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Effect of Probiotic Curd during Pregnancy on Infant Nutritional Status (0-6 Months) in Agam and Tanah Datar Regencies in 2020/2021

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ABSTRACT

The curd contains Lactic Acid Bacteria 103 CFU/ml which is probiotic. Probiotics can maintain and repair the intestinal mucosal epithelium so that it can absorb nutrients optimally. Good absorption of nutrients can support nutritional status and good weight in infants. This study aims to determine the effect of probiotic curd during pregnancy on postpartum depression and infant nutritional status (0-6 months).

This study uses a quasi-experimental design. The population in this study were all postpartum mothers who had babies (0-6 months) in the Agam and Tanah Datar districts. Sampling using purposive sampling technique by meeting the inclusion criteria amounted to 51 people for each group. Postpartum depression using the Endiburgh Postnatal Depression Scale (EPDS), while nutritional status by conducting interviews and anthropometric measurements.

While the percentage of nutritional status of infants in mothers who were given curd probiotics (treatment) was higher (98.0%) with good nutritional status and 1 person (2.0%) infants with poor nutrition. In the control group, there were 48 (94.1%) infants who were not given curd probiotics with good nutritional status and 3 people (5.9%) with poor nutritional status.there was an effect of probiotic curd during pregnancy on the nutritional status of infants aged 0-6 months with p value = 0.039 ($p < 0.05$).

However, the provision of probiotics from food intake has an effect on weight gain of pregnant women.

Keywords: *Probiotic curd, Infant Nutritional Status.*

INTRODUCTION

According to the Indonesian Ministry of Health (2016), the golden generation of 2045 is the generation that can build the Indonesian nation into a great, advanced and dignified nation. It starts at 270 days during pregnancy and the first 730 days after the baby is born which is called the 1000 HPK period (First Day of Life)[1]. The period of 1000 HPK has been scientifically proven to determine the quality of a human's life. Therefore, this period is also referred to as the golden period, the critical period, and the World Bank (2006) calls it the window of opportunity.

During the period of 1000 HPK, it can have a negative impact, namely poor nutrition, over nutrition, and also have an impact on stunting. According to WHO (2018)[2], stunting is a long-term result of nutritional deficiencies with height for age less than -2 SD (Standard Deviation) below the median length. Stunting is also caused by chronic malnutrition and repeated infections from the fetus to the child aged 23 months (TNP2K, 2018)[3].

According to Lamid (2015) Stunting can occur when a child experiences failure to thrive due to chronic malnutrition. Failure to thrive can occur during pregnancy, from

conception to the first 2 or 3 years of life. As a result of this failure to thrive, it can cause a decrease in the proportion of skeletal and soft tissue growth[4]. Dadih is a fermented product of buffalo milk carried out by Lactic Acid Bacteria (LAB) which naturally exists in buffalo milk and the environment[5]. Lactic Acid Bacteria (LAB) are a group of gram-positive bacteria that do not have spores and are capable of converting carbohydrates (glucose) into lactic acid. The genus of bacteria belonging to the lactic acid bacteria group consists of the genera Lactobacillus, Leuconostoc, Bifidobacterium, Streptococcus, Carno bacterium, Enterococcus, Lactococcus, Vagococcus, Weissella, Propionibacterium and Pediococcus[6].

Dadih contains BAL 103 CFU/ml which is probiotic which is an alternative to antibiotics that acts as a growth promoter. And various other therapeutic functions that can improve the balance of microbes in the digestive tract and are able to improve the immune system[7]. Pregnant women with good consumption of probiotics are known to have better immune function, this is in accordance with the statement by Wibowo et al, (2015) which is safe for health. LAB and its derivative products are able to prevent the emergence of various diseases that can overcome the impact of nutritional health on children. Encouraged by this, the authors are interested in conducting research on the effect of probiotic curd during pregnancy on the nutritional status of infants aged 0-6 months[8].

LITERATURE REVIEW

Dadih is a type of buffalo milk product which is a local wisdom from West Sumatra and has the potential to become a functional food [9]. The native people of West Sumatra call it dadiah. Dadih is widely known by the people of West Sumatra, Bengkulu, Jambi [10]. Generally, curd is consumed by the people of West Sumatra as a side dish and side dish [11].

Probiotics are good bacteria whose microorganisms are able to have a beneficial effect on health if consumed in sufficient quantities. Probiotic bacteria are generally from the lactic acid bacteria (LAB) group. Probiotic bacteria work anaerobically to produce lactic acid which results in a decrease in the pH of the digestive tract which hinders the development and growth of pathogenic bacteria that are beneficial to human health[12].

The journey of growth and development of children, which occurs since in the womb, is influenced by multiple factors. Genetic factors (nature) will integrate with environmental and parenting factors (nurture) to shape the long-term growth and development of a child. Currently, of the various factors that influence the growth and development of children at an early age, there is one factor that is the focus of discussion and research in the world of pediatrics, namely the role of the gastrointestinal tract. So far, the gastrointestinal tract is better known as the main organ in nutrient absorption, but it also plays a very important role in the formation of children's brain circuits through various special mechanisms. Currently, there is a growing body of research evidence showing that the critical period of child brain development overlaps with the period of colonization of the microbiota in the gastrointestinal tract, and changes in one of these conditions seem to influence the two systems[13].

MATERIALS & METHODS

This is an observational study with a quasi-experimental approach, which is to find a causal relationship[14]. This research was conducted by giving curd to the intervention mother and pudding to the control group mother. while nutritional status was measured in infants aged 6 months. Initial data collection was done by interviewing the respondents by means of a physical examination, and examination of the infant nutritional status. In addition, does it also have an effect on the nutritional status of babies born.

Statistical Analysis

The sample in this study was conducted by sampling using purposive sampling technique to meet the required number of samples, namely 51 postpartum mothers who had babies in the Agam and Tanah Datar Regencies. This study used Fisher's exact statistical test with p <0.05, which means that there is an effect of probiotic curd during pregnancy on infant nutritional status (0-6 months) in Agam and Tanah Datar regencies in 2020.

RESULT

This research has been carried out in Agam and Tanah Datar areas. Initial data collection was done by interviewing 51 respondents who were given treatment and 51 controls by means of the infant nutritional status.

Table 1: Characteristics of Research Respondents

Respondent Characteristics	Treatment Group (n = 51)		Control Group (n = 51)	
	f	%	f	%
Education				
Elementary School	5	9,8	7	13,7
Junior High School	3	5,9	12	23,5
Senior High School	38	74,5	28	54,9
Tertiary Education	5	9,8	4	7,8
Occupation				
Working	9	17,6	6	11,8
Not Working	42	82,4	45	88,2
Respondent Age (Mean ± SD)	**28,00 ± 3,39**		**26,63 ± 3,57**	

Table 1 explains that the most education in the treatment and control groups is junior high school level, namely 38 people (74.5%) in the treatment group and 28 people (54.9%) in the control group. 42 respondents (82.4%) in the treatment group did not work and 45 respondents (88.2%) in the control group also did not work. The mean age of the respondents in the treatment group was 28.00 ± 3.39 years and the control group was 26.63 ± 3.57 years.

Table 2: Differences in nutritional status of infants who were given probiotic curd (treatment) with mothers in the control group

Nutritional Status	Treatment Group (n = 51)		Control Group (n = 51)	
	f	%	f	%
Poor Nutrition	1	2,0	3	5,9
Good Nutrition	50	98,0	48	94,1
Excessive Nutrition	0	0	0	0
Total	**51**	**100**	**51**	**100**

Table 2 The percentage of infant nutritional status in mothers who were given probiotic curd (treatment) was higher (98.0%) with good nutritional status and 1 infant (2.0%) with poor nutrition. In the control group, there were 48 (94.1%) infants who were not given probiotic curd with good nutritional status and 3 people (5.9%) with poor nutritional status.

Table 3 Based on statistical tests using the Fisher Exact test, it was found that there was an effect of probiotic curd during pregnancy on the nutritional status of infants aged 0-6 months with p value = 0.039 (p <0.05).

Table 3: Effect of probiotic curd during pregnancy on the nutritional status of infants aged 0-6 months

Infant Nutritional Status	Treatment Group (n = 51)		Control Group (n = 51)		*p value*
	f	%	f	%	
Poor Nutrition	1	2,0	3	5,9	0,039
Good Nutrition	50	98,0	48	94,1	
Total	**51**	**100**	**51**	**100**	

DISCUSSION

The level of education is extremely influential on changing attitudes and improving nutrition in pregnant women. In this study, the majority of respondents' education was at the junior high school level (74.5%) where the mother's education factor was one of the determinants of nutritional status, maternal, infant, and child mortality[15]. Education is one of measures used in socioeconomic status. Pregnant women who have less education will affect the mother's ability to obtain information about the importance of nutritional intake in pregnancy.

In addition, education also affects knowledge, especially knowledge about the importance of consuming curd for health. Respondents who have never heard of curd before and are not accustomed to consuming

curd are given motivation and counseling about the importance of consuming curd as an additional supplement to improve body health, especially for pregnant women who need more nutrition than other adult women. In general, respondents at the research site have known the benefits of curd for health.
Based on statistical tests using the Fisher Exact test, it was found that there was an effect of probiotic curd during pregnancy on the nutritional status of infants aged 0-6 months with p value = 0.039 ($p < 0,05$).

In addition to providing many benefits for the health of the human body, in broader sense, it also provides special benefits for the health and nutrition of pregnant women. The provision of curd as an additional food for pregnant women can meet the additional energy needs of 200-300 kcal/day and an additional protein requirement of 1-1.7 grams per Kg/body weight. Lack of energy and protein in pregnant women causes malnutrition (KEK), nutritional anemia, abortion, LBW and IUGR babies[16].

Providing curd to pregnant women starts from the second trimester of pregnancy until the final trimester before delivery. The intervention was initiated by selecting the research location based on the availability of curd supply and the presence of pregnant women in each location. Furthermore, with the assistance of cadres to find pregnant women according to the criteria and obtained from Community Health Center that meet the inclusion criteria. Initial measurements were carried out on all pregnant women who met the criteria including anthropometry, food consumption and questionnaire interviews. All pregnant women who met the criteria were used as treatment samples and the rest were used as controls. After the intervention, the final measurements were carried out which included maternal anthropometric measurements, maternal weight before delivery, as well as infant anthropometric measurements including birth weight, birth length, head circumference and chest circumference. Follow-up after the baby birth will be carried out for 6 months by monitoring the growth and morbidity of the mother and baby.

Studies have shown that colonization of the gastrointestinal microbiota during pregnancy has a long-term effect on the condition of the baby who is born until later in life. At the time in the womb, the fetus lives in relatively sterile conditions. Metabolites of the mother's microbiota will affect the growth of the fetus size and the development of the fetal brain through placental mediators. The placenta plays a highly important role for the growth and development of the fetus, especially in dangerous conditions such as malnutrition. The placenta can perform its own tissue breakdown (autophagy) to provide energy and essential nutrients for fetal development [17].

Lactic Acid Bacteria (LAB) in curd act as probiotics that can regulate the digestive tract ecosystem. Metabolites produced by LAB can inhibit the growth of pathogenic bacteria, improve the immune system, prevent constipation, lower cholesterol, be anti-mutagenic, anti-carcinogenic, anti-vaginitis, produce B vitamins and bacteriocins[18].

Provision of probiotics from food intake also affects the weight gain of pregnant women. In addition, psychological factors and maternal stress during pregnancy to postpartum greatly affect the development and increase in baby weight. This is because the stress mechanism in the HPA-axis pathway is extremely sensitive to changes in gastrointestinal microbes because the development process of this mechanism occurs simultaneously with the formation of early microbiota colonization in the baby's digestive tract so that it will affect the growth and increase in the baby's birth weight in the future. Colonization of the newborn microbiota will have the same properties as the mother's microbiota until the child is 1 year old. After the age of 1 year, the gastrointestinal microbiota of children will have characteristics that

resemble those of adults. For this reason, the need for nutritional intake of curd is given during pregnancy to maintain the microbiota in the mother's body and its effect on optimal baby weight in the future[19].

Research conducted by Abrams (2018) explains that every kilogram of maternal weight gain in the first, second, and third trimesters is associated with a statistically significant increase in fetal birth weight and nutritional status later in life. Whatever the relation between birth weight and variables such as pre-pregnancy weight, age, height, and maternal parity suggests that fetal growth and development is also an outcome of pregnancy[20].

CONCLUSION

Based on existing researches, there are so many benefits and nutritional content of curd that are useful for maintaining a healthy body. Especially for pregnant women. because it has a high nutritional value composition in addition to LAB content which has the potential as probiotics and so that people can choose curd as an additional food of choice.

ETHICAL CLEARANCE

Research ethics considerations were submitted to the Research Ethics committee of the Faculty of Medicine, Andalas Padang University and have obtained recommendations to pass the ethics review through a letter number 707 / KEP / FK / 2019 dated January 02, 2019.

QUALITY ASSURANCE

Data supervision is carried out at every stage of research to ensure the accuracy and accuracy of the results of the examination, with the aim to ensure that everything has been done correctly so that the data obtained is valid and can be accounted for academically. The object of supervision includes the examination of the health of pregnant women, the process of giving curd pudding to respondents from the beginning to the end of pregnancy, the evaluation of respondents, the recording system is carried out correctly and well documented. All *quality* assurance stabilization processes in this study still refer in accordance with the established research protocols.

REFERENCES

1 Ministry of Health. 2016. Integrated Antenatal Service Guidelines. Third ed. Jakarta: Directorate. General of Nutrition Development and KIA RI; 2016.
2 World Health Organization. Department of Mental Health, 2019. Substance Abuse, Mental Health Evidence, & Research Team. *Mental health atlas 2019*. World Health Organization.
3 TNP2K. 2018. 100 priority districts/cities for stunting intervention volume 1. Secretariat of the Vice President of the Republic of Indonesia. Jakarta.
4 Lamid, Astuti, 2015. Problems (Stunting) in Toddlers.
5 Rizqiati H, Sumantri C, Noor RR, Damayanthi E, Rianti E. 2015. Isolation and identification of indigenous lactic acid bacteria from North Sumatera River Buffalo Milk. IJAVS. 20:87-94.
6 Syukur S, Purwati E. 2013. Probiotic Biotechnology for Community Health. Yogyakarta.
7 Fauzi. Arasj, (2014). The Effect of Giving Curd (Fermented Buffalo Milk) through Supplementary Food on Nutritional Status, Incidence of Diarrhea and ARI in stunted children aged 1-4 years. The study was conducted in Kenagarian Kototangah, Tilatang Kamang District, Agam Regency, West Sumatra. *'AFIYAH*, *1* (1).
8 Wibowo N, Mose JC, Karkata MK, Purwaka BT. Kristanto H, Chalid MT, et al. 2015, The Status of Probiotics Supplementation during Pregnancy. Indonesian Medical Journal; 24; 120-130.
9 Hardiningsih, R., Napitupulu, R.N.R., Yulinery, T., 2006. Isolate and test the resistance of some Lactobacillus isolates at low pH. Biodiversity,15-17.
10 Afriani, R., Rahayu, P. (2009). The potential of curd lactic acid bacteria from Kerinci Regency as a food biopreservative. Research Report.
11 Surono IS. 2015. Indonesian traditional dairy foods. Asia Pac J Clin Nutr. 24:S26-S30.

12 Yuniastuti, A., 2015. Probiotic monograph book (in a health perspective). UNNES PRESS. Semarang.
13 Borre, Y.E., O'Keeffe, G.W., Clarke, G., Stanton, C., Dinan, T.G., Cryan, J.F. 2014. Microbiota and neurodevelopmental windows: implications for brain disorders.Trends Mol. Med. 20, 509e518.
14 Sastroasmoro S, Ismael S. Basics of clinical research methodology. Jakarta agung seto. 2011;55.
15 Bencaiova G, Burkhardt T, Breymann C. Anemia-prevalence and risk factors in pregnancy. Eur J Intern Med. 2012; 23(6): 529-33.
16 Helmizar H, Yuswita E, Putra AE, others. Analysis of the nutrients and microbiological characteristics of the Indonesian dadih as a food supplementation. Glob J Health Sci. 2019;11(1):155–61.
17 Bildirici I, Longtine MS, Chen B, Nelson DM. Survival by self-destruction: a role for autophagy in the placenta? Placenta. 2012; 33(8):591-8.
18 Cruz-Pereira JS, Rea K, Nolan YM, O'Leary OF, Dinan TG, Cryan JF. Depression's unholy trinity: dysregulated stress, immunity, and the microbiome. Annu Rev Psychol. 2020;71:49-78.
19 Grenham S, Clarke G, Cryan JF, Dinan TG. Brain--gut--microbe communication in health and disease. Front Physiol. 2011;2: 94.
20 Freedberg DE, Zhou MJ, Cohen ME, Annavajhala MK, Khan S, Moscoso DI, et al. Pathogen colonization of the gastrointestinal microbiome at intensive care unit admission and risk for subsequent death or infection. Intensive Care Med. 2018;44(8):1203-11

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