

An Assessment of Adolescent Eating Habits in Public Schools of Chak Shahzad, Islamabad

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Abstract: Eating patterns influence the nutritional status, health, learning process and academic performance of the school children. This study was conducted to explore the food availability at school canteens and food intake by adolescents in break period. A cross sectional study was conducted on 290 adolescents (145 were girls and 145 boys) of 6th, 7th and 8th grade from public schools of Chak Shahzad, Islamabad. Pre-structured questionnaire was used for data collection. Chi square / fisher exact test was done by using SPSS to check the association. The mean age of adolescents was 12.6 ± 1.33 years. They were reported normal, underweight, overweight and obese as 176 (60.7%), 79 (27.2%), 27 (9.3%) and 9 (2.8%) respectively. Nutritional status was significantly related with gender, age and grade of adolescents with p-value <0.05. Response showed that 199 (68.6%) adolescents prefer canteen food during break time, and 66 (22.8%) give preference to homemade lunch. Few of them 25 (8.6%) take fruits in school break time. About (24.8%) took drink with lunch which were juices 30 (10.3%), milk/milk shake 14 (5.9%), carbonated drinks 6 (2.1%), and tea/coffee 13 (4.5%). Consumption of carbohydrates, protein, fruits, vegetables, and dairy products was found as 64 (22.1%), 26 (0.9%), 32 (11%), 4 (1.4%) and 1 (0.3%) respectively in adolescents who brought their lunch from home. Around 49% of students were not satisfied with food provided on their school canteens. Availability of food items on school canteens and overall eating pattern of adolescents is not satisfactory. There is a need of school canteen guidelines/policy and nutritional education to canteen staff and pupils.

Keywords: School Canteen, Pakistan, Eating Habits, Adolescents

1. Introduction

“The promotion of a healthy diet during adolescent contributes not only to better mental, social and physical health during this life stage, but also sets the basis for better health throughout life course, and contributes to a longer life with better quality” WHO [1]. It is a topic of concern at the moment because of its association with development of non-communicable diseases (NCDs) in later life.

Adolescence is a period of transition between life as a child and life as an adult. During this decisive period the food/meal intake patterns and dietary patterns are built and

have vital effect on health and lifetime nutritional status of the individuals. Food consumed in adolescence set the pattern for future eating behavior and food preferences [2]. Malnutrition at this stage has an impact later in life [3].

Unfortunately, most studies show that adolescents have poor eating habits that do not meet their recommended dietary guidelines [4]. Their diets are characterized by high intake of calories, sweetened beverage, fat, salt, sugar, and less intake of vegetables and fruits. Skipping of meal, specially breakfast, eating unhealthy snacks and fast food are also associated with poor eating habits [5, 6].

Nutrition initiatives have been focusing on children and

women in the most developing countries, thus, neglecting adolescents. Focusing on adolescents nutrition needs could be an important step towards breaking the vicious cycle of malnutrition, chronic diseases and poverty.

According to the 2010 Australian Dietary Guidelines for Children and Adolescents, Healthy foods and drinks comprise of the following: cereals and breads, rice, noodles, pasta, fruits, vegetables, legumes, nuts, dairy foods, low fat milk, cheese, yoghurt, lean meat, poultry, fish, eggs, and water. On the other side, Unhealthy foods and drinks include the following: drinks including carbonated drinks, flavored drinks; pastry-based or crumbled hot foods, deep fried foods, savory snack foods such as biscuits, crisps, chips; ice creams and cakes, muffins, sweet pastries, slices, and bars [7]. The 2012 Nutritional Guidelines for Filipinos have similarly advised the consumption of more fruits and vegetables and limit the intake of foods that are high in fats, sugar and salt [7]. Poor nutrition of adolescent is a risk for the overall development of country. Investing on adolescent health is a wiser option for earlier prevention of chronic diseases for low income countries [8].

Adolescents spend most time in school. The food provided through the school canteen may comprise a third of a student's total daily intake and have a significant influence on their health and nutrition. School food environment can shape to healthy or unhealthy eating habits depending on the food available [9]. For promotion of healthy lifestyle well organized school environment can be an ideal place [10]. There are no substantial literatures about the nutritional values of foods and drinks offered at school canteens. However, some studies support the idea that children may not be eating the right kind of foods at school. Schools can promote healthy eating through school policies, role modeling by school staff, curriculum and regulating the availability of foods for students to purchase at school [11].

Adolescents constitute 22% of the population in Pakistan. This study is designed to access the eating habits of adolescents during break time in public schools of Islamabad. Results can be helpful to the school management for the formulation of healthy food guidelines and provision of healthy foods in the canteen to help reduce the double burden of malnutrition in the country.

2. Operational Definition

2.1. Adolescents

Adolescence is the period in human growth and development occurring after childhood and before adulthood, from 10 to 19 years. Based on different phases of development, adolescence is divided into early adolescence (10–13 years), middle adolescence (14–16 years) and late adolescence (17–19 years) (WHO).

2.2. Eating Habits

The way individual or group of people eats, what they eat, how they eat and when. It includes meal frequency, diet

composition and food choices of individuals.

3. Methodology

A cross sectional study was conducted in four months of duration from July to Oct 2015 on purposive selected adolescents from public schools of Chak Shahzad, Islamabad. The sample size was calculated using the single population proportion formula.

$$N = z^2P(1 - P) / e^2$$

Where:

n=the sample size

z^2 =Z value corresponding to a 95% level of significance=1.96

p=Adolescent population which is 22% according to Bureau of Statistics GOP 2011

$q=(1-p) = (1-0.22) = 0.78$

e=Absolute precision which has been taken as 5%

By putting values in formula:

$$N = (1.96)^2 \times 0.22 (0.78) / (0.05)^2$$

The calculated sample size is 263. By 10% increase it is 290. Finally 290 assessments, 145 from girls and 145 from boys were carried out. Healthy adolescents of 6th, 7th and 8th grade whose age's ranges from 9 to 17 years, present in schools during the survey were included in the study. While those suffering from any chronic disease, or having any type of food allergy was excluded from the study. Data was collected by using pre-structured questionnaire with questions regarding school food environment, homemade food, and eating habits of adolescents. Height (cm) was measured with the help of measuring tape. Weight was measured in kilograms using bathroom scales. BMI was then calculated by using the following formula: Weight in kg/Height in m^2 . For statistical purposes BMI ranges were divided into WHO defined four groups. Which are BMI <18.5 as underweight, 18.5-24.5 as normal, 25-30 as overweight and >30 as obese. Food intake practices of school children during break time was taken as dependent variable while age, gender, weight, height, BMI, habits of food consumption, availability of food, and consumption of homemade food by adolescents were considered as independent variables.

Data entry and analyses was done by the statistical software program SPSS version 21.0. In descriptive analysis Mean, and Standard Deviation for quantitative variables while Frequencies and Percentages was calculated for categorical variables. In inferential analysis chi-square or Fisher's exact test was carried out. 95% confidence interval with a significance level of p-value <0.05 will be used for all analyses. Results were shared with schools and parents of children for appropriate interventions.

The ethical approval from an internal review board of Health Services Academy was obtained to conduct the study. Formal permission from the management of the selected school was obtained. Written informed consent was obtained from the participants before filling a questionnaire. Data was

be used for the purpose of study only. Confidentiality and anonymity was maintained.

4. Results

4.1. School Canteen Characteristics

The study was conducted in girls and boys public schools of Chak Shahzad Islamabad. Both schools were closed campus and it was not allowed for the students to go out from the school during study or break hours. Students had to spend six hours in school. According to the information obtained from schools/canteen management no school had canteen food guidelines. Girl's school has food program for students and provide information session to canteen staff. It had clean canteen and covered food availability. Boys school offer information session to school canteen staff but it had no food program for pupil. It had clean canteen but with uncovered food. Both schools offer filtered water for students. Both schools offer carbohydrate group food during break time to students, only girl school offer protein item in the form of kabab burger. There was no source of vegetables, fruits, and milk products in both schools canteen. Carbonated drinks were available on both canteens while boy's school canteen also offers tea to their students in break time. (Table 1)

Table 1. School canteen characteristics as reported by school management.

Variable	Girls school	Boys school
Food guidelines/policy	No	No
Food program	Yes	No
Information session for canteen staff	Yes	Yes
Campus rule	Closed campus	Closed campus
Food covered	Yes	No
Canteen clean	Yes	Yes
Water	Filtered	Filtered
Food groups availability on school canteens		
Carbohydrate group	Yes	Yes
Protein group	Yes	No
Vegetables	No	No
Fruits	No	No
Milk products	No	No
Carbonated drinks/Tea	Yes	Yes

4.2. Adolescent's Baseline Characteristics

Total 290 adolescents from public schools of Chak Shahzad, Islamabad were approached. Out of total 145 (50%) were girls and remaining 145 (50%) were boys. Participants' age ranged from 9 to 17 years. The mean age was computed as 12.6 (SD 1.33) years. The mean age of female adolescent was 12.6 (SD 1.33) years while of boys was 12.8 (SD 1.58) years. Among total 126 (43.4%) were the students of 6th class, 101 (34.8%) were from 7th and 63 (21.7%) students were from 8th class. Illiteracy was found in 94 (32.4%) mothers of the respondents. Mothers of most had passed primary/middle class 101 (34.8%) followed by Secondary/higher secondary school certificate 68 (23.4%) and bachelor/master's degree 21 (7.2%). Only 6 (2.1%) had higher education than master. Majority mothers of the adolescents were unemployed 267 (92.1%). Fathers of most

had Secondary/higher secondary school certificate 104 (35.9%) followed by primary/middle class 88 (30.3%) and bachelor/master's degree 48 (16.6%). While 19 (6.6%) had higher education than master. 31 (10.7) of them had uneducated fathers. Among total 271 (93.4%) had employed fathers. Girls had mean height of 1.46 (SD 9.4) meters and with a mean weight of 38 (SD 8.55) kg. Whereas male adolescent had mean height of 1.35 (SD 13.9) meters with mean weight of 41.7 (SD 5.87) kg. From the results most of the students that was 176 (60.7%) had normal BMI However, prevalence of under and overweight was observed among the respondents as well. Among those who were malnourished 79 (27.2%) underweight while 27 (9.3%) were overweight and 9 (2.8%) were obese. The mean BMI of girl students (17.78%) was lower compared to male students (22.87%).

4.3. Dietary Intake of Adolescents

More adolescents 267 (92.1%) reported to had habit of consuming their meal regularly. Habit of taking 3 or <3 meals/day was reported by 265 (91.4%) adolescents which is a typical oriental pattern. Snacks between the meals were not a common feature. It seems alarming that more than 90% of respondents had habit of consuming less than 4 meals a day. Few 18 (6.2%) of the studied adolescents take 4 meals a day. Only 7 (2.4) had habit of taking more than five meals. (WHO recommend 4-5 meals/day). Meal consumption 3/<3 times was reported more in girls 137 (94.5%) than boys 128 (88.3%). Taking meal 4-5 times and >5 times was more in boys which was 11 (7.6%) and 6 (4.1%) compared to girls 7 (4.8%) and 1 (0.7%) respectively. The difference in girls and boys number of meal consumption was not statistically significant with p-value 0.093.

On the data collection day 245 (84.5%) respondent adolescents reported that they had breakfast on that day, while other 45 (15.5%) skipped it. For those who did not have breakfast, majority reported inadequate time, not used to having breakfast, and no appetite to be the reasons. When asked about breakfast consumption practices, 224 (77.2%) reported that their take breakfast at every morning. Nine (3.1%) never take their breakfast. Those who almost ate breakfast were 4 (1.4%), and those who consume it sometimes were 9 (3.1%). Approximately equal percentages were reported towards breakfast consumption attitude among boys and girls respondents. The minor difference was not statistically significant with p-value 0.695. The most commonly consumed commodities were found to be bread (41%) or paratha (27.2%) and egg (41.4%) followed by tea (37.6%), which was taken, together in the morning. Children also consumed to a lesser extent of roti (7.9%), milk (7.2%), jam (2.4%), margarine (2%), fruit (1.7%), vegetables (1.6%), juice (1.4%), rice (0.7%), cake, rusk, chicken and coffee (0.3%) each.

On survey day, out of 290 adolescents 218 (75.2%) ate at the break time; whereas 72 (24.8%) did not take any sort of food during school timings. More girls 123 (84.8%) consumed lunch than boys 95 (65.5%). This difference is significant with p value <0.001. Responses showed that 199 (68.6%) adolescents prefer canteen food during break time, and 66 (22.8%) give preference to homemade lunch. Analysis

showed that more boys 107 (36.9%) prefer to buy lunch from school canteen than girls 92 (31.7%), while 43 (14.8) girls gave preference to home lunch box. Consumption of fruits was seen more in boys which was 15 (5.2%) than girls 10 (3.4%). The difference in consumption preferences between boys and girls is statistically significant with p-value 0.001. Fruits to be consumed were as; apple (9.7%), banana (1.4%), grapes (0.7%), peach (1.7%) and strawberry (0.3%). Other commodities were as; paratha (7.5%), roti (2.5%), and bread (6.2%) along with egg (7.8%), jam (2.1%), saalen (1.8%), and acchar (1%). Other foods were rice (1.4%), milk (0.3%), chips (2.4%), and biscuit (2.1%). 172 (59.3%) bought something for eating or drinking from school canteen. Different food items purchased and consumed from the school canteen by adolescents were as; samosa (15.1%), chat (2.1%), naan (12.9), channy (4.4%), roll (10.2%), rice (1%), nimko (5.1%), biscuit (10%), chips/paper (11.6%), chocolate (0.7%), coke (1.7%) and juice (6.6%). Pupils who bought their lunch in the school canteen, 75 pupils indicated the reasons for snacking from school were as liking 12 (4.1%), hunger 31 (10.7%), clean food (2.4%), fresh food (1.3%), good quality food (13.1%), healthy food (1%), and tasty food (5.2%) etc. In total, 72 pupils (24.8%) took drink with lunch. Drinks that pupils consume were juice 30 (10.3%), milk/milk shake 14 (5.9%), carbonated drinks 6 (2.1%), and tea/coffee 13 (4.5%), while 218 (75.2%) pupil took plain water with food. 6 (2.1%) pupils take no drink or water with food.

Around 49% of students not satisfied with food provided on their school canteens. Dissatisfaction level was more in girls. About 33% girls were not satisfied with the food provided on school canteens; While 45 (15.5%) boys were dissatisfied. The difference between lunch satisfaction among boys and girls is significant with p-value <0.001. The common reasons quoted by students for being dissatisfied with the school lunch included: Meals provided were not healthy (21.4%), unhygienic (9.9%), not of good quality (3.7%), costly (3.7%), not labeled (0.7%), not tasty (1.3%), no variety (3.1%), not covered, not fresh oily and spicy food (0.3% each). Money given to students for food ranged from Rs. 0 to 200/-, with the mean of 25.7 (SD 23.38) PKR per day. It was found that girls students (mean 19; SD 13) got comparatively less pocket money than boys (mean 32; SD 28.8).

Table 2. Adolescents eating preferences.

Study variables	Girls	Boys	Total	P-Value
	N (%)	N (%)	N (%)	
Eating at school				
No	22 (7.6)	50 (17)	72 (25)	<0.001
Yes	123 (42)	95 (33)	218 (75)	
Lunch preferences				
Canteen food	92 (32)	107 (37)	199 (69)	0.01
Homemade food	43 (15)	23 (8)	66 (23)	
Fruit	10 (3.4)	15 (5)	25 (9)	
Satisfaction about canteen food availability				
No	96 (33)	45 (16)	141 (49)	<0.001
Yes	49 (17)	100 (35)	149 (51)	

Consumption of carbohydrates, protein, fruits, vegetables, and dairy products was found as 64 (22.1%), 26 (0.9%), 32

(11%), 4 (1.4%) and 1 (0.3%) respectively in adolescents who brought their lunch from home. The major energy providing group for pupils who rely on school canteen was carbohydrate. Other food groups were not included in the diet of those who buy for eating from school canteen. About half 142 (49%) adolescents reported to use some sort of vitamin or food supplements. There was no much difference in girls and boys who use these with percentages 48.3% and 49.7% respectively.

5. Discussion

Healthy eating is important for student development. School eating environment plays a key role in shaping students' behavior. The schools which we observed had no canteen food policy/guidelines. Girls has food program, offer information session for canteen staff, clean canteen and covered food availability. Boys school offer information session to school canteen staff but it had no food program for pupil. It had clean canteen but with uncovered food. In Hong Kong 53.0% of schools had developed their healthy policy. About 92.2% were aware of the lunch guidelines, 78.4% schools take part in healthy eating promotion activities during the period of study [12].

Food habit is a major determinant of nutritional status. The present study revealed that majority of the adolescents 265 (91.4%) had three or less than three meals daily. This is highly commendable and should be encouraged. Review of literature shows that no in depth research are available for such data in Pakistan. Meal pattern is covered to some extent in National Nutrition survey but is deficient in covering all stages of life cycle, among which, adolescence is one. It reflects general behavior of Pakistani population, according to which usually three meals a day are eaten [13]. Consumption of breakfast can boost a child's diet and help in holding the attention of the pupils in school, so associated with better academic performance. The present study revealed that 84.5% reported had breakfast on survey day. The percentage of those who consume regular breakfast (77.2%) is less than the study of Poland according to that 83.2% has regular breakfast [14]. The findings of a Mauritius study revealed that 92% of the children mentioned taking breakfast in the morning [15].

Out of 290 adolescents 218 (75.2%) ate at schools on survey day whereas 72 (24.8%) did not take any sort of food during school timings. Response of this study showed that 68.6% adolescents prefer canteen food during break time and 22.8% gave preference to homemade lunch. Few respondents take fruits 8.6% in lunch. The results of Hong Kong study were opposite than ours according to which for 80.5% pupil source of snacks was from their home and 12.1% of students buy snacks from school tuck shops or vending machines [12]. For those who consumed homemade lunch the most popular energy giving food was found to be fruit (11%) followed by egg (7.8%), paratha (7.5%), and bread (6.2%). Mauritius Packed lunches consisted mainly of eggs and convenience foods such as sausages without any vegetables [15].

Unfortunately school canteens observed in this study lack healthy and variety of food items. A study conducted in De La Salle Araneta University (DLSAU) indicates the same results that most foods and drinks of the three selective school canteens were found to be unhealthy with one canteen serving nearly all unhealthy foods and drinks [16]. While another study revealed that main meals available for pupil were healthy pizzas, roast meats, sausage rolls and chicken korma. Drinks that pupil consume in our study were juices, milk/milk shakes, carbonated drinks and tea/coffee. Other study showed the results that pupil had fizzy drink during their lunch [17].

Results of this study indicate that the diets of adolescents are very limited in diversity. The pattern is characterized by minimal intake of protein group foods, vegetables, fruits and dairy products and high consumption of carbohydrate especially in those who depend on school canteen. A study of Lithuania also indicates low intake of vegetables and fruits [18]. According to the study of Turkey conducted by Dilek Ongan, Contribution of fat and saturated fat to energy and sodium content was high in school lunch [19]. Another study of Turkey indicates that it is worrying that the consumption of sweets is high whereas fruit and vegetable consumption is low [14]. Study conducted in Tanzania also reported low fruits and vegetable intake and high intake of snacks and soft drinks [20]. Study of Saudi Arabia also indicates that vegetables and fruits, except dates, were not frequently consumed by most students [21]. According to the previous study conducted in Pakistan consumption of foods from different food groups varied. Junk foods and fizzy drinks consumption was quite high among children [22].

It is very important to provide healthy foods at school canteens for adolescents. In this context (Helen, 2005) says that “the components of an eating well strategy for school food are now being brought together and we should welcome this new opportunity to make a real impact on the health of young people. We need however to remain vigilant that the basic principles of good nutrition remain at the forefront of decision making”. Similar spirit is required in Pakistan, so that healthy food is available to the adolescents who are the most important group of Pakistani population [22].

6. Conclusion of the Study

No food guidelines were followed by school canteens as a result these are providing unhealthy food to adolescents. Diets of pupil in schools are limited in diversity with minimal consumption of protein foods, fruits, vegetables and dairy products. There is a need for nutrition education for school management and adolescents to sensitize them on healthy eating habits.

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