Assessment of dietary behavior of high school students of an urban setting in Pakistan

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Abstract

Objectives: Exposure to energy dense foods increases the risk of obesity and non communicable disease in adult life. We conducted this study to assess the dietary behavior among class six to ten school students of government and private schools in Pakistan.

Methodology: This cross-sectional study was conducted in a sub district of Hyderabad, Pakistan using a questionnaire to measure food frequency by interviewing them through a recall method. A total of 504 male and female students of 6-10 grades were selected by simple random sampling method.

Results: We found that 83% children did not bring lunch from home to school and 44% ate at a fast food outlet during the school time. We also found that 31% schools allowed some food chain restaurant to sell fast food to students during recess hours and schools took their students to such restaurants for fun and eating trips for on an average of 1.8±0.8 times a week. More than half of the students ate breakfast and lunch at home less than three times a week. We also found that children ate vegetables and fruit least frequently whereas starch and meat containing foods more frequently and in greater amounts.

Conclusions: School children in our sample were exposed to high density fast foods and ate vegetable and fruits less frequently and could access fast foods much easily during school hours. Most did not bring lunch to school. Many schools facilitated the students to be exposed to fast foods by letting fast food companies to operate inside schools or by arranging student trips to the fast food outlets.

Key Words: diet, children, school, fast food, behavior

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Introduction

[1] Evidence clearly shows that consumption of unbalanced and energy rich foods over time leads to the development of many non-communicable diseases (NCDs) including type-II Diabetes mellitus (DM) [2] and cardiovascular diseases. [3] Children who eat healthy diets are at lower risk of developing cardiovascular diseases in adult life. Asian population has highest burden of the NCD risk factors including consumption high calorie and energy dense diet. There is sufficient evidence that long-term consumption of high fat and sugar rich foods can contribute to obesity among school age children; not only in developed but also in low and middle income countries. [4, 5] Childhood obesity is a progressive phenomenon and is a known risk factor for the metabolic syndrome and type-II DM. [6] International Diabetes Federation estimates that currently 415 million adults have DM which will rise to 642 million by 2040. [7] Also,most diabetics live in low and middle income countries which will experience greatest increase in the burden of DM over the next 22 years. [8]

School children are exposed to these energy dense foods not only at homes but also at schools. As most food chain outlets and franchises target children for marketing their products, which is mostly "junk food" i.e. providing little nutrition but of high caloric content, it leads to unhealthy weight gain. [9, 10] School policies and practices play a pivotal role on children's abilities to develop and practice healthier life styles. They have the responsibility to encourage children to consume healthy diets and engage in regular physical activities. Studies have consistently shown that schools can help children maintain a healthy weight if an all-inclusive program of healthy diet and physical activity is implemented in full sprit. [11] Research, which used schools as platforms for the promotion of healthy diets in children, shows that parental involvement, implementing broader environmental changes to to aware children about healthy food choices as part of the curriculum, positively changed children's dietary patterns. [12, 13] Pakistan stands among the countries which have prevalence of obesity, among boys and girls, between 15% to 20%. [14] Pakistan being a low income country faces a*double burden of diseases;* with the burden of many NCDs and their risk factors increasing. [15] Although the dietary habits in adults has been studied much but the subject needs detailed inquiry in children in Pakistani context. This study was aimed to assess the dietary patterns prevalent among high school children in an urban area of Pakistan.

Methods

This cross sectional study was conducted during July and August 2009 in one of the four *Talukas* (smaller administrative units in a district) in Hyderabad. Hyderabad city is the third largest city in Pakistan with a current estimated population of 2 million inhabitants. The target population for the study was grade 6 to 10 high school male and female students, from 8 private and 2 government schools of the selected *Taluka*. The sample size of 504 male and female students was selected though simple random sampling method from the government and private schools and subsequently from the classes according to the probability proportional to size. The sample was divided among the male and female students in schools equally because they made up equal proportion in their registration in high schools in the *taluka*. A structured questionnaire was used to inquire about diet related behaviors of students; it was pilot tested on 30 students for corrections before final interviews. Data were analyzed through SPSS version 17.0 by using appropriate descriptive and inferential statistics such as chi square and t-test at 5% level of significance. The study was approved by the ethics review committee (ERC) of the Aga Khan University (AKU) Karachi. A prior written consent and assent was obtained from the students and their parents, respectively.

Results

The results were available for 501 students; 80% and 20% of whom were from private and public schools, respectively. The mean age of students was 13.8 ±1.6 years old, 255 (50.9%) were males and 246 (49.1%) females. Sixty seven percent students were from middle socioeconomic status. There was almost equal participation of students according to their classes, i.e. 20.2% in class 6 and 17.6% in class 10. Table 1 shows results of the

variables on behavior of students about consumption of various foods during and after school time based on recall of the week before the interview. A significant 83% did not bring lunch in school, only 7% ate at home and 44% ate at a fast food restaurant during school time for about 1-3 times in the week before the interview.

Table: 1 Dietary behavior of high school students in the week preceding the interview

	n (%)
Bought lunch at school	
Never	165 (33%)
1-3 Times in the week	336 (67%)
Brought lunch to school from home	
Never	417 (83%)
1-3 Times in the week	84 (17%)
Ate lunch at home on a school day	
Never	36 (7%)
1-3 Times in the week	464 (93%)
Did not eat lunch at all	
Never	332 (67%)
1-3 Times in the week	168 (33%)
Ate at a fast food outlet	
Never	279 (56%)
1-3 Times in the week	222 (44%)
Ate breakfast last week	
Never	68 (14%)
1-3 Times in the week	433 (86%)
Meals or snacks while watching television	
Never	114 (23%)
1-3 Times in the week	387 (77%)

We found that during the 6 month period prior to the interview a significant 31% of the schools had allowed any fast food chain restaurant in the city to run an outlet inside the school premises during recess time for children to buy the food; which included the chicken or meat burgers, pizzas, fried chicken and fried potatoes. A quarter of the schools arranged group trips to these food chain restaurants for eating lunch, which also consisted mainly of fast food. On an average schools arranged such trips 1.8(SD=0.4) times in the six months prior to the interview. We also inquired as to what were the cultural patterns prevalent with regard to eating meals in homes and we found that although half of the students ate breakfast alone and more than three quarters of them ate lunch and dinner with their parents (Table 2).

Table 2: Eating practices of high school students

	n (%)
Fast food outlet at school in last 6 months	
Yes	153 (31%)
No	346 (69%)
School trips to a fast food restaurant	
Yes	119 (24%)
No	382 (76%)

Breakfast a day before	
With parents	262 (52%)
Alone	239 (48%)
Lunch a day before	
With parents	357 (71%)
Alone	144 (29%)
Dinner a day before	
With parents	388 (77%)
Alone	112 (22%)

We adapted adult food frequency questionnaire and used it to assess the foods eaten by the students. The list of common food items was edited after the pre testing of the food frequency questionnaire on 30 students prior to interviews to develop the list of commonly eaten foods in the area. Recall for each day of the week prior the interview was used as a method to measure the frequency of consumption of these foods. The results of the most common foods consumed are presented in Table 3. Generally, the students consumed starch and meat containing foods moderately whereas the consumption of vegetables was limited to very low frequency i.e. 'less than a week'' in some and to ''Never to once a month'' in most cases. Almost half of the students consumed protein foods at least once a week. With mango and orange being the fruits available in the season when the interviews were done; they were consumed by a third of the students on weekly basis. However the consumption of other fruits least frequent.

Table 3: Frequency of consumption various foods by the high school students of Hyderabad, Pakistan

	Never to once a month n(%)	**Once in last week** n (%)	**Once daily** n (%)	**2-5 Daily in last week** n (%)
Starch				
Paratha (fried traditional bread)	187 (37%)	132 (26%)	159 (32%)	23 (05%)
Puree(deep Fried subcontinental bread)	322 (64%)	136 (27%)	34 (07%)	7 (01%)
Briyani(chicken rice)	144(29%)	291(58%)	43(09%)	23 (05%)
Vegetable (cooked)				
Cauliflower	330(66%)	159 (32%)	9 (02%)	3 (01%)
Cabbage	344(69%)	140 (28%)	12 (02%)	5 (01%)
Brinjal	326(65%)	163 (33%)	10 (02%)	2 (0.4%)
Gourd	359(72%)	135 (27%)	6 (01%)	0.4 (0.4%)
Beetroot	438(88%)	48 (10%)	9 (02%)	2 (0.4%)
Reddish	378(76%)	100 (20%)	13 (03%)	5 (01%)
Turnip	404(81%)	88 (18%)	5 (01%)	0 (0%)
Yam	433(88%)	49 (10%)	8 (02%)	5 (01%)
Bitter gourd	411 (83%)	76 (15%)	9 (02%)	2 (0.4%)
Beans	409 (82%)	74 (15%)	12 (02%)	4 (01%)
Lentils	193 (39%)	274 (55%)	32 (06%)	2 (0.4%)
Fruit				
Watermelon	285 (57%)	153 (31%)	54 (11%)	8 (02%)
Apricot	281 (56%)	167 (33%)	41 (08%)	12 (02%)

Peach	293 (59%)	152 (31%)	46 (09%)	7 (01%)
Mango	103 (21%)	70 (14%)	173 (35%)	154 (31%)
Orange	127 (26%)	173 (35%)	173 (35%)	26 (05%)
Protein foods				
Mutton/Beef	184 (37%)	264 (53%)	41 (08%)	6 (01%)
Chicken curry	116 (23%)	295 (59%)	71 (14%)	15 (03%)
Fish fry	270 (54%)	203 (41%)	22 (14%)	3 (01%)
Fish curry	277 (56%)	192 (39%)	20 (04%)	4 (01%)
Egg ommollette	186 (37%)	199 (40%)	110 (22%)	5 (01%)
Boiled egg	273 (55%)	178 (36%)	45 (09%)	2 (0.4%)
Dairy				
Whole milk	192 (39%)	84 (17%)	200 (40%)	23 (05%)
Skimmed milk	288 (58%)	74 (15%)	119 (24%)	16 (03%)
Yoghurt	175 (35%)	177 (36%)	128 (26%)	16 (03%)

Discussion

Our findings that most children in the schools did not bring lunch from home and most of them ate at a fast food outlet during the school hours, a quarter of schools allowed food chain restaurant to sell fast food to students during recess hours and took their students to such restaurants for fun trips and eating trips; highlight the importance of interventions to influence children to eat healthier food. As the children were exposed to energy dense foods they were probably less interested to eat required amounts of vegetables and fruits.

Most children did not bring their lunch therefore they were more inclined to buy cheap and high caloric low energy foods from or outside their schools. Additionally, most schools did not have explicit policy about lunch boxes. Bringing lunches to schools ensures that students are less exposed to high fat and energy dense foods. [16] Interventions with parental involvements in the dietary modification of children have shown better outcomes among obese children. [17] However, as working parents are challenged by time constraints to help children eat quality foods at schools and at home, [18] realization by parents about the importance of healthy diets is a positive predictor of children adopting healthy diet related behaviors. [19] Not only this but the effects of learning from parents' behavior towards eating healthy food last longer than parents just controlling their children in order to eat healthy food. [20]

As most students in our study bought foods during school hours or from out of home during non-school time, most of this food consited of fast food. As fast foods\ consist of mainly fried ingredients, they are shown to be associated with abnormal weight gain in children. [21] Since more than a quarter of these schools facilitated encouraged children to eat at fast food restaurants and other quarter by allowing fast food restaurant to sell such foods to children, the studies are consistent that access to fast foods, in terms of distance, enhances the consumption of these foods. [22, 23] Interventions have helped children to eat lunch within school during school times have reduced eating at fast food restaurants. [24]

The fact that most children did not bring their lunch from home and that they were eating fast foods during school times justifies our finding that children did not eat vegetables as main meals of the day. Our finding is consistent with research elsewhere that exposure and access to energy dense and sweet foods leads to diminished consumption of healthier foods such as fruit and vegetable. This is because of high caloric content of the fatty and energy dense foods which may provide low vitamins and other essential nutrition but are high in calories and are highly tasty and additctive. [25] The consumption of fruit and vegetables is consistently shown to be associated with children growing with normal weight and development of lower risk of NCDs. [26] Influencing schools to adopt policies which require children to bring lunches and draw criteria for the contents of the lunches has also shown significant improvements in the quality of lunch in schools in developed countries. [27] Home based interventions directed at changing behavior of parents toward choices such as wise buying, cooking

and eating healthier foods have shown to contribute to healthy weight gains in children; they, however, require education of parents on healthful dietary choices. [28]

Strengths and limitation

The strengths of study included pilot testing of questionnairewhich was edited accordingly to make it easily understandable even by the students of the sixth class. This study is also one of the few which present an in-depth analysis of food frequency of school going children in Pakistan. The data collectors were given a three days training before the study. The children of junior classes were not able to concentrate for too long at the time of interview especially on food frequency related questions; which was a weakness in our study.

Conclusion

We conclude that high school children in Pakistan are exposed to high density fast foods and eat vegetable and fruits less frequently. Fast food is readily accessible to these children outside their homes. In addition to this; parents played a little facilitative role in encouraging or supporting their children to adhere to healthy foods. We recommend an increasingly responsible role of parents and families to ensure that their children are not exposed to fast foods when they are in schools or outside their homes. We also recommend that schools be monitored, facilitated by giving guidance, policy advice and support by the relevant segments of the state such as health and education departments, so that they can encourage children eat healthier foods during school hours.

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