



In-Depth Review of Caregivers' Nutrition Education effects, on Complementary Feeding Practices in Nigeria

Akinrinmade Remilekun*

Department of Nutrition and Dietetics, Rufus Giwa Polytechnic Owo, Nigeria

***Corresponding author:** Akinrinmade Remilekun, Department of Nutrition and Dietetics, Rufus Giwa Polytechnic Owo, Ondo State, Nigeria

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Abstract

This study is an in-depth finding of the effect of nutrition education on caregivers' complementary feeding practices. The WHO recommendations for optimal complementary feeding are based on continued breastfeeding, early introduction of solid or soft diet, minimum meal frequency (MMF) and minimum dietary diversity (MDD) in terms of food groups. Improved knowledge on adequate complementary feeding could positively affect the attitude of caregivers towards complementary feeding practices. Meanwhile, effect of demographic and socio-economic status was also reviewed. Materials used for this study are secondary data from archived materials and existing literature on effects of nutrition education on complementary feeding in Nigeria and other developing. The study showed that reports on complementary feeding practices in developing countries are rated inadequate, with inappropriate early introduction of complementary feeding. Complementary feeding was either introduced too early or too late with thin and low iron rich and vitamin A rich diet. Study revealed poor practices of Minimum Meal Frequency (MMF) and Minimum Dietary Diversity (MDD). Force feeding overrides responsive feeding which attracts other complicated health issues among the infants. The final summary showed that nutrition education will be an effective tool to solve the problem of inadequacy in complementary feeding practices.

Introduction

The knowledge, attitude and practices of complementary feeding among caregivers in the developing countries have been rated poor [1]. Caregivers' nutrition education on complementary feeding is an effective tool to improve the complementary feeding practices. Other factors affecting the complementary feeding as revealed by researchers are socio-demographic and socio-economic status of the caregivers. The effects of nutrition education on knowledge, attitude and complementary feeding practices of the caregivers and the nutritional status of infants revealed by existing literature are discussed in this chapter. Infants feeding practices reports available in some West African nations showed poor practices of MAD by caregivers in Ghana (13%) and in Benin Republic (9%) [2]. The report of the Nigerian National Demographic and Health Survey [3] indicated that only 11% of the breastfed infants received complementary foods from at least four food groups. Globally, about 45% of infants less than 6 months of age were exclusively breastfed (EBF), with 42% in sub-Sahara Africa and 29% for West and Central African countries. In Nigeria, EBF rate is at 17%, which implies that

83% have had untimely introduction of complementary feeding [1]. In the developing countries, malnutrition has been proved to be responsible for over 41% of the deaths among children 6 to 24 months of age [4,5] revealed that under nutrition of protein and energy-giving foods contributed to 45% of death, among children less than five years of age in evidence-based research carried out in 34 countries in the world. The global strategy for infants and young child feeding was based on the significance of nutrition in the early months and years of life [6]. These strategies include monitoring, assessing and promoting adequate infant nutrition, breastfeeding, feeding behavior, national health programs and infants feeding guidelines. In order to achieve adequate infant feeding practices in the developing nations, the global strategies must be followed.

Research objectives are

a) To ascertain the relationship between caregiver's nutrition education on caregivers' complementary feeding knowledge, attitudes and practices

b) To identify relative findings on effects of nutrition education on caregivers' complementary feeding knowledge, attitudes and practices

c) To establish the on effects of caregivers' nutrition education on infant's nutrition status

Research Methods

Secondary data from existing literatures on effects of nutrition education on complementary feeding knowledge, attitude and practices as well as the infant's nutrition status was used to make compilations on these findings.

Demographic and socio-economic factors influencing caregivers complementary feeding practices:

Demographic and socio-economic status of caregivers is one of the major factors associated with poor complementary feeding practices of caregivers and nutrition status of infants in developing countries [7]. Maternal age, educational level and the household's income have been reported as factors associated with the complementary feeding knowledge, attitudes and practices among the caregivers. The caregivers' age and low education level attainment have been revealed to influence complementary feeding practices in countries such as India [8]. In Nepal, indicated that mothers of infants aged 6-23 months working outside the home were less likely to practice optimal complementary feeding that meet the recommended dietary diversity. Also, [9] revealed that mothers that worked 8 hours outside their homes were unable to meet the recommended dietary diversity and meal frequency for infants in Nigeria. This was associated with limited time they had with their children. [10] revealed that food restrictions due to cultural belief as well as economic status of mothers were contributing factors to inappropriate feeding practices among mothers in Cross River State, Nigeria. In Moretele District in South Africa, [11] showed that adherence to cultural practices affects mothers' attitude to complementary feeding practices. Households with lower wealth index were found to be the more likely to have inappropriate complementary feeding practices in India, Bangladesh, Nepal, Pakistan and Sri Lanka [12]. There was a significant association found between caregivers' socio-economic status and infant feeding practices in Nekemte, Ethiopia. The study showed that caregivers in the low socio-economic strata practiced sub-optimal complementary feeding [13]. The effects of economic status on nutrition status of children have also been illustrated by researchers. In Ondo State, [14] discovered low intake of energy dense food and protein containing food among children whose mother were living in rural communities of Ondo state. The author stated further that the mothers were of low socio-economic status. This corroborates the research of [15] on effect of low socio-economic status of rural market women in owo Local Government of Ondo State on the nutrition status of their infants. The study reported a positive correlation between low economic status of the market women and the feeding practices as well as the nutritional status of the children. Research has proved that caregivers required skilled support to adequately feed their infants

despite the limitations which could be caused by socio-economic and demographic status of the caregivers [16]. Nutrition education is an effective way of improving complementary feeding practices among mothers as [17] reported that poor feeding practices are not necessarily due to lack of high quality of foods at the household but lack of infants' feeding knowledge by the caregivers.

Complementary feeding knowledge, attitude and practices:

Knowledge is the understanding of any given topic [18]. In this study, knowledge referred to the ability to understand specified aspects of complementary feeding practices. Attitudes are emotions, motivations and perceptive as well as cognitive beliefs that could either positively or negatively influence the caregivers' complementary feeding attitudes [18-20]. Caregivers complementary feeding attitudes or infant' feeding behavior is influenced by his/her emotional, motivational and perceptual as well as thoughts [20]. Attitudes have the ability to influence the future behavior of the caregivers' knowledge and could explain the reason why caregivers adopt complementary feeding practices and no other alternatives [21]. The terms attitude, beliefs and perceptions are interchangeable. In this study, "practices" is an observable action of a caregiver that could affect his/her infants' nutrition, such as eating, feeding, water treatment, cooking and foods selection for the infants. Practice and behavior are terms used interchangeable, though practice has a connotation of long-standing or commonly practiced behavior [22].

Effect of nutrition education on caregivers' complementary feeding knowledge:

Knowledge on complementary feeding by the caregivers has been revealed by [11] to be limited in African countries. A Nigerian study showed that knowledge on benefit of continued breastfeeding along complementary feeding till the infant's age 24 months is low [23]. A descriptive study on maternal knowledge on complementary feeding in India, established that 75% of caregivers had average knowledge on appropriate consistency and safe preservation of infant's meal [24]. The circumstances are similar to Nigeria, Ondo State in particular. According to [25], only 30% of the caregivers have adequate knowledge of complementary feeding in Nigeria. In Ondo State, it is reported that 70% of the caregivers used sorghum majorly as complementary foods [15]. The role of nutrition education on caregivers feeding knowledge cannot be underrated. The [16] stated that inadequate knowledge on appropriate complementary feeding is a determinant of malnutrition among the infants in the developing countries. The effect of organized and well-planned nutrition education on complementary feeding knowledge have been proved by researchers [26] reported that 88% of caregivers in North Shan State and Karachi State Republic of the Union of Myanmar were able to plan infants' meals from more than four food groups after nutrition education on the infants feeding knowledge [27] showed that nutrition education to improve maternal complementary feeding knowledge significantly impacts on knowledge of meal preparation for children in Uganda. The authors stated that 71% of caregivers who received nutrition education

intervention had improved knowledge in complementary feeding and were able to improve in infants feeding frequency. Furthermore, Nutrition education and counseling on infants feeding improved the complementary feeding knowledge of caregivers significantly by 1.5 points in a study conducted in the Philippines. Ondo State, Nigeria still suffers a setback in adequate complementary feeding as there is lack or low knowledge of complementary feeding [15]. The author reported that caregivers in Ondo State had low knowledge on food diversification. Intervention programs which involve the caregivers and Community Health Extension Workers have been confirmed to be limited in Ondo State thereby causing a research gap on complementary feeding knowledge in Ondo State, Nigeria consistency. The study of [15] was a cross-sectional study to determine the situation of feeding practices and factors affecting the feeding practices of the infants. In Nigeria, only 3.7% of households have access to an improved water resources located on premises, free of E-coli and available when needed [28]. The report showed that diarrhea is prevalent due to poor access to portable drinking water. Caregivers knowledge to improved access to portable water was low as 63.4% of caregivers used unprotected well in Biye community in Kaduna, Nigeria [29] the author stated further that water boiling method is the cheapest way to achieve portable water for the infants in the community.

Effect of nutrition education on caregivers' complementary feeding attitudes:

The UNICEF [17] suggested that reduction of child mortality can be achieved when IYCF awareness is improved. The poor complementary feeding attitudes have been linked with communities' beliefs and mothers' perceptions [30]. Showed that socio-cultural belief has a strong influence on infants feeding and determines optimal infants feeding practices; breastfeeding and complementary feeding in Kakamega County, Kenya. In Zambia, majority stopped breastfeeding before the appropriate time because they believed that breast milk was not enough, and that the child had lost interest in breastfeeding described how Mexican mothers in a cross-sectional survey mostly fed their children liquid and semi liquid foods with few vegetables, meats and legumes. The author stated that Mexican mothers took this decision due to their perspective on the consistency of the food for infants, that is, soft or solid foods are detrimental to infants' health [31] confirmed that, despite the economic status and educational attainments of mothers, they exhibit poor attitude to complementary feeding in Shabelle Zone of Somalia due to influence of the cultural belief. Feeding thin consistency feeds in small amounts and food restriction due to cultural beliefs are common in Nigeria [32, 33] revealed that scientific knowledge on infant feeding practices would improve complementary feeding attitude among mothers in Republic of Kosovar. Meanwhile, the author's opinion was in contrast to [34] who revealed that despite the nutritional education on importance of consumption of pulses to children's wellbeing in Southern Ethiopia, there was no significant difference between attitudes of mothers who received the training and attitudes of mothers in the control group due to cultural belief on effect of pulses on children

[35] experienced low acceptability of blended complementary food with pulses in Ethiopia. This study put into consideration the fact that cultural beliefs may be influencing caregivers' attitude and therefore focused on other beneficial food items in the study area to improve caregivers' attitude on complementary feeding [36]. Showed that despite the knowledge of complementary feeding among mothers in Lagos State, Nigeria, the mothers had the poor attitude towards timely introduction of complementary feeding as majority of the caregivers introduced complementary feeding too early or too late. The author stated that this was prevalent among working mothers. The intervention of nutrition education and counseling was proved to improve mothers' attitude towards complementary feeding [37] revealed that caregivers had change in attitudes towards responsive feeding and their infants' nutrient intake was higher compared to the control group. Most studies conducted both in Ondo State and in other locations in Nigeria were descriptive and cross-sectional studies, leaving research gaps on effect of nutrition education on complementary feeding attitudes in the area [23] conducted a cross-sectional survey in Nigeria on factors affecting breastfeeding practices. This was a cross sectional study which identified poor practices of breastfeeding but could not profound solution through an intervention [25] conducted a study in Lagos, Nigeria on factors associated with inadequate complementary feeding. Also, [14] carried out a study on complementary feeding in Ondo State, Nigeria on effect of socio-economic status on infant feeding. The above two studies were cross-sectional studies on factors associated with inadequate complementary feeding in Nigeria. The studies of [25,14] were unable to improve the complementary feeding attitudes of the caregivers in the study areas because they were cross-sectional studies and not an interventional study. The above two studies had little or no effect on the participants, although they could be included by Nigerian government's program for policy framework. The study of [38] and [39] was designed to assess complementary feeding practices among caregivers and there was no intervention on complementary feeding practices in these studies. There is limited literature on the effect of nutrition education on maternal attitudes towards complementary feeding.

Effect of nutrition education on caregivers' complementary feeding practices:

A report by UNICEF showed that complementary feeding practices are globally poor [2]. In Ireland, only 36% of infants had timely initiation of solid and semi solid foods. According to [40], only 1.8% of caregivers in Uganda fed infants with protein containing food products, especially meat during the period of complementary feeding [41] stated that only 28% of caregivers in Ghana were able to feed their infants 2-3 times daily with adequate complementary meals. The level of inadequate complementary feeding in Nigeria is worse than that of Ghana as only 11% of exclusively breastfed infants receive complementary meals from four food groups and only 7% of the non-exclusive breastfed infants were fed with adequate complementary feeding in Nigeria. These show the poor practices of complementary feeding among caregivers in the

region. United States Agency for International Development [42] in an assessment of infant and young child feeding practices in Nigeria affirmed that there are challenges to improve on complementary feeding behaviors among caregivers with infants. However, the author indicated that with well-trained health workers, coordinated and targeted messaging to caregivers and influencing groups in the communities, there will be a great deal of progress towards increasing optimal infant and young child feeding practices in Nigeria. To corroborate the above, [38] and [39] observed that nutrition education intervention among caregivers in Nigeria will improve the caregivers' complementary feeding practices [43] discovered that nutrition education on complementary feeding carried out by 30 several studies in developing countries showed statistical evidences of improved complementary feeding practices of mothers. Therefore, the study recommended nutrition education among mothers to improve complementary feeding practices. The study of [29] on improved hygiene practices among caregivers showed that 79.6% caregivers boiled their drinking water in Biye community, Kaduna, Nigeria. Interventions that improved complementary feeding practices among caregivers were carried out in some part of the world such as Cambodia, Zimbabwe, Mali and Ghana with different degrees of success. In Bangladesh, [44] revealed that breastfeeding counseling improved exclusive breastfeeding among mothers. The author revealed that when mothers received counseling on exclusive breastfeeding, they practiced it until 135 days while the control group practiced exclusive breastfeeding for 75 days. This improvement achieved was due to interventional research by the researcher. Another instance was the successful report of FAO [20] in a program titled "Promoting improved complementary feeding" in Cambodia. The program was based on counseling, training and cooking demonstration. This program was carried out by conducting home visits to assist households who were encountering challenges in adopting the improved complementary feeding and the caregivers were trained with improved recipe. The program was recorded to be a success as the caregivers had improved knowledge, attitude and complementary feeding practices. However, a similar nutrition education program which trained the caregivers on improving complementary feeding in Zimbabwe proved unsuccessful due to inadequate monitoring system and lack of trained personnel for continuity [27] stated that women who receive nutrition education on complementary feeding were able to prepare complementary diet from over four food groups, compared to their attitude towards dietary diversity before the nutrition education. The success report of Cambodia nutrition education and training program was particularly based on the current caregivers with infants at the time of the program in the study area. The program did not plan for the sustainability of the program on subsequent caregivers; as there were no community-based personnel that were involved to receive the training [20]. Also, in Zimbabwe, the nutrition program to promote adequate complementary feeding practices was unsuccessful due to lack of trained personnel educating caregivers to continue with the programs among the caregivers. There has been limited documentation of complementary feeding on nutrition education targeted at the caregivers as well as health personnel

within the health care system who deals with maternal and child's health in Ondo State. Surveys on infants' feeding practices available were mainly on cross-sectional survey of the situation and no known intervention was found.

Effect of caregivers' nutrition education on nutrition status of infants

The National Demographic and Health Survey carried out by revealed that 43% of children less than five years of age in rural areas of Nigeria were stunted and 29% of Nigerian children were underweight and too thin for age. In Ondo State, 26% of children less than five years were stunted while 43% were underweight [45]. Inadequacy in complementary feeding practices can result to malnutrition in children during the complementary feeding period [46]. Declared the period of complementary feeding as a period of windows of opportunity for growth flattering. Revealed that there were suboptimal complementary feeding practices among mothers studied in different geographical area in Nigeria which leads to growth flattering of infants in the area. Interventions that can bring about improvement in the nutrition status of infants could be achieved by nutrition education [5] revealed that weight and height increased among children 6-24 months of age after maternal nutrition education on complementary feeding in Sri Lanka and Tanzania. Concluded that nutrition education intervention was successful in reducing malnutrition in Pakistan as 36% malnourished children progressed to normal nutrition status [47] showed that there was an increase in weight (350g) and length (0.66cm) among the infants of caregivers in intervention group that received complementary feeding nutrition education in Karachi, Pakistan [48] stated that pooled-effect sizes from three recent systematic reviews suggested a modest nutrition education but there was a significant effect of the types of complementary feeding interventions on weight and length gain [49] revealed the effectiveness of nutrition education as a tool to improve mothers' knowledge and complementary feeding practices which improved the nutrition status of the infants. The author reported in a post-program comparison research carried out among mothers in Uganda. Mother who participated in the program had significant improvement on complementary feeding practices which in turn had positive impact on the nutrition status of their infants. In Nigeria there is limited literature on benefit of nutrition education on nutrition status of the infants. The above interventional studies on nutrition education on complementary feeding were carried out to determine the effect of the intervention on complementary feeding practices as well as the effects on the nutritional status of the infants.

Discussion

The literatures reviewed for this study showed that the complementary feeding knowledge, attitude and practices among the caregivers is inadequate, and this affects the nutrition status of infants. The caregivers especially in the developing countries such as Nigeria and some African nations have limited or low knowledge of appropriate complementary feeding practices. The caregivers' complementary feeding practices are not in line with the WHO

recommended guidelines for infants feeding. The knowledge on the appropriate time of introducing complementary feeding among the caregivers was established. Majority of the caregivers had knowledge on timely introduction of complementary feeding (6 months), although not all of them. It means that some introduced early while some introduced it late. This is similar to the report of [47]. The author reported that in Karachi, Pakistan 17% of the mothers lacked knowledge of appropriate time of introducing complementary feeding and 83% had good knowledge. Although, [13] revealed that 44.2% of mothers in Nekemte, Ethiopia lacked knowledge on rightful time of introducing complementary feeding. The literature reviewed further showed that the attitudes of the caregivers towards complementary feeding were influenced by the culture and the belief of the caregivers as an individual and the communities. It is an established fact that nutrition education would be an effective means of improving complementary feeding practices among caregivers on; timely introduction of complementary feeding, soft/solid food consistency, good hygiene practices, food diversification, consumption of iron rich foods and minimum acceptable diet. Effect of caregivers' belief on dietary diversity as indicated by [30] revealed that mothers' attitude towards infants feeding played a significant role in food they fed the children in Kakamega County, Kenya [34] reported that mothers' negative attitude towards pulses in feeding the infants was the factor preventing mothers to diversify complementary foods with pulses in Southern Ethiopia but the knowledge of the caregivers in the intervention group was improved on dietary diversity after nutrition education. According to [50] knowledge either directly contributes to attitude formation or indirectly affects attitudes. Complementary feeding practices by caregivers globally were rated poor [16]. The author stated further that the situation does not exclude the caregivers in the developed world; it is a global problem [16]. The effect of poor complementary feeding practices on the infants' wellbeing has been identified and determined to be, increase in morbidity and mortality rate [16]. Survival rate of infants before their first birthday has been associated with feeding practices of the caregivers [51]. Intervention on complementary feeding practices rated the second to reduce mortality rate in infancy. It has been shown that infant and young child feeding is a key area to improve child survival, promote healthy growth and development [52].

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Conflict of interest

The researchers declare no conflict of interest regarding this study.

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