

Assessment of Malnutrition among Students of Various Districts of West Bengal: A Review

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Abstract

According to World Health Organization (WHO), "Health is a state of complete physical, mental and social wellbeing and not merely an absence of disease". Energy is required for all physiological processes which are made available through breakdown of complex food materials consumed on daily basis. The nutrition available through food consumption is closely related to the overall health and well being of a person. In the state of West Bengal, poor nutritional status of children, especially in rural areas is becoming a major cause of concern. Not only does it contribute to overall underperformance in schools (including increasing school drop outs), it also predisposes these children towards increasing chances of getting Non-communicable diseases, such as diabetes. Thus this study analysed published reports on nutritional status of children in various districts of the state West Bengal. For this purpose, the study explored the district-wise malnutrition scenario among primary/upper primary students in West Bengal. It was indicated that only less than one-fourth students had appropriate or ideal nutritional status and rest were in various stages of food deprivation which is a matter of great concern.

Keywords: *Nutritional status, school children, poverty, malnutrition, mid-day meal*

Introduction

Primary school children (6-13 years) form about 16% of the total population. Free and compulsory education up to the age of 14 years is the constitutional commitment. It is estimated that about 40% of children drop out at primary school¹. Low enrolment and higher school dropout rate are attributed to poor socio-economic conditions, child labour and lack of motivation compounded by poor nutritional status of the children. Unfortunately many of the Indian children including those of West Bengal suffer from under-nutrition primarily due to low food intake, which could be due to poverty, ignorance etc.^{2,3}. Prolonged under-

nutrition has detrimental effects on all organ-systems and may result into life threatening conditions⁴⁻⁷. This undoubtedly hampers their attendance and performance in their school.

The problem of malnutrition among primary and upper-primary students of West Bengal and its trend (which indicates about effectiveness of the Mid-Day Meal Programme and suggests necessary actions), a cross-sectional school-based epidemiological study was done during the period of April 2014 to March 2015. The study revealed that state-wide prevalence of malnutrition was 26.1% and 19.6% in primary and upper primary students respectively. Another 28.6% and 26.1% of the studied population were 'At High Risk' of developing malnutrition (3rd to <10th percentile weight and height in respect to age & sex) among primary and upper-primary students⁸. State-wide Ideal Nutritional status was 17% and 23.5% among primary and upper-primary students^{9,10}. Prevalence of anaemia was 29% and 19% among primary and upper-primary students, respectively¹¹. Religion-wise, Muslims had a

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higher malnutrition than Hindus. Caste-wise, STs had a higher malnutrition than SCs in primary level but SCs had higher malnutrition than STs among upper-primary students^{12,13}. Based on above, it is suggested that districts such as Purulia, Maldah, Murshidabad, Burdwan, Nadia—all may be considered as the most important and primary students of them need to be targeted for improvement of their nutritional status on priority basis. Health and nutrition are the most important contributory factors for human resource development in the country^{14,15}. Dietary requirement of essential nutrients varies with age, gender, physiological status and physical activity¹⁶. Globally, millions of school-going children suffer from under-nutrition¹⁷.

Therefore, nutrition support to primary education is considered as a means to achieve the objective of

providing free and compulsory universal primary education of satisfactory quality to all the children below **Ideal nutritional status** (25th – 75th percentile of Indian Reference Population developed by Indian Academy of Paediatrics) was found to be 17% and 23.5% in primary and upper-primary students¹⁸. Anaemia was prevalent in 29% and 19% in above-said two groups of students respectively. State-wise prevalence of overweight and obesity was 1.7% and 0.8%, and 2.7% and 0.8% among primary and upper-primary students, respectively^{19,20}. Above data indicates that under-nutrition situation improves to some extent among school students as age advances and as students move from primary to upper-primary classes. Exclusive stunting was prevalent in the tunes of 6.9% and 5.7%, and exclusive under-weight was 6.4% and 4.6% in primary and upper-primary students, respectively²¹ as summarised in Tables 1 and 2.

Table-1: Under-weight and stunting in Primary [N=12020] and Upper-Primary Students [N=12091] at age of 14 years

	PRIMARY STUDENTS	UPPER-PRIMARY STUDENTS
Exclusive Stunting	6.9% (n=828)	5.7% (n=685)
Exclusive Under-weight	6.4% (n=775)	4.6% (n=560)
Both stunting & under-weight	12.8% (n=1533)	9.3% (n=1124)

Table-2: Urban-Rural scenario of Malnutrition and Anaemia in Primary and Upper-Primary students at age of 14 years

	PRIMARY STUDENTS		UPPER-PRIMARY STUDENTS	
	Rural (n=8323)	Urban (n=3697)	Rural (n=8272)	Urban (n=3819)
Malnutrition	29.1% (n=2419)	19.4% (n=717)	21.4% (n=1767)	15.8% (n=602)
Anaemia	32.3% (n=667)	21.6% (n=203)	21.3% (n=436)	14.2% (n=137)

District-wise scenario:

It shows district-wise situation of malnutrition and ‘At High Risk’ population among primary students, who are considered as more vulnerable than upper primary students²². From intervention point of view ‘At

High Risk’ population or population with low growth velocity (including low linear growth velocity) must be considered together with Malnutrition group as there is often shifting from ‘At High Risk’ to Malnutrition group, particularly in an under-privileged community²³. This often occurs in situations such as starvation, low food

intake, infection, worm infestation etc.^{24,25}. It is evident that districts namely Purulia (38.4%), Jalpaiguri (37.8%), Darjeeling Plain (35%), Maldah (33.7%), Murshidabad (32%), Burdwan (31.2%) and Coochbehar (30.1%) – all have a malnutrition prevalence rate of more than 30% among primary students. But 'At High Risk' population remains between 27% and 32% in those districts.

Medium prevalent Districts (malnutrition prevalence rate of >20 to 30%) were Bankura (28.7%), Birbhum (28.7%), Uttar Dinajpur (27.2%), Dakshin Dinajpur (26.7%), South 24 Parganas (24%), Midnapore West (21.8%), Hooghly (21.6%), Midnapore-East (20.9%) and Nadia (20.3%), whereas low prevalent Districts (prevalence rate of >10% to 20%) were North 24 Parganas (18.8%), Howrah (18.5%), DGHC (15.5%) and Kolkata (10.5%). At High Risk population distribution varies between 18 and 20.

DISTRICT WISE SENERIO OF MALNUTRITION

BANKURA DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 28.7% (173/602) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 34.9% (210/602), 24.9% (150/602), 11.5% (69/602) and 34.0% (51/150) respectively. It is also evident that prevalence rate of malnutrition among urban students was 25.7% (53/206) and within it, male had a prevalence rate of 23.6% (25/106) & female had a prevalence rate of 28.0% (38/100). Similarly, prevalence rate of malnutrition among rural students was 30.0% (120/396) and within it, male had a prevalence rate of 30.0% (59/195) and female had a prevalence rate of 30.3% (61/201).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 19.8% (119/601) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 26.0% (156/601), 28.0% (168/601), 26.3% (158/601) and 27.0% (41/152) respectively. It is also evident that prevalence rate of malnutrition among urban students was 16.4% (33/201) and within it, male

had a prevalence rate of 14.2% (23/162) and female had a prevalence rate of 25.6% (10/39).

Similarly, prevalence rate of malnutrition among rural students was 21.5% (86/400) and within it, males had a prevalence rate of 26.6% (37/139) and females had a prevalence rate of 18.8%.

BIRBHUM DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 28.7% (172/600) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 25.7% (154/600), 28.2% (169/600), 17.5% (105/600) and 37.3% (56/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 15.8% (31/196) and within it, males had a prevalence rate of 17.2% (20/116) and females had a prevalence rate of 13.8% (11/80). Similarly, prevalence rate of malnutrition among rural students was 34.9% (141/404) and within it, males had a prevalence rate of 44.5% (81/182) and females had a prevalence rate of 27.0% (60/222).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 24.8% (149/602) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.7% (167/602), 26.7% (161/602), 20.8% (125/602) and 20.5% (31/151), respectively.

PURULIA DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 38.4% (231/602) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 29.2% (176/602), 20.6% (124/602), 11.8% (71/602) and 36.2% (54/149), respectively. It is also evident that prevalence rate of malnutrition among urban students was 33.2% (64/193) and within it, males had a prevalence rate of 30.9% (29/94) and females had a prevalence rate of 35.4% (35/99).

Similarly, prevalence rate of malnutrition among rural students was 40.8% (167/409) and within it, males had a prevalence rate of 43.6% (88/202) and females had a prevalence rate of 38.2% (79/207).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 22.2% (134/604) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 24.2% (146/604), 29.3% (177/604), 24.3% (147/604) and 14.6% (22/151) respectively. It is also evident that prevalence rate of malnutrition among urban students was 17.2% (35/203) and within it, males had a prevalence rate of 25.5% (26/102) and females had a prevalence rate of 8.9% (9/101).

Similarly, prevalence rate of malnutrition among rural students was 24.7% (99/401) and within it, males had a prevalence rate of 27.1% (55/203) and females had a prevalence rate of 22.2% (44/198).

NADIA DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 20.3% (122/600) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 29.3% (176/600), 29.0% (174/600), 21.3% (128/600) and 13.3% (20/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 11.9% (19/160) and within it, males had a prevalence rate of 11.2% (11/98) and females had a prevalence rate of 12.9% (8/62).

Similarly, prevalence rate of malnutrition among rural students was 23.4% (103/440) and within it, males had a prevalence rate of 29.7% (60/202) and females had a prevalence rate of 18.1% (43/238).

Malnutrition (particularly Under nutrition) Profile of Upper Primary Students –

Overall prevalence rate of malnutrition was 16.7% (100/600) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.0% (162/600), 29.3% (176/600),

27.0% (162/600) and 17.3% (26/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 19.4% (33/170) and within it, male had a prevalence rate of 21.0% (22/105) and female had a prevalence rate of 15.5% (23/148). Similarly, prevalence rate of malnutrition among rural students was 15.6% (67/430) and within it, male had a prevalence rate of 15.2% (30/197) and female had a prevalence rate of 15.9% (37/233).

MALDAH DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 33.7% (202/600) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.3% (164/600), 22.7% (136/600), 16.3% (98/600) and 40.7% (61/150), respectively. It is also evident that prevalence rate of malnutrition among urban students was 18.5% (12/65) and within it, males had a prevalence rate of 20.6% (7/34) and females had a prevalence rate of 16.1% (5/31).

Similarly, prevalence rate of malnutrition among rural students was 35.5% (190/535) and within it, males had a prevalence rate of 38.4% (104/271) and females had a prevalence rate of 32.6% (86/264).

Malnutrition (Under nutrition) Profile of Upper Primary Students

Overall prevalence rate of malnutrition was 20.0% (120/600) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 27.7% (166/600), 29.3% (176/600), 23.0% (138/600) and 26.7% (40/150), respectively.

MURSHIDABAD DISTRICT

MALNUTRITION (UNDER NUTRITION) PROFILE OF PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 32.0% (192/607) among primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 30.6% (186/607), 25.7% (156/607), 11.7% (71/607) and 36.0% (54/150), respectively. It is also evident that prevalence rate of malnutrition among

urban students was 28.4% (31/109) and within it, males had a prevalence rate of 27.3% (15/55) and females had a prevalence rate of 29.6% (16/54).

Similarly, prevalence rate of malnutrition among rural students was 32.7% (154/498) and within it, males had a prevalence rate of 32.3% (80/248) and females had a prevalence rate of 33.2% (83/250).

MALNUTRITION (UNDER NUTRITION) PROFILE OF UPPER PRIMARY STUDENTS

Overall prevalence rate of malnutrition was 25.5% (153/600) among upper primary students. The same of 'At High risk', 'At Low risk', 'Ideal Nutrition' status and 'Anaemia' was 30.0% (180/600), 22.2% (133/600), 22.3% (143/600) and 22.0% (33/150) respectively. It is also evident that prevalence rate of malnutrition among urban students was 20.0% (16/80) and within it, males had a prevalence rate of 18.3% (11/60) and females had a prevalence rate of 25.0% (5/20).

Similarly, prevalence rate of malnutrition among rural students was 26.3% (137/520) and within it, males had a prevalence rate of 28.3% (68/240) and females had a prevalence rate of 24.6% (69/280).

Conclusion

The study explored the district-wise malnutrition scenario among primary and upper primary students in West Bengal. It is a matter of great concern that only less than one-fourth students had appropriate or ideal nutritional status and rest were in various stages of food deprivation. Strengthening of existing school meal program is needed, with emphasis on malnourished and high risk children especially in rural areas with lower parental education and poor sanitary practices.

Nutritional surveillance involving above students seems to be beneficial.

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not applicable

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