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Study of Differences in Children Nutrition Status Aged 6-24 Months with Exclusive and Non-Exclusive Breastfeeding in Mattampa Bulu Village

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ABSTRACT

Background: : Breast milk is the most ideal biological and physiological first food during the growth and development process due to the presence of protective and nutritional factors and also the needs of children according to their age and phase of growth and development.

Methods: This study aims to determine differences in nutritional status based on BB/U and PB/U for children aged 6-24 months in Mattampa Bulu Village. This study used 47 samples which were measured for body weight and length then the mother filled out a questionnaire.

Result: The results of the study using the Chi Square test showed that there was a significant difference between nutritional status based on body weight in children with exclusive and non-exclusive breastfeeding history with $p < 0.05$ (p = 0.011), but there was no difference in nutritional status based on PB/ U with $p > 0.05$ (p=0.913).

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Results: Based on the research, it may be concluded that children with exclusive breastfeeding have good nutritional status based on the indicators of BB/U and there is no difference in the incidence of stunting in children with a history of exclusive and non-exclusive breastfeeding

Keywords: Exclusive Breastfeeding; Non-Exclusive Breastfeeding; Nutritional Status

Introduction

Breast milk is the most ideal biological and physiological first food during the growth and development process due to the presence of protective and nutritional factors and according to the needs of infants in the first 6 months of life where the highest metabolic rate and growth occur at this time.[1,2] This is according to the United Nations Children Fund (UNICEF, 2016) which were later adopted by the Government of Indonesia through PP No.33 of 2012 Article 2 by setting a target of achieving 80% exclusive breastfeeding for 6 months, which previously was only 4 months. It aims to achieve the SDGs in 2030 which contains 17 goals with 169 targets, on point "Ending Hunger" which targets nutrition improvement and "Good Health and Prosperity".[3]

Epidemiological data shows that the National Exclusive Breastfeeding graph from year to year has fluctuated until in 2018 it was at 65.16%. As for regionally in South Sulawesi, it was 73.56%. Even though the above percentage is from the national figure, exclusive breastfeeding in South Sulawesi Province is still considered lacking because it has not reached the national target. In Bone district itself, the coverage of exclusive breastfeeding has not yet reached the target, according to the Health Office of South Sulawesi which reached the target only East Luwu Regency (87.1%), North Luwu Regency (84.8%), Sinjai Regency (83.8%). , and Soppeng Regency (81.2%). As for nutrition problems, Bone Regency is included in the 5 districts with the highest cases of malnutrition (BB/PB), namely 8.9% and malnutrition (BB/U) 36.08%, and stunting (TB/U) 34.3%. Lamuru Health Center is one of the health service units in Lamuru District that covers 12 villages/ward with 28 integrated healthcare centers. Among the 12 villages/ward, according to the monthly report for the November 2019 period, there are villages with the highest number of BRL (Below the Red Line) nutritional status cases, namely Mattampa Bulu village with 3 cases of 100% exclusive breastfeeding coverage.[4] Children with a history of not getting exclusive breastfeeding are known to be 10% sick and continue to die at the age of less than 5 years. This can reduce the quality of Human Resources (HR) related to intelligence, productivity, and individual creativity with poor nutritional status which has an impact on achievement and low performance that will affect life, family, and the next generation, as in Islam on how to prepare and make their descendants to become a quality generation, can be realized by giving the best

nutrition which is breast milk that explained in QS Al-Baqarah/2: 233. The sentence explained that Al-Qur'an has outlined that breast milk, both by biological mother or not, is the best nourishment for infants up to 2 years old as an order not an obligation. However, it was a suggestion that was strongly emphasized, as if it was an obligatory command.[5]

Based on the information above, the authors are interested in examining differences in nutritional status based on BB/U and PB/U in children aged 6-24 months with exclusive and non-exclusive breastfeeding history in Mattampa Bulu Village.

Methods

This research was conducted in Mattampa Bulu Village, Lamuru District, Bone Regency for 1 month. This research is a descriptive survey research using a cross sectional study approach. The population in this study were all children aged 6-24 months who live in Mattampa Bulu Village, Lamuru District, Bone Regency. The sample used was determined using a simple random sampling technique with inclusion criteria, namely willing to be a respondent, children aged 6-24 months, born full month by weight ≥ 2500 grams without complications and exclusion criteria. Not willing to be a respondent, date, month, and the year of birth of the baby is unknown, the respondent's mother suffers from a mental disorder, or is unable to communicate, and the child has a congenital disease or other chronic disease that can interfere with growth and development. The number of samples used in this study was determined using the Slovin formula with the results of 47 children.

The sample was then measured its weight using *baby scale* and body length using a length board which is then converted into a Z-score and interpreted based on the WHO-NCHS growth chart, where BB/U is categorized as over nutrition (>+2 SD), good nutrition (-2SD to +2SD) and poor nutrition (-3SD to <-2SD) and PB/U are categorized into stunting (<-2 SD) and not stunting (≥-2 SD) -. Then to find out the breastfeeding history, the mother was given a questionnaire containing questions about the identity of the mother, father, and child as well as the breastfeeding history which was validated through an interview.

The data obtained were then processed using Statistical Package Social Science (SPSS) for windows with un-variety analysis to determine the frequency distribution of respondents' characteristics and using the Chi Square test to determine the significant relationship between variables with a significance value of $p < 0.05$.

Result

Table 1. Frequency Distribution of Respondent Characteristics based on Children's Age, Childrend's Gender and Exclusive Breastfeeding History in Mattampa Bulu Village 2020

Characteristic		Frequency	Percentage
Children's Age	6-11	13	27.6

	12-17	20	42.6
	18-24	14	29.8
Children's Gender	Male	25	53.2
	Female	22	46.8
Exclusive Breastfeeding History	Yes	28	59.6
	No	19	40.4

The results of the un-variety analysis obtained the frequency distribution of the respondent's characteristics which can be seen in table 1. Based on Table 1 shows that the age group of respondents at most is 12-17 months with a total of 20 respondents (42.6%) and the least is 6-11 months with a total of 13 respondents (27.6%). The frequency distribution of respondents based on gender in Table shows that it was dominated by boys with a total of 25 children (53.2%) and girls as many as 22 children (46.8%). The frequency of distribution of respondents based on breastfeeding history shows that children with exclusive breastfeeding are 28 children (59.6%) and non-exclusive breastfeeding are 19 children (40.4%).

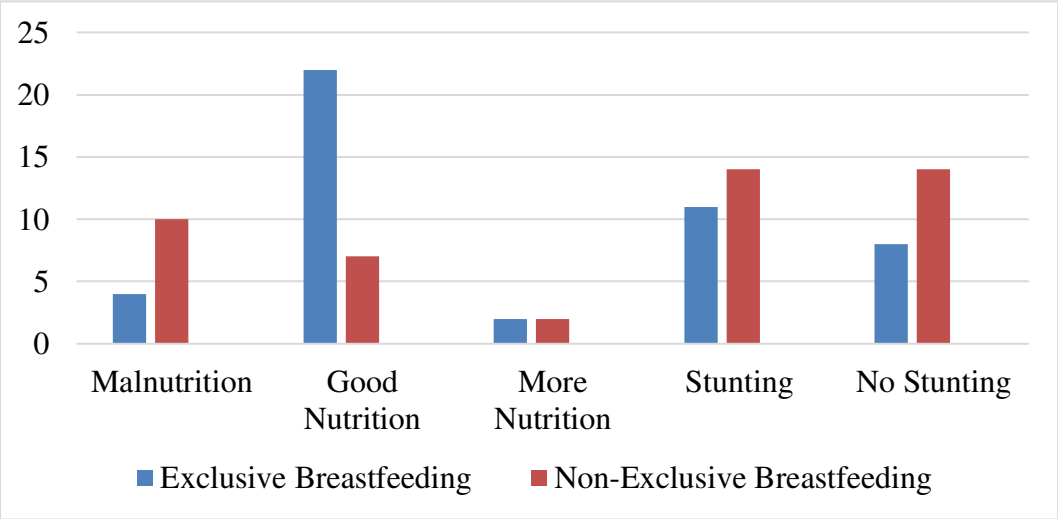
Table 2. Relationship between Exclusive and Non-Exclusive Breastfeeding with Nutritional Status

Nutritional status	Exclusive Breastfeeding (n)		*p-value*
	Yes	Not	
BB/U			
Malnutrition	4	10	0.011
Good Nutrition	22	7	
More Nutrition	2	2	
PB/U			
Stunting	11	14	0.91
No Stunting	8	14	

Table 2 shows the results of bivariate analysis with $p < 0.05$ ($p = 0.011$), which means that there is a significant relationship between nutritional status based on body weight in children aged 6-24 months with exclusive and non-exclusive breastfeeding history in Mattampa Bulu Village.

Table 2 shows the results of bivariate analysis with $p < 0.05$ ($p = 0.913$), which means that there is no significant relationship between nutritional status based on PB/U in children ages 6-24 months with exclusive and non-exclusive breastfeeding history in Mattampa Bulu Village.

Graph 1. Frequency Distribution of Nutritional Status of Children Aged 6-24 Months with a History of Exclusive and Non-exclusive Breastfeeding in Mattampa Bulu Village 2020



From Graph 1, the difference in the frequency distribution of nutritional status can be seen based on BB/U and PB/U in children with exclusive and non-exclusive breastfeeding history. Nutritional status based on body weight is dominated by good nutrition with exclusive breastfeeding history and more or less nutrition is experienced by children with non-exclusive breastfeeding history. As for the nutritional status based on PB/U, the number of stunted and non-stunted children is the same in children with exclusive breastfeeding history and for children with a history of non-exclusive breastfeeding more stunting.

Discussion

a. Relationship between Nutritional Status (BB/U) with Exclusive and Non-Exclusive Breastfeeding History

From the results of the study, children with good nutrition who have exclusive breastfeeding history are 22 children, but there are still 7 children who have non-exclusive breastfeeding history, this was cause by their mothers who work so the high mobility and activities outside the house make the baby suction stimulation on the nipple is reduced which can physiologically affect milk production. Lack of maternal knowledge, makes them choose not to give breast milk or try to stimulate milk production through baby sucking and replace it with formula milk or giving MP-ASI before the age of 6 months, which can change children's food habits so that in the end they no longer want to consume breast milk or in some cases the baby has nipple confusion, based on some mothers' statements from interviews. Besides that, work can also increase maternal stress. Stress can trigger the secretion of adrenaline which can cause vasoconstriction of blood vessels in the alveoli, resulting an impaired let-down reflex so that milk does

not flow.[5,6]

According to Molgaard (2011), there is a correlation between a child's weight and exclusive breastfeeding because the whey protein content of 60% in breast milk is known to increase muscle mass. Whey protein contains amino acids that are very similar to muscle protein and has many branched chains of amino acids that can increase protein synthesis in muscle. The high content of lysine and arginine can stimulate anabolic hormones, namely growth hormones which play a dominant role in the growth phase of children. Oligosaccharides are also known to have an effect on growth.[7]

Whey protein: casein is also found in formula but in smaller amounts, namely 20%: 80%. While in breast milk 60%: 40%. It is said that the composition of nutrients in breast milk is more optimal for infant growth. Some literature also says that formula-fed children have a bigger risk of developing obesity in later life.[8] This is based on the casein protein content in formula milk which can stimulate insulin growth factor 1 (IGF-1) which synergizes with anabolic hormones and has a proteolysis inhibitory effect. Although the protein is present in formula milk, the ratio of whey protein: casein in breast milk is far more optimal and easily absorbed by the baby's digestion.[1]

Another factor that also plays a role in exclusive breastfeeding is motivation. Even if the mother works or has less milk production, with high motivation, she will always try to breastfeed her baby under any circumstances. Because children are a gift as well as a great responsibility from Allah swt to parents (mother and father). Because the meaning of a child is so great, his presence is highly anticipated. In historical flashes, many prophets and apostles prayed to Allah swt so that they would be blessed with a child, who not only asked for the gift of mere offspring, but also descendants who had pious qualities, thayyiban, qurrata a'ayun and imam al-muttaqin. Among the efforts to get a child who is thayyibah since the beginning of his birth is by giving exclusive breastfeeding.[5]

The high urgency of the parental responsibility in this case for mothers to give exclusive breastfeeding which in QS Al-Baqarah/2: 233 has been explained and as the hadith of the Prophet Muhammad, namely:

"A husband is the leader of his family members and will be asked about the family he leads. A wife is the head of her household and children and will be asked about her responsibilities. " HR. Bukhari: 2278

b. Relationship between Nutritional Status (PB/U) and Exclusive and Non-Exclusive Breastfeeding History

The results of the statistical test in table 4.26 show that there is no significant relationship (p-value: 0.913) between the exclusive and non-exclusive breastfeeding history on the child's PB/U. This is in accordance with the research of Azevedo, et al (2019) which said that there was no significant

relationship between body length (PB/U) of toddlers (6-59 months) to the history of exclusive and non-exclusive breastfeeding with p value = 1.00.

The PB/U indicator is used to interpret the linear growth of children who are further categorized as stunting or not. Stunting occurs in children with chronic malnutrition, certain nutritional deficiencies, and chronic infectious diseases.

However, according to Yablonski (2015) malnutrition or deficiency of certain nutrients is related to children's linear growth problems or called stunting. The linear growth of the appendicular skeleton is the result of a cascade formed in the cartilaginous growth center of long bones, called the epiphyseal growth plate (EGP) which is controlled by complex interactions between growth hormone and extracellular matrix components. Good nutrition will ensure the availability of "building blocks" for the growth process including proteins, lipids, and carbohydrates. Thus, malnutrition can impair the longitudinal growth rate of bone and reduce the length of the EGP. Animal studies have demonstrated a link between the effects of protein malnutrition on linear growth, but in humans it is still difficult to determine specifically the role of nutritional, environmental, and hormonal factors such as IGF-1, thyroid hormone, leptin, and sex hormones that can stimulate fibroblast growth factor 21 and vitamin D which can also be caused by nutritional and environmental factors. Moreover, it is known that growth hormone (GH) plays a dominant role in the growth phase of children.[9,10]

The results of the study found that from 47 children there were 25 children (53.2%) who were stunted. According to the researchers' observations, one of the factors that may play a role is the culture of the local community. In the research process, the researchers found a quite interesting culture from the research location area, namely "Mabakkang". In this Mabakkang tradition, people who are in the territory of the customary holders, which are included in the research location, are required not to consume any type of meat within 40 days at any given time. Limitation consumption of meat, which is a source of animal protein and iron, forming new tissue during growth, in a long time can cause protein deficiency which will inhibit its growth. This is in accordance to Nuryanto's research (2016) which states that there is a significant relationship between protein intake and Z-score TB/U in toddlers. Where Indonesia is also known to be a country with a higher protein energy deficiency (PEM) rate than other ASEAN countries and South Sulawesi is included in an area with low protein consumption per capita.[11]

In addition, for mothers who carry out this tradition, breastfeeding mothers need more protein intake which has been regulated in the lactation RDA of +20 grams/day. Protein production in milk for 6 months total exclusive breastfeeding is about 1,500 g (1.5 kg). For a 60 kg woman with 25% body fat, lean body mass is 45 kg, or about 11 kg protein. Assuming that the efficiency of conversion from body protein to milk protein is approximately the same as the conversion of dietary protein to milk protein (70%), a woman consuming only the RDA for protein for non-pregnant and non-lactating women needs

to mobilize about 19% of tissue body to support milk production for 6 months. That is, if the intake of protein from the mother's diet is less, then the production of protein in milk will also be reduced, which is needed for infants 0-6 months at least 9 grams/day (National Academy Press, 2001). In addition, it is known that mothers who are malnourished or who experience CED during pregnancy can cause intrauterine growth restriction (IUGR) which contributes to the incidence of stunting in children.[12]

The theory states that the prevalence of stunting and linear growth of the body is absolutely influenced by intake, with intake that meets the NAN (Nutrition Adequacy Number) then toddlers will grow optimally, intake that meets the NAN must meet 13 general guidelines for balanced nutrition, which includes carbohydrates, proteins, vitamins, minerals, and water (Latif, 2017). Thus, children who do not receive exclusive breastfeeding but receive nutritional supplementation from other sources such as complementary feeding in terms of quantity and quality can also have normal linear growth (body length) and age-appropriate growth. According to the results of the Agricultural Census (BPS, 2013), the main commodities in Mattampa Bulu Village are cocoa (466 households), lowland rice (390 households), beef cattle (335 households), and corn (171 households). Where cocoa contains 20/100 grams of protein, corn 3.27/100 grams of protein and beef 26/100 grams of protein and rice which contains 28/100 grams of carbohydrates. With nutritional intake from these food sources, it can replace nutritional intake that is not obtained from exclusive breast milk which contains 7 g/100 ml of carbohydrates and 0.9 g/100 ml of protein.[13,16]

This is in line with research by Molgaard (2011) which explains that there is a significant the relationship between giving formula cow's milk to children's linear growth through the mechanism of stimulation of IGF-1 synthesis and insulin secretion. However, it has not been able to explain the mechanism specifically.[14]

Conclusion

Nutritional status based on BB/U in children aged 6-24 months with exclusive and non-exclusive breastfeeding history had significant differences. As for the nutritional status based on PB/U, no significant relationship was found, this may be influenced by other factors that are more dominant and were not investigated in this study, so it is recommended for further research to examine more specifically and more broadly the factors that may be involved in determining the nutritional status of children.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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