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Nutritional Composition of Complementary Feeding in Ethiopia:- A Review

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Abstract*: Complementary feeding has been improvised through education and different formats to be implemented among mothers through governments of different countries of the world. But also big organizations like WHO and UNICEF have been playing major roles in the implementation of complementary feeding to infants in the world. This shows us how important it is in the development of a child growth. This takes us to understand what complementary feeding is. According to WHO it is defined as "a process starting when breast milk alone is no longer sufficient to meet the nutritional requirements of infants, and therefore other foods and liquids are needed, along with breast milk" [1-3]. According to the above definition it is a meal that is started when breast feeding is no more sufficient and should be required to fill the nutritional requirements needed by the infant. Breast feeding is required to be started as soon as the baby is born and should be exclusive till the age of six month since it has all the nutrients that the baby needs till that age but when the baby is more than six months old it requires more energy and nutritional requirements to the body which help in growth and development of the toddler. That is why after six month old mothers are advised to start complementary feeding that fulfills all the necessary nutritional compositions. Nutritional composition on the other hand is components of foods and provides values for energy and nutrients including protein, carbohydrates, fat, vitamins and minerals and for other important food components such as fiber. This review is initiated by the few known knowledge about complementary feeding and nutritional composition of the foods in Ethiopia.*

Keywords: - *Nutritional composition, Complementary feeding, Ethiopia*

Introduction

Nutritional composition of foods is essential in the food we eat since it is the base for growth and development of the body. It becomes especially essential in foods that are given to children because the improper and imbalance composition of nutrients in children effects are lifelong [4]. Complementary feeding on the other hand is known in most of the world as transitional foods from breast feeding to the general adult feeding. And this period is most important since it has two benefits first it enables the baby to enable the development of the digestive tract which ready's to be fed the adult food and second and most important it is the base for development and growth of the baby mental and physical status of the body along with breast milk feeding [5, 6]. Many of the disease that comes along with complementary feeding with improper nutritional composition are malnutrition like stunting and wasting. These malnutrition's affect the baby in its adult life in one way or the other since brain development along with physical growth is halted. And we say this is the baby makes it alive because many under-five children are related to malnutrition in their early lives [7]. After analyzing this many governmental bodies and worldwide organizations gave priority in complementary feeding and the proper nutritional composition of the food given to children to minimize the death of under-five children [8].

When should we start complementary food?

According to pediatricians complementary food should be started from when the baby is six month old along with breast milk. Even though some argues it should be started by the age of fours month old many accepts the six month age limit since the body digestive system development is reached at that age. This helps the baby to normalize the food that will be later consumed in adult life and even know if there are any food related allergic reactions to the baby. More over the feeding not only should be timely that is it should be started by the age of six month but also it is important to be adequate, safe, and should be cared while feeding [9]. Many developing nations have problem in practicing this time limit. According to studies many mothers in developing nations only give breast milk to the baby until the age of eight month sometimes up to the age of twelve months considering it is enough to the baby. And this practice is seen harming the infant in diverse ways from malnutrition to developmental defects and finally early child death. For example in India only 54.5% of children between the ages of 6 and 8 months had received any complementary foods and in Nigeria, only 21% of breastfed children receive the minimum acceptable complementary feeding diet [10] and when we see the data of Ethiopia, only 4.2% of breastfed children of 6–23 months of age have a minimum acceptable diet [11].

How much should we give per day?

Along with when to start giving complementary foods, how much must be given to the infant in a day is an important question. The amount ranges from age to age because of the daily energy needs of the baby. The total energy requirement estimated for healthy breastfed infants vary based on level of breast milk intake. In babies age from 6–8 months it is approximately required 615 kcal/day at, at 9–11 months 686 kcal/day, and at 12–23 months 894 kcal/day. This accounts for 29, 55, and 71% of total daily energy needs, respectively. We also should put in consideration that this requirements increase and decrease according to status of the country whether it is a case in developed country verses developing country [12].

What should be the nutritional composition of complementary food?

According to studies a nutritional composition of complementary food should be balanced in both macro and micro nutrients. The proper composition gives the baby enough energy and helps in growth of the body. As mentioned above this complementary feeding is mostly used as a transition period to adult food but it doesn't mean it should be ignored in fulfilling the required nutrients or else it will have a serious consequences in the development and growth of the body of the baby. Many non-communicable diseases like diabetes and metabolic syndromes have been seen in later years of life associated with the improper feeding of complementary food [13]. To halt this studies suggest that complementary foods should combine plant based and animal based products and should also be able to give the infant the necessary nutrients especially like calcium, iron and zinc along with carbohydrate, protein and fat.

As for carbohydrates the question is not that one infant is not getting enough but rather may be only getting it in a bulk amount. As we all know and understand carbohydrates are found abundantly in the food we consume everyday especially in legumes and cereals. So as many mothers prefers to feed their infants legumes and cereal based foods it's usually covered but the amount and quantity given to the baby may affect the health of the individual. Because of many cereals and legumes have lots of fiber it is also not advisable to introduce the infant to an oversized amount of fiber at small age cause it cause stool bulk, flatulence and reduces appetite. Mostly carbohydrate based foods are low energy based foods which cannot give the required amount of energy to the infant [14].

Proteins are the building blocks of our body since they make up majority of the organs. They are responsible for cell growth and differentiation. And they are required in smaller amount when compared to carbohydrates. Even though they are required by the body in smaller amount when compared to the above one their importance makes them essential than the above which is carbohydrate. Daily nutritional requirement of protein in grams per day to fulfill 9.1 g for 6–8 months, 9.6 g for 9–11 months, and 10.9 g for 12–23 months. As an example we can see that many of the malnutrition occurring among infants and children are protein-energy malnutrition. Proteins are found in two forms as high quality found in milk and eggs and the low quality which is found in plants. But here we have to consider is which type of protein we are giving to the infants considering the importance it always should be the high quality ones [2, 15]. While there is an argument among studies the limit of fats required for infants it still remains that it must be supplied according to the level of breast milk intake. For infants who are younger than eight months old it is established that fat shouldn't be added in their complementary food since the breast milk has it covered but for infants nine month and above it is recommended that fat should be added in their food For those with low breast milk intake, complementary foods should provide dietary fats appropriating to 34, 38, and 42% of daily energy requirements for 6–8, 9–11, and 12–23 months, respectively. With adequate breast milk intake, however, the requirement from complementary foods is 0 g/day (0%) at 6–8 months, 3 g/day (5–8%) at 9–11 months, and 9–13 g/day (15–20%) at 12–23 months [1, 2, 16, 17].

In the group of micronutrients some are essential and must be added to the food as soon as the complementary feeding started. Nutrients like iron, calcium and zinc are important to promote bone growth, health and development in infants so strict measures to make sure the infants take them must be implemented. But on the other hand vitamins are not that essential on the first year of life and can be introduced in the second year of the infant life through fruits total daily requirement for micronutrients required from complementary foods ranges from 30 to 97%. For example, 97% of iron, 81% of phosphorus, 76% of magnesium, 86% of zinc, 73% of sodium, and 72% of calcium during 9–11 months are expected from complementary foods [16].

What is the status of complementary feeing with appropriate nutritional composition in Ethiopia?

Complementary feedings in the world change from place to place. They vary according to culture and living standard of the people in their respective countries. Even though many think malnutrition is a developing country world problem many developed nations are seen with the same problem. For example a study shows that many infants were affected by poor protein and micronutrient insufficiency in the common wealth countries. The study showed that because of the early introduction of complementary food to the infants stunting, underweight and even anemia were seen among the infants. But introduction of early complementary feeding

was not the reason found but also the nutritional requirements of the food were also not achieved [18]. But this doesn't mean the problem in the world is the same. In some countries the complementary foods lack micronutrients and only based on macronutrients and in some parts of the world they tend to cover some portion of the macro and some portion of the micro nutrients leaving. Whether partially covered or not the problem still remains high [19].

Countries like Guatemala are especially affected by the loss of micronutrients in their foods especially nutrients like calcium, iron and zinc. To the contrary vitamin A was found sufficient due to fortification of their sugar. But still they need to work on adding the micronutrients that they are missing since they are the most important ones especially in the first year of the infant life [20]. Same defects among children are seen in Magnolia. A study showed that there is also a problem in micronutrients is found. This was a result of lot of cereal and non-nutrition snacks intake. These two reasons created the problem in the country [21].

Where infants are found in millions that is the South Asia the impact is seen highly. There stunting among children is high and is seen in the time of complementary feeding by which in conclusion we can say that infants lack protein in their food. It is not only that but also the intervention used to halt the problem was also found to be limited because it failed to improve the complementary feeding [22].

In Africa different countries studies shows different results. For example a study done in Kenya showed that the problem in the complementary foods lacking micronutrients is not having the raw material like milk , eggs , vegetables and other but the problem was on giving the infants on one group of food that is bound because of their culture. This kind of practice can be overcome by education to the society especially to the mothers [23]. On the other hand a study done in Ghana showed the extent to which not only the feedings lack proper nutritional composition but also many were not able to start having complementary food in the age of six month. The factors range from cultural beliefs to poverty to not having postnatal checkups. All this contributed to the deficiency and by worse lack of complementary feeding to the infants in the country [24].

When seeing the status of Ethiopia it varies from place to place. Since the country is a multicultural diverse country every region approach to complementary feeding differed from one another. For example a study done in one part of the northern Ethiopia showed that consumption of low energy food was high like peas and beans also non nutritional intakes where high like tea [25]. On another study done on the southern part of the country showed that children under age one was found to have been feed with appropriate and acceptable range of nutritional composed complementary foods compared with children above one year old. This was caused by knowledge gap among the society which needs a slot of work as well [26]. The pastoralist community found in Ethiopia was found to have another type of nutritional composition defect. Here the major lack among the society was found to be lack of vitamins that could have been found in fruits and vegetables. Also animal products except milk were found in minimal amount [27]. But the problem of insufficient nutrients in complementary food doesn't only occur in rural areas of the country. a study showed that the capital city of Ethiopia which is Addis Ababa also appear to have many children affected by the problem. The study revealed that the children not only get nutritionally inadequate meal but also they were getting meals fewer in numbers [28]. As a whole the major problem found to be in the country according to another study is having meals in less or no micro nutrients, depending majorly in carbohydrate foods and having no or very less amount of fat along with less iodine and vitamin A in some parts of the country. But also the study along with others showed that micronutrients like zinc and iron were nit found to be insufficient in the country [29].

Finally the problem in Ethiopia related to nutritional composition in complementary feeding is not lacking the raw materials but rather it is seen lack of education and in some parts cultural approach towards feeding infants. Even though the country has shown promising change toward the problem much more is needed [30]. One good example the country can take from others is fortifying food so that people still will be comfortable in feeding their children according to their culture and at the same time the children will get complete nutrient composed complementary food. This has been tried among different countries and showed promising results [31]. And also ready to eat cereal meals fortified with all the necessary nutrient compositions are also another good example that can be supplied by the government in lower prices so that people especially living in cities can take care their infants [32].

Conclusion

Complementary foods with low nutrient composition are affecting many infants in the world whether they are found in developed countries or not. Ethiopia is also affected by the problem and trying its best to overcome the problem. The main lack of nutrient in the country differ from region to region vitamins and fat remain the common ones.to overcome this food fortification is advised and governmental engagement is needed.

References

1. WHO. *Guiding principles for complementary feeding of the breastfed child*. 2001; Available from: https://www.who.int/maternal_child_adolescent/documents/a85622/en/.
2. Abeshu, M.A., A. Lelisa, and B. Geleta, *Complementary Feeding: Review of Recommendations, Feeding Practices, and Adequacy of Homemade Complementary Food Preparations in Developing Countries - Lessons from Ethiopia.* Front Nutr, 2016. **3**: p. 41.
3. WHO. *Infant and Young Child Feeding: Model Chapter for Textbooks for Medical Students and Allied Health Professionals. Geneva:*. 2009; Available from: Available from: http://apps.who.int/iris/bitstream/10665/44117/1/9789241597494_eng.pdf.
4. Szponar, L., G. Okolska, and M. Kundzicz, *[Foodstuffs intended for special dietary uses for infants and young children in the light of the directives of the European Union and standards of the Codex Alimentarius FAO/WHO].* Med Wieku Rozwoj, 2000. **4**(3 Suppl 1): p. 99-107.
5. Monte, C.M. and E.R. Giugliani, *[Recommendations for the complementary feeding of the breastfed child].* J Pediatr (Rio J), 2004. **80**(5 Suppl): p. S131-41.
6. Ketema, D.B., K.F. Muchie, and A.A. Andargie, *Time to poor treatment outcome and its predictors among drug-resistant tuberculosis patients on second-line anti-tuberculosis treatment in Amhara region, Ethiopia: retrospective cohort study.* BMC Public Health, 2019. **19**(1): p. 1481.
7. Wagnew, F., et al., *A meta-analysis of inpatient treatment outcomes of severe acute malnutrition and predictors of mortality among under-five children in Ethiopia.* BMC Public Health, 2019. **19**(1): p. 1175.
8. Mohseni, M., A. Aryankhesal, and N. Kalantari, *Prevention of malnutrition among children under 5 years old in Iran: A policy analysis.* PLoS One, 2019. **14**(3): p. e0213136.
9. Obbagy, J.E., et al., *Complementary feeding and micronutrient status: a systematic review.* Am J Clin Nutr, 2019. **109**(Suppl_7): p. 852s-871s.
10. UNICEF. *United Nations Children's Fund.Programming Guide Infant and Young Child Feeding*. May 2011; Available from: https://www.unicef.org/nutrition/files/Final_IYCF_programming_guide_2011.pdf.
11. EDHS. *Central Statistical Agency [Ethiopia], ORC Macro. Ethiopia Demographic and Health Survey 2011. Addis Ababa:*. 2011; Available from: https://dhsprogram.com/pubs/pdf/FR255/FR255.pdf.
12. Dewey, K.G., *Nutrition, growth, and complementary feeding of the breastfed infant.* Pediatr Clin North Am, 2001. **48**(1): p. 87-104.
13. Alvisi, P., et al., *Recommendations on complementary feeding for healthy, full-term infants.* Ital J Pediatr, 2015. **41**: p. 36.
14. Caballero, B. *Encyclopedia of Human Nutrition2nd Edition*. 20th July 2005; Available from: https://www.elsevier.com/books/encyclopedia-of-human-nutrition/allen/978-0-08-045428-3.
15. Reeds, P.J. and P.J. Garlick, *Protein and amino acid requirements and the composition of complementary foods.* J Nutr, 2003. **133**(9): p. 2953s-61s.
16. Dewey, K.G. and K.H. Brown, *Update on technical issues concerning complementary feeding of young children in developing countries and implications for intervention programs.* Food Nutr Bull, 2003. **24**(1): p. 5-28.
17. Forsido, S.F., et al., *Complementary feeding practices, dietary diversity, and nutrient composition of complementary foods of children 6-24 months old in Jimma Zone, Southwest Ethiopia.* J Health Popul Nutr, 2019. **38**(1): p. 14.
18. Cattaneo, A., et al., *Child nutrition in countries of the Commonwealth of Independent States: time to redirect strategies?* Public Health Nutr, 2008. **11**(12): p. 1209-19.
19. Gibson, R.S., E.L. Ferguson, and J. Lehrfeld, *Complementary foods for infant feeding in developing countries: their nutrient adequacy and improvement.* Eur J Clin Nutr, 1998. **52**(10): p. 764-70.
20. Campos, R., et al., *Contribution of complementary food nutrients to estimated total nutrient intakes for rural Guatemalan infants in the second semester of life.* Asia Pac J Clin Nutr, 2010. **19**(4): p. 481-90.
21. Lander, R., et al., *Poor dietary quality of complementary foods is associated with multiple micronutrient deficiencies during early childhood in Mongolia.* Public Health Nutr, 2010. **13**(9): p. 1304-13.
22. Aguayo, V.M., *Complementary feeding practices for infants and young children in South Asia. A review of evidence for action post-2015.* Matern Child Nutr, 2017. **13 Suppl 2**(Suppl 2).
23. Ferguson, E., et al., *Zinc, iron and calcium are major limiting nutrients in the complementary diets of rural Kenyan children.* Matern Child Nutr, 2015. **11 Suppl 3**(Suppl 3): p. 6-20.
24. Issaka, A.I., et al., *Determinants of inadequate complementary feeding practices among children aged 6-23 months in Ghana.* Public Health Nutr, 2015. **18**(4): p. 669-78.

25. Baye, K., et al., *Nutrient intakes from complementary foods consumed by young children (aged 12-23 months) from North Wollo, northern Ethiopia: the need for agro-ecologically adapted interventions.* Public Health Nutr, 2013. **16**(10): p. 1741-50.
26. Mekonnen, T.C., et al., *Meal frequency and dietary diversity feeding practices among children 6-23 months of age in Wolaita Sodo town, Southern Ethiopia.* J Health Popul Nutr, 2017. **36**(1): p. 18.
27. Mengistu, G., et al., *Energy and nutrient intake of infants and young children in pastoralist communities of Ethiopia.* Nutrition, 2017. **41**: p. 1-6.
28. Solomon, D., Z. Aderaw, and T.K. Tegegne, *Minimum dietary diversity and associated factors among children aged 6-23 months in Addis Ababa, Ethiopia.* Int J Equity Health, 2017. **16**(1): p. 181.
29. Stoecker, B.J. and Y. Abebe, *Context for food-based approaches for improved feeding of infants and children in Ethiopia.* Food Nutr Bull, 2014. **35**(4 Suppl): p. S209-13.
30. Srivastava, N. and A. Sandhu, *Infant and child feeding index.* Indian J Pediatr, 2006. **73**(9): p. 767-70.
31. Lutter, C.K. and J.A. Rivera, *Nutritional status of infants and young children and characteristics of their diets.* J Nutr, 2003. **133**(9): p. 2941s-9s.
32. Smith, J.D., et al., *Association between Ready-to-Eat Cereal Consumption and Nutrient Intake, Nutritional Adequacy, and Diet Quality among Infants, Toddlers, and Children in the National Health and Nutrition Examination Survey 2015-2016.* Nutrients, 2019. **11**(9).