The Health Care Pattern and The Diversity of Animal Protein Sources In Stunting and Non-Stunting Under Two Years Children In East Kalimantan

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Abstract:

The Stunting is still a major problem in child health in East Kalimantan Province. Various prevention and management efforts have been carried out through specific and sensitive interventions. Even so, the complex determinants of stunting risk still require further analysis, especially regarding parenting practices in families with under two years of age children. This was an observational study with a case-control design. The sample in this study were mothers who had under-two years of age children who lived in the selected stunting locus, in North Penajam Paser, East Kutai, and Kutai Kartanegara Regencies. Data were obtained from 88 children (cases) and 171 children (controls). Health care pattern data were analyzed by Mann Whitney test and child's feeding pattern was analyzed by the Chi-square test. This study showed that there was a difference in the scores for health care (p-value <0.01) and child feeding pattern (p-value=0.02) between families of under-two years of age children who are not stunted and those who are stunted. The diversity of animal protein sources is quite diverse, but the percentage of mothers who provide processed foods such as nuggets and sausages were still quite high. It concluded that in children who are not stunted group, their health care and feeding patterns are better than children who are stunted. It is suggested to increase mother knowledge with educational packages that focus on health care, child feeding patterns, and optimal diversity of animal protein sources.

Key words : Child Feeding Pattern; Health Care Pattern; Stunting; Under-Two Years Aged Children

1. Introduction:

Stunting is one of the nutritional problems in the world, especially in developing countries. Stunting become a problem because its association with increased risk of morbidity and mortality. United Nations Children's Fund (UNICEF) et al., (2020) estimated the incidence of stunting in 2017 reach until 22.2% or around 150.8 million toddlers in the world experiencing stunting. Of this amount more than half stunting children come from Asia (WHO, 2019). World Health Organization (WHO) data on the prevalence of stunting under five, Indonesia was included in the

third country with the highest prevalence in the South-East Asia Regional (SEAR). The average prevalence of stunting under five in Indonesia in 2005-2017 was 36.4%.

Feeding practices are a factor indirectly influencing nutritional status, while nutritional status can be directly affected by food intake and infectious diseases. Lack of food intake can be caused by several factors including economic, socio-cultural, educational, and environmental factors (2). Environmental factors, especially sanitation hygiene, was one of the risk factors for stunting as shown by Sari et al., study (2022) which found that diversity of animal protein intake and home sanitation hygiene jointly affect the incidence of stunting (p=0.038, r2=0.102). Personal and environmental hygiene affect the risk of infectious diseases which have an impact on the nutritional status of toddlers (4). Research conducted in Burkin Faso, West Africa concluded that an unhygienic environment and the provision of wrong food intake had a relation with the occurrence of stunting in children.

Titaley et al., (2013) study, which analyzed the determinants of stunting using Basic Health Research data in 2013, stated that the determinants of stunting were antenatal care examinations less than 4 times, low birth weight infant and low-income households. In addition, this study stated that what still needed to be researched is feeding practices in children. The results of the study (6), show that toddlerhood is a difficult time in feeding children, because children have started to be active and parental monitoring has also begun to decrease. The nutritional state of toddlers is influenced by family parenting, especially parents, because toddlers are still dependent on fulfilling food intake and health care. Study of Rahman, (2018), regarding child feeding, showed that families which apply good feeding patterns will lower the risk of stunting.

2. Research Methods

This study is an observational study with a retrospective case control, by dividing sample into two groups: (1) the group who have the health problem being studied (cases) in this case was stunting children and (2) the control group was not stunted children. Sample in this study were mothers who have under-two years aged children who lived in the selected stunting locus area: North Penajam Paser, East Kutai and Kutai Kartanegara districts. The minimum sample size in this study was calculated based on the formula Lemeshow et al., (1993) with calculation result of 85 respondents and rounded up to 90 for both cases and controls. Furthermore, in order to increase statistical power, control can be increased to a ratio of 1:2. In this study, the total sample was targeted to 270 respondents. After the data collection process was carried out, only 259 respondents were obtained and completely filled in the questionnaire. Data analysis of the feeding pattern variable was tested using the Chi square test, and the health care pattern variable the Mann Whitney test was carried out because data was not normally distributed .

3. Result and Discussion

The following data is the distribution of cases and controls based on characteristics. It is shown that there is no difference in the proportion of stunting among various characteristics except for

education. Among the respondents who did not fulfill the compulsory education, the highest proportion was found in mothers with stunted children (48.9%) compared to controls (35.1%). Further analysis found that there was a relation between maternal education level and incidence of stunting (p value = 0.044) with Odds Ratio: 1.77 which indicate that the risk of suffering from stunting is 1.77 times higher for children whose mothers do not complete 12 years of compulsory education compare to those who complete 12 years of compulsory education

Table 1.Respondents characteristics

	Case/ Stunting (n=88) (%)	**Control/Not stunting (n=171) (%)**	**Total**	**p value**
Gender				
Male	49 (55.7)	83 (48.5)	132 (51)	0.338
Female	18 (44.3)	44 (51.5)	62 (49)	
Family salary				
Same as regional standart	57 (64.8)	90 (52.6)	147 (56.8)	0.083
	31 (35.2)	81 (47.4)	112 (43.2)	
Maternal education				
Not fulfill	43 (48.9)	60 (35.1)	103 (39.8)	0.044*
Fulfill compulsory education	45 (51.1)	111 (64.9)	156 (60.2)	
Child immunization				
Incomplete	13 (14.8)	22 (12.9)	35 (13.5)	0.815
Complete	75 (85.2)	149 (87.1)	224 (86.5)	
BKB participation				
Participate	51 (58)	101 (59.1)	152 (58.7)	0.969
Not participate	37 (42)	70 (40.9)	107 (41.3)	

Although analysis showed there was no significant relation, descriptively, it could be considered as important information that in families with stunting children, there were 14.8% incomplete immunizations, and 13.6% had poor health care patterns. Another condition that needs to be considered is that Bina Keluarga Balita (BKB) development program participation is still low at 41.3%.

Table 2. Variations in Consumption of Animal Protein Sources in Stunting and Non- Stunting Groups

	Case/ Stunting (n=88) (%)	**Control Not stunting (n=171) (%)**	**Total**	**p value**
Fish and processed fish products				
Less varied	63 (71.6)	120 (70.2)	183 (70.7)	0.926
Varied	25 (28.4)	51 (29.8)	76 (29.3)	
Meat, egg and its processed products				
Less varied	62 (70.5)	110 (64.3)	172 (66.4)	0.395
Varied	26 (29.5)	61 (35.7)	87 (33.6)	
Milk and dairy products				
Less varied	58 (65.9)	112 (65.5)	170 (65.6)	1.00
Varied	30 (34.1)	59 (34.5)	89 (34.4)	

Table 2 revealed that most of stunting children (71.6%) had less varied fish and processed fish products consumption, less varied of meat, egg and its processed products (70,5%) also less varied in milk and dairy products (65.9%).

The Mann Whitney analysis showed that there was no difference in the average diversity of animal protein consumption between the stunting and not stunting group in terms of fish and processed protein (p value=0.633), meat, eggs and their processed (p value=0.304), and milk and their processed (p value=0.304) P value=0.588). Nevertheless, the Food Frequency Questionnaire (FFQ) results showed of the three groups of animal protein sources, it is known

that the milk and dairy products such as flavored UHT milk are most often consumed in the stunting group (14.8%), nuggets (12.5%), ice cream (9.1%) and chicken sausage (8.1%), there were even parents who give salted fish (3.4%), while in the not stunting group the most varied types of protein consumed are the meat and its processed products (35.7%).

Table 3. Health care and feeding pattern

	n	Mean	Std.Deviation	p value
Health care pattern				
Stunting	88	29.16	2.03	<0.01*
Not Stunting	171	28.30	3.56	
Pressure in feeding				
Stunting	88	13.32	2.05	0.02*
Not Stunting	171	13.66	2.13	

Table 3, the Mann Whitney analysis showed there was a difference in the average score of health care patterns between stunted and non-stunted (p value <0.01). It means that there were good practices from mothers of children who are not stunted such as more diligent in washing their hands and taking their children to Posyandu (Integrated Health Services Post). In feeding patterns, there were difference in the average pressure score in feeding (p value = 0.02). It mean that there were good practice from mothers of children who are not stunted, for example they take care of eat, ensure that child's need were met, guiding and directing the child to finish eating, but not by forcing the child to eat. This research showed that the diversity of consumption of animal protein was still low both the stunting group and not stunting group, although no significant relation was found with stunting, but the results of this study found that the diversity of animal protein consumption in the stunting group was lower. Based on research conducted on toddlers in Samarinda, it was found that toddlers who did not consume animal protein were nine times more likely to experience stunting compared to those who consumed animal protein sources during the week (p = 0.023, OR = 9,000). Likewise, toddlers who do not finish their food at every meal were also three times more likely to experience stunting (p=0.02, OR=2.882) (9). These results in line with research conducted by Azmy & Mundiastuti, (2018), toddlers have a 1.6 times greater risk of experiencing stunting if they consume insufficient amounts of protein nutrients. Similar results were also shown by Sulistianingsih & Yanti, (2016) research, that found significant relation between protein intake and nutritional status (TB/U) in toddlers, where toddlers who had lack protein in their diet had a 17.5 times risk of experiencing stunting.

Research conducted by Hanani & Susilo, (2020), showed that the majority of respondents who experienced stunting had low feeding practices. Poor feeding practices include always fulfilling children's wishes to consume foods as they like, parents sometimes force children to want to consume certain foods (13). The results of this study strengthened by research, which stated that low feeding children was at greater risk of experiencing stunting compared to children who were well fed (14–17). In this study, it was also found that stunting group often consumed

processed foods such as nuggets, sausages and milk and it was even found that there were still parents of stunting toddlers who gave salted fish as a side dish for their children's daily consumption, which had high in sodium and very minimal in nutrients. Frequent consumption of processed foods was associated with low intake of fruit and vegetables and low intake of micronutrients, the contribution of processed foods such as nuggets and sausages is high in fat and saturated fat and less in calcium, fiber and iron compared to food from fresh ingredients prepared at home (18–20)The high consumption of sugar from flavoured drinks such as Ultra High Temperature (UHT) milk and fruit-flavoured milk in this study was also found in a study conducted by Prijono et al., (2020) which found that toddlers with stunting consumed more sugar (14.83 grams/person/day) than toddlers with normal nutritional status.

Parental attitudes and control in feeding become one of the influencing factors in actualize adequate nutritional intake for children (22–25). The form of attitude and control of parents' feeding towards their children could be seen from several aspects, such as restrictions, pressure to eat and monitoring (13). According to (26), eating restrictions in children was one of parents' efforts to limit their children's consumption of fast food or sweet foods. The nutritional status of children was influenced by the family's parenting style with the parents as the main actor, because children were still dependent on fulfilling their food intake and health care on them. In some research regarding child feeding, families that implement good feeding patterns for toddlers will reduce the risk of stunting (7,17,27,28).

Parents' ability to child care could be improved through community-based groups, Toddler Family Development (BKB) program. However, for most parents, parenting skills did not come naturally, but need to be acquired through a learning process. Study of Vitaningrum, (2021) showed that this program could improve parents' knowledge, attitude, and skills in fostering and nurturing their child development in order to achieve optimal health. Mothers who have good knowledge about how to prevent stunting, causes of stunting, short-term impacts and long-term impacts of stunting will motivate mothers to improve parenting patterns and increase attachment to their children (Noviana et al., 2023). Our study found that the parents' participation in BKB was remain low. Therefore it was important to increase participation in Toddler Family Development (BKB), as Wahyuningsih et al., (2020) analysis that the implementation of BKB was very effective as an effort to increase knowledge about child health and strengthen parents' abilities in caring for their children.

4. Conclusion

It concluded that there was a difference in the average score of health care patterns between stunting and not stunting under two years children. It was also found for feeding patterns, there was differences in the average score of pressure in feeding. Animal protein sources data showed that mothers of stunting under two years children still provide processed food more than once a day. It recommended to conduct education and training about sources of animal protein food from the local area to meet the nutritional needs of children under two years old. It also needed to

increase parents' participation in Toddler Family Development (BKB).

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