

Feeding practices and nutritional status of children with rheumatic fever in Bangladesh.

Tazun Akhter^{1,2}, Ratna Khatun³, Shima Begum⁴, Shirin Sultana⁵, Rita Khandaker⁵, Faisal Muhammad^{2*}

¹Department of Vitreo-Retina, National Institute of Ophthalmology and Hospital, Sher-e-Bangla Nagar, Dhaka, Bangladesh

²Department of Public Health, Faculty of Allied Health Sciences, Daffodil International University, Dhaka 1207, Bangladesh

³Department of Adult Medical and Surgical Nursing, Grameen Caledonian College of Nursing, Mirpur-2, Dhaka, Bangladesh

⁴Department of Pediatric Nursing, Dhaka Shishu Hospital, Sher-e-Bangla Nagar, Dhaka, Bangladesh

⁵Department of Midwifery and Community Health Nursing, Ibn Sina Nursing Institute, Kallyanpur, Dhaka, Bangladesh

Abstract

Background: The children must be well-nourished and healthy so as to grow into healthy adults. The growth and development of the children continues to be a major public health problem in Bangladesh.

Objective: This study was aimed to identify the feeding practices and nutritional status of children with rheumatic fever in Bangladesh.

Methods: A descriptive cross-sectional study was conducted among 110 children aged 5-15 years, who suffered from rheumatic fever and attended National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRF and HD) during March to June of the year 2016. The instrument used for data collection was a semi-structured questionnaire. Data collection was done using face-to-face interview with parents/caregivers of the children. Data analysis was done by using SPSS version 16.

Results: In this study more than half (53.6%) of the children were aged 13-15 years and 60.0% of them were males. Slightly above half (50.9%) of the respondents were from urban area and 67.3% of the family had ≥ 4 children. More than two-fifths (44.5%) of the respondent's housing condition was semi-pacca and 45.5% of them lived at least 3 person per bedroom. Little above three-fifths (60.9%) of the children's duration of suffering rheumatic fever was ≤ 48 months. About 73.6% of the children were fed colostrum. About 35.5% of the fathers had SSC level of education and 33.6% of the mothers had primary level of education.

Conclusion: The overall nutritional status of the study participants (children) was not satisfactory. Our findings reveal that more than sixty percent of the children were underweight. The children should be properly immunized and vaccination program for the children against common infectious diseases of childhood should be provided.

Keywords: Feeding practice, Nutritional status, Children, Rheumatic fever.

Accepted on October 01, 2019

Introduction

Rheumatic fever is prevalent in many part of the world such as Indian subcontinent, Arab countries, Africa and some portion of Central and South America [1]. According to community and school surveys, the prevalence rates range from 1 to 22 per 1000 children [2]. However the prevalence of rheumatic fever (RF) and rheumatic heart disease (RHD) has declined sharply although in developing countries, RF is still a leading cause of heart disease and consequently, death in children and young adults [3]. Acute rheumatic fever is the most common cause of cardiac disease. A study estimated that about 12 million people in developing countries were affected by acute rheumatic fever

and rheumatic heart disease, with the majority of these being children [4]. Another study stated that this level of morbidity is comparable to that in developed countries earlier this century, prior to an increase in the standard of living and the establishment of penicillin [5,6]. Globally, it was estimated that over 2.4 million children aged 5-14 years were having rheumatic heart disease (RHD) in the year 2005, and close to four-fifths (79.0%) of all these cases were from less-developed countries and Bangladesh was included [7]. According to revised Jones criteria among children aged 5-15 years in rural Bangladesh the prevalence was 1.2 [8]. A study reported that rheumatic fever is likely to be associated with protein energy malnutrition [9]. Nutrition is a process by which living

organism utilize food for tissue functions, life maintenance and energy production. New generation are the future of every country. The children must be well-nourished and healthy so as to grow into healthy adults. The growth and development of the children continues to be a major public health problem in Bangladesh [10]. The problem is directly or indirectly related to abnormally high child mortality and morbidity in the country, especially 5-15 ages of children.

Methodology

Study design and study site

This study was a descriptive cross-sectional study conducted at out-patient department of National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRF and HD) in Dhaka capital city of Bangladesh.

Study period, study population and sampling technique

This study was conducted for a period of 3 months (March to June) in the year 2016. The children who suffered from rheumatic fever and had attended a National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRF and HD) during the period of this study were selected using purposive sampling technique. A total of 110 children aged between 5-15 years in the National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRF and HD) were recruited and seriously sick children were excluded for participation.

Data collection method

The questionnaire used in this study was pre-tested and finalized prior to the data collection. The questionnaire was prepared using the selected variables according to the study objectives. The English version of the questionnaire was developed and translated to Bangla for data collection. Data were collected from the parents/caregiver of the children using face to face interview technique.

Data processing and analysis

All the collected data were checked, verified and edited. Data analysis was done using a Statistical Software i.e. SPSS version 16.0. Data were analyzed according to the study objectives. The descriptive statistics included the frequencies, percentage, mean, median and standard deviation. A Pearson chi-square test was conducted to find the association between variables; P-value less than or 0.05 was considered statistically significant. While assessing the nutritional status of the children, the anthropometric measurements were taken to identify the Body Mass Index (BMI) of the children. A method previously used in another study was adopted to identify the nutritional status of the children [11].

Results

Socio-demographic characteristic and other information of the children

Table 1 shows that more than half (53.6%) of the children were aged 13-15 years and 60.0% of them were males. Slightly above half (50.9%) of the respondents were from urban area, followed by 29.1% rural area and the rest were from slum (20.0%). About 67.3% of the family had ≥ 4 children. More than two-fifths (44.5%) of the respondent's housing condition was semi-pacca and 45.5% of them lived at least 3 person per bedroom. Little above three-fifths (60.9%) of the children's duration of suffering from rheumatic fever was ≤ 48 months. About 69.1% of the children had completed their immunization and 73.6% of the children were fed colostrum. Little above seven-tenths (71.8%) of the children were exclusively breastfed.

Table 1: Socio-demographic characteristic and other information of the children (n=110).

Variable	Frequency	Percentage
Age group (years)		
05-Aug	10	9.1
09-Dec	41	37.3
13-15	59	53.6
Sex		
Male	66	60
Female	44	40
Residence		
Urban	56	50.9
Rural	32	29.1
Slum	22	20
Number of children in the family		
01-Mar	36	32.7
≥ 4	74	67.3
Housing condition		
Pacca	29	26.4
Semi-pacca	49	44.5
Kacha	32	29.1
Persons per bedroom		
2 Person	22	20
3 person	50	45.5
≥ 4 person	38	34.5
Duration of suffering from rheumatic fever		
≤ 48 months	67	60.9

Citation: Tazun Akhter,Ratna Khatun,Shima Begum,Shirin Sultana,Rita Khandaker,Faisal Muhammad. Feeding practices and nutritional status of children with rheumatic fever in Bangladesh. *Allied J Med Res* 2019;3(1):10.

49-96 months	38	34.5
≥ 97 months	5	4.5
Completed Immunization		
Yes	76	69.1
No	34	30.9
Fed colostrum		
Yes	81	73.6
No	29	26.4
Exclusive breastfeeding		
Yes	79	71.8
No	31	28.2

Socio-demographic characteristics of the parents

Table 2 shows that 35.5% of the fathers had SSC level of education, followed by 20.0% no formal education, 16.4% primary, 15.5% HSC and the rest (12.6%) had bachelor and above level of education. About 32.7% of the fathers were service holders, followed by 29.1% businessmen, 10.9% were daily laborer and 10.0% of them were farmers. Regarding the mothers educational level 33.6% of them had primary level of education, followed by 26.4% who had no formal education and 17.3% had SSC. Most (41.8%) of them were housewives, followed by 19.1% who were business holders and 18.2% of them were service holders. Most (48.2%) of the parent's family monthly income was ≤ 10000 taka.

Table 2: Socio-demographic characteristics of the parents (n=110).

Variable	Frequency	Percentage
Father's Education		
No formal education	22	20
Primary	18	16.4
SSC	39	35.5
HSC	17	15.5
Bachelor and above	14	12.6
Father's Occupation		
Daily laborer	12	10.9
Farmer	11	10
Service holder	36	32.7
Business	32	29.1
Others	19	17.3
Mother's Education		
No formal education	29	26.4

Primary	37	33.6
SSC	19	17.3
HSC	15	13.6
Bachelor and above	10	9.1
Mother's Occupation		
Housewives	46	41.8
Daily laborer	11	10
Service holder	20	18.2
Business	21	19.1
Others	12	10.9
Family monthly income (taka)		
≤ 10000	53	48.2
10001-15000	28	25.5
>15000	29	26.3

Nutritional status of the children

Figure 1 shows that close to seven-tenths (67.3%) of the children were underweight, followed by 20.9% who had normal body weight and the remaining (11.8%) were overweight.

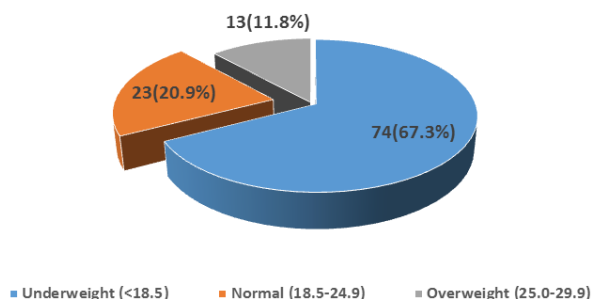


Figure 1: Nutritional status of the children (n=110).

Distribution of the children by their feeding practices

Table 3 shows that most of the children (63.6%) consumed rice more than 5 times in a week and 46.4% of them took bread more than 5 times per week. More than half (56.4%) of the children took egg 1-3 times in a week and 51.8% of them never took beef in a week. About 51.8% of the children took poultry meat 1-3 times in a week and 41.8% of them took fish 1-3 times in a week.

About 63.6% of the children took vegetables more than 5 times in a week and 35.5% of the children consumed milk 1-3 times in a week. Two-fifths (40.0%) of the children consumed green leafy vegetables 1-3 times in a week and 67.3% of them never

took yellow fruit in a week. About 74.5% of the children never took sour fruit in a week.

Table 3: Distribution of the Children by their Feeding Practices (n=110).

Name of food	Never/week	1-3 time/week	4-5 time/week	>5 time/week
Rice	0(0.0)	11(10.0)	19(17.3)	80(63.6)
Bread	8(7.3)	16(14.5)	35(31.8)	51(46.4)
Egg	29(26.4)	62(56.4)	10(9.1)	9(8.1)
Beef	57(51.8)	40(36.4)	8(7.3)	5(4.5)
Poultry meat	50(45.5)	57(51.8)	2(1.8)	1(0.9)
Fish	22(20.0)	46(41.8)	34(30.9)	8(7.3)
Vegetable	5(4.5)	14(12.7)	21(19.2)	70(63.6)
Milk	31(28.2)	39(35.5)	4(3.6)	36(32.7)
Green leafy vegetables	15(13.6)	44(40.0)	30(27.3)	21(19.1)
Yellow fruit	74(67.3)	24(21.8)	5(4.5)	7(6.4)
Sour fruit	82(74.5)	23(21.0)	2(1.8)	3(2.7)

Association between nutritional status and some demographic characteristics

Table 4 shows the nutritional status of the child was not significantly associated ($P>0.05$) with age of the child, residence, and father's educational level. However the

immunization status, colostrum feeding, exclusive breastfeeding, mother's educational level and family monthly income were significantly associated ($P<0.05$) with nutritional status of the child.

Variables	Body Mass Index (BMI)			χ^2	df	p-value	
	Underweight (<18.5)	Normal	Overweight (25.0-29.9)				
Age of the Child							
43682	5 (6.8)	3 (13.0)	2 (15.4)	10 (9.1)	18.203	2	0.403
43808	33 (44.6)	7 (30.4)	1 (7.7)	41 (37.3)			
13-15	36 (48.6)	13 (56.6)	10 (76.9)	59 (53.6)			
Residence							
Urban	33 (44.6)	14 (60.9)	9 (69.2)	56 (50.9)	24.101	1	0.301
Rural	28 (37.8)	2 (8.7)	2 (15.4)	32 (29.1)			
Slum	13 (17.6)	7 (30.4)	2 (15.4)	22 (20.0)			
Completed Immunization							
Yes	44 (57.9)	20 (87.0)	12 (92.3)	76 (69.1)	18.1	1	0.021
No	30 (42.1)	3 (13.0)	1 (7.7)	34 (39.1)			
Fed Colostrum							
Yes	47 (63.5)	22 (95.7)	12 (92.3)	81 (73.6)	22.202	1	0.002
No	27 (36.5)	1 (4.3)	1 (7.7)	29 (26.4)			
Exclusive Breast feeding							
Yes	46 (62.2)	21 (91.3)	12 (92.3)	79 (71.8)	17.601	1	0.001
No	28 (37.8)	2 (8.7)	1 (7.7)	31 (28.2)			

Citation: Tazun Akhter,Ratna Khatun,Shima Begum,Shirin Sultana,Rita Khandaker,Faisal Muhammad. Feeding practices and nutritional status of children with rheumatic fever in Bangladesh. *Allied J Med Res* 2019;3(1):10.

Father's Education							
SSC and below	54 (73.0)	15 (65.2)	10 (76.9)	79 (71.8)	15.221	2	0.211
HSC and above	20 (27.0)	8 (34.8)	3 (23.1)	31 (28.2)			
Mother's Education							
SSC and below	63 (85.1)	13 (56.5)	9 (69.2)	85 (77.3)	28.111	1	0.003
HSC and above	11 (14.9)	10 (43.5)	4 (30.8)	25 (22.7)			
Family Monthly Income (taka)							
≤ 10000	47 (63.5)	4 (17.4)	2 (15.4)	53 (48.2)	23.208	2	0.01
>10000	27 (36.5)	19 (82.6)	11 (84.6)	57 (51.8)			
Total	74 (67.3)	23 (20.9)	13 (11.8)	110 (100)			

Discussion

This study was conducted to identify the feeding practices and nutritional status of children with rheumatic fever in Bangladesh. In this study about 67.3% of the family had ≥ 4 children. A similar study conducted in Bangladesh reported that more than half out of 477 patients came from a family comprising of ≥ 7 members [12]. More than two-fifths (44.5%) of the respondent's housing condition was semi-pacca. A similar study conducted in the same hospital (NCCRF and HD) reported that most of the patients attending this hospital were residing at Kacha house and house consisting of less living rooms increases the incidence of rheumatic fever [12]. More than forty five percent of the respondents lived at least 3 person per bedroom. A study conducted in Bangladesh reported that crowding in one sleeping room facilitates the risks of infection. More than two-fifths of the households use only 1 room nationally [13].

Regarding the educational level of the parents, 35.5% of the fathers had SSC level of education and 33.6% of the mothers had primary level of education. A study reported that the literacy rate in Bangladesh is low, 38.2% people have got no education and 55.1% of those aged ≥ 5 years can write a letter for communication [14].

Close to seven-tenths (67.3%) of the children were found underweight. A study in Bangladesh reported that nearly half of children in Bangladesh have chronic malnutrition [15]. A study in 2013 reported that close to half of the world's 161 million stunted children lived in Asia and more than one-third in Africa [16].

A study reported that mostly the nutritional status of children is highly influenced by feeding practices [17]. About 46.4% of the children took bread more than 5 times in a week and 56.4% of the children took egg 1-3 times per week. More than half of the children took poultry meat 1-3 times in a week and 35.5% of the children consumed milk 1-3 times in a week. About 67.3% of them never took yellow fruit in a week and 74.5% of the children never took sour fruit in a week. In a study carried out in NCCRF and HD, reported that higher risk of rheumatic

fever was observed; low consumption of eggs, milk, chicken, fruits, and bread [9].

The nutritional status of the child was not significantly associated with age of the child, residence, and father's educational level. However the immunization status, colostrum feeding, exclusive breastfeeding, mother's educational level and family monthly income were significantly associated with nutritional status of the child. A study reported that all children who were simultaneously stunted were also underweight [18]. According to the World Health Organization (WHO) conceptual framework there are many factors responsible for childhood stunting, i.e. maternal disease, age, short stature, low educational level of the caregiver, short birth intervals, poor care practices, poor nutritional status, inadequate feeding, poor-quality food, low dietary diversity, inadequate water supply, early cessation of breastfeeding, non-exclusive breastfeeding; and clinical and subclinical infection such as diarrhea and malaria etc. [17,19].

Conclusion

The overall nutritional status of the study participants (children) was not satisfactory. Our findings reveal that more than sixty percent of the children were underweight. It also reveals that 69.1% of the children had completed their immunization and most of them were exclusively breastfed. Nevertheless the immunization status, colostrum feeding, exclusive breastfeeding, mother's educational level and family monthly income found significantly associated with nutritional status of the child.

Recommendations

The children should be properly immunized and vaccination program for the children against common infectious diseases of childhood should be provided.

Complimentary feeding frequency should be maintained and should contain proper calorie and protein.

Education and more awareness regarding nutrition, breastfeeding and complimentary feeding should be given to the mothers.

References

1. Adanja J, Marinkovic JP, Vlajinac HD, et al. Rheumatic fever and diet. *Isr J Med Sci.* 1991;27:161-3.
2. World Health Organization. Control of rheumatic fever and rheumatic heart disease. Geneva: WHO Technical Report Series No. 764:1998.
3. World Health Organization. Community control of rheumatic heart disease in developing countries: a major public health problem. *WHO Chron.* 1980;34:336-5.
4. World Health Organization and International Society and Federation of Cardiology. Strategy for controlling rheumatic fever/rheumatic heart disease, with emphasis on primary prevention: Memorandum from a joint WHO/ISFC meeting. *Bull. WHO.* 1995;75:583-7.
5. Kumar R. Controlling rheumatic heart disease in developing countries. *World Health Forum.* 1995;16:47-51.
6. Kaplan EL. Global assessment of rheumatic fever and rheumatic heart disease at the close of the century. Influences and dynamics of populations and pathogens: a failure to realize prevention. *Circulation.* 1993;88:1964-1972.
7. Carapetis JR, Steer AC, Mulholland EK, et al. The global burden of group A streptococcal diseases. *Lancet Infect Dis.* 2005;5:685-4.
8. Ahmed J, Zaman MM, Hassan MMM. Prevalence of rheumatic fever and rheumatic heart disease in rural Bangladesh. *Trop Doct.* 2005;35:160-1.
9. Zaman MM, Yoshiike N, Chowdhury AH. Nutritional factors associated with rheumatic fever. *J Trop Pediatr.* 1998;44:142-147.
10. Muhammad F, Chowdhury M, Arifuzzaman M, et al. Public health problems in Bangladesh: Issues and challenges. *South East Asia J Public Health.* 2016;6:11-6.
11. Chowdhury ABMA, Wasiullah S, Haque MI, et al. Nutritional status of children living in an orphanage in Dhaka City, Bangladesh. *Mala J Nut.* 2017;23:291-8.
12. Hussain MA, Nahar A, Begum K, et al. Study on life style of the patients of rheumatic fever attending the National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRF/HD) during the year 1993 to 1996. *J Dhaka Med Coll.* 2008;17:56-8.
13. Akhtaruzzaman M, Khan MNI, Islam SN. Institute of Nutrition and Food Science, University of Dhaka; Dhaka: Nutrition, Health and Demographic Survey of Bangladesh-2011. A Preliminary Report. 2013.
14. Bangladesh Bureau of Statistics. Ministry of Planning; Dhaka: 2011. Report on the Bangladesh Literacy Survey. 2010.
15. Islam AKMM and Majumder AAS. Rheumatic fever and rheumatic heart disease in Bangladesh: A review. *Indian Heart J.* 2016;68:88-8.
16. Onis M, Branca F. Childhood stunting: a global perspective. *Maternal Child Nutrition.* 2016;12:12-6.
17. Kyaw. Feeding practices and nutritional status of children age 6-23 months in Myanmar: A secondary analysis of the 2015-16 Demographic and Health Survey. *PLoS One.* 2019;14:e0209044.
18. Myatt M, Khara T, Schoenbuchner S, et al. Children who are both wasted and stunted are also underweight and have a high risk of death: a descriptive epidemiology of multiple anthropometric deficits using data from 51 countries. *Arch Public Health.* 2018;76:28.
19. Stewart CP, Iannotti L, Dewey KG, et al. Contextualising complementary feeding in a broader framework for stunting prevention. *Maternal Child Nutrition.* 2013;9:27-45.

*Correspondence to:

Faisal Muhammad

Department of Public Health

Daffodil International University (DIU)

102 and 102/1 Shukrabad, Mirpur Road

Dhanmondi, Dhaka-1207

E-mail: fokkanya@yahoo.com