JMCH Journal of Maternal and Child Health (2021), 06(05): 560-568
Masters Program in Public Health, Universitas Sebelas Maret

Meta-analysis

Psycho-Social Stimulation and Food Diversity of Children Detected Stunting

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ABSTRACT

Background: Stunting is a growth failure in children under five due to chronic malnutrition so that children are too short for their age. According to WHO, stunting becomes a public health problem if the prevalence is 20% or more. The prevalence of stunting under five in Indonesia in 2018 was more than 20% so that it became a public health problem and needed to be addressed immediately. Food diversity describes the quality of food for toddlers. Providing a variety of foods will increase the risk of malnutrition, stunting, and disease disorders. Stunting not only has an impact on physical growth but also psychosocial development. This study aimed to analyze whether psychosocial stimulation and food diversity were associated with stunting.
Subjects and Method: This research is an observational analytic with a case control approach. The study population was all toddlers aged 24-59 months in Bangkok Village, Gurah, Kediri, East Java, Indonesia, in August 2020. Using the fixed disease sampling technique, a sample of 25 stunting toddlers aged 24-59 months as the case group and 25 non-stunted toddlers as the control group. The dependent variable is the incidence of stunting, while the independent variables are psychosocial stimulation and food diversity. The stunting measurement was carried out based on the TB/U measurement. Measurement of psychosocial stimulation using the HOME (The Home Observation for Measurement of the Environment Revisited) questionnaire and diversity using the IDDS (Individual Dietary Diversity Score) questionnaire. The data collected were analyzed by Chi Square and Fisher's Exact Test.
Results: The incidence of stunting was associated with psychosocial (p= 0.031) and food diversity (OR= 12.67; CI 95%= 3.31 to 48.50; p < 0.001).
Conclusion: Psychosocial stimulation and food diversity are associated with stunting. Not consuming a variety of foods increases the incidence of stunting 12 times.

Keywords: stunting, psychosocial stimulation, food diversity.

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Cite this as:
Rahmawati D, Agustin L (2021). Psycho-Social Stimulation and Food Diversity of Children Detected Stunting. J Matern Child Health. 06(05): 560-568. https://doi.org/10.26911/thejmch.2021.06.05.06.

BACKGROUND

Stunting is a growth failure in children under five due to chronic malnutrition so that children are too short for their age. The 1000 HPK period is a golden period that starts from conception, the growth of the fetus in the womb, until the child is 2 years old. This period determines the quality of children's health both physically and spiritually, children's intelligence, and productivity in the next period (Ministry of National Development Planning/Bappenas, 2018). Stunting is measured based on WHO growth standards described by a z-score for height/

age (HAZ) less than -2SD/standard deviation and less than -3SD (Guide, 2010). Stunting is a nutritional problem that can interfere with the growth and development of children. Further stunting can cause problems in the future, such as children who are malnourished, children become sick more easily, height is not optimal as adults, and impaired cognitive ability development. Stunting does not only have a physical impact but also has an impact on psychosocial development (Primasari and Keliat, 2020). Stunting can reduce the quality of human resources (HR) because the organs of the body, especially the brain, are not able to develop optimally. In addition, it also increases the risk of diseases such as hypertension, diabetes mellitus, heart disease, and stroke (Ministry of National Development Planning/Bappenas, 2018). Stunting allows children to be unhealthy and unproductive. If this situation lasts into adulthood, the next generation of poor families will be formed (Ministry of the Republic of Indonesia, 2016).

The prevalence of stunting under five in the last 10 years showed an insignificant decrease. Riskesdas 2018 shows the prevalence of stunting under five is 30.8% (Ministry of Health of the Republic of Indonesia, 2018). In 2013 it was 37.2%, and in 2007 it was 36.8%. According to WHO, stunting under five becomes a public health problem if the prevalence is 20% or more. The prevalence of stunting under five in Indonesia is still high (more than 20%) so it is a public health problem and needs to be addressed immediately (Ministry of the Republic of Indonesia, 2016). The prevalence of stunting in rural areas is greater than stunting in urban areas. According to the 2018 Riskesdas, stunting in rural areas was 34.9% compared to 27.3% in urban areas (Ministry of Health of the Republic of Indonesia, 2018). Aprilliyani Pepi Lusita's research in 2015 showed that at the Gabus II Health Center as a rural area of stunting, 30.37%, while at the Pati II Health Center as an urban area, stunting was 7% (Pepi et al., 2017).

Various efforts have been made to prevent stunting, but not much has been done for handling toddlers who have been detected as stunting. The results of a longitudinal study of data from the Indonesian Family Life Survey (IFLS) show that there is a change in the Z-score value in early childhood growth (0-2 years) to pre-puberty (7-9 years). Short cases at an early age (0-2 years) who failed to catch up to growth (catch up) at the age of toddlers then 77% will remain short at pre-pubertal age, on the contrary short cases at an early age (0-2 years) and managed to catch up. growth at the age of toddlers, 84% will grow normally at pre-pubertal age (Ketut and Tarigan, 2017). The research proves that there are still opportunities for stunting to catch up with their growth.

The concept of handling children under five detected stunting is carried out through psychosocial stimulation activities and nurturing food diversity (Pritasari, 2018). Masrul stated that the family's psychosocial stimulation for stunting toddlers was still lacking compared to normal toddlers. The low level of psychosocial stimulation will certainly affect the next child's growth (Masrul, 2019). Food diversity describes the quality of food consumed by toddlers. This study aims to analyze whether psychosocial stimulation and food diversity are related to the incidence of stunting.

SUBJECTS AND METHOD

1. Study Design

This research is an observational analytic with a case control approach. The research was conducted in Bangkok Village, Gurah, Kediri, in August 2020.

2. Population and Sample

The study population was all toddlers aged 24-59 months, with the Fixed Disease Sampling technique, a sample of 25 stunting toddlers aged 24-59 months was found as the case group and 25 normal toddlers aged 24-59 months as the control group.

3. Studi Variables

The dependent variable is the incidence of stunting, while the independent variables are psychosocial stimulation and food diversity.

4. Operational Definition of Variables

The incidence of stunting was a condition of failure to thrive in children under five years of age measured based on anthropometric standards for measuring the nutritional status of TB/U children).

Psychosocial stimulation was psychosocial stimulation given by parents and families to toddlers.

Food diversity was a group of food consumed by toddlers in a certain time.

5. Study Instrument

Incidence of stunting was measured by measuring height, MCH book, and cadre notebook. Stunting if < - 3 SD to < -2 SD and not stunting: -2 SD to > 2 SD. Psychosocial stimulation was measured by the HOME (The Home Observation for Measurement of the Environment Revisited) questionnaire. Psychosocial stimulation is low if the score is 0-29, moderate 30-45, high 46-55. Food diversity was measured by the IDDS (Individual Dietary Diversity Score) questionnaire which consisted of 9 food groups. Foods do not vary if IDDS score is 0-5 and vary if IDDS score > 5.

6. Data Analysis

Psychosocial stimulation was analyzed by Chi Square test (X2), while food diversity was analyzed by Fisher's Exact Test.

7. Ethical Clearance

Research ethics which include informed consent, anonymity, and confidentiality were carried out during data collection. The research ethics approval letter was obtained from the Ethics Committee of Stikes Karya Husada Kediri.

RESULTS

1. Sample Characteristics

The subjects of this study were 50 toddlers aged 24-59 months consisting of 25 stunted toddlers and 25 non-stunted toddlers. Most children under five (72%) are the first and second children, male (52%), have a birth weight 2500 grams (86%), do Early Initiation of Breastfeeding (60%), receive exclusive breastfeeding (52), there is a family member who smokes (66%). While the age of the mother is mostly 21-35 years old (56%) and the latest level of education with low criteria is elementary and junior high school (48%). Most of the psychosocial stimulation is moderate psychosocial stimulation (64%) and as many as (52%) toddlers do not get a variety of foods (Table 1).

2. Bivariate Analysis

Stunting toddlers there are 5 toddlers who receive low psychosocial stimulation, while in normal toddlers none of them receive low psychosocial stimulation. Bivariate analysis using the chi square test (CI=95%) the relationship between psychosocial stimulation and the incidence of stunting obtained p= 0.031. This shows that there is a relationship between psychosocial stimulation and the incidence of stunting (Table 2).

As many as 20 stunted toddlers received food that was not diverse, while 6 normal toddlers received food that was not diverse. Bivariate analysis using fisher's exact test on the relationship between food diversity and stunting was found to be p <0.001 (OR=12.67; 95% CI 3.31 to 48.50). This shows that there is a relationship between food diversity and the incidence of stunting. Toddlers who consume a variety of foods that do not have a variety of food are 12 times more likely to experience stunting than

toddlers who consume a variety of foods that are diverse (Table 3).

Table 1 Characteristics of research subjects (n = 50)

Characteristics	Category	Frequency	Percentage
Maternal Age	< 20 years	1	2.0%
	21-35 years	28	56%
	> 35 years	21	42%
Maternal education	<Senior High School	24	48%
	≥Senior High School	21	42%
	Diploma – Bachelor	5	10%
Maternal occupation	Not working	29	58%
	Working	21	42%
Toddler's gender	Female	24	48%
	Male	26	52%
Parity	First and second born	36	72%
	Third and >4 born	14	28%
Birth weight	<2,500 gram	7	14%
	≥2,500 gram	43	86%
IMD / Early Initiation of Breastfeeding	Yes	30	60%
	No	20	40%
Exclusive breastfeeding	Yes	26	52%
	No	24	48%
Family members who smoke	Yes	33	66%
	No	17	34%
Psychosocial stimulation	Low	5	10%
	Moderate	32	64%
	High	13	26%
Food diversity	Not varied	26	52%
	Varied	24	48%

3. Bivariate Analysis

Table 2. The relationship between psychosocial stimulation and the incidence of stunting (n=50)

Stunting incident	Psychosocial stimulation						p
	Low	%	Moderate	%	High	%	
Stunting	5	20	16	64	4	16	0.031
Normal	0	0	16	64	9	36	

Table 3. Relationship between food diversity and stunting (n=50)

Stunting incident	Food diversity				OR	95% CI		p
	Not Varied	%	Varied	%		Upper Limit	Lower Limit	
Stunting	20	80	5	20	12.67	3.31	48.50	<0.001
Normal	6	24	19	76				

Table 4. T-Test Results Differences in Mean Fatigue Scores with and without Husband's Support

Group	n	Mean	SD	Effect Size	p
Pretest:	44				
With husband's support	22	10.87	0.94	-	0.460
Without husband's support	22	10.68	0.65		
Posttest:	44				
With husband's support	22	2.82	1.05	4.13	<0.001
Without husband's support	22	7.14	1.04		

DICUSSION

1. The relationship between psychosocial stimulation and stunting

Psychosocial stimulation is a psychosocial stimulus given by the family to toddlers. Measurement of psychosocial stimulation using the HOME (The Home Observation for Measurement of the Environment Revisited) questionnaire totaling 55 statements divided into 8 aspects which include learning stimulation, language stimulation, physical environment, warmth and acceptance, academic stimulation, modeling, stimulation variations to children, and positive punishment (Totssika and Syva, 2004). Table 2 shows that there are 5 stunting toddlers who receive low psychosocial stimulation and none of normal toddlers. There is a relationship between psychosocial stimulation and the incidence of stunting (p= 0.031).

Table 1 showed that 42% of mothers under five work, but this does not affect the psychosocial stimulation received by their toddlers. Another study showed that there was no difference between psychosocial stimulation given to children under five in families of working and non-working mother (p= 0.712). Working mothers can still do good psychosocial stimulation parenting. In this case the quality of the mother-child interaction itself is more important than the quantity. What determines the success or failure of nurturing psychosocial stimulation for toddlers is not the amount of time spent with toddlers but how the quality of time is used (Latifa et al., 2010). Research in Libya shows that psychosocial stimulation which includes no or infrequent direct interaction, indirect interaction, and interaction through media contact between children and fathers is associated with stunting (El Taguri et al., 2009). Other studies have also shown that psychosocial stimulation in toddlers aged 36-59 months in Honduras is significantly associated with ECD (Early Childhood Development), and mother and father involvement is needed to increase ECD (Urke et al., 2018). Here it can be seen that it is not only mothers who play a role in providing psychosocial stimulation but fathers and other family members also play a role.

Stunting has psychosocial impacts ranging from cognitive, motor, language, personality, emotional, moral, spiritual, and social aspects (Primasari and Keliat, 2020). Another study showed that giving psychosocial stimulation would increase children's cognitive development (β=0.512), where an increase of one unit of psychosocial stimulation would increase cognitive development by 0.512 points (Hastuti et al., 2010). Another study showed that there was a relationship between stimulation and the development of toddlers aged 12-36 months (p=0.027). Appropriate stimulation can give good results on the development of fine and gross motor skills of toddlers (Ulfah et al., 2018). Another study also showed that there was a relationship between stimulation and the development of children aged 4-5 years ($p < 0.001$).

Stimulation is an important factor for toddler development, lack of stimulation in toddlerhood will cause delays and disturbances in child development (Sumiyati and Yuliani, 2016). Another study also showed that there was a relationship between stunting and motor development of toddlers aged 6-23 months (p= 0.002). The motor development of stunted toddlers is still lacking when compared to non-stunted toddlers (Pantaleon et al., 2016). Other studies also showed that there were differences in gross motor, fine motor, language, and personal social development in stunted and non-stunted children ($p < 0.05$). The low motor skills of stunting toddlers are a result of the delay in the muscle maturation process, so that the mechanical ability of the muscles is reduced. Long-term nutritional deficiencies, especially

fat and protein, will inhibit the process of formation and maturation of muscle tissue, so stunting children are slower to master motor movements compared to children who have normal height (Hanani and Syauqy, 2016).

Providing adequate psychosocial stimulation has great benefits for toddler growth and development. Psychosocial stimulation from infancy can increase mother-infant interaction through the skin-to-skin process, can also increase the baby's immune system and normalize metabolism (Masrul, 2019). Stunting does not only have a physical impact but also has an impact on the psychosocial development of children, so the role of parents in providing psychosocial stimulation is very necessary.

2. The relationship between food diversity and stunting

Food diversity describes the quality of food consumed by toddlers. Table 3 shows that 80% of stunted toddlers consume a variety of foods and 20% consume a variety of foods. Fisher's exact test shows that food diversity is associated with stunting. Toddlers with a variety of food intakes that did not vary significantly increased the likelihood of experiencing stunting by 12 times compared to those who consumed various types of food (OR=12.67; CI 95%= 3.31 to 48.50; p<0.001).

Previous research showed that 85.4% of stunting toddlers aged 24-59 consumed diversified food and 14.6% of stunting toddlers consumed diverse foods, so there was a significant relationship between food diversity and stunting incidence (p≤0.05) (Widyaningsih, Kusnandar, and Anantanyu, 2018). Other studies also show that 74.5% of stunting toddlers consume a variety of foods. Food diversity is related to stunting, toddlers who consume food that is not diverse have a 3.61 times risk of experiencing stunting than toddlers who consume diverse foods (OR= 3.61; p <0.05) (Wantina et al., 2017).

Food diversity data collection (IDDS) was carried out using the recall method, in which the mother or caregiver was asked to remember and write down the food consumed by the toddler during the previous 24-hour period. Figure 1 shows that the distribution of food groups among stunted toddlers mostly consumed cereals and tubers such as rice, bread, and noodles and the least consumed vegetables such as spinach, carrots, cauliflower, tomatoes, and long beans. Research in Tigray Ethiopia shows that most toddlers also consume cereals as the most dominant food even though toddlers at that age should consume sufficient and varied foods (Mean= 3.56) (Hailemariam et al., 2018). Another study showed that 98.9% of toddlers aged 18-23 months consumed cereals/grains and tubers. Cereals and tubers are an alternative food for families with low incomes because they are easy to obtain and affordable (Maulida et al., 2014).

Figure 1 also shows stunted toddlers consume less meat than non-stunted toddlers such as chicken and catfish. Another study showed that children under five who consumed animal food sources were less likely to be stunted (OR= 0.69; 95% CI= 0.54 to 0.89; p<0.001). Toddlers who consume animal food sources not only reduce stunting but also increase anthropometric indices, and reduce mortality and morbidity due to malnutrition (Darapheak et al., 2013).

Based on recall data collection, most of the toddlers consume snacks (packaged snacks), so the food is less diverse. Food diversity can be influenced by the toddler's preference for a type of food. This can be seen from the types of food that become the consumption habits of toddlers (Nurmayasanti and Mahmudiono, 2019). Toddlers who consume excessive snacks will already feel full when it is time to eat. This causes nutritional intake to be reduced.

Food diversity is a determinant of the quality of food consumed by toddlers. Consumption of food that is not diverse is a problem in developing countries including Indonesia. The low consumption of animal products, fruit, and vegetables coupled with the high consumption of staple foods (cereals and tubers) makes it difficult for the body to absorb these nutrients. Providing a variety of foods will increase the risk of malnutrition, disease disorders, and infant mortality. It is estimated that 6% of under-five deaths can be prevented by providing a variety of foods (Utami and Mubasyiroh, 2020). Although the growth of stunting toddlers cannot be like normal toddlers, it does not mean that parents ignore the adequacy of nutrition for their toddlers. Nutrition is still needed by stunting toddlers for the development process, body cells need nutrients to develop including brain cells (Primasari and Keliat, 2020).

AUTHOR CONTRIBUTION

The authors would like thank to research and research agency which has provided research grants for novice lecturers for the 2019/2020 fiscal year. Dian Rahmawati acts as writer, Lia Agustin acts as data collector.

FUNDING AND SPONSORSHIP

This research was funded by a Beginner Lecturer Researcher grant from the Ministry of Research, Technology and Higher Education in 2020.

CONFLICT OF INTEREST

There is no conflict of interest in this study.

ACKNOWLEDGMENT

The researcher would like to thank mothers or caregivers of toddlers who are willing to participate in this study.

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