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Original article

Beyond Breast Feeding: Meal Diversity, Frequency and Adequacy in Children of 6- 23 months of Age Visiting Tertiary Care Hospital of Western Maharashtra

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Abstract

Appropriate Infant and young Child feeding practices are important for growth and development of children. The present cross sectional analytical study was done to assess meal/ dietary components of IYCF practices and its associated maternal factors among children aged 6–23 months on 277 children attending an immunization clinic in a tertiary care government hospital of western Maharashtra. Proportion of children with Minimum Dietary Diversity (MDD), Minimum Meal Frequency (MMF) and Minimum Acceptable Diet (MAD) were 69.3%, 76.17% and 55.5% respectively. Proportion of children receiving micronutrients under food groups of Vitamin A, C, D and iron was 20%, 48% and 23% and 23% respectively. The proportion of children consuming junk food was biscuits (84.4%), chocolates (84.8%), chips (44%) and baby foods (48.7%). There was no association between education and working status of mothers and feeding practices of children ($p>0.05$). First time mothers had significantly higher meal diversity, frequency and acceptable score as compared to those who already had at least one child ($p<0.05$). Counseling of mothers in urban slums regarding appropriate complementary feeding and harmful effects of consumption of junk foods by children can be done in immunization clinics.

Key words: Minimum Dietary Diversity, Minimum Meal Frequency, Minimum acceptable Diet, Infant and young Child Feeding

Introduction

Infant and Young Child Feeding (IYCF) practices of mothers play a crucial role in determining nutrition status of children [1]. Complementary foods are those additional foods which are provided in addition to breast milk after 6 months of age in order to fill the energy gap demanded by the children for proper growth and development [2]. Inappropriate complementary feeding on one hand can increase the risk of under nutrition, illness, and mortality and on the hand lay the foundation for obesity, diabetes and other lifestyle diseases [3].

The three important components of IYCF apart from early initiation and exclusive breast feeding are meal diversity, meal frequency and meal adequacy. The emphasis of counseling in ANC clinics and post natal visits is mainly on breast feeding component of IYCF and the remaining meal related components are neglected which can negatively affect growth and health of the child in the critical window period of 6m- 23m of age.

Various factors are responsible for inadequate complementary feeding practices [4-7]. These can be classified into maternal factors like education status, working status, maternal health, knowledge about complementary feeding, counseling by health care worker etc, child factors like birth order, birth weight, repeated infections, other co morbidities etc, and family factors like socioeconomic status, type of family and hygiene and sanitation. Hence the present study was planned to assess meal/ dietary components of IYCF practices and its associated maternal factors among children aged 6–23 months.

Methodology

Present cross sectional study was conducted at immunization clinic of a government funded tertiary care hospital in western Maharashtra. Institute ethical clearance and written informed consent from mothers was taken. Most of the population visiting this clinic belonged to lower socio-economic group, which were residing in the nearby slum areas of the hospital. The minimum sample size was calculated using proportion of children age 6-23 months receiving an adequate diet from NFHS-4 for Maharashtra (8.5%) which was 113. However we took a total sample size of 277. A pretested questionnaire by Breast Promotion Network of India (BPNI), Maharashtra was used and data was collected form mothers using one to one interview method. The child was excluded from study in case mother had not come along (as history of dietary intake from a care giver could be unreliable). Data on socio demographic variables were noted.

Minimum Dietary Diversity (MDD) was defined as breast fed children 6–23 months of age who had received foods from 4 or more food groups from a total of 10 food groups, Cereals, Pulses, Vitamin A, vegetables, Diary products, Egg, Non-Vegetarian item, Vitamin C, Iron and Vitamin D. The mothers were asked 24 hour recall of child's diet and then the items were listed under different food groups. For vitamin D exposure to sunlight and duration or presence of a window from which adequate sunlight reaches the room was asked.

Minimum Meal Frequency (MMF) was defined as children aged 6–23 months who receive solid, semi-solid, or soft foods (but also including milk feeds for non breastfed children) the minimum number of times or more. For breastfed children the minimum number of times varies with age (two times if 6–8 months and three times if 9–23 months). For non breastfed children, the minimum number of times does not vary by age (four times for all children aged 6–23 months).

Minimum Acceptable Diet (MAD) was defined as for children aged 6–23 months who receive at least the MDD as well as at least the MMF according to the definitions mentioned above. History of junk food, baby food and consumption of non human milk was collected using food frequency questionnaire . Data was entered in Microsoft Excel and analyzed IBM Statistics SPSS ver 21.

Results

Majority of the children were in age group 9-23 months (232, 83.7%) and remaining (45, 16.3%) were in age group of 6-8 months. Majority of the mothers (253, 91%) were home makers. Nearly half of mothers (149, 53%) were educated above matriculation and very few (20, 7%) were uneducated and (15, 5.4%) were educated till fifth standard only. Less than half of mothers (132, 47.6%) belonged to nuclear family. One third of the mothers (107, 38.6%) were accompanying their first child (primipara). Two thirds of mothers (184, 66.4%) had a normal vaginal delivery. Less than one third (77, 27.7%) had initiated breast feeding within half an hour of delivery, remaining 42(15%) between 30 min to 1 hr and remaining half 145 (52.3%) after 1 hour.

MDD was observed in (192,69.3%) and percentage of children consuming food items under various food groups is given in figure 1. MMF was seen in (211,76.17%) of the children between 6 and 23 months. However, Minimum meal adequacy was seen in only half of the subjects (154, 55.5%). Various factors affecting MDD, MMF and MAD were studied using chi square test (Table 1) and logistic regression analysis for MAD Table 2. The proportion of children consuming junk food was biscuits (84.4%) ,chocolates (84.8%), chips (44%) and baby foods (48.7%). Consumption of junk food by subjects is given in figure 2. Other feeding practices were that less than half (112, 40%) were being fed with other family members, (142, 51.2%) with songs / stories, (100, 36.1%) in presence of mobile/ television, (134, 48.3%) were being forcefully fed.

Table 1: Association between various maternal factors and MDD, MMF and MAD

Maternal factors	Minimum dietary diversity		Minimum meal frequency		Minimum Acceptable Diet	
	Yes	**No**	**Yes**	**No**	**Yes**	**No**
Up to Matriculation	83	45	91	37	61	67
More than matriculation	109	40	120	29	93	56
p value	0.135		0.066		0.014*	
Employed	18	06	19	05	14	10
Unemployed	174	18	192	61	140	113
p value	0.527		0.719		0.778	
Nuclear	100	45	101	31	70	62
Joint	92	40	110	35	84	61
p value	0.895		0.899		0.412	
First child	82	25	90	17	72	35
Second or higher order child	110	60	121	49	82	88
p value	0.036*		0.0014*		**0.002***	

*p<0.05

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Multiple logistic regression analysis was done with MAD as the outcome (dependent variable). The predictor covariates (independent) variables were maternal education, her working status, being part of nuclear family and parity (first child vs more than one child).

Table 2: Logistic regression analysis for maternal factors and minimum acceptable diet

Maternal factors	Exp (B)	SE	Sig
Educational status	1.593	0.253	0.066
Working	1.011	0.447	0.981
Nuclear family	0.841	0.249	0.486
Primipara	1.975	0.265	0.010

Out of the 107 primipara mothers (95, 88.7%) were working, 73 (68.2%) were educated more than matriculation and (60, 56%) belonged to joint family.

Figure 1: Consumption of items from various food groups by children 6-23 months

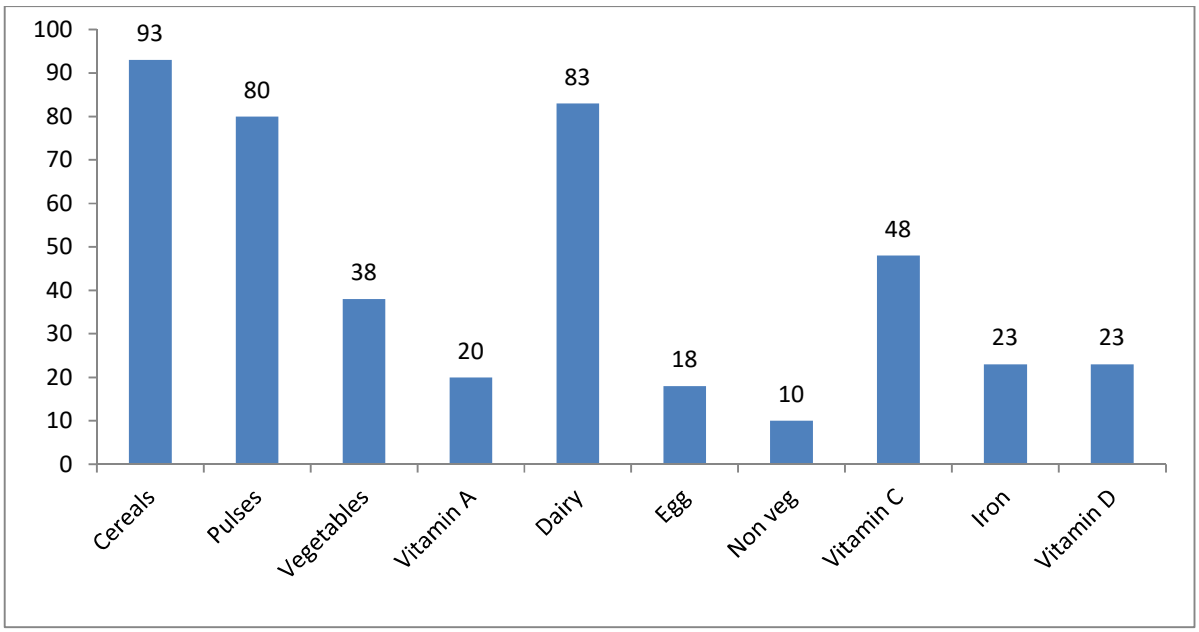
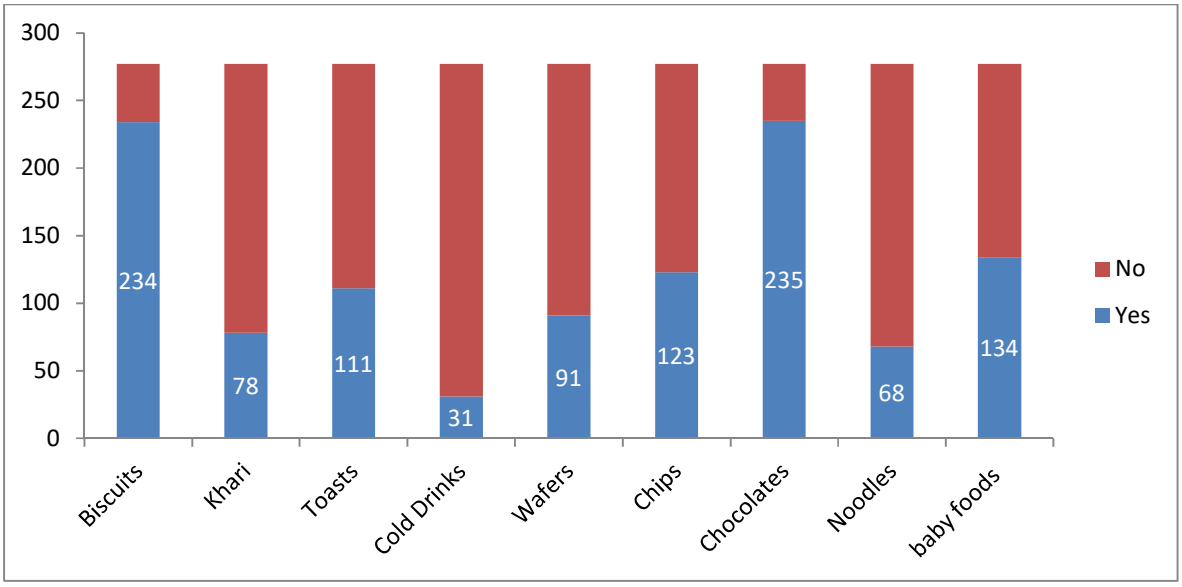


Figure 2: Consumption of junk food by children 6-23 months



Discussion

World Health Organization and UNICEF have documented appropriate IYCF practices as the most important solution for fighting the problem of under nutrition [8]. The period of feeding between 6-23 months of age is important for long-term health. After one year of age, diversification in diet is more important than even continuation of breast feeding [9]. Dietary diversity is one of the strongest and constant factor which can affect anthropometry of children [10]. MDD in the present study was calculated using 10 food groups which included Iron, Vitamin D and Vitamin C separately in contrast to guidelines which recommend 7 groups only. As per NFHS 4 data from Maharashtra only MDD and MMF in 55% of children aged 6–23 months were 48% and 55% respectively [11]. Though MDD in the present study was higher as compared to various other studies and NFHS-4, the cause of concern was lack of consumption of food items from vitamins and minerals groups (micronutrients) which can lead to hidden hunger. Children were being fed with traditional recipes comprising of starchy cereals and pulses and started on animal milk. Lack of consumption of other groups may be due to their per se low consumption even for the adults in the family as majority of subjects were from lower socioeconomic status. It is also known fact that maternal dietary diversity is strongly associated with child dietary diversity practice [6,12].

Our subjects were mainly from an urban slum area residing in a single room which lacked a window or any access to sunshine leading to poor availability of Vitamin D [13]. Also the study was conducted in Western Maharashtra where the winters are not severe and the mothers don't feel the need to keep children in open under the sun. This is in contrast to rural areas in India where there is adequate open area and small children can be easily exposed to sunshine [14].

Apart from diversity the quantity is a complementary factor as high diversity scores may be more or less nutritionally meaningful if many food groups are given, but in extremely small quantities and then diversity scores become meaningless. MMF and MAD in the present study was much higher than other studies and NFHS- 4 data for Maharashtra. MMF was higher in the study than MDD. This could be due do mothers offering children convenience foods as biscuits and chips in between major meals. We found that it was a common practice to offer the child biscuits softened by dipping them in hot early morning tea of mother. Nearly all of them were practicing this and were satisfied that at least child was eating something in the morning. These junk food items used by mothers served the purpose of convenience foods as children don't resist them and consume without bothering the mother. The main concern of the mother was to feed the child without paying much heed to the quality or nutrient aspects of feeding.

We found no association between educational status of mother with MDD as compared to other various studies where higher education had had greater odds of feeding diversified foods[6,15]. This can be explained as the mothers irrespective of educational status had more or less same socioeconomic status and similar access to mass media. There was no association between the type of family and feeding practices of the subjects. In nuclear families mothers are the sole decision makers for feeding of children and over the influence of mass media were feeding baby foods and other junk foods which were convenient with their household work.

The first time mothers in the study were feeding children better than others. This in contrast to other studies which state that as mother's parity increase, she gets experience on how to prepare and feed diversified diet to her child [6,16]. Our findings are supported by study of Ahmad etal who in their study found children with higher birth order had poor MDD [17]. Majority of of first time mothers in our study were working and educated. Working primi mothers had better MAD but lacked time especially those who were in nuclear family and resorted to feeding children with packaged food items.

The increased consumption of commercially produced snack foods and beverages is a cause for concern because these products are often energy dense, nutrient poor, and high in salt or sugar, making them inappropriate for IYCF. In addition, their consumption can displace breast milk and replace the consumption of more nutritious foods. Pries et al. 2017 stated that in a cross sectional survey conducted in Cambodia, Nepal, Senegal, and Tanzania proportion of children 6–23 months of age who had consumed commercially produced sugar sweetened beverages the day prior to the interview ranged between 16% and 32%[18].

What concerned us also the most in the dietary practices of our subjects was high proportion of children who had consumed biscuits and chips in the past 24 hrs. Our results are similar to a recent study in Indonesia in which 81.6% children had consumed a commercial snack [19].

Lack of accurate and unbiased information to mothers is one of the important causes of unhealthy feeding practices. The present system of counseling is rightfully focused on early initiation of breast feeding and continuation of same till 6 months. However in the bargain no emphasis is given to teach mothers complementary feeding and it is assumed that it will automatically happen. We need one to one counseling of mothers during interactions in immunization sessions especially in session of measles vaccine in urban areas where counseling services through triad of ANM, AWW and ASHA are as such lacking for urban poor. When mothers don't have access to information from health care workers they resort to information available in media through advertisements who

exploit the emotions of parents through false promises and tag lines of health messages with respect to child growth and encourage both children and parents to consume junk food. Though, it may be able to meet calorie requirements of young children through junk food which are energy dense but are not able to fulfill the requirements of various macro and micronutrients required for the growth.

The health care workers in immunization clinics of urban areas can take quick history of MAD and make suitable corrections in complementary feeding practices of mothers based on other social, religious, and cultural factors. The immediate outcome will be in inform of better growth of child reduced stunting and prevention of loss of IQs in the longer run. Various studies have demonstrated that mothers who had discussed nutrition with their health care workers are more likely to stick to IYCF guidelines while feeding their child.

The study has limitation of recall bias and social desirability bias. It may not also accurately reflect children' past feeding experience since it considers only 24-hour feed. This study does not take account of the quality of food provided.

Conclusion:

The proportion of children who received MDD, MMF and MAD was 69.3%, 76.17% and 55.5% respectively. The first time mothers had significantly better feeding practices. Feeding of junk foods by mothers need to be addressed through counseling.

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