



Effect of nutrition education intervention on complementary feeding practices of mothers in Bangladesh

Sakhina Khatun¹, Shanzida Khatun², Happy Bandana Biswas³ and Mohammad Nurul Anowar⁴

¹ Nursing Instructor, Shaheed Tajuddin Ahmad Nursing College, Gazipur, Bangladesh

² Faculty, National Institute of Advanced Nursing Education & Research, Bangladesh

³ Faculty, National Institute of Advanced Nursing Education & Research, Bangladesh

⁴ Faculty, National Institute of Advanced Nursing Education & Research, Bangladesh

Corresponding Author: Sakhina Khatun

DOI: <https://doi.org/10.33545/nursing.2024.v8.i1.A.437>

Abstract

Background: Improper feeding practices results in under nutrition which is one of the leading causes of child mortality. Inadequate knowledge, attitude of mothers influences poor feeding practice. Nutrition Education Intervention can improve health and nutritional status of the children.

Objective: The objective of the study was to examine the effect of nutrition education intervention on complementary feeding practices of mothers in Bangladesh.

Methods: A quasi experiment study conducted at Khude Bormi village, Gazipur from July 2021 to 2022. Forty participants were recruited conveniently. Nutrition education intervention was given for two weeks. Data were collected using structured self-administered questionnaires including Socio-demographic Questionnaire, Knowledge Attitude and Practice Questionnaire before and after intervention. Data were analyzed using Descriptive statistics and Inferential statistics.

Results: The average age of the mothers was about 25 years & most of the mothers were housewives. The mean difference of knowledge was (mean -5.075, SD= 2.28), attitude (Mean -21.875, SD= 7.19), and practice (Mean= -15.050, SD= 6.39) regarding complementary feeding among mothers that indicates statistically significant differences before and after intervention.

Conclusion: This study found that nutrition education intervention significantly improved mother's knowledge, attitude and practices regarding complementary feeding. Nutrition education intervention program should be conducted to improve the complementary feeding practice of mothers at remote community level.

Keywords: Complementary feeding, knowledge, attitude, practice, nutrition education, mother, children

Introduction

The first 2 years of life is considered as a window of opportunity for promotion of optimal growth and development of children (World Health Organization, 2003). Infant & young children's nutrition, growth, development & survival depend on appropriate feeding practices (Imdad, Yakoob, & Bhutta, 2011) [16]. Infant and Young Children Feeding (IYCF) practices reflect breast feeding and complementary feeding (UNICEF, 2011) [39].

Recent study revealed undernutrition results in 45% of all child deaths aged 0-5 years annually, and poor and improper feeding practices is one of the leading causes of undernutrition (WHO, 2021). In 2020, 149 million children under5 were stunted, 45 million were wasted around the world (WHO, 2021). In Bangladesh, the rate of under-five mortality is 45 deaths per thousand live births (BDHS, 2017-2018). According to UNICEF (2021), worldwide, only 24% of 0-6 months old infants received the minimum dietary diversity (MDD), and 54 % received the minimum

required meal frequency (MMF). In Bangladesh, only 21% children are fed with following recommended Infant and Young Child Feeding (IYCF) guidelines (Bangladesh Breast Feeding Foundation, 2013), around 35% of children 6 - 23 months met minimum acceptable diet, 38% received adequately diverse diet, and 81% met minimum meal frequency (BDHS, 2017-2018). A number of studies reported that the quality of complementary feeding in the country is far from adequate (Zongrone, Winskell, & Menon, 2012) [45].

While, the causes of malnutrition are complex, and inappropriate complementary feeding, giving improper complementary foods, too late and so fast weaning are also responsible for malnutrition in children (Semahegn, Tesfaye, & Bogale, 2014) [35]. Children living in rural community in Bangladesh, are most vulnerable and about 31% under-five children are stunted, 8% are wasted and 22% underweight (BDHS, 2017-2018). A study revealed that poor dietary intake is a proximal cause of child under-

nutrition (Black *et al.*, 2013) ^[9]. Another study showed that inadequate complementary feeding practices are associated with negative growth patterns (Onyango, Borghi, Onis, Carmen, & Garza, 2014) ^[30]. Insufficient quantities and inadequate quality of complementary foods, together with poor feeding practices, pose a threat to children's health and nutrition (Mutta, 2017). Whereas, timely introduction of adequate, safe, & age-appropriate complementary feeding, consuming a variety of foods is important for meeting essential nutrient requirements needed to promote growth & development (Shumey, Demissie, & Berhane, 2013) ^[37]. As mothers are the closest persons to children, their behaviors in relation to child nutrition can be greatly influenced by their knowledge, attitudes, and practice (Tariku, Whiting, Mulualem, & Singh, 2015; Mirzaei *et al.*, 2018) ^[38, 23]. Study found that poor nutritional knowledge and practices of mothers regarding appropriate complementary foods can lead to undernutrition in infancy and early life (Nabugoomu *et al.*, 2015) ^[27]. Maternal lack of knowledge and awareness results in poor child feeding practices and poor feeding practices significantly enhance childhood malnutrition (Desalegn, Lambert, Riedel, Negese, & Biesalski, 2019) ^[11]. Improving the knowledge, attitude, and practices of mothers in complementary feeding is an inseparable part of efforts to improve nutrition of infants (Arifin, Masrul, & Ali, 2019) ^[3]. A study showed that nutrition education has been significantly improved knowledge of mothers regarding appropriate feeding (Lassi, Das, Zahid, Imdad, & Bhutta, 2013; Kajjura, Veldman, & Kassier, 2019) ^[50, 9]. Prior research showed that nutrition education intervention improved mothers' knowledge and practices toward pulse-based complementary feeding (Mulualem, Henry, Berhanu, & Whiting, 2016) ^[25]. Recommendation by scholars indicated that nutritional education and counseling are needed to enhance knowledge and awareness on complementary feeding practice of the mothers in the communities and promotion of context-

specific child feeding practices. Although many countries focused on improvement of complementary feeding practice of mothers through nutrition education intervention but, such kind of studies are inadequate in the context of Bangladesh. In addition, most of the studies conducted on different cultures and contexts. The findings of the present study provided information about existing feeding practices of the mothers so that appropriate steps can be taken to fulfill the goals of the appropriate complementary feeding practices. It may also act as a baseline data for developing clinical practice guidelines. Findings of the study can be used to develop the strategies for improving complementary feeding practices of mothers. Educational module can be prepared for nurses to provide appropriate nutrition education on complementary for mothers with 6-23 months old children. Therefore, the study aimed to examine the effect of nutrition education intervention on complementary feeding practices of mothers at Khude Barmi community in Gazipur, Bangladesh.

Objective

The objective of the study was to examine the effect of nutrition education intervention on complementary feeding knowledge, attitude & practices of mothers in Bangladesh.

Conceptual framework

The conceptual framework for this study is adopted from (KAP) survey (Wan, Rav-Marathe, & Marathe, 2016) ^[41]. "K" stands for knowledge of the problem, "A" for attitude towards the problem, and "P" for practice or preventive behaviour to protect against the problem. KAP survey is a health behaviour change theory, proposed by western scholars in the 1960s (Wan, Rav-Marathe, & Marathe, 2016) ^[41], in which the changes of human behaviour are divided into three processes: the acquisition of knowledge, the generation of attitudes and the formation of behaviour.

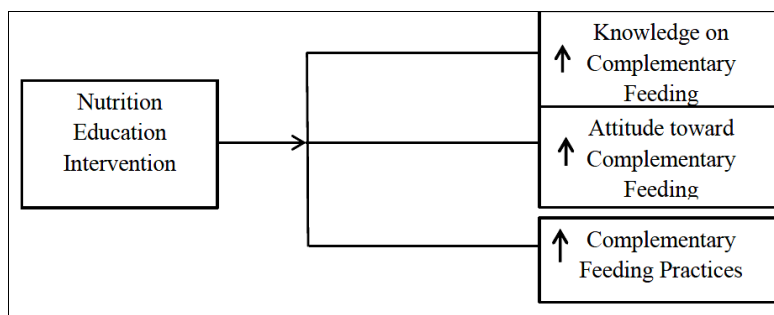


Fig 1: Conceptual framework of complementary feeding Knowledge, Attitude& Practice

Knowledge regarding complementary feeding refers to their comprehension of complementary feeding, its importance, food groups & complementary feeding guidelines for different age groups such as time of introducing complementary feeding, daily meal frequency, food variety, food consistency, and hygiene practices.

Attitude toward complementary feeding refers to any preconceived ideas about complementary feeding and its importance, mothers' feelings towards aspects of complementary feeding, and the appropriateness to behave in particular ways about complementary feeding practices. Complementary feeding, practice includes timely

introduction of complementary feeding, continuation of breast feeding until two years of age, feeding at least four types of foods & minimum three times daily, increasing meal frequency during illness, hand washing before preparing complementary foods & feeding to a child.

Methods

Study Design

A quasi experiment one group pre-test post-test design was used to examine the effect of nutrition education intervention on complementary feeding practices of mothers at KhudeBormi community in Gazipur, Bangladesh from

July 2021 to June 2022

Study Participants

Study participants were mothers of 6-23 months old children residing at Khude Bormi village, Sadar Upazilla, Gazipur district in Bangladesh. From Khude Barmi community, 40 mother-child pair was conveniently selected. Participants were mother-child pair who met the following inclusion criteria: (1) mother who had an apparently healthy breast feeding child with 6-23 months old (2) residing only in the KhudeBarmi at GazipurSadarupazilla, (3) who were interested to participate. Participants were excluded if (1) mothers who had twin child of 6-23 months old; (2) health care personnel, & (3) previously received nutrition education intervention.

The sample size was calculated by using G power analysis with mean difference between two dependent means (matched paired t test) at the significance level $\alpha = 0.05$, power $(1-\beta) = 0.80$, and medium effect size 0.5. The calculated sample size was 34. In order to reduce attrition rate, 10% more subject was added. Therefore, the final sample size was 40 in this study.

Nutrition Education Intervention

Nutrition Education Intervention module was developed based on World Health Organization Infant and Young Child Feeding guidelines and ToT manual on Pulse for improved Nutrition (Hawassa University & University of Saskatchewan, 2015). Intervention module was hundred & twenty minutes long and designed to be completed over three sessions (40 minutes/ session). The Nutrition Education Intervention module focused on module one: Overview of complementary feeding, module two: Concept of food groups & diversifying diet, & module three: Complementary feeding guidelines for different age group children. Following key messages of complementary feeding practices was emphasized breastfeeding for at least 2 years; appropriate amount and frequency of feeding, increasing the number of feedings with age; increasing consistency and quality of food with age; increasing feedings during diversifying the diet using a variety of foods; safe preparation and hygiene practices; not using bottle feeding; and responsive feeding practices of the mothers. Practical demonstration of complementary food preparation was also done. Moreover, mothers were clearly informed how they can improve their children’s feeding practices, nutritional status, and reduce the burden of malnutrition.

The content validity of the nutrition education intervention module was tested & confirmed by a nutritionist, expert faculties from Child Health Nursing department of National Institute of Advanced Nursing Education and Research, a paediatric doctor and two paediatric nurses who had clinical experience of more than ten years. The module prepared in English was back translated by three bilingual experts according to translation process.

Nutrition education intervention was conducted for two weeks, commencing the day after baseline data collection. All sessions was face to face group session and was conducted at the mother’s convenience time in local language Bangla dividing the participants into five groups: (A-E), each consisting eight members. Total three sessions

consecutively provided to each participant/ group. One group participated in one session daily. The nutrition education intervention was provided using theoretical session, discussion, poster, leaflet and practical demonstration.

Instruments

Structured Self-administered questionnaire was used for data collection. The Instrument consists of four sections. Section I is related to participant’s Socio Demographic Questionnaire (SDQ), section II is related to Complementary Feeding Knowledge Questionnaire (CFNQ), section III is related to Complementary Feeding Attitude Questionnaire (CFAQ), and section IV is related to Complementary Feeding Practice Questionnaire (CFPQ). The instruments were validated by a panel of experts including a pediatric doctor & a nutritionist. The original instruments were translated by back translation process. The reliability of instruments was tested by Cronbatch’s alpha ($\alpha=0.7$) co-efficient method.

Data Collection Methods

Approval obtained from the Institutional Review Board (IRB (Exp. NIA-S-2020/109) of NIANER and Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh. Four research assistant having at least higher secondary school education were engaged in the study.

Informed written/ thumb print consent was obtained from each mother before data collection. Each mother was given a code number and was divided into five groups (A-E) based on the age of their children. Pretest was done through structured self-administered questionnaires by the research assistants. Socio-demographic data was collected only at baseline.

Post-test data was collected after two weeks of intervention using the same questionnaires by the same research assistants. After complementing post-test data collection, the mothers and children received small gifts and light snacks as compensation for their time & working hours.

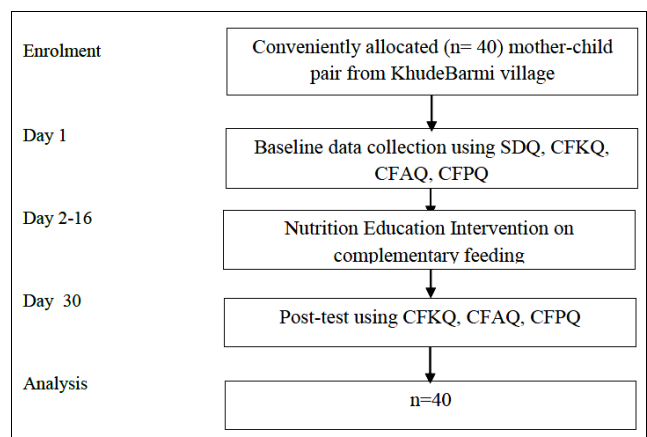


Fig 2: Research process

Notes: SDQ=Socio-Demographic Questionnaire; CFKQ= Complementary Feeding Knowledge Questionnaire; CFAQ=Complementary Feeding Attitude Questionnaire; CFPQ= Complementary Feeding Practice Questionnaire. IYCF= Infant & Young Child Feeding

Data Analysis

The statistical analysis was performed by using IBM SPSS (Version 20.0). Both descriptive and inferential statistics were used to analyze the data. The demographic characteristics of mothers & children were measured by the descriptive statistics frequency, percentage, mean, standard deviation. Complementary feeding knowledge, attitude and practice were measured using descriptive frequency.

Inferential statistics Paired t-test was used to compare complementary feeding knowledge, attitude and practice score of mothers both before & after intervention.

Results

The findings of this study are presented under the following headings of subject's characteristics.

Table 1: Socio-demographic characteristics of the participants

Variables	Category	n	%	M±SD
Maternal characteristics				
Age of mother				24.78±4.67
Religion	Muslim	34	85%	
	Non-Muslim	6	15%	
Marital status	Married	40	100%	
	Single			
Educational background	Illiterate	10	25	
	Primary education	6	15	
	SSC	15	37.5	
	HSC & above	9	22.5	
Occupation of mother	Housewife	31	77.5	
	Others	9	22.5	
Child characteristics				
Age of the child	6-12 Months	7	17.5	
	13-23 Months	33	82.5	
Sex of the child	Male	20	50	
	Female	20	50	
Birth order of the child				1.9±.90
Household characteristics				
Type of family	Nuclear family	25	62.5	
	Joint Family	15	37.5	
Average monthly income (Taka)				9825±5795.17

Table 1 shows the demographic characteristics of participants. The average age of mothers was 24.78 years. About 37% mothers had secondary school education 22.5% had higher secondary and above level of education, 25% mothers were illiterate. (85%) mothers were Muslim. The majority of the mothers (77.5%) were house wife. Most of

the (62.5%) mothers lived in nuclear family. Average Monthly family income was 9825 taka. The demographic characteristics of children shows majority of children (82.5%) were 13-23 months old. The half of the children was female.

Table 2: Comparison of complementary food variety practice before & after intervention

Food groups	Pretest	Post test	t	P
	Yes	Yes		
	n(%)	n (%)		
1. Cereals, roots, tubers, grains (Rice, corn, wheat),	26(65)	34(85)	-3.12	<0.003
2. Legumes/nuts, pulse	12(30)	33(82.5)	-5.99	< 0.001
3. Milk & milk foods	25(62.5)	40(100)	-4.84	<0.001
4. Fish/meat	10(25)	39(97.5)	-10.14	< 0.001
5. Egg	23(57.5)	34(85)	-2.36	<0.023
6. Vitamin A rich Fruits & vegetables	17(42.5)	33(82.5)	-3.77	<0.001
7. Other fruits & vegetables	6(15)	29(72.5)	-5.45	<0.001

Table 2 represents there was significant increase in all most all type of complementary food feeding practices after intervention ($p<0.05$). Finding showed that before intervention, 30% mothers feed Cereals, roots, tubers, grains (Rice, corn, wheat), 30% Legumes/nuts, pulse, 62.5% Milk & milk foods, 25% Fish/meat, 57.5% Egg, 42.5% Vitamin

A rich Fruits & vegetables, 15% Other fruits & vegetables their child. After intervention 97.5% mothers feed, Cereals, roots, tubers, grains (Rice, corn, and wheat), 97.5%, Legumes/nuts, pulse, 100 % feed, Milk & milk foods, Fish/meat, and, Sugar/Fat/oils, 57.5% fed Egg, 97.5% fed Vitamin A rich Fruits & vegetables to children.

Table 3: Effect of Nutrition Education Intervention on Complementary Feeding Knowledge, Attitude & Practice of Mothers (N=40)

Variable	Pre-test	Post-test	Mean Difference	t	P
	Mean \pm SD	Mean \pm SD			
Knowledge	3.60 \pm 1.71	8.68 \pm 2.09	-5.075 \pm 2.28	-14.08	.<0.001
Attitude	43.23 \pm 6.41	65.10 \pm 2.17	-21.875 \pm 7.19	-19.25	.<0.001
Practice	40.70 \pm 6.65	55.75 \pm 2.35	-15.050 \pm 6.39	-14.90	.<0.001

Table 3 shows the mean pre-test knowledge, attitude & practice score of mother's was 3.60 \pm 1.71, 43.23 \pm 6.41, 40.70 \pm 6.65 and post-test knowledge attitude & practice score was 8.68 \pm 2.09, 65.10 \pm 2.17, 55.75 \pm 2.35 respectively. The mean difference of knowledge attitude & practice was=-5.075 \pm 2.28, -21.88, -15.05 respectively which indicates significant difference between pre and post-test score. In matched paired t-test analysis, it was found that there was a significant mean difference between pre and post-test knowledge, attitude & practice among mothers (t=-14.08, p <.000), (-19.25, p <.000), (-14.90, p <.000). Therefore, mother's knowledge, attitude & practice level statistically significantly increased after two weeks nutrition education intervention. The nutrition education intervention was significantly effective to increase knowledge, attitude & practice among mothers.

Discussion

The findings of the study showed that the average age of the mothers was about 25 years. Based on the result, it can be stated that average age of mothers had reached the early adult and ready to provide care and fulfill the needs of their child. This finding agrees with the previous study (Arifin, Masrul, & Ali, 2019) [3]. However, the finding is incongruent with the. In the present study, most of the mothers were housewives. This means that the mothers most probably depended on their husbands for provision of food and other household necessities. This study was similar with several studies. Present study revealed that most of the mothers had at least secondary school education which means that the mother's education level is in the middle category. So it is easy for mothers to capture the information provided. The equivalent results found in a study where most of caregivers had similar findings (Samuel, Akintayo, & Eyinla, 2021; Arifin, Masrul, & Ali, 2019) [3]. The finding was incoherent with several studies where majority of the mothers was illiterate. This was also reflected in a study where mothers have fewer years of education which results in poor childcare. The findings also specified average family income was poor according to Bangladesh national poverty line 2019. This finding was supported by (Rahman, Bhuiyan, & Das, 2022). The study finding revealed that the complementary feeding knowledge of mothers increased at the end of intervention. Complementary feeding knowledge of mothers increased from 3.60 to 8.68 after intervention. It is possible that the significant change in mother's knowledge could have been ascribed to the nutrition education messages provided. Nutrition education improved mothers' knowledge regarding meal frequency, amount, consistency and the variety of food groups that are appropriate for IYC. This finding is consistent with previous several studies (Samuel, Akintayo, & Eyinla, 2021; Muluaem, Henry, Berhanu, & Whiting, 2016; Kajjura, Veldman, & Kassier, 2019; Saleem, Mahmud, Baig-Ansari, & Zaidi, 2014) [25]. The finding is also comparable to

another study from Kenya which reported that the mean nutrition knowledge was significantly higher in intervention group than that of the control group at the end of the study (Waswa, Jordan, Herrmann, Krawinkel, & Keding, 2015). Similarly, a study from Southern Ethiopia showed significant improvement for knowledge and practices of complementary feeding after intervention. Another study from India revealed that cluster-randomized trial on complementary and responsive feeding education to caregivers found that complementary feeding messages were effective in changing the knowledge and behaviors among mothers after intervention. In addition, (Manikyamba, Vidya, Satyavani, Prasad, & Deepthi, 2015; Jumiyati & Yulianti, 2016) reported significant improvement in mothers' knowledge after nutrition education.

Finding of this study indicated that attitude of mothers towards complementary feeding increased significantly after nutrition education intervention. The attitude level of mothers on complementary feeding was increased significantly from 43.23 to 65.10. In other words, the nutrition education gave a positive effect to the mother's attitude in the effort to provide good complementary feeding. This shows that there is a tendency to change attitudes in a positive direction. This was achieved through the use of posters to display the benefits of appropriate complementary feeding practice. It was stated that people will not have change in behavior unless they see the benefits (USAID, 2011). This shows that change in attitude among the mothers in the intervention group was based on the information received during the nutrition education. The findings are in line with (Arifin, Masrul, & Ali, 2019; Akinrinmade, NJOGU, OGADA, & KESHINRO, 2019) [3]. The study indicated that complementary feeding practice level of mothers increased significantly after two weeks nutrition education intervention. The score of mothers practicing appropriate complementary feeding was improved from 40.70 to 55.75 at the end of the study. This illustrates that a nutrition education intervention is able to improve complementary feeding practices of mothers. This could be possible for increased knowledge & positive attitude during nutrition education intervention. This finding is supported by a number studies (Muluye, Lemma, & Diddana, 2020; Kajjura, Veldman, & Kassier, 2019; Arifin, Masrul, & Ali, 2019) [3] that nutrition education for caregivers improved infant and young child feeding practice. For instance, an intervention study in Eastern Ethiopia, that assessed the effect of nutrition education on the caregiver's knowledge and practice, found out significant improvement in the practice of the caregivers.

The present study findings revealed that more children were fed more varied diets at the end of intervention. There was an increase in the proportion of children consuming vitamin A-rich vegetables and fruits, dark green leafy vegetables, legumes and nuts, and other fruits and vegetables after intervention compared with pretest. This finding supported

by a randomized controlled intervention study conducted in Uganda where caregivers in the intervention group selected an increased variety of foods for their children compared with the control group (Kabahenda, Mullis, Nickols, & Erhardt, 2011). This finding is also in line with a study from China that showed significantly higher proportion of mothers in the intervention group used fish/ meats, eggs, beans, dark green leafy vegetables, and fruits to feed their children at the end of the nutrition education intervention (Shi, Zhang, Wang, Caulfield, & Guyer, 2010). Study findings also compare favourably with study conducted in Ethiopia where it was reported that nutrition education improves IYC dietary diversity practices. An assessment of the single food items to the diets of the children showed that milk, egg and were the common animal-source foods fed to children.

However, despite targeted nutrition education messages, not all mothers showed an improvement in practice after the 15 days intervention period. It is possible that the implementation of newly acquired knowledge regarding appropriate IYC feeding practices could have been compromised by household socioeconomic factors, including mother's level of education.

The significant improvement of knowledge, attitude and practice of complementary feeding of mothers as well as increasing the number of food groups might be due to exposure to nutrition information, routine teaching, and demonstration. The improvement might also be explained by the improvement of mothers' complementary feeding knowledge during nutrition education intervention. This suggests that nutrition education intervention had the power to change the existing poor nutritional knowledge and attitude, simultaneously improving complementary feeding practice of infants and young children.

There were some limitations of present study. Firstly, the study design was quasi experiment; secondly, study used only one setting which did not reflect generalization of the findings to other settings; and finally, the instruments of the study were developed based on the literature reviewed.

Conclusion

Nutrition education intervention significantly improved complementary feeding knowledge, attitude and practice of mothers of 6-23 months old children. This illustrates that a nutrition education intervention is able to improve complementary feeding practices of mothers with infant and young children.

Recommendations

Study strongly suggests to strengthen and extend the community based nutrition education program to the lower level and remote communities. Training should be provided to the health workers on nutrition education intervention and optimal Infant & Young Child Feeding. Furthermore, the relationship between the health professionals and community should be strengthened. Health workers should continue nutrition education on complementary feeding regularly in remote communities to reduce the nutritional problems among children. Further study is needed to investigate the effect of nutrition education on complementary feeding using Health Belief Model in larger population. A Comparative study can be conducted in rural

and urban area on complementary feeding.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Abubakar A, Holding P, Mwangome M, Maitland K. Maternal perceptions of factors contributing to severe under-nutrition among children in a rural African setting. *Rural Remote Health*. 2011;11(1):1423.
2. Allen LH. Adequacy of family foods for complementary feeding. *Am J Clin Nutr*. 2012;95:785-6.
3. Arifin Y, Masrul M, Ali H. The effect of nutrition counseling on complementary feeding practice of mothers having infants aged 6-12 months. *J Midwifery*. 2019;4(1):66-77.
4. Badran IG. Knowledge, attitude and practice: The three pillars of excellence and wisdom: A place in the medical profession. *East Mediterr Health J*. 1995;1:8-16.
5. Bangladesh Breast Feeding Foundation. Guidelines for complementary feeding in Bangladesh. Bangladesh Breast Feeding Foundation; c2013.
6. Bangladesh Breast Feeding Foundation. Improved Recipes for Complementary Feeding of Children Aged 6-23 Months. Bangladesh Breast Feeding Foundation; c2013.
7. Bangladesh Bureau of Statistics (BBS), UNICEF Bangladesh. Progotir Pathay, Bangladesh Multiple Indicator Cluster Survey 2019, Survey Findings Report. Dhaka, Bangladesh: Bangladesh Bureau of Statistics (BBS); c2019.
8. Bangladesh Bureau of Statistics. Bangladesh population and housing census 2011. Statistics Division, Ministry of Planning; c2011.
9. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, *et al*. Maternal and child undernutrition and overweight in low-income and middle-income countries. *Lancet*. 2013;382:427-51.
10. Burns J, Emerson JA, Amundson K, Doocy S, Caulfield LE, Klemm RD. A qualitative analysis of barriers and facilitators to optimal breastfeeding and complementary feeding practices in South Kivu, Democratic Republic of Congo. *Food Nutr Bull*. 2016;37:119-31.
11. Desalegn BB, Lambert C, Riedel S, Negese T, Biesalski HK. Feeding practices and undernutrition in 6-23-month-old children of Orthodox Christian mothers in rural Tigray, Ethiopia: longitudinal study. *Nutrients*. 2019;11(1):138.
12. Eagly AH, Chaiken S. The advantages of an inclusive definition of attitude. *Soc Cogn*. 2007;25(5):582-602.
13. Eagly A, Chaiken S. Attitude structure. In: *Handbook of Social Psychology*. 1st ed. 1998. p. 269-322.
14. Gessese D, Bolka H, Abajobir AA, Tegabu D. The practice of complementary feeding and associated factors among mothers of children 6-23 months of age in Enemay district, Northwest Ethiopia. *Nutr Food Sci*. 2014.

15. Hawassa University & University of Saskatchewan. Pulse consumption improved nutrition: A manual for training community leaders; c2015.
16. Imdad A, Yakoob MY, Bhutta ZA. Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries. *BMC Public Health*. 2011;11:S25.
17. Inayati DA, Scherbaum V, Purwestri RC, Hormann E, Wirawan NN, Suryantan J, *et al*. Infant feeding practices among mildly wasted children: a retrospective study on Nias Island, Indonesia. *Int Breastfeed J*. 2012;7(1):1-9.
18. Kajjura RB, Veldman FJ, Kassier SM. Effect of nutrition education on knowledge, complementary feeding, and hygiene practices of mothers with moderate acutely malnourished children in Uganda. *Food Nutr Bull*. 2019;40:221-30.
19. Karigi LN, Mutuli LA. Socio-Cultural Practices and Beliefs Influencing Infant and Young Child Feeding in Lubao Sub-Location Kakamega County. *J Nutr Health Food Eng*. 2016;5(1):160. DOI: 10.15406/jnhfe.
20. Kim TR, Ross JA, Smith DP. KOREA: Trends in Four National KAP Surveys, 1964-67. *Stud Fam Plann*. 1969;1(43):6-11.
21. Lassi ZS, Das JK, Zahid G, Imdad A, Bhutta ZA. Impact of education and provision of complementary feeding on growth and morbidity in children less than 2 years of age in developing countries: A systematic review. *BMC Public Health*. 2013;13:1-10.
22. Manikam L, Robinson A, Kuah JY, Vaidya HJ, Alexander EC, Miller GW, *et al*. A systematic review of complementary feeding practices in South Asian infants and young children: the Bangladesh perspective. *BMC Nutr*. 2017;3(1):1-13.
23. Mirzaei A, Nourmoradi H, Zavareh MSA, Jalilian M, Mansourian M, Mazloomi S, *et al*. Food safety knowledge and practices of male adolescents in west of Iran. *Open Access Maced J Med Sci*. 2018;6:908.
24. Monterrosa EC, Pelto GH, Frongillo EA, Rasmussen KM. Constructing maternal knowledge frameworks. How mothers conceptualize complementary feeding. *Appetite*. 2012;59:377-84.
25. Mulualem D, Henry CJ, Berhanu G, Whiting SJ. The effectiveness of nutrition education: Applying the Health Belief Model in child-feeding practices to use pulses for complementary feeding in Southern Ethiopia. *Ecol Food Nutr*. 2016;55:308-23. DOI: 10.1080/03670244.2016.1161617
26. Mutua MK. Patterns and determinants of breastfeeding and complementary feeding practices in urban informal settlements, Nairobi, Kenya; c2017.
27. Nabugoomu J, Namutebi A, Kaaya AN, Nasinyama G. Nutrition education influences child feeding knowledge, attitudes, and practices of caregivers in Uganda. *Am J Health Res*. 2015;3:82-90.
28. National Institute of Population Research and Training (NIPORT), and ICF. Bangladesh Demographic and Health Survey 2017-18. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT and ICF; c2020.
29. NIPORT. Bangladesh Demographic and Health Survey 2014. National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International; c2013.
30. Onyango AW, Borghi E, de Onis M, Casanovas MC, Garza C. Complementary feeding and attained linear growth among 6–23-month-old children. *Public Health Nutr*. 2014;17:1975-83.
31. Owais A, Suchdev PS, Schwartz B, Kleinbaum DG, Faruque ASG, Das SK, *et al*. Maternal knowledge and attitudes towards complementary feeding in relation to timing of its initiation in rural Bangladesh. *BMC Nutr*. 2019;5(1):1-8.
32. PAHO/WHO. Guiding Principles for Complementary Feeding of the Breastfed Child. WHO, Division of Health Promotion and Protection/Food and Nutrition Program; c2003.
33. Palwala M, Sharma S, Udipi SA, Ghugre PS, Kothari G, Sawardekar P. Nutritional quality of diets fed to young children in urban slums can be improved by intensive nutrition education. *Food Nutr Bull*. 2009;30:317-26.
34. Rytter MJH, Kolte L, Briend A, Friis H, Christensen VB. The immune system in children with malnutrition: a systematic review. *PLoS One*. 2014;9(8):e105017.
35. Semahegn A, Tesfaye G, Bogale A. Complementary feeding practice of mothers and associated factors in Hiwot Fana Specialized Hospital, Eastern Ethiopia. *Pan Afr Med J*; c2014 .p. 18.
36. Senarath U, Dibley MJ. Complementary feeding practices in South Asia: Analyses of recent national survey data by the South Asia Infant Feeding Research Network. *Matern Child Nutr*. 2012;8:5-10.
37. Shumey A, Demissie M, Berhane Y. Timely initiation of complementary feeding and associated factors among children aged 6 to 12 months in Northern Ethiopia: An institution-based cross-sectional study. *BMC Public Health*. 2013;13:1050. DOI: 10.1186/1471-2458-13-1050.
38. Tariku B, Whiting SJ, Mulualem D, Singh P. Application of the health belief model to teach complementary feeding messages in Ethiopia. *Ecol Food Nutr*. 2015;54:572-82.
39. UNICEF. Infant and young child feeding. *Nutr*; c2011 .p. 11-13.
40. United Nations Children’s Fund (UNICEF). The State of The World’s Children 2019. New York: UNICEF; c2019.
41. Wan TT, Rav-Marathe K, Marathe S. A systematic review of KAP-O framework for diabetes. *Med Res Arch*; c2016 .p. 3.
42. White JM, Begin F, Kumapley R, Murray C, Krasevec J. Complementary feeding practices: Current global and regional estimates. *Matern Child Nutr*. 2017;13:e12505.
43. World Health Organization. Global strategy for infant and young child feeding. World Health Organization; c2003.
44. World Health Organization. Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. World Health Organization; c2009.
45. Zongrone A, Winskell K, Menon P. Infant and young child feeding practices and child undernutrition in Bangladesh: insights from nationally representative data. *Public Health Nutr*. 2012;15:1697-704.

46. Locks LM, Pandey PR, Osei AK, Spiro DS, Adhikari DP, Haselow NJ, *et al.* Using formative research to design a context-specific behaviour change strategy to improve infant and young child feeding practices and nutrition in Nepal. *Matern Child Nutr.* 2015;11:882-96.
47. Black RE, Allen LH, Bhutta ZA, Caulfield LE, De Onis M, Ezzati M, *et al.* Maternal and child undernutrition: global and regional exposures and health consequences. *Lancet.* 2008;371:243-60.
48. Saaka M, Larbi A, Mutaru S, Hoeschle-Zeledon I. Magnitude and factors associated with appropriate complementary feeding among children 6-23 months in Northern Ghana. *BMC Nutr.* 2016;2:1-8.
49. Roba KT, O'Connor TP, Belachew T, O'Brien NM. Infant and young child feeding (IYCF) practices among mothers of children aged 6-23 months in two agroecological zones of rural Ethiopia. *Int J Nutr Food Sci.* 2016;5:185-94.
50. Lassi ZS, Das JK, Zahid G, Imdad A, Bhutta ZA. Impact of education and provision of complementary feeding on growth and morbidity in children less than 2 years of age in developing countries: A systematic review. *BMC Public Health.* 2013;13:S13.
51. Bhutta AZQ, Ahmed T, Black RE, Cousens S, Dewey K, Giugliani E, *et al.* Maternal and child undernutrition: What works? Interventions for maternal and child undernutrition and survival. *Child Care Health Dev.* 2008;34:404-5.
52. World Food Programme. Nutritional guidance for complementary food. Available from: <https://www.wfp.org/publications/nutritional-guidance-complementary-food>. Accessed on 28.01.2022.
53. UNICEF. Community Infant and Young Child Feeding (C-IYCF) Counselling Package. Available from: https://www.unicef.org/nutrition/index_58362.html.
54. Advancing Nutrition. IYCF Recommendations in COVID-19. Available from: <https://www.advancingnutrition.org/what-we-do/social-and-behavior-change/iycf-recommendations-covid-19>. Accessed on 28.01.2022.

How to Cite This Article

Khatun SK, Khatun S, Biswas HB, Anowar MN. Effect of nutrition education intervention on complementary feeding practices of mothers in Bangladesh. *International Journal of Advance Research in Nursing.* 2025;8(1):01-08

Creative Commons (CC) License

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.