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BMI;
DIETARY PRACTICS OF SCHOOL GOING CHILDREN AND THEIR BMI MAY PREDICT FUTURE HEALTH HAZARDS.

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ABSTRACT: Malnutrition results in the death of about 54 percent of all child death each year. From the time of birth of a children to the growing age nutrition and balanced diet is one of the major concerns of parents and the nutritionists. Many different ways are devised to assess the nutritional status of the child. One of the widely accepted tools is to measure the Body Mass Index (BMI) of child. BMI provides a non-interventional and easy method for early diagnosis of malnutrition. **Objectives:** To determine current dietary practices among school going children and highlight the health risks associated with abnormal BMI. **Place and Duration:** Government setup, Primary and Middle Schools of Islamabad were visited, from 1st August 2015 to 31st November 2015. **Study Design:** A questionnaire based cross-sectional study. **Patients and Methods:** A sample size of 184 was taken. Parents of class 6, 7 and 8 included. Parents were asked to fill with diaries of students and was taken back after 3 days. Height and weight was taken. **Results:** Out of 184, male students were 109 and female students were 71. 125 children took breakfast. 61 eat vegetables 3 times a week and 3 twice a week. 16 children never eat vegetables. 103 children had good appetite. **Conclusion:** Dietary habits in children in urban area is satisfactory, but slightly increase tendency towards unhealthy food is observed.

Key words: BMI, Malnutrition, Growing children, Obesity.

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INTRODUCTION

Adequate nutrients are one of the essential requirements for growing children. Malnutrition results in the death of about 54 percent of all child death each year.[1] According to another report 35% of child mortality is due to underweight of children.[2] Apart from mortality a number of diseases are linked from unhealthy diet.[3] Lifestyle, eating habits and food consumption finds a link with cancer and cardiovascular disease. Atherosclerosis is the cardiovascular problem that begins in child hood, especially in fat rich babies but low muscle mass. These children are more prone to insulin resistance in future.[4,5] In low income groups children's are particularly deficient in macro and micro nutrients.[6,7] Because of rapid influx in urbanization paradigm is shifting, typical and traditional food usage is decreasing and more use of junk food is increasing that's why obesity in child hood is an emerging and challenging health problem.[8,9] diet rich in fruits and vegetables can help in prevention from such health hazards.[10] Similarly food items deficient in essential nutrients is also harmful because it's insufficient to meet adequate growth and development. As diet is a very basic necessity for the growth of a child that's why parents are always concern with balance diet formula. Many different ways are devised to assess the nutritional status of the child. One of the widely accepted tools is to measure the Body Mass Index (BMI) of child.[12] BMI provides a non-interventional and easy method for early diagnosis[12] of malnutrition.[13] Our study is aimed at assessing nutritional value of different diets in school going children of Islamabad city. Also to find out the current dietary practices among these children. The study is designed to analyze the effect of diet on B.M.I (basal metabolic index) in school going children. The analyses includes the dietary practices, eating habits and to identify eventually, risks, protective factors and possible directions for interventions on incorrect nutritional/physical activity and intra-familiar life styles in a sample of School going children. As

todays child is a future of any nation that's why healthy child can built healthy and productive nation. "Good dietary practice is cornerstone for growing children during early childhood and school-age years; children begin to establish habits for eating and exercise that stick with them for their entire lives." It's the dietary practice that define nutritional status of school going children. Apart from economical influences it's also reflected by cognition and educational status. In this study we are trying to determine dietary practices of school going children of class 6th (of almost 11 years of age) to 8th (of almost 13 years) and health risks associated with abnormal BMI. Diabetes, Hypertension & Atherosclerosis is associated with high BMI and Anemia, Rickets, Kwashiorkor & Marasmus with low BMI

Study Design

A questionnaire based cross-sections study conducted in public sector schools of Islamabad.

Settings

Government setup, Primary and Middle Schools of Islamabad were visited

Duration of Study

3 months from 1st August 2015 to 31st November 2015

Sample Size

A sample size of 184 was taken using WHO calculator.

Sample Technique

Convenience sampling. Parents of mentally and physically fit students from 6th, 7th and 8th class were included in study. Parents were asked to fill a Food Frequency Questionnaire (FFQ). The FFQ was sent to parents attached with homework diaries of students and was taken back after 3 days. Students were divided in groups comprising of age, weight and height. According to age the students were divided in two groups. One comprised of age group from 9 to 12 years and the other from 13 to 16 years. Height and weight of each child was measures. Children in study were divided into 6 groups based on weight as 20 to 25 Kg, 26 to 30 Kg, 31 to 35 Kg, 36 to 40 Kg, 41 to 45 Kg and 6th group 46 Kg and above. Students ranging in height from 4 feet 6 inches to 5 feet were taken in one group and from 5 feet to 5.5 feet in other group. BMI was calculated using height and weight of each student.

Inclusion Criteria

- School going children of age ranging from 9 to 16 years (Students of class 6th, 7th and 8th class)
- Mentally and Physically fit students

Exclusion Criteria

Handicapped, Diseased & Mentally retarded children

Data Collection Procedure

Schools of Islamabad were visited and Parents were asked to fill a Food Frequency Questionnaire (FFQ) .The FFQ was sent to their parents attached with homework diaries and asked to return after 7 days. Food items were divided into two categories healthy and unhealthy. Healthy food contain Milk, Vegetable, Breakfast and unhealthy food contains junk food, chocolate, ice-cream, and noodles. Height and weight were noted of each student

Data Analysis Procedure

Data was analyzed using SPSS 16 version. Frequencies of Age, gender and BMI were taken. Mean and Standard Deviation were taken of numeric variables like Age and BMI. Chi-Square were taken and P value less than 0.05 taken as significant.

RESULTS

Total study population was 184. Out of these male students were 109 (59.4%) and female students were 75 (40.6%). About 46% students were in the age group of 9 to 12 years while 54% were in age group of 13 to 16 years. According to class division 53 (28.8%) were from 6th class, 75 (40.8%) from 7th class and 56 (30.4%) from 8th class. Most of the students (50.7%) had weight in the range of 26 to 40 Kg. For height maximum of students (46.2%) were in range of 4 feet 6 inches to 5 feet.

Variables	Categories	Value
Gender	MALE	109 (59%)
	FEMALE	75 (40.76%)
Age in years	9 TO 12	46%
	>12 TO 16	54%
Class of students	6TH CLASS	53(28.8%)
	7TH CLASS	75 (40.8%)
	8TH CLASS	56 (30.4%)

Table-I. Age and gender of school going children

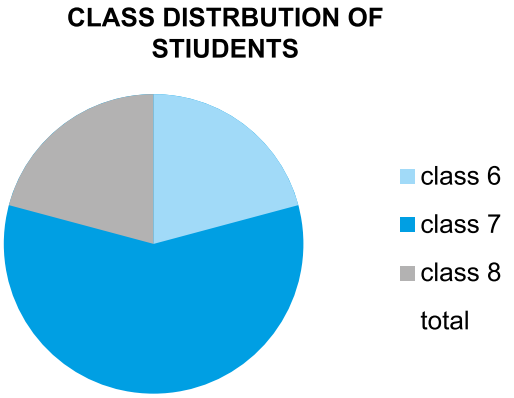

Figure-1. Class distribution of school going children

When parents were asked about their children eating fast food an everyday response was given by 21 (11.4%) and never by 35 (19%). Most of the children eat breakfast at home 125 (67.9%). Only a small percentage 7 (3.8%) never had breakfast. When questioned about eating vegetables 61 (33.2%) eat vegetables 3 times a week and 38 (20.7%) twice a week. A response of never was given by 16 (8.7%) children for eating vegetables. Noodles in diet were thrice a week among 36 (19.6%) children, 50 (27.2%) twice a week and 38 (20.7%) once a week. Ice cream was included in diet every day for 24 (13%), thrice a week for 52 (28.3%), twice a week for 54 (29.3%). 69 (37.5%) eat chocolate daily while 49 (26.6%) thrice a week. Meals per day were two times for 46 (25%), 3 times for 68 (37%) and 4 times for 33 (17.9%). On the question of taking milk an everyday response was given by 83 (45.1%), thrice a week by 40 (21.7%) and never by 24 (13%). Soft drinks were everyday in diet of about 33 (17.9%) and thrice a week 58 (31.5%), twice a week 32 (17.4%) and never by 16 (8.7%). When parents were asked do their children eat between meals, 57 (31%) eat everyday between meals and 43 (23.4%) never eat between meals. About 103 (56%) parents responded that their child had good appetite.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Percentile < 5: Underweight	51	27.7	27.7	27.7
	Percentile >= 5 and < 85: Healthy weight	115	62.5	62.5	90.2
	Percentile >= 85 and < 95: Overweight	18	9.8	9.8	100.0
	Total	184	100.0	100.0	

Table-II. Body mass index of school going children

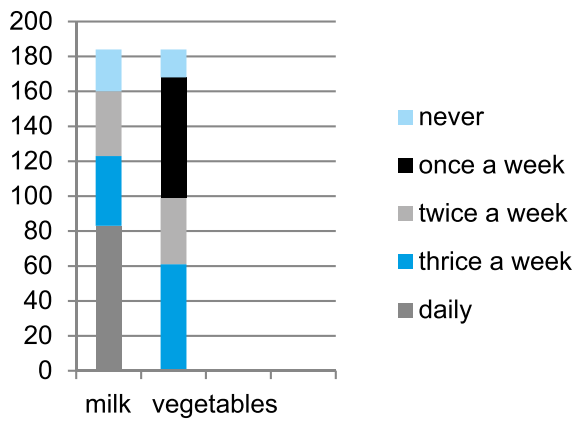

Figure-2. Dietary practices/ healthy food intake by school going children

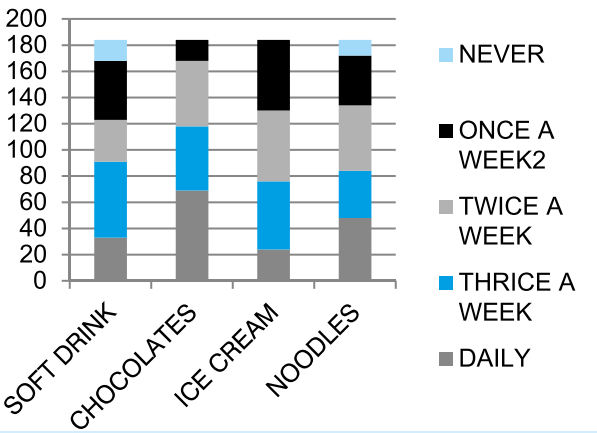

Figure-3. Dietary practices /junk food intake by school going children

DISCUSSION

Our current study focuses on the dietary practices among school going children. Diet, food choice, nutrition are among the major concerns in school going children. A very fast growing age group in schools of urban area was selected in this study because dietary practices by this age develop in children and effect their health through adolescence. It is important to know the dietary practices in community so that proper educational programs can be planned to educate school going children regarding healthy balanced diet. Underweight as well as obesity has been a state of malnutrition among this age group. Obesity is associated with reduced life expectancy.[14] Fruits and vegetables are associated with reduction in disease rate.[10] Adequate nutrition is also necessary for maintaining cholesterol levels in body.[15] With increased use of junk food there would be a lack of essential nutrients. Junk food, chocolates in diet of our population was high, about 37.5% children eating chocolates every day. Similarly daily intake of soft drinks ice creams and noodles is also increasing. Meal patterns are very important to follow. In our study 67.9% children took breakfast while only 3.8% did not take it. 37% take meals thrice a day and 17.9% children eat more than 4 times a day. About 22.8% of our population was overweight while 6.5% population is underweight. A study by prus-ustan has shown increased death rate among underweight children.[2] Overweight is also linked with increased morbidity.[14,15] because of raising trends in prevalence of overweight and obesity in all the age groups[16], especially in young children more factors are under consideration that improve the understanding of various behaviors of children's towards eating. This understanding helps in improvement of dietary practices. FITS (The Feeding Infants and Toddlers Study) conducted on 3022 infants and toddlers, according to it children from 4 to 24 month of age are given in appropriate diet that significant amounts that doesn't meet the demands of development of these children, its poor in nutrients and energy deficient.[17] 18% to 33% of infants and toddlers didn't consume vegetables on a typical day and when they use vegetables French fries was the comments form of consuming it. Consumption of energy drinks exceeds by 10 to 30%[18], Unfortunately, not only this but this trend keeps going up with growing age.[19,20] According to a survey done by Canadian Community Health out of ten seven children belonging to age group 4 to 8 years basically does not meet the minimum required number of servings for vegetables and fruit which is set per Canada's Food Guide to Healthy Eating.[21] not only this but they doesn't meet the recommended servings for grains and milk products. There for it's suggested that in appropriate and poor eating habits is the problem of many societies including developed and under developed both countries. These habits grow with growing age youngsters seems to be more consuming un health foods like consumption of calorie rich food, sweetened beverages such as soda[19], rich in spices but nutritionally poor snacks like junk and eating unhealthy/ un hygienic food outside homes, on other hand decline in consumption of healthy food like milk, eggs, Haney, grains, vegetables and other nutrient-dense foods. Patterns of meal consumption also vary as teenagers more frequently skip breakfast[19] and rarely participate in family dinners. In our study most of the children eat breakfast at home 125 (67.9%). Only a small percentage 7 (3.8%) never had breakfast. 61 (33.2%) eat vegetables 3 times a week and 38 (20.7%) twice a week. Noodles in diet were thrice a week among 36 (19.6%) children, 50 (27.2%) twice a week and 38 (20.7%) once a week. Meals per day were two times for 46 (25%), 3 times for 68 (37%) and 4 times for 33 (17.9%). 83 (45.1%) consume milk daily, 40 (21.7%) thrice a week and 24 (13%) never consume milk. These all are healthy eating practices. Probably it's the reason that 62. 5% children have healthy/ normal BMI because of high consumption of balanced food, rich in nutrients. Here it is also important that in our study 27.7 % children's were underweight and these are at health risk for poor development and growth and suffer from anemia, Rickets, Kwashiorkor & Marasmus acquire poor resistance to many communicable diseases. On the other hand consumption of junk food items like ice cream, chocolates and soft drinks is also noticed. This may be the reason of 9.8% overweight children present in our study and these are the children who are at future risks of obesity related

diseases like Diabetes Mellitus, Hypertension, Dyslipidemia and Cardiovascular disorders. As the quality nutrition is directly related to socio economic factors and health awareness and education status of parents and family it is also important to assess nutritional status of children with respect to these factors. As our study was confined to urban area of Pakistan where the socioeconomic factors and parents education and health awareness status is relatively better generally that's why majority of children's dietary habits are healthy, however more studies are required to conduct at larger population size including both urban and rural areas of Pakistan in order to identify factors that can play a role in improvement of dietary practices and built a healthy nation.

CONCLUSION

Most of the children in our study follow healthy dietary practices and have healthy BMI, while consumption of poorly contained nutrients food is also noticed that may be the cause of underweight children, similarly overweight children are also present in low percentage and likely cause may be increased consumption of junk food, chocolates and ice creams, soft drinks. Unhealthy dietary practices are associated with future health risks that's why factors directly related to dietary practices like education status and health awareness of Parents and families, socio economic status need to be study in detail. Parents and children need to be educated regarding nutritive values of various dietary products, balanced and healthy diet and healthy hazards related to unhealthy food products.

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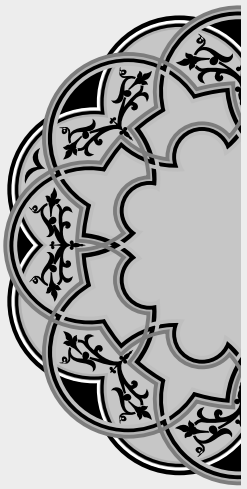

"A fool says what he knows,
and a wise man knows what he says."

YIDDISH PROVERB

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Shafat Khatoon	Intellectual concept, Study Design, Analysis, Discussion and recommendatation	
2	Aijaz Ahmed	Concept, Data collection and analysis	
3	Muhammad Zubair	Study design, Data collection	