Nutritional assessment in School Going Children of 6 years old - A scenario of urban slums in Pakistan

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ABSTRACT

Study evaluated the difference between nutrition status and dietary habits of school going children. A cross sectional and desprective study of 344 students of three different primary school was done in slum areas of Faisalabad having both male and female of age 6 years old. Weight and height were measured with standard scales while assessment of nutritional status was done by using growth charts. Question was used to assess eating behavior and lifestyle. Boys had a significantly higher waist circumference (72.18±9) than girls (66.86±9.91) (p=0.004). Prevalence of overweight is 13.6 ans 6.7% are stunted. There were also differences   between the two groups in terms of following a rhythm of meals: a statistically higher percentage of girls (43.3%) skip breakfast, while significant percentage of boys (63.8%) took a food package to school. A total of 25.8% of the boys and 29% of the girls stated that they eat while watching computer or TV. We found that boys are more prone to obesity as compare to girls. The family environment and education are very important and all our actions should be focused on continuous education about the nutritional status.

Keywords: Nutrition assessment, School going children, Urban slums

Introduction:

School going children are at most crucial stage of their verbal memory development and optimization of co genitive performance. A well balance diet and lifestyle modifications are necessary for all specially school going children of age 5 and 6. These children have to ensure balance diet with adequacy and diversity of optimal consumption of micro and macro nutrients. Research in china showed 76.1%children have 3 meals a day but 8.1% urban and 3.4% rural have breakfast 1.3 times a week or often less [1].another research conducted in USA shows that children trend move towards fast foods 36.1% consume fast foods children whom consume these process foods get extra 187 kcal [2] there are variety of foods that are not consumed by children like fruit, vegetables, dairy products to meet iron calcium and protein requirements. There deficiencies lead to many nutritional disorders hence these children could not able to participate in mental and social well being. This renders them to produce bioactive component that are necessary for their brain health [3] poor nutritional status leads to malnutrition that cause negative effects, alteration in cellular function, cell injury, metabolism impaired function, clinical malnutrition leads to weakness and reduction in immunity that leads to infection. Poses serious health effects like stunned growth, mental disabilities, malnutrition term deigned as combination of both underweight and overweight. Child malnutrition accounts for half of childhood death all over the world [4]. National Nutrition Survey stated that, 33%of all children were underweight, nearly 44% were stunted, 15% are wasted, 50%were anemic, and 33%were iron deficiency anemic). In the last decades, there has been a little reduction in the prevalence of child malnutrition in Pakistan compared to other developing countries [6]. The factors contributing in childhood malnutrition are low birth weight, inadequacy in breast feeding mainly exclusive breastfeeding, inappropriate complementary feeding, maternal education, lack of proper knowledge of nutrition, micronutrient lacking, birth spacing, family socioeconomic status, food insecurity, poor sanitary conditions , vaccination, and communicable and infectious diseases [7] .Pakistan is among the countries in the world with the highest rates of child malnutrition, and its progress in child nutrition and health remains slower than in other South Asian countries [8]

Prevalence of overweight and obesity is higher in Pakistan as compare to other developing countries. The growing rate of overweight and obesity in children is 30% higher in developing countries (classified as countries with poor and average incomes by the World Bank) than in

developed countries. Data provided by the Order of the Ministry of Health in 2013 pertaining to the international situation of obesity indicate that "wealth disease" is a problem even for very many poor countries [9]

The prevalence of overweight in Pakistan ranges between 40-**59.9%** in school going children. Lack of sufficient physical activity and intake to extra calories leads to overweight specially among urban population of Pakistan.

Time spent in front of the computer, TV, or video games is increasing which is a significant factor in the growth of obesity at a global level [10] A study published by the Milken Institute in 2012 notes that each 10% investment of information technology generates a 1% increase in the obesity rate, while a 0.4% growth of the obesity rate due to the time spent in front of the screen leads to an overall growth of 1.4% of the obesity rate. The study also reveals that in countries with a large investment in informational technology, a growth of 1% in the number of physically active people can prevent a growth of 0.2% of obesity [11]

Pakistan overweight and obesity represent a serious epidemiologic and public health problem, due to its growing prevalence. Obesity poses serious health effects and many metabolic disorders. Twenty percent of the children aged 6-12 years and 11% of those aged 13-17 years are diagnosed as overweight or obese. The prevalence of obesity in 2014 was 10.1% in both urban and rural areas.

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Factors included, children being in front of screen from the age of, sensing an average of 2 -4 hours/ day. This situation is detrimental to physical activity. More than 7% children frequently eat fast foods, rich in lipids, salt and sugar. Such a lifestyle is seen within a family, specially, single parent home. [13]

Nutrition awareness plays a pivotal role in prevention of malnutrition. Individuals lacks many nutrient components due to lack of knowledge regarding nutrition hence it can be render by family education and awareness, family planning and development, prevention can restore public health as well can national productivity can increases up to 28%.

Subjects and Methods

Study design; Descriptive and cross section study. This included **344** registered school children's of age 6 years from three different primary schools in urban slums of Faisalabad, Pakistan. Weight and height of each children was measured by using standard scales. And assessment of nutritional status was done by growth charts which include BMI to age (z-score), weight to age(z-score) height to age (z-score). This study was conducted in 4 primary schools from slum areas of Faisalabad, Pakistan

Sampling and data Collection: The sample size of 344 registered school children were calculated for assuming the prevalence of malnutrition. For this study, 4 urban slums of city Faisalabad, Pakistan (satyana, Manawala, Tudii, Zafar Abad) were selected. All children aged 6 years old from each of these slums were examined and interviewed by pre-designed and pre-tested questionnaire, for participants to elicit family information their characteristics, residence, religion, family type, nutritional education and occupation of guardians and information on individuals on age, sex and eating habits.

Anthropometric measurement:

Anthropometric measurements were noted by trained skilled workers. Childs height and weight were measured by using standardized technique recommended by Jellified (Jellify DB: The assessment of the nutritional status of the community. WHO Mongo Series No 1966, 53:1-271) A stadiometer was used to measured height of subjects with accuracy of 0.1cm. Subject was allowed to stand without footwear's with the feet parallel and with heels, buttocks, shoulders and occiput touching the rod, hands hanging by their sides. Head was held upright comfortably by making contact with horizontal head piece. Portable balance was used for calculation of weight with accuracy of 100g. Children instructed to stand in balanced without footwear's and light clothing with looking straight and feet apart. Weight recorded to the nearest value. Stunting (height for age), wasting (weight for height) and underweight (weight for age) were examined by WHO growth charts.

Cut off value with 2+_ SD consider as normal. BMI was calculated by using the equation: weight (kg)/height2 (m). The WHO school age Children Growth References 2007 [11] was used for the assessment of nutritional status by comparing the BMI values with Z-score on child growth.

Data management:

Data was managed by using statically package for social sciences (SPSS). Standard deviation (SD) and means calculated. Difference between two or more categorical variables was assessed by Chi-square test. Comparison between continuous variables was done with student t test. An alpha p value ≤5 were considered as cut of value. Most influential risk factors are measured by multivariate regression analysis.

Data analysis

Specific Identification number were given to each child. MI Z-scores weight for age, height for age were obtained according to growth charts with reference to WHO guidance (WHO (2015) BMI-for-age (5-19 years).

Results.

Results revealed that 25.4% of the children were malnourished with the application of anthropometric measures on growth charts. Boys are more prone to malnutrition as compare to girls. While severe low weight was significantly more in girl as compare to boys.

Z-scores	-4	-3	-2	-1	0	1	2	3	4	5
Height/age	0.25%	0.5%	3.80%	5.50%	27.30%	37%	26.80%	3.40%	0.70%	0.10%
Weight/age	0.20%	1.70%	7.30%	9.30%	42%	22.80%	15.40%	3.10%	0.30%	0.20%
BMI/age	0.60%	0.40%	6.80%	20.10%	33.50%	24.70%	10.50%	2.10%	0.60%	0.20%

Prevalence of wasting is more in boys. Prevalence of overweight and obesity is 13.6% (BMI/age >1 Z-scores) while underweight prevalence was 8.9% (weight/age <-2 Z-score). Stunting percentage was 9.71 %(height/age<-2 Z-score).

Gender	Boys		Girls		T-test	P-value
Anthropometric	Mean	SD	Mean	SD		
Height(cm)	118	5.4	115.7	5.4	3.769	0.015*
Weight(kg)	21.6	3.6	20.4	3.7	2.457	<0.001**
BMI(kg/m2)	15.5	2.73	15.3	2.13	0.652	0.413
*<0.05 Significant						

Mean height of boys is greater than females in all age groups. Boys were heavier than girls mainely its due to the variation in their muscle mass and structure of body.

Distribution of children based on their family characteristics.

Variable	Total	Malnourished
Gender		
Boys	246	76
Girls	177	41
Family type		
Joint	273	53
Nuclear		41
Ever Breastfeed		
Yes		96
No		23
Parental education		
< 6th standard		81
>6th standard		35
Parental Occupation		
Non-working		76
Working		41
Socio-economic Status		
Middle class		43
Lower middle		37
Upper middle		13

Low education, socio-economic factor, family type, accessibility of food are major contributing factors in malnutrion.

Malnutrition prevalence among boys and girls in urban slum.

Nutritional Status	Male (N=246)		Female (N=177)	
	No.	Percent (%)	No.	Percent (%)
Malnourished children	76	30.90%	41	23.20%
Overweight	31	12.60% .30	15	8.50%
Thinness	20	8.10%	11	5.90%
Low weight	15	6.10%	7	3.90
Obesity	11	4.50%	5	2.50%
Stunting	5	1.90%	3	1.70%

Sever Thinness	**4**	1.70	2	1.10%
Severe low weight	**1**	0.30%	3	1.70%
Increase height	**1**	0.50%	1	0.60%
Sever stunting	**0**	0.00%	1	0.60% -.10

 Univariate analysis revealed that female children are at high risk of malnutrition. Children was not got exclusive breast feeding living in joint family system with low socio economic status, education and awareness of their parents are at higher risk of malnutrition. It revealed improvement in family characteristics can restore the child health. No significant association was seen in gender and nutritional status. Younger children are at higher risk of malnutrition thus they need more surveillance and interventions.

There is also no correlation between the gender and obesity. Girls usually have thin waist as compared to boys as it is a natural difference between their physics. We can also consider some genetic factors in study of eating habits and their relationship with obesity. Some families in Pakistan have genetic makeup and family history of individuals surely related to obesity. Males usually have faster metabolism rate as compared to females. Females are more diet conscious as compared to males. This may lead to malnutrition and risk of anemia in females as compared to males. A study reveal that 3 out of 5 females at age of puberty to 35years old suffering from anemia these days through the world. It may also concluded that eating habits with respect to individual habits are also prone to obesity e.g.: eating too much but there is limited or no work out.

Discussion:

Mainly children with age group of 5 to 14 are consider as school going since 1972. But later United Nations educational scientific and cultural organization (UNESCO) revealed 6 to 11 years as primary school age for statically purposes. Present study shows that 13.3 children are overweight while 3.3 are obese due to their poor eating habits and lack of physical activity. Children screen timing also increases in past few decades which impart a contributing factor in overweigh.

Several studies in world revealed that prevalence of obesity is rising day by day due to poor eating habits lack of physical exercise. A study conducts in Iran revealed obesity and overweight prevalence is 7.84% ans 6.52% and girls were 10.38% and 3.89%. While underweight prevalence was 4.34% in boys and 3.89 in girls (18). Same results were receives in Chile and Germany (19-20). Study in Vietnam within the South East Asian nutrition survey reveals that

prevalence of overweight and obesity was higher as compare to undernutrition. Same variation can be seen in other studies conducted in Pakistan, India Nepal and China (22-23) this variance is due to dietary habits, lifestyle, and socioeconomic circumstances in countries. Existing study revealed that 1.9% boys and 1.8% girls were stunted. This shows similarity in stunting percentage between two different genders. The issue was seen in other studies as in Karachi survey, stunting was 14.3% in boys and 14.1 in girls And South East Asian Nutrition Survey showed 9.2% girls and 8.7% boys were stunner (21, 24). Major risk factors associates with obesity are poor eating habits and lack of physical exercise. Preferring unhealthy diet on healthy diet as fruits and vegetable which are major source of vitamins, minerals necessary for the proper functioning of body. In this study we mainly focus on age, family characteristics and rural areas where mostly people lack access to diversity of food due to their poor socio-economic status and education. And this study also revealed that malnutrition is lower in urban areas as compare to rural areas of Pakistan with difference to pre-existing studies. Severity of malnutrition occur in especially particular age group of children. There is also a rural and urban disparities in child malnutrition in all over the world. Mushtaq pointed that prevalence of malnutrition is much higher in rural areas as compare to urban areas. Malnutrition burden is lower in urban areas as compare to rural areas. Similar study was conducted by Anwar he pointed out that children from rural areas in Pakistan are more vulnerable to malnutrition with compare to urban areas. In rural areas if Faisalabad 65% children were underweight and 33% were stunted (42). National nutrition survey also revealed that prevalence of chronic and acute malnutrition is significantly high in rural areas as compare to urban. Family characteristics as well exhibit a contributing factor in malnutrition.

Recent researches revealed that socio-economic, dietary habits, food security, education and awareness, demographic factors are associated with prevalence if malnutrition in children. Recent studies highlighted that there is a strong relation of malnutrition with family characteristics as family size, household socio-economic status, no of children in family, (43)

Socio-economic factors leads to malnutrition are parental illiteracy, younger mothers and multiple parities (38). Crowded houses low education and awareness, poverty are associated with malnutrition (55) In Pakistan typical family is 7 member per household. One member has the responsibility to fulfil family needs. 40% population of Pakistan lives under poverty line. All these factors as large family size, inflation, food security, lack of exclusive breastfeeding and

early weaning are considered associated factors with child malnutrition. Illiterate mother has not much more knowledge of exclusive breastfeeding as well need of child, lack of Education and awareness, inflation parents have not much more to spend in food and basic needs of child hence it a contributing factor in stunting (33)

Conclusion

Study highlights that one in every 4 of registered child were malnourished. Prevalence of overweight (25.4%) is higher while stunting at the lowest 4 (0.3%). Malnutrition prevalence is higher in boys as compare to girls. Associated factors as family size, education, awareness, income, assibilate to food, food diversity, dietary habits, poor lifestyle are involved in child malnutrition. It is an alarming situation in Pakistan that about half of the population is underweight. Hence there is need of intervention to be followed to restore health status of children as well increase productivity. Effective implementations intervention should applied in rural areas of Pakistan. Following interventions are recommended.

Parent's education. Parents plays a very significant role in their child growth and development. Their skill base education and knowledge regarding nutrition can improve the dietary habits of their children. Communication can change behavior. Child disease burden and malnutrition are inter related and they reinforce each other. Hence restoration of child health is must be a foremost responsivity for their growth and development.

School meals.

School meals must follow the dietary guideline as they include fruits, vegetables, dairy etc. Providing guidance on consumption of processes food and mind shift towards healthy meals and physical activity because schools are considered best place for implementations of interventions.

Infectious diseases control.

School going children are more prone to infectious diseases. Many studies reveal that nutritional status is measures of individual immunity.

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