Effect of Age Misstatement on the Assessment of Nutritional Status of School Children

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Introduction

The use of anthropometry has been emphasised by a number of authors as an important means to determine the nutritional status of children. Anthropometry has the advantage of being relatively easy to perform and requires only simple apparatus. Interpretation of anthropometric data mainly depends on age. and thus age plays an important role in assessing the nutritional status. The accuracy of the results. therefore, entirely depends on age. But unfortunately in developing countries the accuracy of the age of children is not dependable. In the developing countries where the level of literacy is low. and the system of birth registration by competent authorities is absent. collection of accurate age is a significant problem. So the use of age dependent data to assess the nutritional status in developing countries may not be acceptable. This indicates the limitation of the use of age dependent anthropometric data in the developing countries.

Weight for height is independent of age but measures wasting only, and it is not a good indicator of chronic malnutrition[1]. Arm circumference for age is less sensitive to age[2]. Weight for age and height for age were reported to be highly sensitive to age misreporting[3]. Bairagi[4-6] studied the effect of age misreporting on the anthropometric assessment of nutritional status. theoretically under a set of assumptions. The only emprical study[6] was conducted in a rural village in Bangladesh covering 679 Children aged between 22 to 59 months. But more studies are needed covering various social classes and age groups to assess the effect of age misstatement of the anthropometrc assessment of nutritional status.

We investigated the effect of age misstatement on the observed

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variations of the nutritional status of school going children by anthropometric indicas specially weight for age and height for age.

Methods

Data was collected in a High School in Dhaka city. A detailed description of the study area and data collection procedures are available elsewhere.[7] Only a brief description is given here. Data collection was done in the months of January to March, 1988. Heights and weights were measured following the methods of Jelliffee[8]. The measurements were done between 8 a.m. and 10 a.m. with school uniform and without shoes. The age of the students were recorded from the school register and was called the reported age . The actual age of the students was collected from the parents through a set of questionnaires and discussions to attain the maximum accuracy of the age of the children. Most of the parents used to maintain family birth records and observed birthdays of the children. In other cases a calendar stating the local events and individual family events was used. Collection of actual age was easier in this way. Age error was defined as the actual age minus the reported age. Nutritional status was calculated using the NCHS Standard[9] for both the reported and the actual ages and compared to assess the variations due to age misreporting in the assessment of nutritional status of the children.

Data of 654 school going children aged between 5 and 18 years were collected and reported here. Data on 41 children were omitted due to unavailability of actual age.

Results

Table-1 shows the age errors calculated by substracting the reported age from the actual age. From the nature of the standard deviation of age and the amount of bias (mean age error). it appears that the ages were both over-estimated and under - estimated. Actully from the count it showed that the age of 3 girls and 41 boys (total 6.7%) were over- estimated in school records and the age of 49.3% of the children under-reported. The age of 44% of the children was reported correctly.

Table-2 presents the distribution of the children by weight for actual and reported age according to Gomez classification[10]. About 4% of the children were actually severely malnourished (60%).25 percent had second degree malnutrition (61 to 75%). 41

Table 1. Age error in months for children aged 60 to 216 months.

Actual Age	No. of Children	Age error* Mean	Standard Deviation
		BOYS	
5-7 years (60-84 months)	92	7.52	8.72
7.1- 10 years (85-120 months)	111	5.94	6.98
10.1- 13 years (121-156 months)	148	8.28	9.76
13.1-18 years (157-216 months)	56	7.21	10.50
		GIRLS	
5-7 years (60-84 months)	47	9.15	9.84
7.1-10 years (85-120 months)	71	5.68	7.83
10.1-13 years (121-156 months)	85	8.34	8.67
13.1-18 years (157-216 months)	44	6.73	8.55

Age error equals actual age minus reported age.

percent had 1st degree malnutrition and 31 percent had normal weight for age. Because of age misreporting the figures appeared as 2 percent, 16 percent and 43 percent respectively. Only 48 percent of the severely malnourished children were correctly reported. Similarly 54 percent of the second degree malnourished children and 67 percent of the 1st degree malnourished children were correctly indentified. The assessment of normal children were relatively close to be correct (95%). Thus the error in age reporting considerably effected the assessment of the nutritional status.

Effect of age misstatement on the assessment of nutritional status by height for age has been shown in Table-3. Data has been calculated according to Waterlow classification II. Less than 1% of the children were severely

Table 2. Distribution of the children by weight for actual and reported age*.

Weight for Actual age	Weight for Reported age				Total
	≤ 60	61-75	76-90	91+	
≤ 60	12	11	2	0	25
	(48)	(44)	(8)		(3.8)
	(100)	(11)	(1)		
61-75	0	86	68	7	161
		(54)	(42)	(4)	(24.6)
		(83)	(26)	(2)	
76-90	0	6	178	81	265
		(2)	(67)	(31)	(40.5)
		(6)	(69)	(29)	
91+	0	0	10	193	203
			(5)	(95)	(31.1)
			(4)	(69)	
Total	12	103	258	281	654
	(1.8)	(15.8)	(39.4)	(43.0)	(100)

* Figures in the parenthesis are row and column percentage respectively.

stunted (less than 80% of the median height for age). 2% belonged to between 80 and 87.5%, 33 percent were between 87.5 and 95% and 64.5 percent were above 95% of the median height for age. Due to the age misreporting the figures appeared as 2%, 1% 22.5% and 76% respectively. Thus the age error greatly affected the assessment of nutritional status by height for age. Sex effects in the age misreporting and subsequently on the assessment of nutritional status was not observed.

Table 3. Distribution of children by height for actual and reported age*.

Height for Actual Age	Height for Reported age				Total
	<80	80-87.5	87.5-95	> 95	
< 80	2	0	1	0	3
		(67)	(33)		(0.5)
		(100)	(1)		
80-87.5	0	5	7	2	14
			(36)	(50)	(14)
	(2)				
			(71)	(5)	(1)
87.5-95	0	2	128	85	215
			(1)	(60)	(39)
	(33)				
			(29)	(87)	(17)
> 95	0	0	11	411	422
			(3)	(97)	(64.5)
			(7)	(82)	
Total	2	7	147	498	654
	(0.5)	(1)	(22.5)	(76)	(100)

* Figures in the parenthesis are row and column percentage respectively.

Discussion

One of the most important concerns of demography is the measuring of error of age reporting. Age miseporting in developing countries is well known[12,13]. Scientists using demographic data require accurate age estimates specially in measuring the age dependent indices. Assessment of nutritional status by anthropometric means requires accurate age data. otherwise a child with a true lower or higher anthropometric index may be wrongly assessed as well nourished or malnourished. Our findings showed that a malnourished child could be assessed to be well nourished due to age misreporting.

Age misreporting in Bangladesh society is common[12]. Age is normally reported higher for younger children and lower for older children[6]. Moreover, there is a likely-hood that children's age are reported in whole numbers and there is a tendency to round up age to the next birthday[4]. The reason behind these patterns of misreporting is social, detail discussions of which are beyond the scope of this paper. However, age misreporting in any direction affects the use of anthropometric

indices in assessing the nutritional status. Among the anthropometric indices body weight and height are affected most. Arm circumference, head circumference and chest circumference are not affected so much by age misreporting. But these parameters are not universally accepted as indices to assess the nutritional status and no internationally accepted standard of these measures are available.

In Bangladesh circumstances, the problem of age misreporting is acute. Illiteracy and absence of birth registration system contribute highly to the problem. As a result use of anthropometric indices to assess the nutritional status is sometimes very difficult. The errors that may come in the assessment have been documented in this paper.

Summary

Effect of age misreporting on the use of anthropometric data to determine the nutritional status of 654 school going children attending a school in Dhaka city has been documented. Under-reporting of age has been common resulting in the overestimation of nutritional status. The age of 44% children was reported correctly and thus the nutritional status was correctly determined. Illiteracy and absence of birth registration system has been noted as the causes of age misreporting.

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