ISSN: 2347-467X, Vol. 07, No. (2) 2019, Pg. 592-599

Current Research in Nutrition and Food Science

www.foodandnutritionjournal.org

Investigation of Infant Feeding Practice and Nutritional Status Among Selected Tribal and Non-tribal Community in Bangladesh

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Abstract

Malnutrition is one of the major causes of mortality for children in developing countries. Inappropriate feeding practices can have profound consequences for the growth, development, and survival of infants and children. A cross sectional study was carried out among 180 mother-infant pair of the tribal (Garo) and Non-tribal (Non-Garo) households at Madhupur Upazilla in Tangail region. The objectives of the study were to assess the feeding behavior of Garo and Non-Garo mothers and also prevalence of malnutrition among infants and young children. More than half of Garo respondents had smaller family size and a higher spending on food compared to Non-Garo respondents. From the breast feeding related information it was seen that colostrum was given to their babies as the first food in Garo (81.2%) and Non Garo groups (63.4%) respectively. It was also observed that 12.2% Garo mothers gave powder milk, but the non-Garo mothers preferred honey and sugar water. Exclusive breast-feeding in Garo and Non-Garo areas were 64.6% and 45.7% respectively. In Non-Garo areas breast feeding continued longer times than Garo areas. The predominance of moderate to severe underweight in Non-Garo and Garo areas were 42.21% and 34.44% respectively. A similar trend of stunting and wasting was found in both groups of the infants. Finally, it can be clearly viewed and concluded that the feeding practices of mothers from Garo community were better compared to Non-Garo communities, and largely depends on various socioeconomic factors that affect the nutritional status of their children.

Article History

Received: 5 March 2019
Accepted: 8 Aug 2019

Keywords

Garo Households;
IYCF Practices;
Malnutrition;
Non-Garo Households.

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Doi: http://dx.doi.org/10.12944/CRNFSJ.7.2.28

Introduction

Malnutrition is one of the major problems of many developing countries associated with almost one-half of all child deaths globally.[1] Today malnutrition not only affects individuals but its effects are passed from one generation to the next as malnourished mothers give birth to infants who struggle to develop and thrive; Survivors are left vulnerable to illnesses, stunted growth and intellectual impairment.[2] About 30% of children (6 59 months) in the World-wide are stunted due to improper feeding and repeated infections.[3] Optimal infant and young child-feeding (IYCF) practices such as exclusive breastfeeding for 180 days and nutritionally sufficient and safe weaning foods starting from 6 months are crucial for health and development, and lastly the survival of infants and young children.[3,4] Introduction of solid, semi solid or soft foods after 6 months of birth can outweigh any potential risks and this is applicable for all countries irrespective of their socio-economic condition.[5] Arifeen *et al.*, (2001) reported in his previous study [6] that infants who are not breastfed have 5 to 7 fold increased risks of death from diarrhea and pneumonia compared to exclusively breastfed infants aged 0-5 months.[6] Good weaning practices at infancy are necessary for achieving and sustaining proper health, nutrition and development.[7] Inappropriate feeding exercises, such as absence of breast feeding, premature or too late introduction of complementary and weaning foods, which is nutritionally insufficient, have negative effect for child growth and development particularly in developing countries.[8]

High prevalence of under nutrition and nutrition related problem exist in Bangladesh such as stunting, wasting, underweight, low birth weight, anemia, iodine deficiency disorders and Vitamin A deficiencies disorders etc.[2] Although Saha *et al.*, (2008)[9] explored the influencing factors behind childhood malnutrition in Bangladesh[9], very few have addressed the determinants related to specific tribal groups. The Garo tribe is one such minority group, originally from Tibet,[10] has very little data regarding the nutritional status of children and related feeding practice. This study was conducted to determine the nutritional status (stunting, wasting, and underweight) of young children, and the infant young children feeding practice among the selected Garo tribes. Similar data was also collected from nearby non-Garo households for comparison. Looking at infant and young children feeding practice among the mothers/care providers and prevalence of malnutrition, may help in designing future plans for activities in the different areas in regard to reduce malnutrition rate and promotion of infant's young children feeding practices.

Methods and Materials

Place of Study

The study areas were the two different villages of Jolchotro and Jangalia at Madhupur Upazilla, Bangladesh.

Study Period

The study was conducted from September 2012 to December 2013.

Type of Study

A cross sectional study was adopted.

Study Population

This study was conducted among the selected infant and young children bearing mothers at Madhupur Upazilla in Tangail region, Bangladesh.

Sampling Technique and Sample Size

At the beginning of this study, a pilot survey was done in two different villages of Jolchotro (having 700 Garo population) and Jangalia (having 600 Garo population) at Madhupur under Tangail area, in Bangladesh. The study subject (child-mother pair) were selected purposively based on having infants (1-11 months) in the household. Data was collected regarding socio-economic conditions, anthropometry and food intake pattern etc. The minimum required sample-size was calculated using the formula: $n=Z^2pq/d2$ where n=required sample-size, p=expected proportion, Z=95% confidence interval, and d=9% error. In Bangladesh, the proportion of child feeding (CF) practices among the mothers of 6-9 months old children is 74%.[11] Therefore, p=74% was taken as the expected proportion, i.e. 0.74, and q is (1-p) = 0.26. A total number 180 mothers–child pair were selected by non-random convenience sampling method; half of them were Garo and another half were Non-Garo households from above two villages, with the same socioeconomic status.

Data were collected by trained volunteers regarding IYCF perceptions and practices by interviewing the mothers using pre-designed, pre-tested, semi structured interviewer administered questionnaire.

Anthropometric Assessment

The anthropometric data were collected based on standard methods. Weight was recorded in kilogram and height was measured in to the nearest 0.1 cm.

Data Analysis

Z score were calculated from the WHO reference data set. Data are presented as frequency distribution using SPSS 14 windows program.

Results

A descriptive, cross sectional study was carried out from selected Garo and Non-Garo Households. The salient feature of this study was presented in the following sections:

In most of the Garo areas the maximum total expenditure on foods were Tk. 4001-6000 while in case of Non-Garo areas the maximum total cost was Tk. 2,000 to 4000 only. And only 3.33% Garo and 15.55 % Non-Garo areas monthly expenditure on foods were <2000 taka (Table 1).

The above figure-1 shows the comparison of first feeding as a food in two groups where colostrum was given to their babies as a first food in Garo (81.2%) and Non Garo groups (63.4%) respectively. About 12.2% of Garo mothers first give powder\formula milk, while in Non-Garo area preference of giving more honey and sugar water are 11.1% and 13.3% respectively (Fig-1).

Table 1: Monthly expenditure of Garo and Non-Garohousehold on foods

Expenditure on foods (Tk.)	Garo n(%)	NonGaro n(%)
<2,000	3 (3.33)	14 (15.55)
2,000-4,000	11 (12.22)	35 (38.89)
4,001-6,000	33 (36.66)	25 (27.78)
6,001-8,000	21 (23.33)	11 (12.22)
8,001-10,000	19 (21.11)	5 (5.55)
10,001-15,000	3 (3.33)	0 (0.0)
15,001-20,000	0 (00)	0 (0.0)
Total	**90 (100)**	**90 (100)**

Figure-2 shows the comparison the duration of exclusive breast feeding and indicates that 64.6% Garo and 45.7%Non-Garo mothers feed exclusively 5 to 6 times. On the other hand, 3 to 4 months both Garo and Non-Garo (13.3 and 34.5% respectively) did exclusive breast feeding.

Table-2 shows the distribution of the all respondents about introduction of complementary foods to their babies and it is highlighted that 40% Garo mothers started complementary feeding at 6 months age of baby and 36.67% Non Garo mothers respectively started complementary feeding at 4 months age of baby.

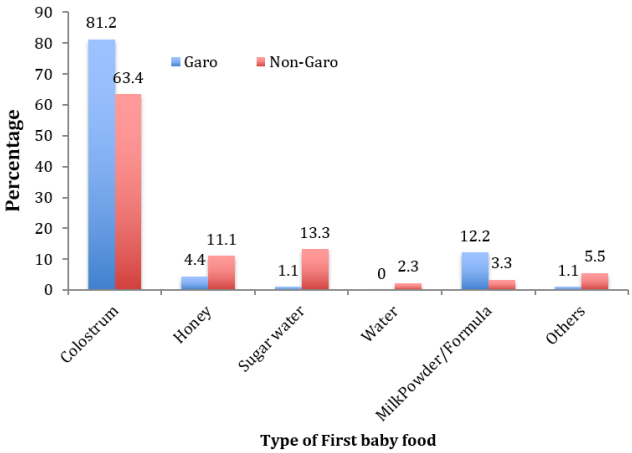

Fig. 1: Information about First Foods for children

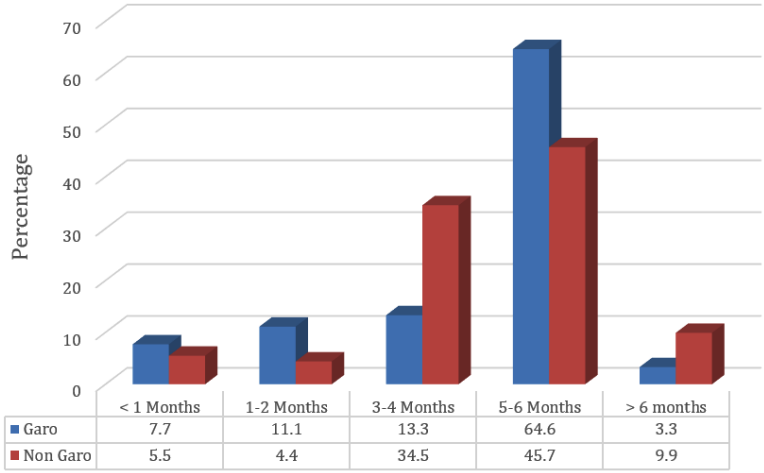

Fig. 2: Comparison the duration of exclusive breast-feeding

Table 2: Comparison of the time of initiation of complementary foods to their babies

Stage of complementary foods introduce	Garo N(%)	Non Garo N(%)
1 month	3 (3.33)	0 (0.0)
2 months	9 (10)	1(1.11)
3 months	7 (7.78)	7 (7.78)
4 months	13 (14.44)	33 (36.67)
5 months	22 (24.44)	19 (21.11)
6 months	36(40)	22 (24.44)
>6 months	0 (0.0)	8(8.89)
Total	**90 (100)**	**90 (100)**

This table-3 indicates that about one third (38.39%) of the Garo infants and young children were given powder milk as first complementary food about half (46.67%) of the Non Garo infants and young children's were given cow's milk as first complementary food (Table-3).

The table-4 indicates that majority of the infants in each group received complementary foods <4 times and 5-6 times per day mainly and this frequency depended on the infant's age, mother's available time and income of the family.

Table-5 shows the type of complementary foods for the children of Garo and Non Garo mothers. It was found that 18.9% of Garo and 26.6% of Non Garo children received cow's milk as complementary food. Other foods such as suzi (13.3%) for Garo and 31.1% for Non Garo, rice (16.7% for Garo and 21.1% for Non Garo) were used as complementary foods. About 25.6% Garo and 5.6% Non Garo used baby formula and only few percent used goat milk, banana, green vegetables, khichuri (Hotchpotch) and fruit juice.

Table 3: Name of first foods introduced as a complementary food

First food introduced as complementary food	Garo n(%)	Non Garo n(%)
Milk /powder milk	35(38.89)	10(11.11)
Rice mashed	0(0)	20(22.22)
Suji	22(24.44)	14(15.55)
Vegetables	6(6.66)	4(4.44)
Fruit juice	4(4.44)	0(00)

Table 4: Frequency of complementary foods given per day

Frequency per day	Garo n (%)	Non Garo n (%)
<4	35 (38.89)	41 (45.55)
5-6	27 (30)	28 (31.11)
7-8	20 (22.22)	17 (18.89)
9-10	8 (8.89)	4 (4.44)
>10	0 (00)	0 (0.0)
Total	**90 (100)**	**90 (100)**

Table 5: Distribution of infants by the types of complementary foods within last 24 hours

Food items	Garo		Non Garo	
	Frequency	Percent	Frequency	Percent
Baby formula	23	25.6	5	5.6
Cow's milk	17	18.9	24	26.6
Goat's milk	1	1.1	0	0
A2nana	7	7.7	5	5.6
Green vegetables	1	1.1	0	0
Rice	15	16.7	19	21.1
Suzi (semolina)	12	13.3	28	31.1
Khichuri (Hotchpotch)	14	15.6	8	8.9
Fruit juice	0	0.0	1	1.1
Total	90	100.0	100	100

Table-6 shows the mean height and weight of the children (1-11 months) were 63.66 cm & 6.63 kg for Garo families and 62.34 cm & 6.70kg for Non Garo families. The Z score values for height for age and weight for height indicate that the infants from non-Garo households were more on the verge of stunting and wasting compared to their Garo counterparts.

According to mid upper arm circumference, a greater number of infants (17.78%) from non-Garo areas were moderately malnourished compared to infants in Garo areas (Table-7).

Discussion

Growth faltering and nutritional problems are common in infants and young children living in low- and middle-income countries. Although health and dietary intake are the immediate causes of malnutrition, child caring practices is another.

Table 6: Mean, Standard Deviation of anthropometric indicators of infants

Anthropometric Indicators	Garo (n= 90)		Non Garo (n=90)	
	Mean	Standard deviation	Mean	Standard deviation
Age (Month)	5.12	0.87	5.71	0.76
Length (cm)	63.66	8.956	62.34	6.906
Weight (Kg)	6.63	2.224	6.70	2.071
Height for age Z-score	-1.02	1.805	-1.61	1.578
Weight for age Z-score	-0.86	1.36	-0.79	1.791
Weight for height Z-score	-0.17	2.170	0.668	2.618

Table 7: Nutritional status of the infants according to mid upper arm circumference (MUAC) classification

MUAC (cm)	Classification	Garo n(%)	Non-Garo n(%)
<11.0	Severe Acute Malnutrition	0	0
11.0-12.49	Moderate Acute Malnutrition	9 (10)	16 (17.78)
12.5-13.5	At risk of acute Malnutrition	38 (42.22)	44 (48.89)
>13.5	Good Nutritional Status	43 (47.78)	30 (33.33)
Total		**90 (100)**	**90 (100)**

important component according to UNICEF model.[12] Complementary feeding practices are essential component of infant feeding practices and are crucial for optimum infant and child nutrition.[13]

In the present study, most of the Garo and non-Garo children were malnourished and a lack of appropriate IYCF practice appeared to be responsible. The age for starting complementary feeding was 4 and 5 months for the majority of non-Garo participants, some of them delaying the process beyond 6 months of age. On the other hand, only 33% of the Garo mothers start complementary feeding after 6 months age of infants, which is in compliance with WHO recommendation.[14]. Previous studies had shown a significant association between untimely introduction of complementary foods and severe stunting and other forms of malnutrition.[15] Studies have also showcased improvement in childhood nutritional status through appropriate initiation of weaning foods.[16]

Yet the extent of malnutrition for infants from non-Garo community was greater than those belonging to the Garo tribe. This finding is remarkable considering the Garo tribe is a marginalized and reclusive group. Introduction of colostrum was found to be higher among Garo respondents compared to non-Garo which justifies their greater prevalence of malnutrition. This is supported from evidence of previous studies such as by Kumar *et al.,*[17] which had shown a positive relationship between deprivation of colostrum and stunting. Another study by Islam *et al.,*[18] had obtained prevalence of stunting to be higher among children who had been deprived of colostrum, delayed introduction to breastfeeding and weaning foods.

Previous anthropological reports suggest the Garo tribe to have a strong matriarchal family system.[19] Mother is the authoritative figure within the household and is the owner of whole family property, thus enjoying a high status.[20] Needless to say, the decision-making power of mother translates to better feeding practice for infants. Recent literature shows that high maternal status or decision-making power might be one of the vital social factors in charge for influencing child's nutritional health.[21,22] Mothers are bound to utilize scarce resources for the benefit of their child if they are allowed to do as such.[23] Our results show that Garo tribe have smaller families while the non-Garo families had a larger family size. But previous research have pointed out that it is not the household size but rather the total household income, expenditure on child rearing and maternal education that account for child nutritional status.[24] Although both groups had been found to be living below the national average income, the Garo households consistently had higher spending on foods compared to non-Garo families. A very recent study on population level analysis of four countries that are India, Ethiopia, Peru and Vietnam showed a positive association between total household food expenditure and Height for age Z score.[25] Mothers of Garo tribe also were more inclined to use appropriate baby formula instead of nutritionally inadequate cow's milk or semolina as complementary food, compared to mothers of non-Garo community. Flawed complementary feeding practices intensified by nutritionally insufficient, and repeatedly contaminated, foods often introduced untimely remain a key cause of malnutrition.[26]

From the study we can conclude that a lot of deficiency in knowledge regarding optimum IYCF exists among the target groups. Future studies can be carried out to determine the extent to which the normative infant feeding practices, across all ethnic groups in Bangladesh, comply with international recommendations. This is necessitated since both groups of population investigated, Garo and non-Garo, had exhibited some form of malnutrition in spite of differing feeding practice. It will also be beneficial to examine the causative factors behind the lack of optimum infant feeding practices by choosing indicators that are culture and ethnicity sensitive for Bangladesh. Seeking inspiration from the Garo culture, it will also be essential to examine variables associated with maternal status (power over resources like food, income, knowledge, and esteem, within the family and in society at large) since mother is the primary caregiver and influence child's growth. These can then be incorporated into many social programs that will promote optimum IYCF practice.

Conclusion

Majority of the Garo and non-Garo children are malnourished and a lack of appropriate IYCF practices appeared to be responsible. The study

also concluded that Garo mothers had better IYCF practice compared to Non-Garo mothers which translated to lesser extent of stunting and wasting of children in the former group. Child nutrition should be deliberated as public health problem. An intervention needs to be developed to address the nutrition problem among underprivileged children in Bangladesh.

Acknowledgement
The author wishes to thank all the participants who were involved in this study. The author did not receive any financial assistance from any funding sources.

Funding
The author(s) received no financial support for the research, authorship, and/or publication of this article.

Conflict Of Interest
The authors declare no conflict of interest.

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