A study of public schools students' consumption of school buffet snacks

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Abstract

This study investigates the quality and quantity of school foodstuff available to the students. The survey was conducted utilizing questionnaire for collecting data. The samples were 490 students at the last grade of daily elementary school, junior high school, and high school in cities of Bojnord, Esfarayen and Shirvan selected randomly. The findings indicate that about half of the students (54%) purchase foodstuff once a day; and around 20% never buy from the buffet. The majority of the people buying foodstuffs from the buffet (56.8%) have an average rate of purchasing. The number of students who buy rarely and limited stuff from the buffet (31.5%) was three times more than those who purchase frequently and various stuff (11.7%).In regard with the food being purchased; most of the students (75.3%) prefer cakes. The students who buy juice and biscuits stand on the second and third rank (with 33.3 and 22.2% of the sample respectively). Another finding is that no significant correlation exists between students inclination for purchasing from school buffets and the independent variables including the city where the students study, gender, parents' jobs, and the pocket money. It was also found that the students' evaluation of the school buffet, their grade, important others (parents, teachers and friends) expectations and approval contribute to the students tendency for buying from school buffets.

Keywords: School, Snack, Student

Introduction

According to experts, nutrition is a multi-faceted issue that can be examined from different angles. At macro level, estimations have shown that childhood malnutrition could impose adverse consequences to governments. Researchers in the field have attempted to draw policy maker's attentions to the consequences of malnutrition, so that with planning preventative programs, they can save future generations from stagnation and retardation [1]. They believe that food quantity and quality and a balanced diet in childhood and adolescence prevents future incidence of many dangerous and incurable diseases. Accordingly, in many countries, the issue of nutrition in these ages is a top health priority [2].

That is why healthful eating patterns in childhood, adolescence, and especially during school years is more important than in other times in life [3]. Food is an essential part of school life and plays an important role in this period. Establishing healthful eating habits is not only important at this period in life, but it is also important for a healthy adulthood [4]. Emphasizing that food is the root of many latent diseases in life, Irena Kesser et al. point out that food habits and food choices established in childhood and adolescence remain largely the same throughout adulthood [5].

In fact, in transition from childhood to adulthood, different aspects of lifestyle habits

including dietary patterns change in adolescents due to higher degrees of freedom of this age group in terms of buying power and pocket money for food and snacks, and tendency to spend more time with peers, copying them and gradually consolidating these habits [6].

These established food habits are related to academic success of students. Michelle Florence believes besides many other factors such as gender, ethnicity, school quality, and socio-economic factors, academic success is also influenced by food and nutrition. Research also confirms that malnourished children have less academic success, and are more involved in negative academic issues like late registration, repeating a grade, and drop-out [7]. Confirming this issue, Howard Taurus points out that health specialist have been attempting for many years to show the important relationship between nutrition and learning ability, and have shown that this could be a logical first step in the development of the school food service program, monitoring educational nutrition programs, and guidance for parents with school children [8]. Undoubtedly, whilst a healthful diet pattern positively affects learning and academic success, it is also important since in no other development period, as much as in puberty and adolescence, does human need energy [9]. Pubertal period is not only associated with physical growth, mood changes, and emotional and psychological developments, but also missing meals, interest in junk food, and eating out that are characteristics of food habits in adolescence, which appear to be influenced by family, friends and mass media [10].

Food patterns and habits of children are at first affected by the family setting, but as they enter school and spend more time outside home and away from direct supervision of parents, they acquire many new habits of "what to eat" and "how to eat" outside their usual habitats. Refreshments, as foods and drinks that reinvigorate the body [11], are occasions in which the child has greater freedom and autonomy to choose food types of interest. In Iran, few studies have investigated the situation with refreshments taken by students, which suggest inappropriate consumption patterns of refreshments and low value foods. A study in Khoramabad-Lorestan showed that 20% of students under study used low value snacks [12]. Another study on students in Tehran showed that 14. 2% fed on banned foods in school [13]. A study conducted in Qazvin indicated that 16.8% of students had procured a variety of banned foods from school buffet snacks [14].

Given the importance of food intake and share of refreshments in providing students health and nutritional needs, and also the fact that so far no study has investigated the level and value of school buffet snacks foods consumed by students at different grades, this study was conducted to investigate students' food habits in relation to foods available at school buffet snackss.

Method

This descriptive, cross-sectional survey used a researcher-made questionnaire to measure the quality and quantity of buffet snacks foods consumed by students and their potential correlation with other parameters. In assessment of the research pivotal variable (level of consumption of buffet snacks foods by students) the following items were considered: number of trips to the buffet snacks, modes of food purchase, amount of money paid, daily level and type of snack in school, preference of purchase and consumption of foods, types of snacks consumed (banned and permitted), also other variables measured included students' attitude toward buffet snacks foods, expectation of others (teachers, parents, peers), and underlying factors such as pocket money, consumption or non-consumption of lunch/breakfast, parents' occupation, family size, gender, major, child order, …. After prepared the questionnaire, in order to assess its content validity, it was put to the judgment of a number of researchers in the field and university professors with various relevant specialties and it was clear that the

questionnaire covers all research parameters. Also, for assessment of reliability of the questionnaire, Cronbach's alpha coefficient was used. Study population included all third year high school students from three cities of Bojnoord, Esfarayen, and Shiravan in North Khorasan Province. According to the spring 2008 census, they totaled 17968 students, and based on the sample size formula, 500 students were selected as the study sample.

These students were randomly selected with considerations for geographical locations of schools (North, South, East, West, and Center) within each city and also with considerations for student gender (girls/boys). Out of the schools selected, 240 students were chosen as response group according to numbers, distributions of boys and girls in schools, school year, and city of schooling. With conducting a preliminary test and calculation of variance of study pivotal variable (level of buffet snacks food consumption by students) and placing it in the stratified sampling formula, the final sample size was determined at 500 students.

The sample size was allocated in accordance with the stratified sampling proportional to size, and the three academic levels (elementary, middle school, high school day courses), gender, and students' city of residence. Finally, students in each category were randomly selected. Data were analyzed with SPSS-18 software using descriptive statistics (central indices and distribution) and appropriate statistical tests chi-square, according to the level of evaluation of variables. Note must be taken that performing this research on elementary, middle and high school students as statistical population was with the desire and consent of these students and that the moral consideration were taken in this care.

Results

Of the 490 students, majority (42.9%) were residents of Bojnoord, 22.2% lived in Esfarayen, and 34. 9% in Shiravan. 37. 8% of students were at elementary level, 31% were at middle school, and 31.2% at high school. 44.7% of study samples were girls and 55.3% boys. Majority of students' mothers (84.2%) were housewives, and nearly half (49.1%) their fathers were self-employed.

Results indicate that half of the students (54%) purchased snacks from school buffet snacks only once a day and nearly 20% never bought anything from the school buffet snacks**.** Also, an overwhelming majority of students (56. 8%) moderately bought snacks at school. On the other hand, students that rarely purchased snacks at school buffet snacks (31.5%) were three times as many as those that often bought foods (11.7%) at school buffet snacks.

In terms of types of foods purchased, the results showed that majority of students (75.3%) bought cakes, fruit juices came second (33.2%), and the third most purchased food item was biscuits (22.2%). Half of the students (52%) declared fixing hunger as the main reason for their purchase. For the same reason, more girls (61.2%) than boys (44. 4%) shopped at school buffet snacks (P=0. 003).

In relation to food purchased at school buffet snacks, there is definite distinction among students, and high school students (33. 8%) tended to buy more than other school levels, also, boys (28%) more than girls (8. 2%) shop at school buffet snacks. Purchase and consumption of school buffet snacksfoodswas more common among those students whose parents prefer them to (62%) and those whose peers also agreed to (63.5%) than in others. It was identified in this study that attitude toward behavior was a determining factor. Those students (61.1%) with average to good assessment of the school shop hygiene status, diversity of food items, opening hours, prices and quality of foods on offer, used the shop more. However, there were only 9% of students that were not happy with the school shop but did purchase excessively (P=0.009).

Even though school buffet snackss are required by the Education Ministry to procure and sell permitted foods only (such as milk, chocolate milk, dried fruits and nuts, cakes,

sweetened breads, local bread, cheese, dates, halva, eggs, baked potatoes, cooked beans and lentils, fruits, juices, biscuits, milk curd, ice-cream, yoghourt drinks, …), but sometimes banned food items are also found in these shops (such as various sandwiches, doughnuts, burgers, chips, hot dog, variety of lollipops, chocolates, pastels, colored candies, chewing gums, carbonated drinks, tamarind, …). Results showed that majority of students (57.1%) solely purchased permitted foods, as against those that only bought banned items (10.4%). This indicates that 16.3% of students bought in equal quantities both permitted and banned food items.

1. Appearance of food items

Great majority of students of different levels (90.2%) preferred packaged foods as their top priority, and only (9.3%) of students (with a huge gap in the second place) preferred unpackaged foods. Students of different school levels had no differences in their preference for packaged foods (P=0.33). However, there was a difference between boys and girls in this respect, and girls (93.8%) more than boys (87.2%) preferred to buy packaged foods. Also, the tendency to purchase unpackaged foods among boys (12%) was more than in girls (6.2%) (P=0.04).

2. Food taste

In terms of taste, most students (69.8%) preferred sweet tasting foods, and their second preference was sour foods. In this respect, no difference was observed between different school levels (P=0.062).

However, the choice of taste was different between girls and boys, and boys (71.3%) very much more than girls (67.3%) bought sweet tasting foods. On the other hand, tendency to buy sour foods among girls (19.6%) was more than in boys (9.3%) (P=0.002).

Discussion

In this study, food consumption at school buffet snacks by students, and quality and quantity of foods consumed at school was investigated. Based on the results of this study, half of the students (54%) used the buffet snacksonly once a day and nearly 20% never purchased from the buffet snacks, which is very close to the results of a study by Rezakhani-Moghadam on students in Qazvin. In his study, it was revealed that 65.2% of students bought their refreshments in school, and 34.8% solely consumed home-made refreshments and did not use the school buffet snacks [14].

According to the results of this study, a great majority of students (56.8%) moderately used foods purchased at school buffet snacks. On the other hand, the number of students that rarely bought foods from the school buffet snacks (31.5%) was almost three times as many as those that often did so (11.7%). The same results were found by Soheili in his study on students in Tehran, where a third of the students (32.2%) bought their snacks at school buffet snacks [13]. In a study on the relationship between food purchased from vending machines and the school canteen food consumed by students, Neumark Sztainer et al. concluded that students in schools with open food policy are significantly more likely to use school canteen foods than students in schools with restricted food policy. They also reported that in schools with specific food policies, students bought food at a rate of 1.1 days/week, while in schools without such policies this figure was 1.9 days/week, indicating a significant difference between the two groups [15].

In the present study, the results showed that majority of students (75.3%) bought cakes at school buffet snacks, and fruit juice (33.2%) was the second mostly purchased item, followed by biscuits (22.2%). This result is similar to that found in other studies conducted in different cities in Iran. According to Rezakhani-Moghadam study on 1300 elementary school students in Qazvin, cakes and cookies with 58.1% was the most consumed snacks in schools [14]. The results of a study by Asfarjoni on students in middle schools in Tehran showed that most snacks consumed by over half of the girls were cakes, cookies, and milk respectively, and by boys, were fruits,

sandwiches, and cakes, respectively [16]. Also, in Soheili Azad's study on 7610 students in Tehran, it was revealed that the most authorized snacks consumed were first biscuits and cookies (47.8%), and second, fruits and juices (38.9%) [13]. A study by Ahmadi on elementary school students in Yasouj also showed that the most popular snacks were biscuits, cakes, fruits, corn puffs, chips, chocolate, candies, bread & cheese, sandwich, dried nuts, and dairy products [17]. In the present study, most students (69.5%) preferred sweet tasting foods; second most popular with 14% was sour tasting foods. There was no significant difference between school levels in this area (P=0.062). However, there was a difference between boys and girls; 71.3% of boys more than girls (67.3) preferred sweet tasting foods and tendency toward sour tasting foods among girls (19. 6%) was more than in boys (9.3%) (P=0.002). This result does not concur with the result obtained by Rowner et al. in 2011 study on 7500 middle school high school students in 222 schools across the U. S. in which younger groups and girls preferred sweet tasting foods more the boys [18].

Irrespective of gender, taste is a determining factor in buying food. In this respect, Shanon et al. emphasize that taste and cost are the important deciding factors for most students in order [19].

In the present study, in majority of students (52%), reason for buying food at the school buffet snacks during the day was to satisfy their hunger, and this was more so in girls (61.2%) than in boys (44.4%). This finding is in agreement with Asfarjoni's results in Tehran, which showed more than half students consumed snacks to satisfy their hunger. Reasons expressed by girls were to avoid fainting, gaining energy, and satisfying hunger, respectively, and boys' reasons were satisfying hunger, forgetting to bring food, not having eaten breakfast [16].

In present study, it was shown that attitude toward behavior was a determining factor. Those students (61.1%) with average to good assessment of the school buffet snacks hygiene status, diversity of food items, opening hours, prices and quality of foods used the buffet snacks more than others. However, only 9% of students that were not happy with the school buffet snacks, yet did purchase excessively (P=0.009). Review of previous research indicated that the impact of attitude on behavior had not been considered in this group of studies, and only Asfarjoni's study included students' assessment of the school buffet snacks, in which, half of the students' assessment of the buffet snacks was medium to bad, mentioning such problems as lack of hygiene, need for repairs, limited space, and disorganization. Another half complained about long queues, pushing and jumping the queue. Others complained about quality and quantity of sandwiches, also, about items being expensive [16].

Although the Ministry of Education requires school buffet snacks to procure and sell permitted food items only, in some school buffet snacks banned items are also on sale. This study showed that most students (57.1%) only buy permitted foods, and students that only buy banned foods make up for 10. 4% of all students. This indicates that 16.3% of students buy permitted and banned foods in equal quantities at school buffet snacks. In previous studies, types of food items purchased at the school buffet snacks were different. Soheili's study indicated that 14.2% of students bought banned foods [14]. Rezakhani also showed that 16.8% of students purchased a variety of different banned foods at the school buffet snacks [14].

Besides the fact that students do purchase both permitted and banned foods at the school buffet snacks, some studies have focused on the issue of availability of banned food items at the school buffet snacks. In a study by Hezavehee et al., 43.3% of students stated that school buffet snacks always has milk, chocolate, chips, corn puffs, and biscuits for sale [20]. In Asfarjoni's study, half of the students expressed that school buffet snacks foods did not have variety and they were

expensive, unhealthful, and not nutritious [16].

Conclusion

Generally, conclusions may be drawn that students' assessment of school buffet snacks, school level, important people's expectations (parents, teachers, and peers) and inducements, all have a share in, and all vary the level of food consumption by students at the school buffet snacks. The results also showed that there was no significant difference between variables of level of food consumption available at the school buffet snacks and parameters like city of residence, gender, parents' occupation, and pocket money, and students equally purchased food items at the school buffet snacks regardless of the differences in the above parameters.

In review of literature, it became clear that extensive studies have been conducted into students' dietary status, in the fields associated with medicine, and with methods comparable with the field of anthropometric measurements. The strength of this study was that unlike previous studies that were mainly performed from a medical perspective and were limited to one school level period, this study, with a social approach, focused on the two dimensions of quality and quantity of foods consumed by students at school, and its statistical population included all three school levels (elementary, middle school, and high school).

According to the results of the present study, to prevent and reduce malnutrition among students, and teach a healthful food conduct, it is necessary to provide an appropriate grounding for students by implementing a holistic program at schools. In this respect, with pervasive and continuing deployment of trained people to schools, the Ministry of Education can provide information and education for students on the importance of nutrition during growth, types of vitamins, proteins, main meals, and snacks.

Change of food culture among students by teachers also seems attractive, in the form of debates in the language of students and free from stereotypes, through transmission of warning messages in brochures and posters, organizing competitions in different fields (painting, articles, posters) to convey healthful eating messages to students, can also be other types of measures.

However, simply relying on sending guidelines to schools cannot free school buffet snackss from banned foods. Therefore, serious monitoring, to reduce share of the banned foods and increase permitted ones seems imperative. It is recommended that this occur through serious and continuous control and monitoring by the student councils, parents' associations, and school principals and deputies.

Accordingly, future studies on the food behavior of students in schools, with two simultaneous qualitative and quantitative methods could lead to a more accurate description and analysis of the conduct and mentality of such behaviors. With qualitative method, not only students' understanding of food conduct at school may be discovered, but also backgrounds to the formation of their understanding can be identified.

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Contributions

Study design: Data collection and analysis; Manuscript preparation: SF

Conflict of interest

"The authors declare that they have no competing interests."

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