Determination of blood glucose levels is carried out using Glucose Oxidase - Aminoantipyrin Peroxidase (GOD-PAP) method. Absorbance measurements and reading of the results of the measurement carried out photometrically using the Erma AE-600N photometer.

Blood specimens are treated for hemolysis and observed base on the scheme below.

### Hemolysis treatment and observation scheme



#### Determination of blood glucose levels

Insert the working reagent into a tube of 1 mL and add 10  $\mu$ L of plasma fluid from each tube to be observed. Glucose level was measured using AE-600N spectrophotometer at a wavelength of 505 nm by comparing it to the absorbance of glucose standard solution and calculating the absorbance blank reagent. The results of the grade and absorbance values that appear on the monitor screen on the device are well recorded.

#### Determination of Hemoglobin

Add as much as 1 mL of drabkins reagent to each prepared tube. Add the serum that has been treated as much as 100  $\mu$ L, then measure the Hb level with the AE-600N spectrophotometer using the factors present in the tool (determined by a previous calibration curve) at a wavelength of 505 nm. The results obtained are then divided by 10 as a multiple factor of the volume of the specimen that has been applied to get the true value.

#### Measurement of plasma absorbance

Add as much as 1 mL of 0.9% NaCl solution into the tube, then add 50  $\mu$ L of plasma as they are measured. Absorbance was measured using AE-600N spectrophotometer. To get the true value, the absorbance displayed on the device monitor is properly recorded and divided by 5 as a factor of the multiple of the specimen volume that has been applied.

#### Statistic analysis

Data from spectrophotometric measurements were analyzed and presented descriptively in tables and graphs based on the average value of each treatment. The hypothesis was evaluated using a one-way ANOVA Repeated Measure with a significance level of 5% and continued with a comparative test to see the significance of the differences between treatments (DMRT test). Statistical analysis was performed using Minitab 17 software.

### III. RESULTS AND DISCUSSIONS

From the research data that has been obtained, hemolyzed specimens that are not corrected for absorbance in blood samples have an increased impact on blood glucose examination results. However, after examining the plasma absorbance and correcting blood glucose levels using a hemolysis sample, it turns out that there is no significant difference in the results of blood glucose as shown in Table 1. The statistical test used for the design of this study is the one-way test Anova for repeated measure with one type of treatment.

Anova one-way repeated measures test carried out on the results of examination of glucose levels that were not corrected by plasma absorbance showed a very significant difference ( $p < 0.01$ ). This is demonstrated (see Table 1) by a very sharp increase in the average value of specimens with no hemolysis treatment, from 71.7 mg / dL to 87.5 mg / dL of the same specimen after 6 times of repeated treatment. This significant difference has occurred in the first hemolysis treatment (1-time treatment) which is shown from the results of the DMRT test analysis. This also proves that if no absorbance correction is made from

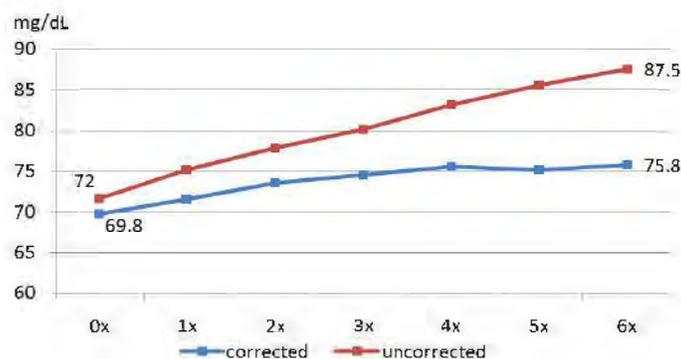
the hemolysis specimen, there is a significant increase in levels.

Table 1. Blood glucose levels of hemolyzed specimens with different treatment variations before and after corrected by plasma absorbance.

Hemolysis treatment	before corrected (mg/dL)		after corrected (mg/dL)	
	Rang e	$\bar{x}$	Ra nge	$\bar{x}$
0 (non-hemolysis)	56. - 93.4	71.7	55,3 - 91,1	69,8
1 time	60. - 94.5	75.2	58,8 - 89,3	71,6
2 times	62. - 95.7	77.8	59,1 - 89,5	72,0
3 times	69. - 97.1	80.2	65,9 - 89,3	74,5
4 times	77. - 99.7	83.1	70,7 - 88,8	75,6
5 times	79. - 98.3	85.5	66,6 - 83,8	75,2
6 times	82. - 101.4	87.5	68,6 - 86,5	75,8
$x$	69. - 97.2	80.1	63,5 - 88.3	<b>73,5</b>

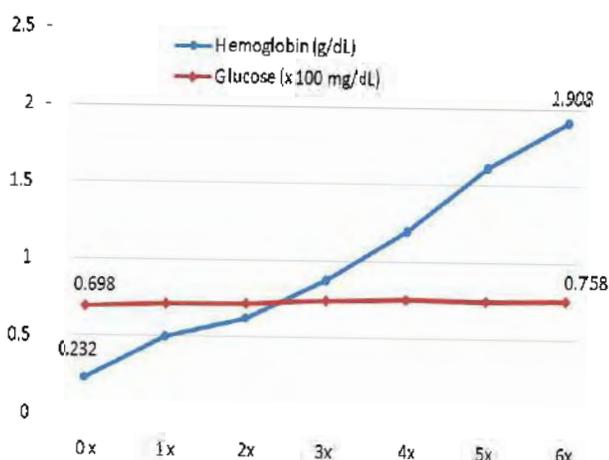
However, after the procedure of plasma absorbance correction was performed on the results as a baseline of hemolysed specimens measurement, the p-value was 0.132, which means that there were no significant differences anymore. The average value of the specimen (non- hemolysis) which showed a result of 69.8 mg / dL only increased slightly to 75.8 mg / dL after the same specimen became hemolysis with repeated treatment 6 times. So it can be interpreted that the hemolysate has no effect on blood glucose levels if the baseline was corrected with the absorbance of the plasma.

Figure 1. The difference between the average corrected and uncorrected blood glucose levels



The higher the repetition of the treatment given, the higher the average value of glucose levels obtained. The magnitude of the difference in increase in the levels of each treatment can be observed in the figures in table 1 above. The difference between specimens that did not undergo hemolysis with specimens that were treated with the highest hemolysis (6 times) reached an average of 15.8 mg / dL. Even in previous studies found an average increase in blood glucose levels with hemolysis treatment as much as 0-20x increased to 60,342 mg / dL. In this study after baseline-correction of plasma absorbance of hemolyzed specimens, an increase of only 6.0 mg / dL of the specimen was treated 6 times.

Figure 2. Comparative graph of elevated levels of Hemoglobin and Blood Glucose Levels after corrected for plasma absorbance



The more treatment is given, the more blood is experiencing hemolysis. In this study the average value of hemoglobin in plasma due to the highest hemolysis treatment was 1.91 g / dL. This condition is indicated by an increase of free hemoglobin in plasma. When compared with changes in the results of blood glucose levels, it is clear that the hemolysate does not interfere with the results obtained from the corrected glucose measurement. Thus, laboratory tests of hemolyzed specimens can be assured of reliable results if appropriate corrective procedures are performed.

The manual calculation that is carried out with the initial formula of end-point measurement, the correction is applied to the same calculation formula by subtracting the absorbance rate of the measured specimen (absorbance of the test) with the absorbance rate of diluted hemolysis plasma (in NaCl solution). In a semi-automated or fully-automated system: the result can be directly corrected by subtracting the value of the initial result that shows at the monitor device with the value of the measured result of hemolysis plasma after being divided by 5 (multiplication factor number).

#### IV. CONCLUSIONS

This study concluded that the implementation of the baseline-correction with the plasma absorbance from hemolyzed specimens can be applied as a standard procedure in clinical laboratory assays. During this time, many laboratories may not examine the specimen when they found this condition, but in according to this discovery of the facts which obtained in this study, it is necessary to consider other actions that must be taken. It might be harmful to the patient due to re-collection in case of rejecting the specimen, on the contrary, if the examination is continued to be carried out, then the results will be unreliable if it was performed without considering the correction and may cause a diagnostic error by the clinician.

Maybe a similar circumstance will also be found if applied to other laboratory tests, especially those using a method similar to this glucose determination method, such as testing of cholesterol, triglyceride and uric acid levels which also use peroxidase enzymes with the same Trinder reaction which product quinone dye compounds.

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# The Effect of Family-Based education on the Implementation of Early Breastfeeding Initiation

Tetti Seritati Situmorang  
Sekolah Tinggi Ilmu Kesehatan  
Mitra Husada Medan  
Medan, Indonesia  
seriatitetti@gmail.com

Edy Marjuang Purba  
Sekolah Tinggi Ilmu Kesehatan  
Mitra Husada Medan  
Medan, Indonesia

Riska Susanti Pasaribu  
Sekolah Tinggi Ilmu Kesehatan  
Mitra Husada Medan  
Medan, Indonesia

Corresponding author: seriatitetti@gmail.com

Abstract,-breast milk is the best food in early life. The success of Exclusive breastfeeding starts from the implementation of the early breast initiation process. The length of time that breast milk comes out the first time is the biggest cause of failure. To make matters worse, the family's perception that the cause of the baby crying is because the milk is not coming out / not enough so formula milk needs to be given. This study aims to identify the effect of family- based education on the implementation of early breastfeeding initiation. The research design uses quasi experiment, pre test and post test with control group design. Beginning with a pre- test for the two groups of respondents, then in the intervention group a family-based education (involving husband/1 other family member) about initiation of breastfeeding is done 3 times. The third stage is to do a post test on both groups. The number of respondents was 40 people in each group of 20 pregnant women. Data analysis using Wilcoxon test and Mann Whitney test. The results showed that there was a significant influence between family-based education on the implementation of early breast initiation ( $p$  value = 0.004). Naturally a healthy newborn can do the early breast initiation process, knowledge and attitudes of the mother and family need to be improved. It is recommended that the application of family- based education to the implementation of early breast initiation to increase the achievement of exclusive breastfeeding

Keywords: family-based education, breastfeeding, early breast initiation

## I. INTRODUCTION

The golden period of child development lasts from the child in the womb until the age of two years. During this period, it was very urgent and effective to optimize various aspects of growth and development in order to establish quality human resources (Faculty of Medicine, Hasanuddin

University, 2014). In this period the brain experiences the fastest development in its life history, which is up to 80%. Post-birth brain nerve cells (numbering billions) do not increase anymore, but the number of connections between brain nerve cells continues. One brain nerve cell can connect with 20,000 other brain nerve cells. The more the number of nerve cell connections the more intelligent the brain (Soetjningsih, 2013). Large number of connections between brain nerve cells is determined by nutrition and stimulation. Failure of nutrient intake during this period has long-term effects that are difficult even those that cannot be changed anymore (Arief, 2011). Problems of nutritional intake of infants in North Sumatra: thin babies who get extra food (36.7%). Exclusive breastfeeding coverage (33.0%), early breast initiation, 1 hour (30.3%), breastfeeding for up to 5 months (48.6%). The prevalence of malnutrition and malnutrition is above the national prevalence. Infants and toddlers aged 0-23 months have malnutrition (2.8%), malnutrition (8.6%), age 0-59 months, malnutrition (3.1%), malnutrition (10.1%) (BB / U indicator). Nutritional status with TB / U index shows the incidence of stunting, at: age 0-23 months, very short (8.0%), short (11.1%), age 0-59 months, very short (9.3% ), short (15.1%). Nutritional status with BB / TB index aged 0-23 months very thin (5.2%), thin (9.3%), age 0-59 months very thin (4.3%), thin (7.7%) . Stunting early in life will have a negative impact on health, cognitive, and functional as an adult (Provincial Health Office, 2017).

Breast milk is the best food in early life (0-6 months), then breast milk is added with complementary foods until the age of two years. The success of Exclusive ASI starts from the implementation of the early breast initiation process (Juwono, 2016). Infants who breastfeed early will succeed exclusively breastfeed eight times greater than infants who do not breastfeed early (Dinkes Prov SU,

2017).

Exclusive ASI Puskesmas Namo Rambe Coverage (40%). The length of time the milk comes out the first time is the biggest cause (> 50%) of failure to initiate breastfeeding. It is worsened by the perception of family / community that the cause of babies crying after breastfeeding is because breast milk is not enough so formula milk needs to be given (Namo Rambe Health Center Profile, 2017). The healthy Indonesia program with the family approach states that the family approach is the key to the success of the program. Family-based education can increase the intention to change health behaviors

(Kemenkes, RI, 2016). Family-based educational interventions on early breast initiation to achieve exclusive breastfeeding to optimize child growth and development in the golden period need to be done.

## II. RESEARCH METHODOLOGY

This research is a quantitative study using a quasi experiment pre-test and post- test with control group

design, to analyze the effect of family chassis education on the implementation of early breast initiation. The intervention group will receive family-based education related to lactation management and the control group will receive education from health workers when conducting Antenatal Care examinations at the Puskesmas. Before the intervention, the pre-intervention and control groups were pre-tested, then family-based education was carried out. After 3 months of family-based education activities carried out, then post tests were carried out on both groups with the same questionnaire instrument as the pre test.

## III. RESULT AND DISCUSSION

### Characteristics of respondents

The sample in this study as many as 40 people consisted of 2 groups: 20 pregnant women 24-24 weeks gestational age who were given family-based education about early breastfeeding initiation which is an intervention group and 20 pregnant women with a range of gestational age the same is not given family-based education about early breast initiation which is the control group.

Table 1. Frequency Distribution of Respondents

No	Characteristics	Group (n=40)				Total	
		Intervention		Control		n	%
		n	%	n	%		
1	Age:						
	- <20 years	1	5	-	-	1	2.5
	- 20-35years	17	85	18	90	35	87.5
	- >35 years	2	10	2	10	4	10
	Total	20	100	20	100	40	100
2	Education:						
	- Elementary	2	10	-	-	2	5
	- Junior High	5	25	3	15	8	20
	- Senior High	7	35	10	50	17	42.5
	- Bachelor	6	30	7	35	13	32.5
- Total	20	100	20	100	40	100	
3	Occupation:						
	- Housewife	16	80	12	60	28	70
	- Civil Servant	1	5	1	5	2	5
	- Private employees	3	15	4	20	7	17.5
	- <del>Entrepriser</del>	-	-	3	15	3	7.5
- Total	20	100	20	100	40	100	
4	Parity:						
	- 1	6	30	8	40	14	35
	- 2	10	50	6	30	16	40
	- 3	4	20	4	20	8	20
	- 4	-	-	2	10	2	5
- Total	20	100	20	100	40	100	

The age characteristics in the two groups were dominated by ages 20-35 years, amounting to 85% in the intervention group and 90% in the control group. Likewise in the characteristics of education, both groups were dominated by high school education at 35% in the intervention group and 50% in the control group. On the same job characteristics, this characteristic is dominated by

IRT by 80% in the intervention group and by 60% in the control group. On the characteristics of parity there are differences, in the intervention group is dominated by parity 2 by 50%, in the control group is dominated by parity 1 by 40%.

#### A. Pre Test Results of Knowledge and Attitudes Respondents

**Table 2. Distribution of Frequency Pre Test Knowledge and Attitudes in Groups Intervention and Control Groups**

	Control	Group (n=40)		Total No Variable Intervention			
		n	%	n	%	n	%
1	Knowledge:						
	- Good	8	40	6	30	14	35
	- Not Good	12	60	14	70	26	65
	Total	20	100	20	100	40	100
2	Attitude:						
	- Positive	8	40	6	30	14	35
	- Negative	12	60	14	70	26	65
	Total	20	100	20	100	40	100

The percentage of good knowledge categories and positive attitudes in the intervention group was greater than the control group. The percentage of good knowledge categories and positive attitudes in the intervention group

was as large as 40%, the percentage of categories of good knowledge and positive attitudes in the control group was also as large as 30%.

#### B. Post Test Results of Knowledge and Attitudes Respondents

**Table 3. Distribution of Post Test Frequency Knowledge and Attitudes in Intervention and Control Groups**

	Control	Group (n=40)		Total No Variable Intervention			
		n	%	n	%	n	%
1	Knowledge:						
	- Good	17	85	4	20	21	52.5
	- Not good	3	5	16	80	19	47.5
	Total	20	100	20	100	40	100
2	Attitude:						
	- Positive	18	90	5	25	23	57.5
	- Negative	2	10	15	75	17	42.5
	Total	20	100	20	100	40	100

The post-test results showed a significant increase in knowledge and attitudes in the intervention group, whereas in the control group there was no increase in knowledge and a positive attitude towards the implementation of early breast initiation. The post-test

results showed a significant increase in knowledge and attitudes in the intervention group, whereas in the control group there was no increase in knowledge and a positive attitude towards the implementation of early breast initiation.

### C. Implementation of early breast initiation in the Intervention and Control Groups

**Table 4. Implementation of Early Breastfeeding Initiation in the Intervention and Control Groups.**

No	Early Breast Initiation	Intervention group		Control Group	
		n	%	n	%
1	Yes	12	60	3	15
2	No	8	40	17	85
	Total	20	100	20	100

The percentage of the intervention group that did the early breast initiation was up to four times compared to the control group.

#### Bivariate Analysis

##### A. Differences in Knowledge and Attitudes of Pre Test and Post Test in the Control Group

**Table 5. Test Results for Differences in Knowledge and Attitudes of Pre-test and Post-test in The Control Group Using The Wilcoxon Test.**

Variable	Pre Test Mean Runk	Post Test Mean Runk	Z-Test	p value
Knowledge	2,00	2,00	-0,577	0,564
Attitude	2,00	2,00	-0,577	0,564

The data table above illustrates the differences in knowledge and attitudes of the pre- test and post-test in the control group using the Wilcoxon test. Known p value

for knowledge and attitude variables 0.564 ( $>0.05$ ) means that there is no significant difference in the knowledge variable and attitude variable in the pre test and post test in the control group.

##### B. Differences in Knowledge and Attitudes of Pre Test and Post Test in the Intervention Group

**Table 6. Test Results for Differences in Knowledge and Attitudes of Pre-test and Post-test in The Intervention Group Using The Wilcoxon Test.**

Variable	Pre Test mean runk	Post Test mean runk	Z test	p value
Knowledge	0,00	5,00	3,00	0,003
Attitude	0,00	5,50	3,16	0,002

The table data above illustrates the differences in knowledge and attitudes of the pre-test and post-test in the intervention group using the Wilcoxon test. It is known that the p value in the knowledge variable 0.003 and

attitude 0, 002 ( $<0.05$ ) means that there are significant differences in the knowledge variable and the attitude variable in the pre-test and post-test in the intervention group before and after family-based education about early breastfeeding initiation

### C. Differences in Implementation of Early Breastfeeding Initiation in Control and Intervention Groups

Table 7. Results of differences in the implementation of early breast initiation in the control and intervention groups using the Mann Whitney Test.

Variable	Control Mean rank	Intervention Mean rank	Z test	p Value
doing early breast initiation	16.00	25.00	-2,902	0,004

The data table above illustrates the differences in the implementation of early breastfeeding initiation in the control and intervention groups using the Mann Whitney Test. Known p value 0.004 differences in the implementation of early breast initiation in the control and intervention groups. Thus, it can be concluded that there is an influence of family-based education about early breast initiation to implement early breast initiation for achieving exclusive breastfeeding for the optimization of child development in the golden period. The results of the study provide results that family-based education can increase the knowledge of pregnant women early breast initiation from 8 people (40%) with a good level of knowledge to 17 people (85%), an increase of 45%. Likewise, the change in negative attitude to positive increased from 8 people (40%) to 18 (90%), an increase of 50%. In contrast to the group of pregnant women who did not receive family-based education about early breast initiation, which did not experience an increase in knowledge and changes in attitude, instead experienced a decline. Knowledge aspects of 6 people (30%) people with a good level of knowledge in the pre-test to 4 people (20%), decreased by 10%. Attitudes aspects that were originally 6 people (30%) decreased by 5% to 5 people (25%). Knowledge is the result of knowing, which will occur after someone senses a certain object, such as seeing, hearing, smelling, feeling and feeling. Most of that knowledge is obtained through the results of seeing and hearing. One strategy for changing knowledge and attitudes is providing information in order to increase knowledge so that awareness arises and eventually people will behave in accordance with that knowledge. Changes in attitude are basically influenced by factors of knowledge and belief / trust that are obtained from the learning process. After the mother and family get an education, reading information about early breast initiation, this knowledge will bring mothers to think, desire and try so that their baby at birth will experience the process of early breast initiation. After the mother knows the stimulus, the next process is to behave towards the stimulus. Aspects that have an important role in

the manifestation of attitudes as a whole are knowledge, thoughts, beliefs and emotions (Notoatmodjo, 2007). The implementation of early breastfeeding initiation when newborns are not only influenced by maternal behavior, the role of the husband and / or family members as well as health workers involved in assisting the maternal birth process is crucial. From the results of observation there are still many health workers who have not yet carried out early breastfeeding initiation. After the baby is born dried, weighed, swaddled and given to the mother or transferred to the baby's room. Mothers and husbands or other family members who have received education about early breast initiation ask for information and ask for the availability of health workers who will help respondent's childbirth to initiate early breast initiation. This is in line with research conducted by (Naim, 2017) which states that there is a significant influence between family-based education on the intention of pregnant women to optimize nutrition in the first 1000 days of life. Babies born healthy do not need to get help to carry out the process of initiating breastfeeding. Naturally newborn babies have olfactory reflexes (olfaction) and visual that is the baby is able to recognize the areola and the characteristic odor of the breast of the mother. In addition, other factors that facilitate the process of initiating early breastfeeding are that newborn babies have the reflex of seeking and sucking the nipples of mother's milk. This fact increases the optimism of mothers and / or family members to carry out the process of breastfeeding early during labor.

#### IV. CONCLUSION

A healthy newborn can do the early breast initiation process, knowledge and attitudes of the mother and family need to be improved.

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# Determining Estimation Factor For Platelet Count Using Microscope With Field Number (Fn) 18

Muhammad Ihsan Tarmizi  
 Medical Laboratory Technology  
 Politeknik Kesehatan Palembang  
 Palembang, Indonesia  
 ihsantarmizi@poltekkespalembang.ac.id

*Abstract*—The estimation number of platelets has been determined based on the method of Barbara Brown (1976), namely multiplying the average platelet count per field of view of 100x objective enlargement with a number of 20,000/mm<sup>3</sup>. Modern microscope ocular lenses show a wide field of view, so the platelets will clearly be visible. The platelet count estimation factor will be more precise if it is determined based on the Field Number (FN) of the microscope. This study used EDTA blood samples to count the platelet counts using the Sysmex XS800i automatic cell counter, followed by making a blood smear and Wright's stain. To determine the mean platelet rate per objective field of view of 100x in zone V using an Olympus CX21 microscope. Furthermore, the ratio of platelet numbers and the average number of platelets per field of view was determined for each sample. The estimation factor is the total ratio obtained divided by the sample size. The number of samples is 64 samples. The estimation factor for the number of platelets obtained is 22, meaning that 1 platelet per field of view is equivalent to 22 x 10<sup>9</sup>/L. Platelet count estimation can be used for reporting platelet count results if there is no equipment available for platelet count with the estimation factor according to the FN microscope.

*Keywords:* estimation factor, total ratio

## I. INTRODUCTION

Examination of blood cell counts, especially leukocytes and platelets, is in demand in many clinics. This is due to the increasing need for such data in an effort to help make a diagnosis. With the increasing demand for blood cell count checks, manual cell count checks can no longer meet these needs. Therefore, an automatic cell counter was made. With an automatic cell counter, cell counting becomes easier, faster and more accurate than the manual method. [1]

Platelets are difficult to count because they break easily and are difficult to distinguish from small stools. Because of the difficulty of calculating, the assessment of the number of platelets in the blood film is very important as a screening examination. [2]

So far, the estimation of the number of platelets is determined based on an old method modified by Brown [3], which is the result of multiplying the average platelet count per field of view of 100x objective enlargement with a number of 20,000/mm<sup>3</sup>. This method applies to normal, low and high platelet counts.

Based on Good Laboratory Practice (GLP), in principle, all platelet count results that are checked with automatic or manual counters must be cross-examined on the peripheral blood smear to confirm the increase or decrease of

platelet count. With the aim of knowing whether there is a difference between the results of the platelet count and the estimated platelet count. [4]

Rohmawati has conducted research on determining the estimation factor for the number of platelets in the peripheral blood smear of thrombocytopenic patients in 2003 [5]. She suggested that the estimation of the platelet count could be used for reporting the results of the platelet count if there is no platelet counting equipment available, with the estimation factor in accordance with the field number (FN) microscope. The estimation factor is determined based on the total ratio between the number of platelets according to the instrument used to the average platelet count per sample size field.

The examination of platelet count is also carried out at a clinical laboratory P, which is one of the largest laboratories in Indonesia. The recognition as the best laboratory is proven by the company success in obtaining ISO 15189 accreditation (special international accreditation for medical laboratories) and the results of External Quality Assurance with the best national ranking, even in 2011 this laboratory was ranked 10th internationally out of 2808 participating laboratories from around the world [6].

## II. METHODS

This type of research is a descriptive study with a cross sectional approach method. The automatic cell counter method of platelet count research was conducted at the Prodia Clinical Laboratory, at Jalan Basuki Rahmat number 801 Palembang. Meanwhile, the research to estimate platelets for peripheral blood smears using a FN 18 microscope was conducted at the Pakjo Health Center, at Jalan Inspektur Marzuki number 2240 Palembang.

The collected data were processed and analyzed by calculating an estimation factor based on a formula that took into account the number of platelets according to the automatic cell counter and the average platelet count per immersion field using an FN 18 microscope.

### III. RESULT

Table 1  
Number of platelet by *automatic cell counter*

	Descriptive Statistics								
	N	Range	Minimum	Maximum	Sum	Mean	Std.	Variance	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
automatic	64	447	58	505	10872	294,88	11,196	89,570	8022,841
Valid N (listwise)	64								

The lowest automatic cell counter platelet count results were  $58 \times 10^9/L$  and the highest was  $505 \times 10^9/L$ , the mean platelet count was 294.88 and the standard deviation was 89.570.

Table 2  
Average number of platelet on blood smears

	Descriptive Statistics								
	N	Range	Minimum	Maximum	Sum	Mean	Std.	Variance	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
rotanaka	64	22,20	3,80	26,00	686,45	13,5231	5,2036	4,16280	17,329
Valid N (listwise)	64								

The mean value of platelets per field of view was obtained by counting the number of platelets in 10 immersion fields of view then divided by the number of visual fields, namely 10. The smallest number of platelets was 3.80 and the highest was 26.00. The average number of platelets was 13.5231 and the standard deviation was 4.16280.

Table 3  
The estimation factor for the FN 18 microscope

Sample Size	The total ratio of platelet count
64	1395.14

The data above were then calculated to find the estimation factor using this formula.

$$\frac{\text{the number of total ratio of platelet count to platelet estimation number}}{\text{the number of samples}}$$

From this formula, the estimation factor for the FN 18 microscope is 22. It means that 1 platelet in the 100x-objective field of view is equivalent to platelet of  $22 \times 10^9/L$ .

### IV. DISCUSSION

The estimation factor that has been known from this study is the same as the previous research, namely 22. This estimation factor is then applied to determine the estimation of the number of platelets in the peripheral blood smear. For example, if the mean platelet count per field of view is 10, then the estimated platelet count =  $10 \times 22 \times 10^9/L = 220 \times 10^9/L$ .

The importance of knowing this estimation factor is to determine the error of platelet count examination using automatic cell counter and peripheral blood smear. If there is a large difference between the two, it should be noted that there is a possibility of errors in platelet recognition tools, for

example platelet aggregation, giant platelets and so on. Other possibilities come from pre-analytic, analytic and post-analytic processes. The examples of pre-analytic errors are swapped samples and errors in writing identities or clots on samples. Analytical errors can occur when the peripheral blood smear does not meet the requirements or if the measuring instrument used is damaged. Post-analytic errors, for example, are errors in writing the platelet count results.

The laboratory can use the estimation factor of 22 to determine the estimation number of the platelet count using an FN 18 microscope. Laboratories that use a microscope with different FN should use a different factor for estimating the platelet count. The estimation of the platelet count can be used to report the results of the platelet count if there is no platelet count facility provided that it is carried out by medical technologists who have adequate knowledge and training.

### V. CONCLUSION

From this study, it was found that the estimation factor for the number of platelets in the peripheral blood smear that was determined using the Sysmex XS800i counter and the Olympus CX21 microscope with FN 18 was 22.

### VI. ACKNOWLEDGMENT

The author is very grateful to the Health Polytechnic for financial support during this study.

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