

PJN

ISSN 1680-5194

PAKISTAN JOURNAL OF
NUTRITION

ANSI*net*

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Nutritional Status of Affluent School Children of Dera Ismail Khan: Is under Nutrition Common?

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Abstract: The present study assesses the frequency of underweight in primary school children from families of high socioeconomic status in Dera Ismail Khan City, Pakistan. It included 322 children, 221 (68.63%) boys and 101 (31.37%) girls. The schools such as The Qurtruba, The City and The Educators were selected as they are the only institutions that cater wards of high socio economic group in Dera Ismail Khan. They were living in healthy environments, have excellent nutrition and easy access to health facilities. Thorough medical examination excluded those suffering from chronic health ailments. Height and weight of each child was taken. BMI was calculated according to the Quatelet's Index and body mass status according to WHO S' criteria. The BMI-for-age percentile was derived by putting BMI values on gender specific CDC S' growth charts 2-20 years. Children falling below 5th percentile were declared as under weight and those >95th percentile as obese. Frequency of under weight in primary school children was found 5.59% (in sample): 4.03% for boys and 1.55% for girls. Boys were more than two times under weight than girls. This may be due to absence of gender discrimination; easy access of girls to kitchen and food stored in the house. It also reflects the changing attitude of these families about the status of women; improvement in the level of education, economics and knowledge about nutrition.

Key words: Body mass status, primary school children, affluent families and Dera Ismail Khan

INTRODUCTION

Good nutrition is the corner stone for survival, health and development of current and succeeding generations. Well nourished children perform better in school, grow into healthy adults and in turn give their children a better start in life. Well nourished women; face fewer risks during pregnancy, child birth and their children set off on firmer development paths, both physically and mentally (UNICEF, Report 40, 2006).

Malnutrition refers to deficiencies, excess or imbalances in intake of energy, proteins and/or other nutrients. Malnutrition includes under nutrition and over nutrition. Under nutrition is the result of food intake that is continuously insufficient to meet dietary energy requirements, poor absorption and/or poor biological use of nutrients consumed. This usually results in loss of weight or under weight. Over nutrition refers to a chronic condition where intake of food is in excess of dietary energy requirements resulting in over weight and/or obesity (WHO-Growth standards, 2002). Underweight; a poor anthropometric status (weight for age/BMI-for-age percentile), is mainly a consequence of inadequate diet and frequent infections (Diarrhea and Respiratory), leading to deficiencies in calories; proteins, vitamins and minerals. Underweight remains a pervasive problem in developing countries where

poverty is a strong underline determinant, contributing to house hold food insecurity; poor child care, maternal under nutrition, unhealthy environments and poor health care. All ages are at risk but underweight is more prevalent under five. Underweight children are at increased risk of mortality from infectious illnesses such as tuberculosis, diarrhea, pneumonia, measles and malaria. The effects of under weight/under nutrition on the immune system are wide ranging. The infectious illnesses also tend to be more frequent and severe in underweight children. There is an increased risk of death from mild to moderate under nutrition. Chronic under nutrition in the first two or three years of life can also lead to long term developmental defects. Underweight was estimated to cause 3.7 million deaths in 2000, about 1.8 million deaths occurred in Africa and 1.2 million in South East Asia(WHO-under nutrition, 2002). Conflicts and natural disasters in many countries have further exacerbated the situation. Increase in the number of underweight children in Africa also reflects a rapid rate of population growth as well as AIDS (UNICEF malnutrition, 2006).

Weight change is the first indication of over or under nutrition. Weight generally reflects recent changes and is an indicator of short term nutritional status. The stature (length or height) is slower to respond. A

decrease in weight indicates acute while decrease in height/length indicates chronic under nutrition (MacLean and Graham, 1982).

Disparities exist between children living in a region or a country or a particular geographic area or among certain population sub groups. Children in rural areas are nearly twice as likely to be underweight as children in urban areas, but high underweight magnitude in urban slums in many developing countries still gives cause for concern (UNICEF-Birth Place, 2007). Significant disparities exist between rich and poor children. On average, poor children are twice as likely to be underweight as rich children. The greatest disparities between rich and poor are found in Latin America and Caribbean, where children living in poorest house holds are 3.6 times more likely to be underweight than children from the richest house holds. The lowest disparities are found in East Asia/Pacific followed by Central & Eastern Europe (CEE)/Common Wealth of Independent States and Sub-Saharan Africa (UNICEF-.House Hold, 2007). Little difference in underweight magnitude exists between boys and girls in every region except South Asia. In South Asia, 47% of girls are underweight compared to 44% of boys (Sirhari *et al.*, 2006). The present study was planned to figure out the magnitude of under weight children (6-11), attending different schools that cater wards of affluent families in Dera Ismail Khan City, Pakistan.

MATERIALS AND METHODS

The present study aimed to assess the magnitude of underweight in primary school children at Dera Ismail Khan. It was carried out in 3 primary sections of schools, having wards of high socio-economic status. The study included 322 school children: 221 (68.63%) boys and 101 (31.37%) girls. Thorough clinical examination of the children excluded those suffering from chronic health diseases. Written permission was obtained from the parents and principals of the institutions. Participation was voluntary.

Weight measurements of children were taken (in kilogram) in stocking feet and light clothing. Stature was measured (in meters) with a wall mounted steel tape possessing a moveable head-board. Children were measured with heels, buttocks and shoulders touching the wall, looking straight ahead and with bare feet. Body Mass Index (BMI) of each child was calculated according to Quatelet's Index. BMI-for-age percentile was used in children and adolescents than BMI. Body mass status was determined according to WHO criteria. Children, falling <5th percentile were considered underweight (WHO, 1995).

RESULTS

This study involved 322 school children (6-11), 221(68.63%) boys and 101 (31.37%) girls. All the children belonged to high socio-economic group. Gender wise distribution of children in different schools is shown in Table 1. School wise distribution of both genders showed maximum participation of The Qurtruba School 131(boys = 81 and girls = 50) followed by The City school 129 (boys = 99 and girl = 30) and The Educators 62 (boys = 41 and girls = 21). Children falling below the 5th percentile in BMI-for-age, were considered underweight according to WHO criteria (WHO, 1995).

Table 2 shows the institutional and gender wise distribution of underweight children. Amongst 18 (5.59%) underweight children, 13 (5.88%) were boys and 5 (4.95%) girls. No significant gender difference was noted for the percentage of underweight children. The maximum number of under weight children (8.06%) was found in The Educators followed by Qurtruba School (6.87%) and The City School (3.10%). These institutions were located in the urban areas with good environmental conditions; have easy access to nutritious diet, health facilities and media. Maximum number of under weight boys (7.40%) were recorded in Qurtruba while 7.32% in Educator and 4.04% in the City school. Among girls, 9.52% girls of Educator were under weight whereas 6% girls in The Qurtruba and none in The City school (UNICEF Nutrition, 2006).

Table 1: Institutional and gender wise distribution of children (n = 322)

School	Total No. of children	Boys		Girls	
		Number	% of boys	Number	% of girls
The qurtuba	131	81	61.83	50	38.17
The city	129	99	76.74	30	23.26
The educators	62	41	66.13	21	33.87
Total	322	221	68.63	101	31.37

Table 2: Institutional and gender wise distribution of underweight school children (n = 18)

Schools	Total		Boys		Girls	
	No.	Underweight (%)	No.	Underweight (%)	No.	Underweight (%)
The qurtruba	9	6.87	6	7.41	3	6.00
The city	4	3.10	4	4.04	0	0.0
The educators	5	8.06	3	7.32	2	9.52
Total	18	5.59	13	5.88	5	5.95

Table 3: Age and gender wise distribution of the sample in schools

Age in years	The qurtuba		The city		The educators		Total
	Boys	Girls	Boys	Girls	Boys	Girls	Boys + Girls
6	07	03	28	0	0	0	68
7	07	04	0	01	18	15	45
8	19	12	13	07	08	02	61
9	09	09	16	07	03	03	47
10	28	13	19	11	06	0	77
11	11	09	23	04	06	01	54
Total	81	50	99	30	41	21	322
% of gender in each school	61.83	38.17	76.74	23.26	66.13	33.87	-

Table 4: Institutional and age wise distribution of underweight school children

Age (Years)	The qurtuba		The city		The educators		Total		% of Total
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	
06	0	0	0	0	0	0	0	0	0.00
07	2	0	0	0	2	2	4	2	33.33
08	0	0	1	0	0	0	1	0	5.56
09	1	1	0	0	0	0	1	1	11.11
10	2	2	1	0	0	0	3	2	27.78
11	1	0	2	0	1	0	4	0	22.22
Total	6	3	4	0	3	2	13	5	100.00

Table 3 revealed the age and gender wise distributions of children (n = 322). Children were 77 (23.91%) at 10 years, 68 (21.11%) at the age of 6 and 61 (18.94%) at 8 years. Both the ages (6 and 10 years) are the periods of growth spurts, negative energy balance would result in reduction of body weight. Participation of the girls 101 (31.36%) was reasonable.

Table 4 presents the age wise distribution of underweight affluent school children (6-11 years) with a total of 18 (boys: 13 and girls: 5). Boys were more than twice the number of girls, reflecting better nutrition of girls. The number of underweight school children were maximum (33.33%) at the age of 07 years, followed by 27.78% at the age of 11 years and minimum at 06 years. Increase in physical activity, poor dietary habits and growth spurt is common at age 5-7 and 10-13 years in children. Early maturing girls may begin their growth spurt as early as 7-8 years and early maturing boys may begin growing at the age of 9-11 years. If they are not provided with sufficient supply of nutrients, they will not gain weight in short term and length (height) in long run (Gordon and Wald Law, 2003).

DISCUSSION

The present study was undertaken to find out the frequency of underweight primary school children of Dera Ismail Khan, Pakistan from high socioeconomic group. The institutions selected for the study was private and having branches throughout the country. The annual expenditure is unaffordable by the middle class and poor families. It was assumed that under nutrition might exist among the high socioeconomic group. The study involved 322 children, 321 (68.63%) boys' and 101 (31.37%) girls. 18 children (5.1%) were found to be

underweight, 13 (4.03%) boys and 5 (1.55%) girls. Gender difference for underweight was statistically significant. It is contrary to what is observed that underweight in girls and gender difference is highest in South Asia. Findings of the present study can be compared with the findings of Nawal-Al-Hamad *et al.* (2006), that observed much lower rates for underweight in school children of Kuwait. Their study included 5047 children (boys: 2522 and girls: 2525), aged 5-10 years, as apart of nutritional survey in Kuwait through Organization of Food and Agriculture (FAO). Underweight in school children was observed boys 3.1% and girls: 1.5%. Gender difference was in agreement with the present study (5% VS 1.55%). Lower rates for underweight in children might be due to better nutritional and socioeconomic conditions in Kuwait. Lower rates in girls also reflect that there is no gender discrimination in Kuwait. Cheryl *et al.* (2006) have also reported the lower rates for the underweight in children (2.7%), as prevalence of under weight in National Health and Nutrition Examination Survey: 2003-2006. The report has been issued by National Center for Health Statistics, USA.

Ismail *et al.* (2005) have observed higher rates for underweight in school children 7.3% (boys: 10.6% and girls: 4.65%) in the National Nutritional Survey based on anthropometry for Egypt (1985-2005). Gender difference was also remarkable. Results of the present study can also be compared with the observation by Sharma *et al.* (2006) that underweight in school children (6-16) in Hyderabad, India was 10.13%. Higher rates for the observed parameter might be due to poor dietary habits, unawareness about nutritional education and intake of junk food. Fong Ming Moy *et al.* (2004) have also

conducted the similar studies in Kuala Lumpur, Malaysia, investigating 1194 children of 5th grade with an average age of 11 years and reported the frequency of underweight children 14.8% (boys 16.1% and girls: 13.3%). Majority of the children had professional fathers. However, 43.7% came from families having more than 4 or 5 siblings, 20.8% had more than 5 and 35.5% had 3 or fewer siblings. Higher rates for the observed under nutrition might be due to different ethnic groups, genetic predisposition, dietary cultures and religious restrictions.

Conclusion and recommendations: Body weight (weight for age) is the earliest, simplest and most important anthropometric measurement to be adopted as an indicator for nutritional status in routine clinical examination of the children. A classification of varying degrees of malnutrition is based on this indicator. This classification is also linked to ultimate health outcome-mortality. Weight-for-age is important clinically and is used to assess the recent malnutrition in communities. Underweight in children reflects the level of socio-economic development as well as that of education and health delivery system. It exposes those sections of society where under nutrition is prevalent and needs to be rectified. It requires educating the concerned society about nutrition; sanitation, environmental conditions and child care.

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