PJN
ISSN 1680-5194

PAKISTAN JOURNAL OF NUTRITION

ANSInet
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorpjn@gmail.com

OPEN ACCESS Pakistan Journal of Nutrition

ISSN 1680-5194
DOI: 10.3923/pjn.2020.279.284

Research Article

The Effectiveness of Counseling on Complementary Food for Mothers and Supplementary Feeding for Increasing weight of Breastfed babies (12-24 Months of Age) in the Aceh Besar District of Indonesia

[1,2]Rachmawati Rachmawati, [2]Rosi Novita, [2]Erwandi Erwandi, [2]Eva Fitriyaningsih, [3,4]Rinaldi Idroes and [5]Novi Reandy Sasmita

[1]Graduate School of Mathematics and Applied Sciences, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
[2]Department of Nutrition, Aceh of Health Polytechnic, Ministry of Health, Aceh Besar 23241, Indonesia
[3]Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
[4]Department of Pharmacy, Faculty of Mathematics and Natural Sciences, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia
[5]Department of Epidemiology, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkla 90110, Thailand

Abstract

Background and Objective: The first 0-24 months of life is one of the most crucial periods for determining the quality of the development of children. This period is a critical time for brain development; consequently, nutrition should be prioritized throughout this time. One effort to realize the importance of nutrition for mothers is a counseling program on complementary foods and supplementary feeding to increase the baby's nutrition. The purpose of this study was to analyze the effectiveness of counseling on complementary food for mothers and supplementary feeding to increase the weights of infants aged 12-24 months. **Materials and Methods:** This study used a quasi-experimental design that included a pre- and post-tests in two groups. This research was conducted from August to December 2019 with 30 infants aged 12-24 months who were selected by purposive sampling. Data were analyzed using the Wilcoxon and the Mann-Whitney U tests. **Results:** Differences were found in the body weights of children ($p = 0.00$). The Mann-Whitney U test results showed no difference in body weights of children between the treatment and control group before treatment ($p = 0.6$); however, an average increase in body weight was found after the intervention. Therefore, counseling on complementary food for mothers may increase the weight of breastfed infants. **Conclusion:** The implementation of counseling on complementary food to enrich the mother's breastmilk and supplementary feeding was found to be effective for increasing the weight of infants aged 12-24 months.

Key words: Pediatric weight, breastmilk, supplementary food counseling, supplementary feeding, stunting

Received: January 08, 2020 Accepted: April 27, 2020 Published: May 15, 2020

Citation: Rachmawati Rachmawati, Rosi Novita, Erwandi Erwandi, Eva Fitriyaningsih, Rinaldi Idroes and Novi Reandy Sasmita, 2020. The effectiveness of counseling on complementary food for mothers and supplementary feeding for increasing weight of breastfed babies (12-24 months of age) in the aceh besar district of Indonesia. Pak. J. Nutr., 19: 279-284.

Corresponding Author: Rahmawati, Graduate School of Mathematics and Applied Sciences, Universitas Syiah Kuala, Banda Aceh 23111, Indonesia

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.

INTRODUCTION

One indicator of the Human Development Index (HDI) is health. Nutritional factors play a critical role in producing healthy, intelligent and productive human beings. Efforts to maximize the child's health should begin in utero and continue from its first day of life. One effort to improve the degree of health is the provision of exclusive breastmilk and complementary foods to enrich the mother's breastmilk. The WHO[1] recommends four important actions to achieve optimal growth and development of infants and children. First, feed breastmilk to the newborn within 30 min of its birth. Second, feed exclusively via breastfeeding from birth until 6 months of age. Third, provide infants aged 6-24 months with weaning foods. Fourth, continue breastfeeding until the child is 24 months or older[1].

Infants who are breastfed for ≥6 months has higher IQ scores and mental health parameters later in life than those infants who breastfed for <6 months[2]. Exclusive breastfeeding followed by appropriate complementary feeding up to 12 months of age can reduce the prevalence of stunting by 19.8%[3]. Further, lack of nutritional intake from complementary foods in breastfed babies aged 6-23 months can cause developmental disorders and substantially raise the risk of stunting[4]. The high prevalence of stunting in developing countries is related to breastfeeding and complementary food behaviors; therefore, the practice of breastfeeding and food supplementation must be optimized[5].

Similar studies have been carried out in an effort to improve the health of infants aged 0-24 months and mothers in parts of Indonesia; however, no such study has been performed in the Aceh Basar region[6]. The local Aceh Basar community has identified a lack of information about the proper nutritional requirements for babies aged 0-2 years[7]. Such information is important as it allows stakeholders in the healthcare sector to obtain accurate data in order to develop appropriate solutions to combat malnutrition in infants.

Complementary feeding remains under practiced, especially in developing countries - only less than one-quarter of children aged 6-23 months in developing countries meet the diversity criteria for complementary food set by the WHO[8]. Breastfeeding in Indonesia-especially exclusive breastfeeding-remains very low. Based on Basic Health Research data (2018)[9], only 37.3% of mothers breastfed exclusively for up to 6 months, which fails by a significant margin to reach the national target of 80%. The percentage of exclusive breastfeeding for infants aged 0-6 months in Aceh in 2018 was 22.99%, a marked decrease from the 53% reported in 2017[10]. Breastfeeding and the addition of complementary foods are influenced by several factors, including knowledge of maternal nutrition[11].

The report of the Aceh Province Nutrition Monitoring (PSG) survey in 2018 stated that Aceh Besar had a 22.1% prevalence rate of malnutrition in children under 5 years of age[12]. The practice of breastfeeding and complementary feeding remain suboptimal and the prevalence of underweight, wasting and stunting among children aged 6-23 months in Aceh is needed to improve the practice of complementary feeding and, thus, the nutritional status of the child[13].

One of the main strategies to overcome community-wide infant nutrition inadequacies is by increasing the role of counseling in nutrition programs for mothers. Counseling is an interpersonal communication approach commonly used to increase knowledge and modify attitudes and behaviors. Counseling on complementary food can improve the mother's knowledge about nutrition and supplementary feedings practices can reduce the risk of stunting and malnutrition. To foster the health of children, this study aimed to examine the effectiveness of counseling on weaning foods and supplementary feeding to increase the weight of breastfed babies aged 12-24 months in Aceh Besar.

MATERIALS AND METHODS

Design: This study used a quasi-experimental design with a pre- and post-test in two groups. The study was conducted from August to December 2019 in the Darul Imarah subdistrict of Aceh Besar. The sample in this study comprised 30 babies aged 12-24 months. The inclusion criteria were as follows: babies with poor nutritional status, babies who were still being breastfed and mothers who were willing to be respondents. Purposive sampling was performed.

Data collection: Counseling on complementary foods and supplementary feedings was given to the treatment group; whereas, the mothers in the control group were only given counseling on complementary foods every two weeks and supplementary feedings in the form of healthy and nutritious snacks were given to babies once daily for eight weeks. The babies' body weights were measured with digital scales before and after the administration of counseling.

Ethical considerations: This study received ethical approval from the Health Research Ethics Commission (HREC) of Aceh Health Polytechnic No: LB.02.03/6118/2018.

Statistical analysis: Data were analyzed with the Wilcoxon and Mann-Whitney U tests.

RESULTS AND DISCUSSION

Characteristics of the sample: Sample characteristics are shown in Table 1. The majority of the sample were aged 12-18 months; 86.7% were in the treatment group and 73% were in the control group. In the treatment group, the majority were male (60.0%), whereas the majority in the control group were female (53.3%). The majority of the babies were malnourished. In the treatment group, 80% of babies were malnourished; in the control group, 93.3% were malnourished.

Babies aged 0-2 years are in a critical developmental period, both physically and cognitively; thus, nutrition is especially important during this period. Malnutrition in children can cause developmental disorders and , if left untreated, can have lasting effects in adulthood. Mothers with high incomes generally obtain higher-quality nutrition than do mothers with low incomes[14]. Lower incomes can affect the child's nutritional status and, thereby, affect the child's development. Efforts to improve nutritional status can be done by providing exclusive breastfeeding and complementary foods. In Indonesia, infants who were exclusively breastfed had good nutritional status and normal head circumference, while infants who were given formula milk were malnourished and had abnormal head circumference; however, developmental trajectory did not differ much between the two groups[15]. Maternal age is a significant prediction for the continuity of breastfeeding until the age of 6 months[16]. From the age of 6 months, breastfed babies begin to be given complementary foods[17].

Babies' body weights before and after intervention: Giving complementary foods and supplementary feeding are required during periods where the breastmilk does not meet the baby's needs; thus, complementary foods and fluids are needed. The target age for introducing complementary foods is 6 months, although breastfeeding should continue until 2 years of age[5].

Results were analyzed using the Wilcoxon and Mann-Whitney U tests because weight data were not normally distributed. The Wilcoxon test showed that there were 13 children in the treatment group whose weight increased after the intervention (which comprised Asiatic Complementary Food Counseling and Supplementary Food Feeding) and the remaining three children were stable in weight. The control group also had 13 children whose weights were found to have increased after the intervention and two children whose weights decreased.

Complementary foods and supplementary foods comprise milk to semi-solid foods. Complementary foods were given in stages and food shapes and volumes were given in accordance with the infant's digestive ability[18]. Complementary food to enrich the breast milk and supplementary feeding were given to increase the baby's

Table 1: Characteristics of the sample according to age, sex and nutritional status (BW/U)

	Treatment group (N = 15)		Control group (N = 15)	
Characteristics	No.	Percentage	No.	Percentage
Age				
12-18 months	13	86.7	11	73
19-24 months	2	13.3	4	27
Sex				
Male	9	60.0	7	47
Female	6	40.0	8	53
Nutritional status				
Poor	3	20.0	1	7
Less	12	80.0	14	93

Table 2: Wilcoxon test results based on negative ranks

Wilcoxon test		N	Mean rank
Weight after and before treatment (intervention group)	Negative ranks	0	0.0
	Positive ranks	13	7.0
	Ties	2	
	Total	15	
Weight after and before intervention (control group)	Negative ranks	2	3.8
	Positive ranks	13	8.7
	Ties	0	
	Total	15	

Table 3: Wilcoxon signed-rank test results

	Weight (treatment group)	Weight (control group)
Z	-3.2	-3.0
Asymp. Sig. (2-tailed)	0.00	0.00

Table 4: Statistical test results

Testing	Weight
Mann-whitney U	99.5
Wilcoxon W	219.5
Z	-0.5
Asymp. Sig. (2-tailed)	0.6
Exact Sig. [2*(1-tailed Sig.)]	0.6

nutrition and energy, because breastmilk only provides 60% of the baby's nutritional needs at 6-12 months of age[19]. Normally, babies aged 4-6 months are introduced supplementary foods but remain breastfed as their main food source[20]. The period wherein babies are given supplementary feedings is highly dependent on the care and feeding behaviors of the mother. Other factors can also play a role, including the mother's knowledge, occupational status and cultural and economic factors. Mothers who are highly educated, who are housewives and who have good economic status are more likely to provide breastmilk and complementary foods exclusively, compared to mothers with low education, who work and who have low economic status[21].

Giving complementary foods and supplementary feeding were found to decrease breastmilk production too early. Additionally, introducing supplementary feedings too early can cause digestive problems for the baby (e.g., diarrhea, constipation) because the baby's digestive system is not sufficiently developed to receive additional foods given at times that do not coincide with its usual feeding schedule. The size of the baby's stomach is still relatively small and can fill quite rapidly despite the baby's nutritional needs not being met. The Wilcoxon test revealed significant differences in the children's weights before and after the intervention between both groups.

Babies' body weights between the treatment and control group: Differences in body weight between the treatment group and the control group were revealed by Mann-Whitney U testing, which found no differences in body weight between the treatment and control groups ($p = 0.6$; Table 4). The results of this study suggest that intervention in the form of providing counseling on breastmilk-complementary foods, either with or without supplementary feeding, can increase a child's weight.

The provision of improper supplementary foods, whether in quality or quantity, can make children malnourished, which, if not immediately addressed, will have a deleterious impact on development. Malnutrition at this age can have permanent effects on growth that can end with stunting and as characterized by poor brain development that affects cognitive abilities, educational attainment and the incidence of metabolic syndrome, all of which can increase the likelihood of developing various degenerative diseases[22]. Intervention in the form of education provided through local health service facilities can increase the knowledge and practice of providing supplementary foods and ultimately improve the growth of child[23].

The practice of breastfeeding and supplementary feeding in Indonesia relates to food diversity, active feeding and good hygiene practices[24]. Providing high-quality nutrition in correct quantities and at correct intervals can optimize development in children[25]. Inappropriate supplementary feeding practices have been identified as a major cause of malnutrition in children in developing countries and interventions in the form of education have been shown to be effective at improving the practice of complementary feeding[26]. The average age of introducing supplementary foods in Indonesia is 4.4 months[24]. Research conducted in the United Kingdom showed that supplementary feedings introduced too early (<4 months) increases the risk of future obesity[27]. Increased duration of breastfeeding (≥6 months) is associated with increased cognitive development and language skills compared to children who have never received breastmilk[28].

The time at which supplementary food is introduced is influenced by several factors, including knowledge of maternal and childhood nutrition, access to information on these topics and the family's economic status. The premature introduction of supplementary food can impair fine-motor development[29]. Premature introduction of supplementary food is influenced by several factors, such as parental income, the mother's knowledge and occupational status, myths, cultural factors and the role of healthcare workers[30]. The duration of breastfeeding has a significant relationship ($p<0.05$) with the body length of a child, especially below the age of three years[31].

The results of this study will benefit the Aceh Besar community, especially mothers and babies, in appreciating the value of counseling on the importance of the mother's nutrition to increase the quantity and quality of breastmilk and on knowledge of supplementary feeding. In addition, these results will prove useful to others parties, such as policymakers, academics and researchers who are interested in carrying out further studies on this topic.

CONCLUSION

Statistical test results revealed differences in children's body weights between the treatment and control group ($p = 0.00$). Mann-Whitney U test results showed no difference in body weight between the treatment group and the control group ($p = 0.6$). An average increase in body weight in the treatment and control groups after the intervention was found. Breastfeeding-complementary foods counseling and supplementary feeding increase the body weight of babies aged 12-24 months. Counseling on complementary food for mothers and supplementary feeding for infants may increase the weight of breast fed infants.

ACKNOWLEDGMENTS

The researcher expresses his sincere gratitude to the Health Polytechnic of the Ministry of Health (Poltekkes) of Aceh for funding this research.

REFERENCES

1. World Health Organization, 2010. Regional consultation on food-based dietary guidelines for countries in Asia region. WHO Regional Office for South-East Asia. https://apps.who.int/iris/handle/10665/205756.
2. Oddy, W.H., G.E. Kendall, J. Li, P. Jacoby and M. Robinson *et al*., 2010. The long-term effects of breastfeeding on child and adolescent mental health: A pregnancy cohort study followed for 14 years. J. Pediatrics, 156: 568-574.
3. Bhutta, Z.A., J.K. Das, A. Rizvi, M.F. Gaffey and N. Walker *et al*., 2013. Evidence-based interventions for improvement of maternal and child nutrition: What can be done and at what cost? Lancet, 382: 452-477.
4. Stewart, C.P., L. Iannotti, K.G. Dewey, K.F. Michaelsen and A.W. Onyango, 2013. Contextualising complementary feeding in a broader framework for stunting prevention. Maternal Child Nutr., 9: 27-45.
5. Lutter, C.K., B.M.E.G. Daelmans, M.d. Onis, M.T. Kothari and Marie T. Ruel *et al*., 2011. Undernutrition, poor feeding practices and low coverage of key nutrition interventions. Pediatr., 128: e1418-e1427.
6. Frankenberg, E., 1995. The effects of access to health care on infant mortality in Indonesia. Health Transition Rev., 5: 143-163.
7. Lewycka, S., C. Mwansambo, P. Kazembe, T. Phiri and A. Mganga *et al*., 2010. A cluster randomised controlled trial of the community effectiveness of two interventions in rural Malawi to improve health care and to reduce maternal, newborn and infant mortality. Trials, Vol. 11, No. 88 10.1186/1745-6215-11-88.
8. WHO., 2020. Infant and young child feeding. World Health Organization. https://www.who.int/en/news-room/fact-sheets/detail/infant-and-young-child-feeding.
9. Hasil Utama RISKESDAS, 2018. Badan Penelitian dan Pengembangan Kesehatan. Kementerian Kesehatan, Indonesia.
10. Al Rahmad, A.H., 2017. Pemberian asi dan mp-asi terhadap pertumbuhan bayi usia 6 – 24 bulan. J. Kedokteran Syiah Kuala, 17: 8-14.
11. Pascale, K.N.A., N.J. Laure and O.J. Enyong, 2007. factors associated with breast feeding as well as the nutritional status of infants (0-12) months: An epidemiological study in Yaounde, Cameroon. Pak. J. Nutr., 6: 259-263.
12. Kemenkes, R.I., 2018. Buku Saku Pemantauan Status Gizi Tahun 2017. Direktorat Bina Gizi Masyarakat Kemenkes 2018, https://promkes.net/2018/01/26/buku-saku-pemantauan-status-gizi-tahun-2017/.
13. Ahmad, A., S. Madanijah, C.M. Dwiriani and R. Kolopaking, 2018. Complementary feeding practices and nutritional status of children 6-23 months old: Formative study in Aceh, Indonesia Nutr. Res. Practice, 12: 512-520.
14. Islam, M., S. Rahman, Kamruzzaman, M. Islam and Abdus Samad, 2013. Effect of maternal status and breastfeeding practices on infant nutritional status - a cross sectional study in the south-west region of Bangladesh. Pan Afr. Med. J., Vol. 16, No. 139 10.11604/pamj.2013.16.139.2755.
15. Kumala, A., 2017. Factors associated with exclusive breastfeeding at primary health care in Indonesia. Pediatr. Ther., Vol. 7, No. 4 10.4172/2161-0665.1000337.
16. Foo, L.L., S.J. Quek, S.A. Ng, M.T. Lim and M.T. Deurenberg, 2005. Breastfeeding prevalence and practices among Singaporean Chinese, Malay and Indian mothers. Health Promot. Int., 20: 229-237.
17. Bhandari, N., S. Mazumder, R. Bahl, J. Martines, R.E. Black and M.K. Bhan, 2004. An educational intervention to promote appropriate complementary feeding practices and physical growth in infants and young children in rural Haryana, India. Community Int. Nutr., 134: 2342-2348.
18. Ahmad, A., S. Madanijah, C.M. Dwiriani, R. Kolopaking, 2018. Iron deficiency risk factors in undernourished children aged 6-23 months in Aceh, Indonesia. J. Gizi Pangan, 13: 145-156.
19. Mufida L., T.D. Widyaningsih and J.M. Maligan, 2015. Prinsip dasar makanan pendamping air susu ibu (MP-ASI) untuk bayi 6–24 bulan: Kajian pustaka. Jurnal Pangan dan Agroindustri, 30: 1646-1651.
20. Amanda, G., 2004. Healthy Baby and Toddler Foods. https://picclick.co.uk/Healthy-Baby-and-Toddler-Foods-The-Complete-Healt-302427169480.html.
21. Lenggogeni, P., 2016. Examining Exclusive Breastfeeding Practice in Indonesia and Its Association to Maternal Socio-Demographic Determinants, to Inform Intervention Efforts Aimed at Reducing Infant Mortality. Master Thesis, Georgia State University.

22. Achad, E., 2014. Periode kritis 1000 hari pertama kehidupan dan dampak jangka panjang terhadap kesehatan dan fungsinya. Persagi, Yogyakarta, Indonesia, https://adoc.tips/periode-kritis-1000-hari-pertama-kehidupan-dan-dampak-jangka.html.
23. Zhang, Y., Q. Wu, W. Wang, M.H.v. Velthoven and S. Chang *et al*., 2016. Effectiveness of complementary food supplements and dietary counselling on anaemia and stunting in children aged 6-23 months in poor areas of Qinghai Province, China: a controlled interventional study. BMJ Open, Vol. 6, No. 10 10.5061/dryad.52mt5.
24. Blaney, S., J. Februhartanty and S. Sukotjo, 2015. Feeding practices among Indonesian children above six months of age: A literature review on their magnitude and quality (Part 1). Asia Pac. J. Clin. Nutr., 24: 16-27.
25. Ortega, F.B., J.R. Ruiz, M.J. Castillo and M. Sjostrom, 2007. Physical fitness in childhood and adolescence: A powerful marker of health. Int. J. Obesity, 32: 1-11.
26. Shi, L. and J. Zhang, 2011. Recent evidence of the effectiveness of educational interventions for improving complementary feeding practices in developing countries. J. Trop. Pediatr., 57: 91-98.
27. Pearce, J. M.A. Taylor and S.C. Langley-Evans, 2013. Timing of the introduction of complementary feeding and risk of childhood obesity: A systematic review. Int. J. Obesity, 37: 1295-1306.
28. Jedrychowski, W., F. Perera, J. Jankowski, M. Butscher and E. Mroz *et al*., 2012. Effect of exclusive breastfeeding on the development of children's cognitive function in the Krakow prospective birth cohort study. Eur. J. Pediatr., 171: 151-158.
29. Amelia and S.W. Nur, 2013. Usia pemberian makanan pendamping air susu ibu (MP-ASI) dengan gangguan perkembangan motorik halus bayi. Journal Midwivery, Vol. 5, No. 1.
30. Kumalasari, S.Y., F. Sabrian and O. Hasanah, 2015. Faktor-faktor yang berhubungan dengan pemberian makanan pendamping ASI dini. Jurnal Online Mahasiswa Program Studi Ilmu Keperawatan Universitas Riau, 2: 879-889.
31. Ntab, B., K.B. Simondon, J. Milet, B. Cisse´, C. Sokhna, D. Boulanger and F. Simondon, 2005. A young child feeding index is not associated with either height-for-age or height velocity in rural Senegalese children. J. Nutr., 135: 457-464.