Assistance in Child Feeding Influences the Nutritional Intake of Stunting Children: *Randomized Control Trial*

Hj. Sukmawati, [1,2] Sirajuddin[2]

[1]Associate Professor in Nutrition and Dietetics Department of Health Polytechnic of Makassar, Indonesia,
[2]Student Doctoral Public Health, Hasanuddin University, Makassar, Indonesia

Abstracts

Background. Basic Health Research (BHR) in 2018 noted the prevalence of stunting in Indonesia was still high 30.8%, and around 8.9 million Indonesian children stunted. The Province of South Sulawesi ranks the fourth highest stunting prevalence of all provinces in Indonesia. Nutrition Status Monitoring (NSM) results in the last three years show the percentage of stunting children in South Sulawesi in 2015, 2016 and 2017 was 34.1%, 35.6%, and 34.8%.

Objective: This study wants to investigate effect of assistance in child feeding for stunting children to nutrient intake and weight gain.

Method: The Randomized Control Trial (RCT). The sample is stunting children aged 2-3 years. There were 30 children (15 as the intervention and 15 as the control group). Study location in the *Paccerakang* Community Health Center in Makassar City. Statistical analysis used to test hypotheses using Mann-Whitney.

Results: an increase in the intake of carbohydrates, protein, vitamin A, z ink higher in the treatment group than the control group ($p<0,05$).

Conclusion: Child feeding assistance significantly influence the nutrition intake of stunting children and also have an effect but not significantly on weight gain of stunting.

Keywords: *child feeding, food assistance, Nutrient Intake, stunting*

Introduction

Stunting is a chronic growth disorder in children due to nutritional deficiencies for a long time, which is based on height index according to HAZ scores index The Basic Health Research in 2018 noted the prevalence of national stunting was still high 30.8%, meaning that the growth was not maximized suffered by around 8.9 million Indonesian children or one in three Indonesian children and South Sulawesi ranks the fourth highest stunting prevalence of all provinces in Indonesia. in 2015, 2016 and 2017 respectively 34.1%, 35.6%, and 34.8%.[1] The extent and magnitude of stunting under five sufferers in South Sulawesi is a very large impact on the development of human resources in the future. Efforts are needed to prevent the adverse effects of Stunting in infancy, so that its continuation can be prevented both physically and psychosocially.[2,3]

The Indonesian government is committed to reducing stunting. Medium Term Development Plan National 2015-2019 health sector has targeted a decrease in the number of stunting of children under five years old to 28% in 2019. Specific programs related to improving under-five nutrition are supplementary feeding, provision of nutritional assistance packages such as high-dose Vitamin A supplementation, complementary feeding.4,5,6 In addition, capacity building has been carried out for health workers, implementing activities such as training for nutrition workers, sanitarians, and

Correspondence Author:
Sirajuddin
Nutrition Department of Health Polytechnic of Makassar, Jalan Paccerakkang KM 14 Daya Makassar, South Sulawesi, Indonesia,
Email: sirajuddin.gizi@poltekkes-mks.ac.id

midwives engaged in community health. Funding support from various ministries programs has been carried out in the framework of overcoming and preventing malnutrition and health problems for mothers and children.[7,8,9,10]

Child feeding is a method that is believed to be able to increase food consumption that meets the child's nutritional adequacy. The variables are consumption patterns that are influenced by food availability at the family level and food access to the regional level. The ability of the family economically to ensure food availability at the household level is also important to be assessed as an indirect variable related to child development.[11,7,12,13]

Knowledge and skills of mothers as caregivers of children become important as primary caregivers in the family. The better the mother's knowledge and skills, the better the quality of her care in child feeding and child health care. Child feeding that is suitable for each stage of growth, is beneficial for children who are stunting to pursue growth retardation.[14,15]

Method

Design study is *Pre Post Test Control Group Design.* Data collection was carried out before and after the intervention. Primary data collected were Child Feeding, Child Health Care, Nutrition, Weight (BB), toddler characteristics, and family characteristics. Data on Child Feeding, Child Health Care, obtained from interviews based on questionnaire instruments. BB data was obtained from anthropometric measurements. Prior to the intervention, the Child Feeding and Child Health Care Training was conducted for mothers of children under five. The training was held for 2 days using lecture, discussion and practice methods . The sample of this study was stunting children under the age of 2-3 years in the area of the Public Health Center of *Paccerakkang* (PHCP) in Makassar City. Based on calculations using sample size formula, j obtained total sample as many as 30 children-where a group of 15 children as a treatment and 15 children as a control group. Respondents are mothers of children under five stunted, and study held April - November 2018..

Results

Subject Characteristics

Sample criteria in this study aged 2-3 years experienced impaired linear growth both short and very short. Determination of the treatment group in the study using *simple random sampling* . In detail , the characteristics of the sample can be seen in the following table .

Table 01 Distribution of Characteristics of *Stunting* Children Aged 2-3 Years

Sample Characteristics	Treatment		Control	
	n	%	n	%
Gender				
1. Male	10	66.7	11	73.3
2. Girl	5	33.3	4	26.7
Total	15	100	15	100
Nutritional Status (Height for Age)				
1. Moderate Stunted	12	80.0	13	86.7
2. Severely stunted	3	20.0	2	13.3
Total	15	100	15	100

Table 0 1 designate k an sexes in the treatment group and the control group is almost the same. Children who have disorders linear growth (HAZ) well short of the treatment group (80.0%), the control group (86.7%) and very short in the treatment group (20%), the control group (13.3%).

Nutrient intake

Table 02 Nutrient Intake of Children Stunting

Nutrient Intake	Intervention	Control	p Value
Carbohydrate (g)	54.11	19.45	0.049
Protein (g)	9.52	2.8	0.000
Fat (g)	14.98	4.09	0.049
Zinc (mg)	0.97	0.5	0.014
Vitamin A (µg)	182.05	45.04	0.031

Table 02 shows that there was an increase in carbohydrate, protein, fat, zinc and vitamin A intake in both groups. Significant increasing of intervention than control group for across nutrient intake.

Discussion

The Indonesian Ministry of Social Affairs (2007) explains that mentoring is a process of social relations between facilitators and targets in the form of facilities (facilities) to identify needs and solve problems and encourage the growth of initiatives in the decision making process so that the independence of targets in a sustainable manner can be realized. The responsibility of a mentor when conducting assistance is greatly influenced by the knowledge of the assistant to the function of the implementation of assistance, where, when and for whom the assistance process is carried out.[16,17,18,19] The purpose of assistance, the function of assistance is very dependent on the context of the problem being accompanied.

The ability to create behavioral change by assistants in the field becomes a benchmark of success in mentoring. Harmony and the warmth of relationships that establish active participation of assistants to help deal with the problem independently, of course, are inseparable from the emotional ties that have been fostered by assistants and mentors. In this study, the companion is a graduate in applied nutrition who has knowledge in the field of nutrition so that he understands very well about matters relating to feeding children under five who experience stunting. Mother of childrens get maximum assistance about child feeding so that the child's feeding patterns have improved which is guided by a balanced menu with a sufficient amount in accordance with needs.[20,21]with a rapid reduction thereafter. We aimed to assess the role of different predictors on stunting reduction over time and across departments, from 2000 to 2012. Methods: We used various secondary data sources to describe time trends of stunting and of possible predictors that included distal to proximal determinants. We determined a ranking of departments by annual change of stunting and of different predictors. To account for variation over time and across departments, we used an ecological hierarchical approach based on a multilevel mixed-effects regression model, considering stunting as the outcome. Our unit of analysis was one department-year. Results: Stunting followed a decreasing trend in all departments, with differing slopes. The reduction pace was higher from 2007-2008 onwards. The departments with the highest annual stunting reduction were Cusco (-2.31%,[22]

The results of this study explain that child feeding assistance, child health care significantly influence the intake of nutrients (carbohydrates, protein, fat, zinc and vitamin A) stunting toddlers aged 2-3 years. This study is in line with research conducted by Sri Dara Ayu (2008) that the nutrition assistance program increases the mother's nutritional knowledge, parenting patterns (patterns of child feeding), nutritional status of KEP infants in the 3 months after assistance.

The results of this study are in line with the theory that the mentoring process carried out aims to change risky behavior to be less risky or not risky in this case including behavior in how to feed children. Therefore that need to be considered when a companion conducts an educational intervention to someone in order to change behavior (behavior of feeding children) must go

through several stages, as follows: 1) Providing complete information will be able to increase knowledge. At this stage increased knowledge (awareness). 2) Provision of information that is continuous and more detailed, for example about the existence of several choices that can be considered before deciding to choose the right one for himself (precontemplative). 3) Deciding to choose the right choice for himself, from several options (comptemplative). 4) Make it ready to make its choices (ready to act). 5) They have often /almost implemented safe behavior (action). 6) The phase while still needs to be given support to be able to continue to maintain and carry out safe behavior (support and maintenance). [23,24]

The assistance process carried out in this study has increased the knowledge of stunting mothers and toddlers about feeding and child health care in order to increase nutrient intake. After she understands how to feed and how to care for children's health, then you get the opportunity to choose how to feed children and how to care for children's health that is good and right. After the mother chooses and believes how to feed the child and how to care for the child's health is good and right, then the mother will carry out the behavior of feeding and child health care according to the module guidelines. Mother of toddlers need to get support from families, companions and health workers so that they can maintain and carry out child feeding behavior and child health care that is good and right so that it can increase the intake of nutrients, especially carbohydrates, proteins, fats, zinc and vitamin A. Substance intake adequate nutrition both in quality and quantity will improve the growth of children under five years of age especially in stunting.

Conclusion

Assistance in child feeding influences the intake of nutrients (carbohydrates, proteins, fats, zinc and Vitamin A) toddler *stunting* aged 2-3 years.

Ethical Clearance: This study approved ethical clearance from The Committee of Research Ethics of Health Polytechnic of Makassar, Indonesia. The informed consent include the research title, purpose, participants' right, confidentiality , and signature.

Sources Funding: The sources of this research cost from Health Polytechnic of Makassar

Conflict of Interest: The author declare that no conflict of interest

References

1. Health Research and Development Body Ministry of Health Republic of Indonesia. Basic Health Research Report of Indonesia Year 2018. Riskesdas 2018. 2018:182–3.
2. Assefa H., Belachew T., Negash L. Socio-demographic factors associated with underweight and stunting among adolescents in Ethiopia. Pan Afr Med J. 2015;20:252, doi: 10.11604/pamj.2015.20.252.3588.
3. Gleason KM., Valeri L., Shankar AH., Hasan MOSI., Quamruzzaman Q., Rodrigues EG., et al. Stunting is associated with blood lead concentration among Bangladeshi children aged 2-3 years. Environ Heal A Glob Access Sci Source. 2016;15(1):1–9, doi: 10.1186/s12940-016-0190-4.
4. Panjwani A., Heidkamp R. Complementary Feeding Interventions Have a Small but Significant Impact on Linear and Ponderal Growth of Children in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. J Nutr. 2017:jn243857, doi: 10.3945/jn.116.243857.
5. Titaley CR., Ariawan I., Hapsari D., Muasyaroh A., Dibley MJ. Determinants of the stunting of children under two years old in Indonesia: A multilevel analysis of the 2013 Indonesia basic health survey. Nutrients. 2019;11(5), doi: 10.3390/nu11051106.
6. Iannotti LL., Lutter CK., Stewart CP., Riofrío CAG., Malo C., Reinhart G., et al. Eggs in early complementary feeding and child growth: A randomized controlled trial. Pediatrics. 2017;140(1), doi: 10.1542/peds.2016-3459.
7. Kang Y., Kim S., Sinamo S., Christian P. Original Article Effectiveness of a community-based nutrition programme to improve child growth in rural Ethiopia : a cluster randomized trial. 2016:1–15, doi: 10.1111/mcn.12349.
8. Usselman CWNSSJRB. Mentor Mothers Program Improved Child Health Outcomes At A Relatively Low Cost In South Africa. Physiol Behav. 2017;176(3):139–48, doi: 10.1016/j.physbeh.2017.03.040.
9. West J., Syafiq A., Crookston B., Bennett C., Hasan MR., Dearden K., et al. Stunting-Related Knowledge: Exploring Sources of and Factors Associated with Accessing Stunting-Related

Knowledge among Mothers in Rural Indonesia. Health (Irvine Calif). 2018;10(09):1250–60, doi: 10.4236/health.2018.109096.

10. Dewey KG. Reducing stunting by improving maternal, infant and young child nutrition in regions such as South Asia: Evidence, challenges and opportunities. Matern Child Nutr. 2016;12:27–38, doi: 10.1111/mcn.12282.
11. Abera SF., Kantelhardt EJ., Bezabih AM., Gebru AA., Ejeta G., Lauvai J., et al. Nutrition-specific and sensitive drivers of poor child nutrition in Kilte Awlaelo-Health and Demographic Surveillance Site, Tigray, Northern Ethiopia: implications for public health nutrition in resource-poor settings. Glob Health Action. 2019;12(1), doi: 10.1080/16549716.2018.1556572.
12. Muhoozi GKM., Atukunda P., Skaare AB., Willumsen T., Diep LM., Westerberg AC., et al. Effects of nutrition and hygiene education on oral health and growth among toddlers in rural Uganda: follow-up of a cluster-randomised controlled trial. Trop Med Int Heal. 2018;23(4):391–404, doi: 10.1111/tmi.13036.
13. Roberts SB., Franceschini MA., Krauss A., Lin P-Y., Braima de Sa A., Có R., et al. A Pilot Randomized Controlled Trial of a New Supplementary Food Designed to Enhance Cognitive Performance during Prevention and Treatment of Malnutrition in Childhood. Curr Dev Nutr. 2017;1(11):e000885, doi: 10.3945/cdn.117.000885.
14. Phelan JC., Link BG., Tehranifar P. Social Conditions as Fundamental Causes of Health Inequalities: Theory, Evidence, and Policy Implications. J Health Soc Behav. 2010;51(1 Suppl):S28–40, doi: 10.1177/0022146510383498.
15. Shekar M., Kakietek J., D'Alimonte MR., Rogers HE., Eberwein JD., Akuoku JK., et al. Reaching the global target to reduce stunting: An investment framework. Health Policy Plan. 2017;32(5):657–68, doi: 10.1093/heapol/czw184.
16. Weaver CM., Dwyer J., Iii VLF., King JC., Leveille G a., Macdonald RS. Processed foods : contributions to nutrition. Am J Clin Nutr. 2014;(99):1524–42, doi: 10.3945/ajcn.114.089284.1.
17. Pearson D., Henryks J., Trott A., Jones P., Parker G., Dumaresq D., et al. Local food: understanding consumer motivations in innovative retail formats. Br Food J. 2011;113(7):886–99, doi: 10.1108/00070701111148414.
18. Sirajuddin. Food Trade Does Not Exist, Contributing to Malnutrition in Asmat Ethnicity. Annals of Nutrition and Metabolism, vol. 75. 2019. p. I–II.
19. Mabli J., Ohls J. Supplemental Nutrition Assistance Program Participation Is Associated with an Increase in Household Food Security in a National. J Nutrtition Community Int Nutrtition. 2015, doi: 10.3945/jn.114.198697.data.
20. Arlinghaus KR., Vollrath K., Hernandez DC., Momin SR., O'Connor TM., Power TG., et al. Authoritative parent feeding style is associated with better child dietary quality at dinner among low-income minority families. Am J Clin Nutr. 2018;108(4):730–6, doi: 10.1093/ajcn/nqy142.
21. Huicho L., Huayanay-Espinoza CA., Herrera-Perez E., Segura ER., Niño de Guzman J., Rivera-Ch M., et al. Factors behind the success story of under-five stunting in Peru: A district ecological multilevel analysis. BMC Pediatr. 2017;17(1):1–9, doi: 10.1186/s12887-017-0790-3.
22. Dev DA., Speirs KE., Williams NA., Ramsay S., McBride BA., Hatton-Bowers H. Providers perspectives on self-regulation impact their use of responsive feeding practices in child care. Appetite. 2017;118:66–74, doi: 10.1016/j.appet.2017.07.022.
23. Calder PC., Board E., Bell A., Kok F., Lichtenstein A., Yaqoob P., et al. The Psychology of Food Choice. cbi.org; 2006.
24. Rosales A., Sargsyan V., Abelyan K., Hovhannesyan A., Ter-Abrahanyan K., Jillson KQ., et al. Behavior change communication model enhancing parental practices for improved early childhood growth and development outcomes in rural Armenia – A quasi-experimental study. Prev Med Reports. 2019;14(August 2018):100820, doi: 10.1016/j.pmedr.2019.100820.