

Availability of Cariogenic Foods in Primary School Canteens of Abha City, Saudi Arabia: A Cross-Sectional Study

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ABSTRACT

Objective: To obtain base line data about the availability of cariogenic foods in the primary school canteens in the city of Abha, Saudi Arabia.

Materials and methods: The present study was performed in 6 to 10-year-old school boys living in Abha city in 2012. Eight public primary schools with canteen facilities were randomly selected and all the children in the schools were included in the study. Data was collected to know the availability of foods which are cariogenic and the students were made to answer a questionnaire that had questions about their source of food intake.

Results: A total number of 1,807 primary school students participated in the study. 87% of the items available in school canteens were cariogenic and only 13% were noncariogenic. 1505 (83%) school children get food from home, 263 (15%) depend entirely on the canteen, 1320 (73%) eat from both home and canteen and only 158 (8%) of the school children rely entirely on homemade food.

Conclusion: The canteens should reinforce the classroom programs relating to food, nutrition and health. Standard guidelines have to be implemented throughout Saudi Arabia about eating habits in school and improve the overall nutritional quality of school food.

Keywords: Dental caries, Cariogenic foods, School canteens.

How to cite this article: Togoo RA, Meer Z, Kandlaya R, Yaseen SM, Al-Shehri TD, Al-Ghamdi HG. Availability of Cariogenic Foods in Primary School Canteens of Abha City, Saudi Arabia: A Cross-Sectional Study. *World J Dent* 2012;3(3):239-242.

Source of support: Nil

Conflict of interest: None declared

INTRODUCTION

The Kingdom of Saudi Arabia has undergone a rapid change in its socioeconomic situation, food consumption patterns, life style and health status during the past four decades. Communicable diseases have almost diminished and diet-related chronic diseases have become the major health problems.¹ Dental caries (DC) is a major public health problem among primary school children in the kingdom,²⁻⁷ and since last decade, the prevalence has risen dramatically from 68² to 96%.⁷ DC is a multifactorial microbial disease in which diet plays a significant role. There has been an enormous amount of experimental research published worldwide, linking fermentable carbohydrate (sugar) with DC. Akpata et al⁸ in 1992, found a significant relationship between decayed and filled surfaces of teeth and the frequency of sugar consumption in 12 to 13-year-old Saudi children.

Food preferences are established early in life and are learned through experiences with food and eating.^{9,10} Key factors in the development of a child's food preferences and eating behaviors are food availability and accessibility. Schools play a major role in influencing the food habits of children as approximately 37% of a child's total energy intake is consumed at school. Preferences for sweet, energy-dense foods are well developed by the time children attend school and children will tend to choose these high sugar snack foods, if made available, in preference to more nutritious options.¹¹

School nutrition policy is important in supporting children to make positive food choices and therefore schools need to regulate the kind of foods and beverages to be sold in the canteens across the country. The purpose of the present study was to investigate the availability of cariogenic foods in the primary school canteens in the city of Abha, Saudi Arabia.

Subjects and Methods

The present study was performed in 6 to 10-year-old school boys living in Abha city in 2012. Eight public primary schools with canteen facilities were randomly selected and all the children in the schools were included in the study. Data was collected to know the availability of foods which are cariogenic and the students were made to answer a questionnaire that had questions about their source of food intake. The data was entered in Microsoft Excel sheet and descriptive statistics were obtained.

RESULTS

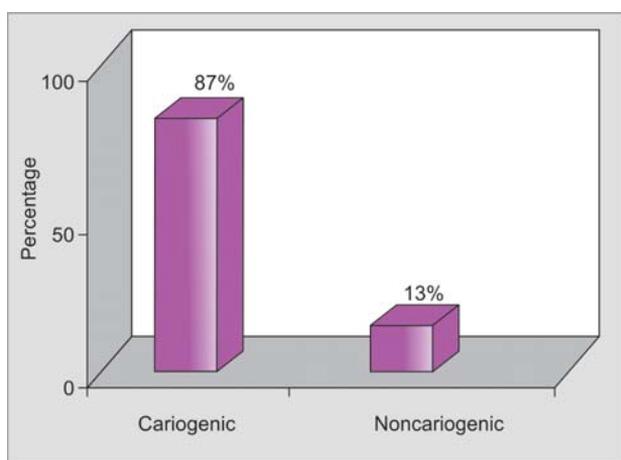
A total number of 1,807 primary school students participated in the study. Data was collected by two investigators and the foods were categorized as cariogenic and noncariogenic items (Table 1).

Approximately, 87% of the items available in the school canteens were cariogenic and only 13% were noncariogenic (Graph 1).

A questionnaire was filled by the students (n = 1807) regarding their source of food intake. Around 1505 (83%) of them replied they bring food from home, 263 (15%) of them would entirely depend on the canteen, 1320 (73%) of them would eat from both home and canteen and only 158 (8%) of them would rely only on homemade food (Table 2).

Table 1: List of cariogenic and noncariogenic foods in the school canteens

<i>Cariogenic foods</i>	<i>Noncariogenic foods</i>
Sugar and chocolate confectionery	Bread, sandwiches, toast
Cakes and biscuits	Pasta, rice
Jams and jellies	Unsweetened/artificially
Ice cream	Sweetened yoghurt
Fruit syrup	Low-sugar breakfast cereals
Sugared soft drinks	Sugar-free confectionery
Flavored/sweetened milk	Fresh fruit
Buns, pastries, fruit pies	Water
Puddings	Sugar-free drinks
Sugared breakfast cereals	Milk, cheese
	Peanuts and dry fruits
	raw/boiled/frozen vegetables
	popcorn and fresh corn



Graph 1: Distribution of cariogenic and noncariogenic items in the school canteen

DISCUSSION

The present study was undertaken to provide base line data about the availability of cariogenic foods in the primary school canteens in the city of Abha, Saudi Arabia and to identify the percentage of children who consume the foods and beverages from them.

In school canteens, foods most readily available are energy-dense fast foods, carbonated soft drinks, sugary breakfast cereals, salty snacks and baked goods, tend to be

high in fats, sugars and salt and nutrient-poor. It is important for health professionals, school authorities and parents to monitor what is being provided to the children in school canteens.

Dental caries is a posteruptive destructive disease of mineralized tissues of the teeth, initiated by acids produced in dental plaque by bacterial fermentation of carbohydrate substrates. A rapid increase in caries probably is because of change to modern diet and dietary habits dominated by products containing refined carbohydrates. A similar trend has also been reported from Canada,¹² Alaska¹³ and Asian countries.¹⁴

Majority of the items sold in canteen were cariogenic (87%). This partly explains the high prevalence of DC in this age group in the country. In socioeconomically developing countries, changing from a traditional to a Western-style diet has led to an increase in the consumption of commercialized food products which are high in sugar and fat.^{15,16}

In response to the questions regarding the source of food, majority of them were utilizing the school canteen for eating during school hours. Only 8% of them were completely independent of canteen food. This shows that increasing number of students are relying on school canteens.

The school canteen should provide opportunities to reinforce healthy eating practices and promote sound long-term nutritional habits among the children. On contrary, school canteens in the country have become a consistent source of supply of cariogenic foods. In school canteens, foods most readily available are energy-dense fast foods, carbonated soft drinks, sugary breakfast cereals, salty snacks and baked goods, tend to be high in fats, sugars and salt and nutrient-poor.

It is important for health professionals, school authorities and parents to monitor what is being provided to the children in school canteens. On the basis of the present findings, the authors would like to make some recommendations to promote healthy noncariogenic dietary habits among children.

Table 2: Source of the foods consumed by the children in the school

<i>Schools (n)/questions</i>	<i>1 (270)</i>	<i>2 (162)</i>	<i>3 (177)</i>	<i>4 (226)</i>	<i>5 (163)</i>	<i>6 (345)</i>	<i>7 (244)</i>	<i>8 (220)</i>	<i>Total (1807)</i>
Students bringing food from home	236	133	161	195	128	272	192	188	1505 (83%)
Students depending on the canteen	32	37	13	30	28	65	41	17	263 (15%)
Students getting food from home and using the school canteen	216	122	136	167	121	218	162	178	1320 (73%)
Students who do not use the school canteen	20	8	20	30	14	38	18	10	158 (8%)

The dental professionals should be encouraged to create partnerships with parents, school authorities and other dental professionals. They should influence the school authorities to incorporate the oral health aspect into the School nutrition Policy and take the responsibility of creating awareness of the relationship between good oral and good overall health among the parents and children.¹⁷

The schools should monitor their canteens, offer healthy food and beverage choices, involve and educate teachers and parents about the benefits of high nutrient and low cariogenic snacks, incorporate interactive oral health, nutrition and health education programs in the school curriculum, eliminate marketing of low in nutrition and highly cariogenic food in the school premises.¹⁷

The parents should cooperate in school dental health programs, avoid replacing proper meals by cariogenic snacks encourage children to have more milk, fruits and noncariogenic foods and monitor what the child eats and drinks at school.¹⁷

CONCLUSION

Although the term 'healthy eating' is familiar to children, it is neither well understood nor applied in practice. The canteen should reinforce the classroom programs relating to food, nutrition and health. Both internationally and locally, school-based nutrition programs that include policy, provision of supportive environments and education are recognized as an important strategy in contributing to improved educational and health outcomes. More research is needed to demonstrate the best ways to encourage the children to adopt healthier eating practices at school and throughout the day and to counteract pressures from advertising and elsewhere that encourage the consumption of foods high in fat, salt and sugar and that may promote over-eating and weight gain. Standard guidelines have to be implemented throughout Saudi Arabia about eating habits in school and improve the overall nutritional quality of school food. However, changing perceptions of school meals and marketing nutritious foods as an attractive and healthy lunchtime option continues to be a challenge. Limited research activities investigating the impact of diet and nutrition on health, behavior, and academic achievement highlights the need for continuing research activities to build a robust evidence base that supports the case for change. Nutrition education of parents appears to be important aspect in changing the child's unhealthy food habits.

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