

Nutritional Status of Children Living in an Orphanage in Dhaka city, Bangladesh

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ABSTRACT

Background: Children living in orphanages tend to be neglected and may be malnourished. This study assessed the socio-economic background and nutritional status of children living in an orphanage in Dhaka city, Bangladesh. **Methods:** A cross-sectional study was conducted among the children in Sir Salimullah Muslim Orphanage, Dhaka from January to November 2014. Systematic sampling was adopted to collect data from 232 children using a semi-structured questionnaire. Anthropometric measurements of the children were taken and the WHO reference growth chart was used to determine the children's nutritional status. Weight-for-age was categorised by mild, moderate and severe malnutrition. The Pearson Chi-square test was performed to determine the association between the extent of malnutrition and socio-demographic characteristics of the children. **Results:** The majority of the children (60.3%) in the orphanage were malnourished, with mild, moderate and severe malnourished being 43.1%, 16.8% and 0.4%, respectively. Malnutrition was higher among the boys than girls in the age group of 15-18 years. The orphans suffered significantly ($P < 0.05$) from malnutrition compared to those, who had at least one parent alive. **Conclusion:** Malnutrition is highly prevalent among children and adolescents under residential care and needs to be addressed. In particular, early identification and intervention can improve the quality of nutritional status of the urban orphanage population. An investigation with a large sample is highly desirable to explore the severity of the problem in the national context.

Key words: Children, Dhaka City, malnutrition, orphanage, poverty, urban

INTRODUCTION

An estimated 8 million to 10 million infants and children live in orphanages around the world (Ahern, 2013). Children living in orphanages world-wide often present

with nutritional deficiencies (Orphan Nutrition, 2015). The orphan problem is rampant in Asia and Africa (Orphan Hope International, 2015). The practice of placing deprived children in orphanages has long

been prevailing in socio-economically poor Asian countries (Mashkooor & Ganesan, 2016).

Children and adolescents constitute about 45% of the population of Bangladesh (Giasuddin & Diba, 2012). As in other least developed countries, Bangladeshi children are subjected to a diversity of conditions, including poverty, malnutrition, poor living conditions, infectious diseases, illiteracy and broken families, all of which may have negative effects on their physical and mental well-being (De Onis *et al.*, 1993).

Childhood and adolescence are critical periods for promoting social and emotional development (NIHCM, 2005). Development during the first two years of life is crucial and has a lasting impact on a child's health (Yue *et al.*, 2016). Parental death in childhood may affect child well-being in various ways. The loss of an economically active adult lessens the domestic income in a family and makes the child vulnerable immediately (Crampin *et al.*, 2003).

Urban malnutrition is an increasing problem globally (Kimani-Murage *et al.*, 2010; Fotso, 2007), being more severe among children living in orphanages. Children in orphanages suffer from malnutrition and infectious diseases (Duggal, Chugh & Duggal, 2012). Nutritional reduction leads to immune compromise, resulting in recurrent and increasingly rigorous infections which further compromise nutritional intake and ultimately may threaten the child's survival (Flank, Klass & Earls, 1996). The importance of determining vulnerability to food insecurity and malnutrition among children growing up in poor urban settings is paramount (Kimani-Murage *et al.*, 2010). It should be noteworthy that malnutrition, physical or mental abuse, food insecurity as well as lack of parental care and protection are predominantly common scenarios among the children living in orphanages of Bangladesh (Madumita *et al.*, 2017).

However, very few studies have addressed the nutritional status of urban orphanage children in Bangladesh. This study aimed to determine the extent of malnutrition among children sheltered in an orphanage in Dhaka city.

METHODS

Study design and setting

A cross-sectional study was conducted from January to November 2014 in the Sir Salimullah Muslim Orphanage Dhaka, Bangladesh. This is an ancient, famous orphanage established in 1909 and one of the largest non-government volunteer organisations in Asia. The orphanage houses a hostel each for boys and girls (age limit: 6-18 years), a mosque, a school, workshops and administrative offices (Sir Salimullah Muslim Orphanage, 2016). A sample of 232 children (130 boys and 102 girls) was selected by systematic sampling for a face-to-face interview from the orphanage depending on availability during the study period. Physically disabled and mentally unsound children were excluded.

Data collection

The study team first collected the list of all children from the orphanage records, developed a sampling frame, and then used a systematic sampling technique to select one in every five children resulting in a sample of 232 children. Systematic sampling technique was particularly convenient for this study as it allowed the study team to easily manage all students as in a list. However, if a listed child was sick, unwilling or not available in the study period, the procedure allowed for the next one from the list to be selected. The study team comprised an epidemiologist, nutrition expert and interviewers who helped to gather the anthropometric measurements, that is, age of the children from the authority of the orphanage and body weight of all study children, weighed

and recorded in kilogram (kg) using a bathroom scale. The questionnaire was developed by pretesting in accordance with the study objective to obtain relevant information that included age, sex, religion, home address, educational status, monthly family income, weight, and duration of stay in the facility, parents living status and previous living status. World Health Organization (WHO) standards "Growth Reference Chart" by age was used for boys and girls of 6-18 years, and measured in comparison to Gomez grading (Khan & Rahman, 2011) based on weight-for-age of malnutrition status (75-90% of standard weight: mild malnutrition, 60-74% of standard weight: moderate malnutrition and <60% of standard weight: severe malnutrition).

Data analysis

Univariate and bivariate analysis showed usual individual malnutrition status by sex, age, duration of stay in orphanage, education status and parents living status. Association between malnutrition and the demographic variables among the orphanage children was explored by Pearson Chi-square test using statistical software SPSS 16.0 version.

Ethical consideration

All study ethical issues were considered and approved by the Department of Public Health, Faculty of Allied Health Sciences in Daffodil International University, which was associated with the orphanage. The study was initiated after getting written consent from the authority of the orphanage and the interview was conducted individually, maintaining strict confidentiality of information.

RESULTS

Mean age of the children in the orphanage was 13.38 ± 3.69 years. More than half (56.0%) the sample were boys and more than two-fifths (43.5 %) belonged to the

age group 15-18 years. For two-fifths (40.5 %) of the children, duration of stay in the orphanage was 0-4 years. In terms of education, 43.1% and 19.4 % had completed primary and higher secondary education respectively. The majority (87.5%) of the children in the orphanage had at least one parent alive. In terms of malnutrition state of the orphanage children, two-fifths of the children (60.3%) were malnourished and more than one-fourth (26.7%) of the malnourished children were in the age group 15 to 18 years. In terms of gender, one-third (33.6%) of the boys were malnourished, and in terms of duration of stay and malnutrition, one-fourth (24.6%) in the 0 - 4 years duration of stay were found to be malnourished in the orphanage. A lower malnutrition status was observed with increasing educational status. More than half (53.9%) the children who had at least one parent alive were malnourished but severity of malnutrition was found to be significantly higher among children who had no parents alive (Table 1).

Table 2 shows grading of malnutrition in comparison to different variables; it can be seen that more children aged 15 to 18 years suffered from malnutrition. Chi-square analysis revealed that though male children had a slightly higher rate of malnutrition, gender of the orphans did not have a significant effect on the severity of malnutrition among the children living in the orphanage. Our findings also revealed that children with higher educational status were less likely to be affected by malnutrition. However, educational status did not have a statistically significant effect on the nutrition level of the of the orphans. Orphans having no parent alive had a significantly higher ($P < 0.05$) malnutrition status compared to those who had at least one parent alive. The severity of malnutrition was found to be dependent on the status of their parents - as to whether they were dead or alive. The study also found that malnutrition among the

Table 1. Socio-demographic characteristics and malnutrition status of study participants [n=232]

Demographic variables	Total n (%)	Malnourished n (%)
Gender		
Boys	130 (56.0)	78 (33.6)
Girls	102 (44.0)	62 (26.7)
Total =	232 (100)	140 (60.3%)
Age (Years)		
6-9	43 (18.6)	27 (11.6)
10-14	88 (37.9)	51 (22.0)
15-18	101 (43.5)	62 (26.7)
Mean age = 13.38 year	SD = ± 3.69	
Duration of stay in orphanage (Years)		
0-4	94 (40.5)	57 (24.6)
5-9	89 (38.4)	55 (23.7)
10+	49 (21.1)	28 (12.1)
Educational status		
Primary	100 (43.1)	58 (25.0)
Secondary	87 (37.5)	53 (22.8)
Higher Secondary	45 (19.4)	29 (12.5)
Parent living status		
No parent alive	29 (12.5)	15 (6.5)
At least one parent alive	203 (87.5)	125 (53.9)

orphans was higher during their first four years in the orphanage and with increasing duration in the orphanage, malnutrition levels gradually declined (Table 2).

Figure 1 shows that a total of 60.3% of children in the orphanage suffered from malnutrition with 43.1% being mild, 16.8% moderate, and 0.4% severe malnutrition.

DISCUSSION

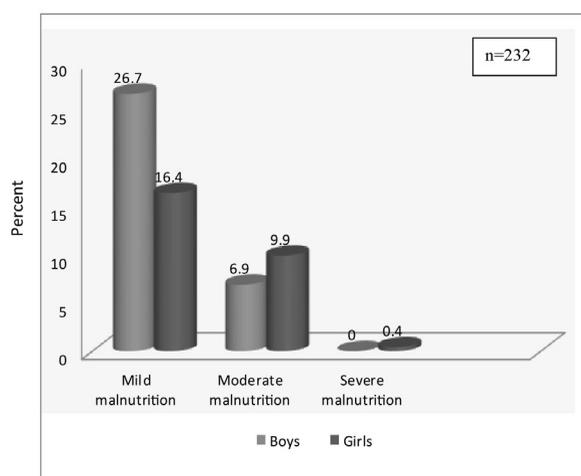
Malnutrition continues to be a serious public health and development concern not only in developing countries but also in the whole world (Gabbad & Hossain, 2014). The study found that 60.3% of the orphans suffered from malnutrition, and this result indicates that the majority of the children living in the orphanage suffered food insecurity. Similar findings were reported in India (Shukla & Shukla, 2011), where more than half of the children living in orphanages were malnourished, irrespective of their age and gender. However, the results of the present study

are in contrast with the findings of other studies (Lindblade *et al.*, 2003; Vaida, 2013; Braitstein *et al.*, 2013; Sadik, 2010) who found that the majority of the participants had normal nutritional status and that there was no clear relationship between orphanhood and the nutritional status of children who lived with their parents.

This study observed that boys were more likely to be malnourished than girls in the orphanage. This result was very similar to another study documented in Uganda (Wamani *et al.*, 2004) which found that males were more vulnerable to poorer nutritional outcomes and were more vulnerable to food insecurity in the orphanage. Among orphanage children in this study, adolescents aged 15 to 18 were more affected; it must be noted however that good nutrition during adolescence is critical to cover the deficits suffered during childhood. The findings of this study were significantly different from another study by Mashkooor & Ganesan (2016) which

Table 2. Grading of malnutrition according to participant's age, gender, education, guardian status and duration of stay [n=232]

Variables	Grading of malnutrition of participants				Total n (%)	P Value
	>90% of standard wt. (Normal) n (%)	76-90% of standard wt. (Mild malnutrition) n (%)	61-75% of standard wt. (Moderate malnutrition) n (%)	<60% of standard wt. (Severe malnutrition) n (%)		
Age						
6-9 years	16 (6.9)	21 (9.1)	6 (2.5)	0 (0)	43(18.5)	0.787
10-14 years	37 (15.9)	37 (15.9)	14 (6.0)	0 (0)	88(37.9)	
15-18 years	39 (16.8)	40 (17.2)	21 (9.1)	1 (0.4)	101(43.6)	
Gender						
Boys	52 (22.4)	60 (25.9)	18 (7.8)	0 (0)	130(56.0)	0.187
Female	40 (17.2)	38 (16.4)	23 (10.0)	1 (0.4)	102(44.0)	
Education						
Primary	42 (18.1)	42 (18.1)	16 (6.9)	0 (0)	100(43.1)	0.568
Secondary	34 (14.7)	37 (15.9)	16 (6.9)	0 (0)	87 (37.5)	
Higher	16 (6.9)	19 (8.2)	9 (3.9)	1 (0.4)	45 (19.4)	
Parent living status						
No parent alive	14 (6.0)	12 (5.2)	2 (0.8)	1 (0.4)	29 (12.5)	0.020**
At least one parent alive	78 (33.6)	86 (37.1)	39 (16.8)	0 (0)	203(87.5)	
Duration of stay						
0-4 years	37 (15.9)	41 (17.7)	16 (6.9)	0 (0)	94 (40.5)	0.102
5-9 years	34 (14.7)	37 (15.9)	18 (7.8)	0 (0)	89 (38.4)	
10+ years	21 (9.1)	20 (8.6)	7 (3.0)	1 (0.4)	49 (21.1)	

Significant difference by nutritional status: ** $p < 0.05$ **Figure 1.** Distribution of participants by grading of malnutrition (Weight-for-age)

showed that the nutritional and health status of institutionalised orphan children of the age group 13-18 years of Anantnag district of Kashmir was not far down compared with different nutritional and health standards. The study also reported that the orphans suffered most from malnutrition up to their first four years of staying in the orphanage. With increasing duration of stay at the orphanage, malnutrition gradually declined, but peaked again in the pre-adult age of 15-18 years as the orphanage could not afford the nutritional requirements of adolescent children. In this regard, our results were quite in accordance with the findings of Panpanich *et al.* (1999) in Malawi, where children who had spend more than one year in the orphanage were less malnourished than those who had been admitted for a shorter time. However, contrary results were found in Kenya (Mwaniki & Makokha, 2013) where orphanage children who had been admitted to the orphanages for a longer period were more likely to be stunted and underweight ($p < 0.05$) than those who had been recently admitted.

About 200 million children worldwide fail to attain their cognitive and socio-emotional potential because of malnutrition, micronutrient insufficiency and lack of motivation during early childhood (Mwaniki & Makokha, 2013). In the case of our study, orphans having no parents alive experienced significantly higher malnutrition compared to those who had at least one parent alive ($P < 0.05$) and this was consistent with the study done in Gondar City, Ethiopia (Teklemariam, Endalkew & Sebsibie, 2014). This study also found that orphans who had no parents were particularly deprived and loss of a mother was even more detrimental

Further, in the case of Bangladesh, the study by Karim & Tasnim (2015) reported 50 % of children less than five years of age are underweight largely

caused by malnutrition. Malnutrition costs Bangladesh an estimated 2-3% loss in national income because of its long term impact on productivity (Save the Children, 2015). Many countries in the world have already developed policies to ensure children's rights in terms of education, food security and environment for children in orphanages as well. However, none of the national policies on children in Bangladesh address the food insecurity and health issues of the large number of orphanage children (National Children Policy, 1994; The Orphanage and Widows' Homes Act, 1994; CRC, 2012). This study finding may be useful in serving as a guide to policy makers to initiate a further study to understand the extent of malnutrition among children in orphanages.

CONCLUSION

Malnutrition exists among three-fifths of the children and adolescents living in the orphanage. Relevant health care authorities, NGOs, and donor agencies should initiate nutritional intervention programs to counter the extent of malnutrition among orphans. Based on the findings of the study, the following recommendations are made to improve the nutrition status of the orphans in Bangladesh:

1. An autonomous health authority in the Ministry of Health and Family Welfare to supervise food security, healthcare and protection of orphanage children.
2. All caregivers and superintendents of orphanages should receive proper training so that they are able to take care of the physical and mental health of the children.

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Availability of data and materials

All information contained in the manuscript, including all relevant raw data, is publicly available to readers or any scientist wishing to use them for non-commercial purposes, without breaching participant confidentiality.

Conflict of interest

The authors declare that they have no financial or non-financial conflicting interest.

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