

The Prevalence of Malnutrition Among Rural Muslim Preschool Children of Kotulpur CD Block, Bankura District, West Bengal.

Sk Anamul Hoque and Dr. Md. Anisujjaman*

Department of Geography, Sidho-Kanho-Birsha University, Purulia, West Bengal, India.

*Corresponding Author: rana.amu@gmail.com

Abstract

The nutritional status of under-five children is an important indicator of community health. Undernutrition may prevail due to insufficient intake of food or due to the attack of infectious disease. The present paper aims to trace out the prevalence of undernutrition among under-five age group Muslim children in the Bankura district. Subjects have been chosen from 12–59 months age group children. The samples were systematically selected from 28 villages. 800 children have been selected out of which 400 children were boys and 400 children were girls. The collected data have been imported into SPSS (version 20) software for further analysis. To assess the nutritional status of children some popular and reliable indicators like stunting, wasting and underweight have been used. The prevalence of undernutrition in this area is very high. According to the World Health Organization cut off (WHO, 1995), stunting, wasting, and underweight of this area were 23%, 30.50% and 36% respectively.

Keywords: Undernutrition, Muslim Children, Stunting, Wasting, Underweight

INTRODUCTION

Malnutrition is a major public health problem in worldwide basically low and middle income countries (WHO, 2004 and Schofield & Ashworth, 1996). It is the cause of child mortality and morbidity (WHO, 1999 & Yohannes *et al*, 2017). The burden of malnutrition in a country hamper economic growth, and production, rises the level of poverty, and pulls Gross Domestic Product (GDP) back (WHO, 2021). Improper diet is the cause of malnutrition. Proper diet is important to balance the human body because it balances not only a child's nutrition but plays an active role in different ways such as healthy growth, the development of a strong immune system, neurological and cognitive function, and proper organ formation also (WHO, 2019). Not only proper diet but also poor socio-economic conditions (Bharati *et al*, 2010) improper breastfeeding practice (Dawn *et al*, 2014), lack of parents' education (Ashis *et*

al,2017 and Ansuya *et al*,2018), nutrition awareness (Sonadai *et al*,2017), poor sanitation, low-quality drinking water (Pal *et al*, 2016) etc, are also the important causes of malnutrition. Malnutrition during infancy and childhood is a very risky symptom. Because a malnourished child has higher chances to be infected with different diseases and can be the risk of premature death (Walson and Berkley, 2018). Malnutrition is most prevalent in developing countries whereas most of the rural areas are facing the silent threat due to child malnutrition (Wahed *et al*, 2017 and Murakar *et al*, 2020). Moreover, several studies have shown that the degree of malnutrition is higher among the underprivileged communities of rural areas (Bisai *et al*, 2008 and Biswas *et al*, 2009). In the global scenario, FAO reported in 2022 that 149.2 million children under 5 years of age were affected by stunted, and 45.4 million children were wasted. A total of 702.7 million people were found to be undernourished. In India, 36.1 million children were stunted and India is the country having the largest number of stunted children in the world and 20.1 million children are wasted. NFHS-5 reported in 2019-21 that stunting, wasting, and underweight children were 35.5%, 19.3%, and 32.1% respectively in India. The stunting rate indicates high prevalence and the score of wasting and underweight indicate critical situation and very high prevalence.

Malnutrition is two types, such as undernutrition due to lack of nutrition and overnutrition due to excess nutrition. Undernutrition nutrition is found in developing countries as well as sub-Saharan Africa and Asian countries. Basically, undernutrition is three types such as stunting, wasting, and underweight. Stunting refers to low height for age, due to long-term insufficient intake of nutrient. It is called chronic malnutrition. Wasting refers to low weight for height, due to insufficient consumption of nutritious food. Underweight refers to low weight for age and it is called acute malnutrition. Underweight children may be stunted, wasted, or both (WHO, 2006). Keeping in mind the present study aims to find out the prevalence of Malnutrition among Muslim children in Bankura district, West Bengal.

MATERIAL AND METHODS

Area of Study

The study will be conducted in the CD block of Kotulpur in the Bankura district of the Indian state of West Bengal. The block is situated from 22° 38' north latitude to 23° 38' north latitude and from 86°

36° east longitude to 87° 46' east longitude. The study area is situated in the south-east portion of Bankura district. The block is composed of eight (8) gram panchayats. According to the census of India (2011), the total population of the district is 188775. The Muslim population of this area is 32922 which occupied 17.44% of the population in the Kotulpur CD block.

Sample

The nature of the study was Cross-section. Subjects have been chosen from 12 – 59 months of age group children. The samples were systematically selected from 28 villages of Kotulpur block. 800 children were selected out of which each 400 children were boys and girls. For the suitability of analyzing the data, the age of the whole samples is grouped into 12 months intervals.

Anthropometric measurements

The anthropometric measurements i.e. height (cm) and weight (kg) have been taken by following standard procedure (Lohman *et al*, 1988).

Evaluation of nutritional Status

To assess the nutritional status of children some popular and reliable indicators like stunting, wasting and underweight have been used. Stunting means when the child failed to grow according to his/her age. Underweight indicates low body mass according to his/her age. The results of wasting show a low weight for height. It is an indicator of acute undernutrition (World Health Organization, 1995)

By following the WHO, 2006 the age and sex-specific -2 Z score has been calculated to define stunting, underweight, and wasting. The formula has been given below

$Z \text{ Score} = \frac{X - \text{median of WHO, 2006}}{\text{Standard Deviation of WHO, 2006}}$, where, X = Particular score of height or weight of a child.

In regards to under-nutrition indicators the WHO, 2006 age and sex-specific -2 Z score has been used to define stunting, wasting and underweight. The applied schemes are given below

Stunting <- 2 HAZ (Z score for height for age); Wasting <-2 WHZ (Z score for weight for height);

Underweight <-2 WAZ (Z score for weight for age)

Statistical analyses

The collected data have been imported into SPSS (version 20) software for further analysis. Appropriate statistical analyses were performed as required and the levels of significance in statistical analyses were set ≤ 0.05 .

RESULTS

Table-1 indicates age and sex specific trends of height and weight among Muslim preschool children. The mean height and weight among boys and girls increased with increasing age. The mean height among boys and girls was 90.37 cm and 89.57 cm respectively and weight among boys and girls was 11.75 kg and 11.36 kg respectively. In both cases, boys were heavier and taller than girls. The age variation of height and weight were strongly significant ($P < 0.001$). The age variation among girls (Height-552.26*** and Weight-148.03***) was higher compared to boys (Height-440.89*** and weight-134.32***) in both cases. A significant sex difference was found at 24-35 months in height ($t=3.16$, $p < 0.01$) and weight ($t=3.09$, $p < 0.01$). Age combined was significant in weight ($t=2.26$, $p < 0.05$).

Table-2 shows the prevalence of undernutrition among Muslim preschool children in the study area. The stunting, wasting, and underweight were 23%, 30.50%, and 36% respectively (Based on WHO, 2006). Stunting is the medium prevalence and wasting and underweight are very high prevalence in this area (WHO, 1995). Most stunting (32.50%) was found at the age of 12-23 months and the same results were found among boys (33%) and girls (32%). Most prevalence of wasting (38%) and underweight (40.50%) were found at the age of 48-59 months. The most wasting boys (36%) and girls (43%) were found in the age group of 36-47 months and 48-59 months respectively and the same results were found in the prevalence of underweight among boys (40%) and girls (42%). The prevalence of stunting decreases with increasing age and the prevalence of wasting increases with increasing age. Age variation in scores of stunting is significant in overall and both sex (Overall- $\chi^2=26.86$, $p < 0.000$; Boys- $\chi^2=18.18$, $p < 0.01$ and Girls- $\chi^2=14.77$, $p < 0.05$). Age variation of wasting is significant in the case of overall ($\chi^2=27.58$, $p < 0.000$) and girls ($\chi^2=24.69$, $p < 0.000$) but boys are not statistically significant.

Table -1: Anthropometric characteristics of the study area

Age (Month)	No	Height			Weight		
		Boys	Girls	t- value	Boys	Girls	t- value
		Mean (SD)	Mean (SD)		Mean (SD)	Mean (SD)	
12-23	100	77.53(5.30)	76.33(4.73)	1.7	9.29(1.54)	8.96(1.42)	1.54
24-35	100	87.84(5.02)	85.75(4.31)	3.16**	11.16(1.71)	10.43(1.62)	3.09**
36-47	100	95.20(4.36)	94.28(4.72)	1.43	12.58(1.82)	12.33(1.66)	1.04
48-59	100	100.91(4.47)	101.91(4.98)	-1.5	13.99(1.85)	13.71(2.09)	0.99
Age Combined	400	90.37(9.98)	89.57(10.64)	1.1	11.75(2.45)	11.36(2.49)	2.26*
ANOVA		F=440.89***	F=552.26***		F=134.32***	F=148.03***	

*** means $p < 0.001$, ** means $p < 0.01$ and * means $p < 0.05$

Table 2 – Prevalence (%) of Stunting, Wasting, and Underweight among the Studied Children

Age (Month)	Stunting(%)			Wasting (%)			Underweight (%)		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
12-23	33.00	32.00	32.50	28.00	18.00	23.00	36.00	28.00	32.00
24-35	25.00	22.00	23.50	34.00	26.00	30.00	34.00	38.00	36.00
36-47	13.00	23.00	18.00	36.00	26.00	31.00	40.00	31.00	35.50
48-59	21.00	15.00	18.00	33.00	43.00	38.00	39.00	42.00	40.50
Age Combined	23.00	23.00	23.00	32.75	28.25	30.50	37.25	34.75	36.00
χ^2	18.18**	14.77*	26.86***	10.26	24.69***	27.58***	3.95	5.41	6.05

*** means $p < 0.001$, ** means $p < 0.01$ and * means $p < 0.05$

Discussion

Undernutrition is one of the major causes of ill health and mortality among children in developing countries like India (Sahu *et al*, 2015). United Nations reported that 45% of under 5 years child died due to undernutrition in India (WHO, 2021). Proper nutritional food is very important to overcome this situation. Undernutrition is not only a problem of child health, it hinders the growth of a country. Because an undernourished child causes an increase in the medical cost and damages the investment in health and education in a country (WHO, 2021). Because an undernourished child may not complete the study and the child would be a burden to a country. As a result, a country cannot achieve its goal for GDP growth (Vollmer *et al*, 2014).

The three common measurements of undernutrition are stunting, wasting, and underweight. The prevalence of stunting, wasting, and underweight among Muslim preschool children are 23%, 30.50%, and 36% respectively in the study area. The stunting rate among boys and girls are same (23%). The prevalence of wasting and underweight among boys was higher compared to girls. A comparison of the prevalence of stunting, wasting, and underweight was made with previous studies (Table-3). The national data reported that stunting, wasting, and underweight among under five-year children were 35.5%, 19.3%, and 32.1% respectively (NFHS-5). In West Bengal, the prevalence of stunting, wasting, and underweight among under five-year children were 33.8%, 20.3%, and 32.2% respectively. The both scores (India and West Bengal) indicated that wasting and underweight are more prevalent in the study area compared to the prevalence of national and regional but the opposite result is found in the case of stunting. In the case of the Bankura district, stunting, wasting, and underweight were 30.3%, 26%, and 38.8% respectively (NFHS-5). The average stunting rate of Bankura is higher compared to the stunting rate of Muslim children in this district and the opposite results are found in the case of wasting and underweight. The stunting and underweight rate in the present study is higher than in some previous studies such as Punjab (Kaur *et al*, 2005), Bankura, West Bengal (Mukhopadhyay & Biswas, 2011), and Karnataka (Joseph *et al*, 2002) respectively and the prevalence of stunting is lower than in some previous studies such as 26.60% from Hoogly, West Bengal (Mandal and Bose, 2009), 54.20% from Paschim Medinipur, West Bengal (Bisai, 2014), 37% from Purulia, West Bengal (Das and Bose, 2009), 33.70% from Khag in Khashmir (Zahoor *et al* 2018), etc respectively. The prevalence of underweight is lower than district of Hoogly, West Bengal.

Study Area	Age Group	Stunting (%)	Wasting (%)	Underweight (%)	Source
INDIA	<5 years	35.5	19.3	32.1	NFHS-5
West Bengal	< 5 years	33.8	20.3	32.2	NFHS-5
Bankura	< 5 years	30.3	26.00	38.80	NFHS-5
Bankura	0.5-5 years	12.80	3.20	7.40	Mukhopadhyay & Biswas, 2011
Hoogly	2-6 years	26.60	50.00	63.30	Mandal and Bose, 2009
PaschimMedinipur	0-5 years	54.20	20.10	65.20	Bisai, 2014
Purulia	2-6 years	37.00	21.50	48.40	Das and Bose, 2009
South 24 Parganas	3-5 years	26.22	35.37	51.07	Giri et al, 2017
Khag, Kashmir	1-5 years	33.70	43.70	47.00	Zahoor et al, 2018
Karnataka	1-5 years	9.40	-	31.20	Joseph et al, 2002
Jabbalpur, Madhya Pradesh	0-5 years	51.6	32.9	61.9	Rao et al, 2005
Punjab	1-5 years	11.4	10.8	15.00	Kaur et al, 2005
Allahabad, Uttar Pradesh	< 5 years	51.60	10.60	36.40	Kumar et al, 2006
Present Study Area	2-5 years	23.00	30.50	36.00	

Table-3 Overall comparison of the prevalence (%) of undernutrition among pre-school children.

(Manda and Bose, 2009), district of Paschim Medinipur, West Bengal (Bisai, 2014), Purulia, West Bengal (Das and Bose, 2009), Khag in Jammu & Kashmir (Zahoor *et al* 2018) respectively. The prevalence of wasting in this study area is higher than other areas such as 20.10% in Paschim Medinipur, West Bengal (Bisai, 2014), 21.50% in Purulia, West Bengal (Das and Bose, 2009), 10.60% in Allahabad in Uttar Pradesh (Kumar *et al*, 2006) respectively and lower than areas such as 50% in Hoogly, West Bengal (Manda and Bose, 2009), 35.37% in South 24 Parganas in West Bengal (Giri *et al*, 2017), 43.70% in Khag in Jammu & Kashmir (Zahoor *et al* 2018) respectively.

The present study showed the poor condition of undernutrition. Undernutrition is not only the cause of food deprivation, several socio-economic variables affect undernutrition. Poverty is one of the major causes. Undernutrition hamper the development of a country, ruined the investment in education and health, and cause a drop in the GDP of a country. The reduction of undernutrition reduces poverty and raises the standard of living (Nandy *et al*, 2005).

CONCLUSION

This study highlights the poor situation of undernutrition among Muslim preschool children and evidence that the study children are under acute and chronic undernutrition. In spite of the huge investment of ICDS to improve child health, the health condition of the Muslim children in the study area is poor. Government should take the necessary steps to improve this condition and there is an immediate requirement of appropriate public health nutritional intervention programmes.

REFERENCES

Ansuya, Baby SN, B Unnikrishna., Anice G, Sashidhara YN, Suneel CM & Vasudev G (2018). Risk factors for malnutrition among preschool children in rural Karnataka: a case-control study. *BMC Public Health*, 18 (283), 1-8.

- Ashis T (2017) Factors Associated with Malnutrition among Under-Five Children: Illustration using Bangladesh Demographic and Health Survey, 2014 Data. *Children*, 1-8.
- Bharati S, Chakrabarty S, Som S & Bharati P (2010). Socio-economic determinants of underweight children in India. *Asian pacific journal of tropical medicine*, 322-327.
- Bisai S (2014). "Prevalence of undernutrition among Santal tribal preschool children of PaschimMedinipur district, West Bengal, India." *International Journal of Pesiatrics*, 2(4.3), 347-354.
- Bisai S, Bose K, & Ghosh A (2008). Nutritional status of Lodha children in a village of PaschimMedinipur district, West Bengal. *Indian J Public Health*, 52, 203-206.
- Biswas S, Bose K, Bisai S & Chakraborty R (2009). Prevalence of thinness among rural Bengalee preschool children in Chapra, Nadia District, West Bengal, India. *Mal J Nutr*, 15(2), 155-164.
- Das S & Bose K (2009). "Anthropometric characteristics and nutritional status of Bauripre school children of Nituria Block, Purulia, West Bengal." *Internet Journal of Biological Anthropology*, 3(2).
- Dawn A & Basu R (2014). Status and challenges of malnutrition in West Bengal with special reference of area under Kolkata municipal corporation. *International Journal of Humanities and Social Science Invention*, 3(4), 56-63.
- Giri SP, Biswas S & Bose K (2017). Prevalence of undernutrition among Bengalee preschool children of Sundarban, South 24 Parganas, West Bengal, India. *Human Biology Review*, 6 (4), 284-300.
- Indian Institute for Population Sciences (IIPS) and MoHFW. National Family Health Survey -5. 2019-21. Available from: http://rchiips.org/nfhs/factsheet_NFHS-5.shtml.pdf. Accessed July 11, 2023.
- Joseph B, Rebello A, Kullu P & Raj VD (2002). Prevalence of malnutrition in rural Karnataka, South India: A comparison of anthropometric indicators. *J Health PopulNutr*, 20, 239-44.
- Kaur G, Kang HS, Singal P & Singh SP (2005). Nutritional Status: Anthropometric perspective of pre-school children. *Anthropologist*, 7(2), 99-103.
- Kumar D, Goel NK, Mittal PC & Misra P (2006). Influence of infant-feeding practices on nutritional status of under-five children. *Indian J Pediat*, 73, 94-99.
- Lohman T.G., Roche A.F., and Martorell R. Anthropometric Standardization Reference Manual. 1988: Champaign, IL. Human Kinetics.

- Mandal GC & Bose K (2009). Assessment of undernutrition by mid-upper arm circumference among pre-school children of Aram bag, Hooghly District, West Bengal, India: An observational study. *Inter J PediaNeonat*, 11 (1).
- Mukhopadhyay DK & Biswas AB (2011). Food security and anthropometric failure among tribal children in Bankura, West Bengal. *Indian Pediatr*, 48(4), 311-314. DOI: doi.org/10.1007/s13312-011-0057-2.
- Murakar S, Gothankar J, Doke P, Pore P, Lalwani S, Dhumale G, Qurashi S, Patil R, Waghachavare V, Dhobale R, Rasote K, Palkar S & Malshi N (2020). Prevalence and determinants of undernutrition among under-five children residing in urban slums and rural area, Maharashtra, India: a community-based cross-sectional study. *BMC Public Health*, 20 (1559), 1-9. DOI: doi.org/10.1186/s12889-020-09642-0
- Nandy S, Irving M, Gordon D, Subramanian SV & Davey SG (2005). "Poverty, Child Undernutrition and Morbidity: New evidence from India." *Bull World Health Organisation* 83:210-216.
- Pal A, Pari AK, Sinha P & Dhara C (2016). Prevalence of undernutrition and associated factors: A cross-sectional study among rural adolescents in West Bengal, India. *ScienceDirect*, 4, 9-18.
- Rao VG, Yadav R, Dolla CK, Kumar S, Bhondeley MK & Ukey M (2005). Undernutrition and Schofield C, Ashworth A. Why have mortality rates for severe malnutrition remained so high? *Bull World Health Organ* 1996;74:223-9.
- Sonadai A, Mboh MP, Ben SM & Brima A (2017). Factors influencing malnutrition in under-five children in Yemoh Town community; Bo city, Southern Sierra Leone. *International Journal of Medical and Health Research*, 3(4), 76-84.
- The state of food security and nutrition in the world (2022). FAO. Rome, <https://doi.org/10.4060/cc0639en>.
- Wahid WAY, Hassan SF & Eldessouki R (2017). Malnutrition and Its Associated Factors among Rural School Children in Fayoum Governorate, Egypt. *Journal of Environmental and Public Health*, 2017, 1-9. DOI : //doi.org/10.1155/2017/4783791
- Walson JL & Berkley JA (2018). The impact of malnutrition on childhood infections. *Wolters Kluwer Health, Inc*, 31(3), 231-236. DOI:10.1097/QCO.0000000000000448

- WHO (1999). Management of severe malnutrition: a manual for physicians and other senior health workers. Geneva.
- WHO (20019). Healthy Diet. <http://www.emro.who.int/nutrition>.
- WHO (2004). United Nations Children’s Fund. Joint statement on the management of acute diarrhoea. Geneva: The Organization.
- WHO (2006). Factsheets: Malnutrition. Accessed by <https://www.who.int/news-room/factsheets/detail/malnutrition>.
- World Health Organization. (1995) .The World health report :1995 :bridging the gaps/report of the Director-General .World Health Organization .<https://apps.who.int/iris/handle/10665/41863>
- World Health Organization. (2006). The WHO Child Growth Standard. 2006. Geneva: WHO.
- Yohannes T, Laelago T, Ayele M & Tamrat T (2017). Mortality and morbidity trends and predictors of mortality in under-five children with severe acute malnutrition in Hadiya zone, South Ethiopia: a four-year retrospective review of hospital-based records (2012–2015). *BMC Nutrition*, 3(18), 1-18.
- Zahoor N, Rouf A, Khan SMS, Amin M & Haq I (2018). “Undernutrition among under five children of rural and hilly area of Khag, Kashmir, India: A community-based cross-sectional study”. *Journal of Medical science and children research*.6(2).503-09.