ORIGINAL ARTICLE

Assessment of Nutritional Status in Children Attending Government Schools in Islamabad, A Cross Sectional Survey

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ABSTRACT

Background: Child malnutrition is a major public health problem in most low income communities leading to high morbidity and mortality. According to National Nutrition Survey of Pakistan, 43% of children are stunted and 15% are wasted.

Aim: To assess the nutritional status of the children attending the government schools in Islamabad.

Methodology: A Descriptive cross-sectional survey was carried out on school going children 6-12 years of age (1st -5th grade) attending Islamabad Model School for Boys F.11/1, Islamabad. Sample Size of 80 was obtained by using Simple Random sampling. Data collection tools, weighing machine, height measuring tape, calculator and a questionnaire form containing socio-demographic data of a child (age, gender, height, weight, socioeconomic group etc.), BMI for age percentile growth chart and height age growth chart. Data analysis was done by using SPSS software version 23.

Conclusion: Shorter heights of children may mask their poor nutritional status and deem them, to be healthy on a BMI scale. Economic, political and social changes should be made with special focus on mothers' education to improve the nutritional status of children.

Keywords: BMI, Nutritional status, Government schools, socio-economic status

INTRODUCTION

Health is often recognized as a basic pillar for social and economic progress; and good nutrition is what it relies on. A well-nourished population produces healthy individuals who are able to learn skills, acquire jobs, be a functioning and contributing part of the society; thus it is essential for the betterment of a country's manpower. Globally, more than thirty eight million children less than five years of age are malnourished[1]. Moreover, poor nutrition is increasingly becoming responsible for increasing deaths among children[2].

Malnutrition, as defined by WHO, refers to "deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients"[3]. In 2016, around 155 million children under the age of 5 years were suffering from stunting, while approximately 41 million were either overweight or obese. Almost half of all deaths of children fewer than 5 years of age are due to malnutrition [4].

In modern age, malnutrition continues to be a serious public health problem and for a long time been recognized as a consequence of poverty since most of the world's malnourished children live in the developing nations of Asia, Africa and Latin America[5]. Child malnutrition in Pakistan can be attributed towards poverty, imbalanced diets, improper breastfeeding and weaning, insufficient food because of large family size and fewer earning members of the family, minimal practice of family planning, and unavailability of food in disaster prone regions[6]. According to the National Nutrition Survey conducted in 2011, around 43% of Pakistan's children were stunted while around 15% were wasted [7]. Proper nutrition in early childhood is the key to a physically and mentally fit adult. A study proved a positive correlation between poor mental health and an unhealthy diet [8]. School-age marks a crucial point in the cognitive and behavioral development of a child. A balanced nutrition in this age is important for a child's academic performance and physical growth; a study proved that children with a better diet quality and having a socioeconomically strong background performed better on an assessment than their counterparts[9].

Malnutrition in children is a growing problem in Pakistan, which can lead to an incompetent workforce in the future and further deterioration of the economy and stability of the country[10]. A study carried out in Faisalabad by Fayyaz et al observed that a significant proportion of stunted children were found in government schools[11]. It is important to determine the factors responsible for this expanding problem, to observe it's relation with socioeconomic factors, with the environment, the availability of facilities and with literacy. The aim of present study was to assess the nutritional status of children of low socioeconomic groups attending government schools in Islamabad

MATERIAL AND METHOD

It was a Cross-sectional (descriptive) study conducted at Islamabad Model School for Boys F-11/1, Islamabad. The study population included male children (6-12 years of age). Those who had any chronic illness were excluded from the study. Assuming a prevalence (p) of 29.5%, (underweight prevalence data from a study conducted in urban squatter settlement in Islamabad (12), precision (d) of 10%, and 95% confidence level (z=1.96), the appropriate sample size was z2pq/d2=80. Simple random sampling was used. Children of age 7-12 years belonging from grade 2 to grade 7 were randomly selected. A total of 80 children were assessed.

Data was collected with the help of an anthropometric assessment form. It recorded the participant's age, height and weight. BMI and height-for-age of the child were later calculated by the students. The assessment form also covered each child's father's occupation and education, alongside his mother's occupation and education.

Data Collection Procedure: We measured and noted down each child's anthropometric measures. The children were asked their age, fathers' education and occupation, and their mothers' education and occupation. If a child could not produce any information, it was labeled as "unknown". The children were assessed randomly till the sample size was reached.

Data Processing & Analysis: SPSS software was used for analysis of data. Frequency distribution & cross-tabulations of related variables were examined, pie charts and bar graphs were constructed, and significant results and associations were noted. The WHO reference charts of height-for-age of boys and the reference BMI-for-age charts were used to assess the children and put them into their suitable categories.

Operational Definitions

BMI: "Body Mass Index is a person's weight in kilograms divided by the square of height in meters"[13].

Underweight: "A child whose BMI is less than 5th percentile on BMI for age percentile growth chart is considered as underweight"[14].

Healthy: "A child whose BMI is between 5th and 85th percentile on BMI for age percentile growth chart is considered as healthy".

Overweight: "A child whose BMI is between 85th and 94th percentile on BMI for age percentile growth chart is considered as overweight"[15].

Obese: "A child whose BMI is 95th or more than 95th percentile on BMI for age percentile growth chart is considered as obese"(15).
Stunted: "A child who has height less than 2 standard deviation of a normal child of that age(16)"
Severely stunted: "A child who has height less than 3 standard deviation of a normal child of that age(16)"

RESULTS

Table 1 show that the total study population consisted of 80 students. In BMI category, 50 (62.5%) were found to be normal, 23 (28.7%) were underweight, 3 (3.8%) overweight and 4 (5%) obese. However, in "Height for age" category 12 (15%) were found to be stunted.

In Table 2, we can see that 35 (43.75%) mothers had no education and in this category 11 (13.75%) of children were underweight. 32 (40%) had up to primary education and 8 (10%) of children in this category were underweight, 10 (12.5%) had up to

secondary education and only 3 (3.75%) were educated up to Matric. The mothers who had no education, 7 ((8.75%) of their children were stunted as well.

Table 1: Anthropometric measurements of study population

BMI category of the child	Frequency	Percentage
Underweight	23	28.7
Normal	50	62.5
Overweight	3	3.8
Obese	4	5.0
Total	80	100.0
Height for age of the child	Frequency	Percentage
Severely stunted	1	1.3
Stunted	12	15.0
Normal stature	67	83.8
Total	80	100.0

Table 2: Association between Mother's education, BMI and Height of the child

		BMI category of the child				Total
		Underweight	Healthy	overweight	Obese	
Education of the Mother	No education	11*	21	1	2	35*
	Primary	8*	21	2	1	32*
	Secondary	3	6	0	1	10
	Matric and above	1	2	0	0	3
Total		23	50	3	4	80
		Height for age of the child			Total	
		Severely stunted	Stunted	Normal		
Education of the Mother	No education	0	7*	28	35	
	Primary	0	3*	29	32	
	Secondary	0	2	8	10	
	Matric and above	1	0	2	3	
Total		1	12	67	80	

In table 3 we can see that 6 out of 23 children in the underweight category of BMI were stunted as well, whereas 6 out of 50 children in the healthy category of BMI were also stunted. Moreover, 1 child who was severely stunted also appeared healthy on BMI Scale. Their short height masked their underweight status.

Table 3: Association between Height for age and BMI

		BMI category of the child				
		Underweight	Healthy	Overweight	Obese	Total
Height for age of the child	Severely stunted	0	1	0	0	1
	Stunted	6*	6*	0	0	12*
	Normal	17	43	3	4	67
		23	50	3	4	80

DISCUSSION

A study carried out in Abbottabad, Pakistan observed that children attending government schools were mostly underweight and did not perform well academically(17). Similar findings were observed in a study carried out in Sindh as well(18). Another study carried out in Nigeria showed that the percentage of underweight school going children is higher in public schools than that in private schools; public schools had majority of children belonging to low socioeconomic group who faced unavailability of nutrient rich foods, with starchy foods comprising a large portion of their diet(19). Our study corroborates the aforementioned survey, and shows the presence of this contrast in Pakistan as well. The socioeconomically substandard families here face the same problems, there is absence of nutritionally balanced meals because of unavailability of quality foods and even if they are available the families cannot afford them. Another study carried out in Faisalabad, Pakistan, stated the contrast between child health of rural and urban population(20), and attributed it to change in

physical activity and lifestyle between urban and rural life. Our study contradicts with their reasoning, and proves that an urban school in Islamabad can have a high percentage of malnourished children as well. Therefore, though lifestyle changes do create a discrepancy between urban and rural school going children; it is rather their socioeconomic background that plays a more important role in determining and affecting the health of the children.

The low height-for-age of the healthy children masked their underweight status, and decreased the overall percentage of malnourished children. The low height-for-age, although, is a medical problem, it can be attributed to genetics as well; this is a limitation of our study. We were unable to assess the parents of the children due to time constraints; moreover the children were too young to understand and could not comment on their parents' heights. Another limitation is that we did not monitor the growth progress of the children with time; it is highly likely for the children to undergo growth spurts during puberty and be categorized as healthy with normal stature. Furthermore, this study does not take into account the family sizes of the participants; it is possible for a poor family with fewer individuals to have healthier family members than those of a family of larger size. A limitation of this study is that we were unable to survey more than 1 school since all other schools were closed for summer vacation. But the school we visited acts as an ideal representative of government run schools.

CONCLUSION

Shorter heights of children may mask their poor nutritional status and rule them out as healthy on BMI scale for children. Economic, political and social changes should be made with special focus on mothers' education to improve the nutritional status of children.
Recommendations: As stated earlier, parental education plays a major role in child health, at times even more than financial status of the family. Hence, steps need to be taken to educate the mothers regarding child health. It is imperative to inform them about healthy balanced diets for their families, about nursing and

weaning, and about family planning as well. They should be encouraged to spread what they learn to others.

The women should be urged to seek advice from pediatricians and nutritionist regarding their children. They should be educated about the different nutrient components of food and how each of them is important on its own.

With the worsening economy of Pakistan it has become ever harder for financially poorer families to afford good quality food. Steps need to be taken to introduce nutrient rich foods that are cheap in the market, and to introduce substitute foods that have the same nutrient content but are priced lower. Pulses and fish, for example, is a cheaper substitute to meat for protein.

Ethical Considerations: The proposal was approved by the Institutional Review Board of Fazaia Medical College. Consent was taken from the principal of the school, after being informed about the nature and purpose of the study. Confidentiality of data was also ensured.

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