Beverage and soft drink consumption by adolescents from a public school

Consumo de bebidas e refrigerantes por adolescentes de uma escola pública

Consumo de bebidas y refrescos en adolescentes de una escuela pública

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ABSTRACT

Objective: To evaluate the consumption of beverage and soft drinks by adolescents of a public school in São Paulo, Brazil.

Methods: 71 adolescents (aged between 14 to 17 years old) from both genders, attending a technical school in the metropolitan area of São Paulo, answered the following questions: the kind of beverage taken during meals, the places where soft drinks were consumed and the main reason related to this intake.

Results: The most frequent consumed beverage was the industrialized fruit juice (38.1%), followed by regular soft drinks (28.6%) and natural fruit juices (22.2%). The main place where soft drinks were consumed was home (38.2%), followed by school (22.1%). The main reason associated with soft drink intake was the flavor (75.4%).

Conclusions: Sweet beverage intake was frequent among adolescents, specially soft drinks. These beverages are available and consumed at home and at school, and they were considered tasteful. Nutritional education programs should discuss how to prioritize the intake of other beverages and how to control the sale of these products at schools, aiming to stimulate the intake of more healthy beverages by adolescents.

Key-words: Adolescent; soft drinks; child nutrition.

RESUMO

Objetivo: Avaliar o consumo de bebidas e refrigerantes por adolescentes de uma escola pública de São Paulo (SP).

Métodos: Participaram do estudo 71 adolescentes com idade entre 14 e 17 anos, de ambos os gêneros, matriculados no ensino médio em uma escola técnica da região metropolitana de São Paulo. Avaliaram se o tipo de bebida consumida durante as refeições, os locais onde se consome refrigerante e o motivo que leva ao consumo.

Resultados: A bebida mais consumida durante as refeições foi o suco de frutas industrializado (38,1%), seguido do refrigerante do tipo comum (28,6%) e do suco de frutas natural (22,2%). Os locais do consumo de refrigerantes foram a casa (38,2%), seguida da escola (22,1%). O principal fator apontado para o consumo de refrigerantes foi o sabor (75,4%).

Conclusões: O consumo de bebidas açucaradas foi frequente entre adolescentes, especialmente o refrigerante. Essas bebidas são disponíveis e consumidas tanto em casa como na escola e consideradas saborosas. Os programas de educação nutricional devem pensar em como priorizar o consumo de outras bebidas, além de controlar a comercialização de refrigerantes nas escolas, com o objetivo de estimular o consumo de bebidas mais saudáveis para essa faixa etária.

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Palavras-chave: adolescente; refrigerantes; nutrição da criança.

RESUMEN

Objetivo: Evaluar el consumo de bebidas y refrescos por adolescentes de una escuela pública de São Paulo.

Métodos: Participaron del estudio 71 adolescentes con edad entre 14 y 17 años, de ambos géneros, matriculados en la secundaria en una escuela técnica de la región metropolitana de la ciudad de São Paulo. Se evaluó el tipo de bebida consumida durante las comidas, los locales donde se consumen refrescos y el motivo que lo lleva al consumo.

Resultados: La bebida más consumida durante las comidas fue el jugo de frutas industrializado (38,1%), seguido por el refresco de tipo común (28,6%) y por el jugo de frutas natural (22,2%). Los locales del consumo de refrescos fueron la casa (38,2%), seguido por la escuela (22,1%). El principal factor señalado para el consumo de refrescos fue el sabor (75,4%).

Conclusiones: El consumo de bebidas con azúcar, especialmente los refrescos, fue frecuente entre adolescentes. Esas bebidas son disponibles y consumidas tanto en casa como en la escuela y son consideradas sabrosas. Los programas de educación nutricional deben pensar en cómo priorizar el consumo de otras bebidas, además de controlar la comercialización de esos productos en las escuelas, con el objetivo de estimular el consumo de bebidas más sanas para esa franja de edad.

Palabras-clave: adolescente; refrescos; nutrición del niño.

Introduction

Adolescents are at risk for overweight, obesity, and chronic noncommunicable diseases – particularly diabetes – due to inadequate eating habits[1,2]. Habits acquired during adolescence may persist into adulthood, as may overweight and obesity present during this stage[3]. Data from the Brazilian Family Budget Survey (*Pesquisa de Orçamentos Familiares*, POF)[4] conducted in 2002/2003 suggest that 16.7% of Brazilian adolescents are overweight (17.9% of boys and 15.4% of girls) and approximately 2% are obese (1.8% of boys and 2.9% of girls).

Adolescents' dietary habits are characterized by consumption of fatty, high-calorie foods, fast foods and junk foods, soft drinks, and low intake of fruits, vegetables, and dairy products. Furthermore, inadequate dietary practices, such as skipping meals and substituting snacks for traditional meals such as lunch and dinner, are commonplace[5-14].

According to the Brazilian Association of Soft Drink and Non-Alcoholic Beverage Industries (ABIR), "soft drinks are industrialized, non-alcoholic, carbonated beverages with added flavors and high refreshing power." One can of cola drink contains 7-9 tablespoons of sugar[15]; soft drinks may therefore be considered sources of "empty calories," providing no nutrients or nutritional value whatsoever[16].

Over the past few years, soft drink consumption has been on the rise in Brazil. The 2002/2003 POF shows that, between 1975 and 2003, *per capita* soft drink purchases increased from 1.29 to 7.65 liters per year—a 490% rise[4]. Soft drink consumption in the young is mostly influenced by product flavor and by parental consumption, which constitutes a role model for children and adolescents[17].

The present study sought to assess beverage and soft drink consumption by adolescents attending a public school in the city of São Paulo.

Method

The present study is part of a larger project, "Eating attitudes and their determinants in adolescents in the city of São Paulo" (*Atitudes Alimentares e seus determinantes em adolescentes no município São Paulo*). Data collection took place between August and December 2009.

The results reported for the present study actually refer to the pilot study of the larger project. After this initial stage, the study questionnaire was modified, the sample size was calculated and eligibility criteria were defined.

The larger project enrolled a representative sample of students of vocational schools run by the Centro Paula Souza in the city of São Paulo, Brazil. Students were selected by simple random sampling, based on the calculations recommended by Silva[18]. The maximum proportion was estimated at 50%, with a 3% margin of error, for a total of 1067 subjects. To account for the possibility of sampling loss, 20% was added to the calculated value, for a final sample of 1280 adolescents enrolled in schools of the Centro Paula Souza system, which manages vocational schools and technical colleges throughout the state of São Paulo.

Four first-year classes were randomly selected from the school chosen for the pilot study, for a total of 71 male and female students between the ages of 14 and 17.

Data were collected through the Adolescent Eating Attitudes Questionnaire (*Questionário de Atitudes Alimentares de Adolescentes*, QAAA), adapted from the Eating Among Teens (EAT) project instrument. The original questionnaire devised for Project EAT comprises 100 questions meant to assess health, meals,

physical activity, relationship between the respondent and his or her parents, vegetarianism, compulsive eating, dieting, fast food consumption, soft drink consumption, and several other aspects. The authors of the instrument authorized any and all modifications necessary.

The questionnaire was translated to Portuguese and adapted to the Brazilian reality, with changes made do address social and environmental aspects and personal and behavioral factors associated with nutrition in adolescents. After adaptation, the instrument (now the QAAA) was back-translated into English.

The final version of the QAAA consists of 72 questions; 37 of those present in the original instrument were removed as irrelevant to the purposes of the present study and the Brazilian reality, such as those concerning depression, suicidal behavior, and drug use. Six additional questions were adapted from two other instruments used in prior studies for assessment of eating disorder risk[19] and body image[20] and three new questions on determinants of food consumption were added. Some foods suggested as examples were adapted to equivalents more common to Brazilian adolescents, as were some idioms and statements.

The study variables were the type of beverage consumed during meals, the sites of soft drink consumption, and the reason(s) for soft drink consumption. Weight and height, self-reported by respondents, were used for calculation of body mass index (BMI), which was then used for classification of nutritional status according to World Health Organization criteria[21].

Data analysis was carried out in the SPSS 13.0 software environment. Variables were assessed for the sample as a whole (n=71) and stratified by gender and nutritional status. Frequencies were calculated and the chi-square test was used for between-group comparisons. The significance level was set at 5% (p=0.05).

The parent project was approved by the Research Ethics Committee of the Faculdade de Saúde Pública da Universidade de São Paulo.

Results

Of the 71 respondents, 42.3% were male and 57.7% were female. Just over half of the adolescents interviewed had married parents (62.0%), and 73.0% lived with a nuclear family (father, mother, and siblings). Of those in whom nutritional status was assessed (n=65), most had BMIs within the normal range (86.1%), approximately 5% were overweight, 8% were obese and only 1.5% were underweight.

The beverage most commonly consumed by adolescents during meals was industrialized fruit juice (38.1%), followed by regular soft drinks (28.6%) and 100% fruit juice (22.2%) (Figure 1).

Gender stratification of beverage consumption during meals showed that girls consumed industrialized fruit juice more often than boys (55.6% vs. 44.4%) and consume soft drinks more often as well (61.1% vs. 38.9%), although there were no significant

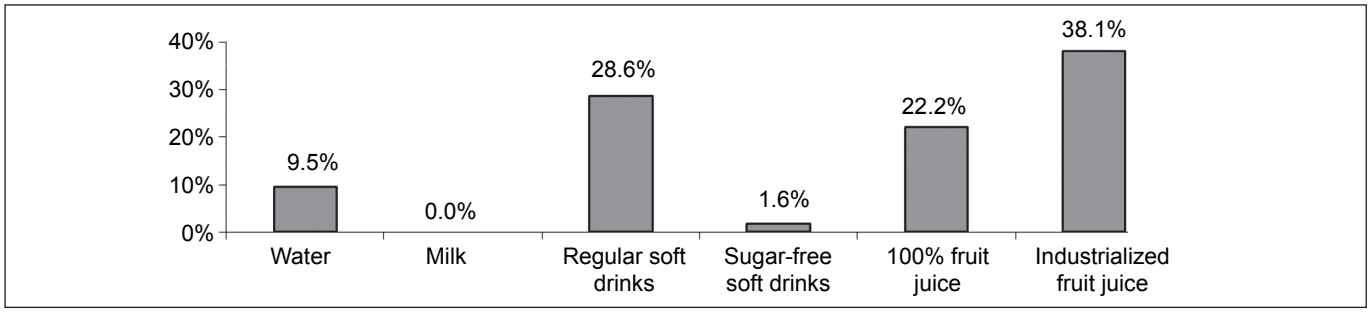

Figure 1 - Type of beverage most often consumed during meals

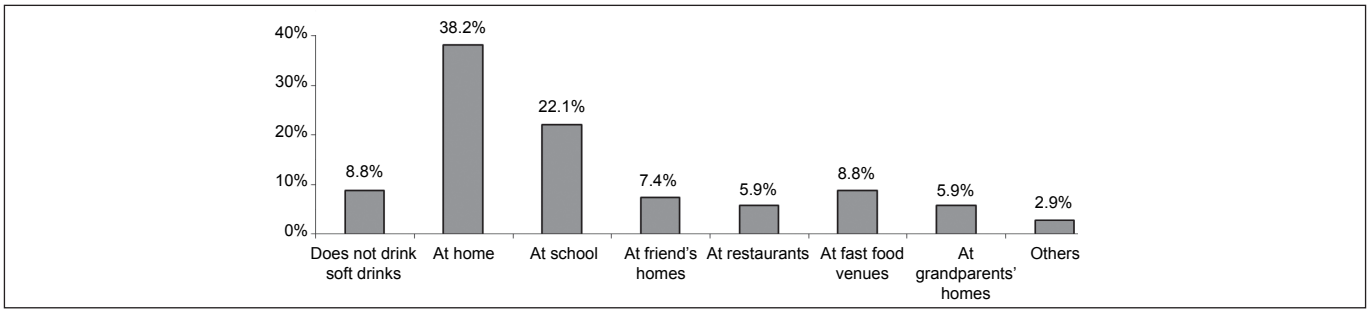

Figure 2 - Most frequent site of soft drink consumption

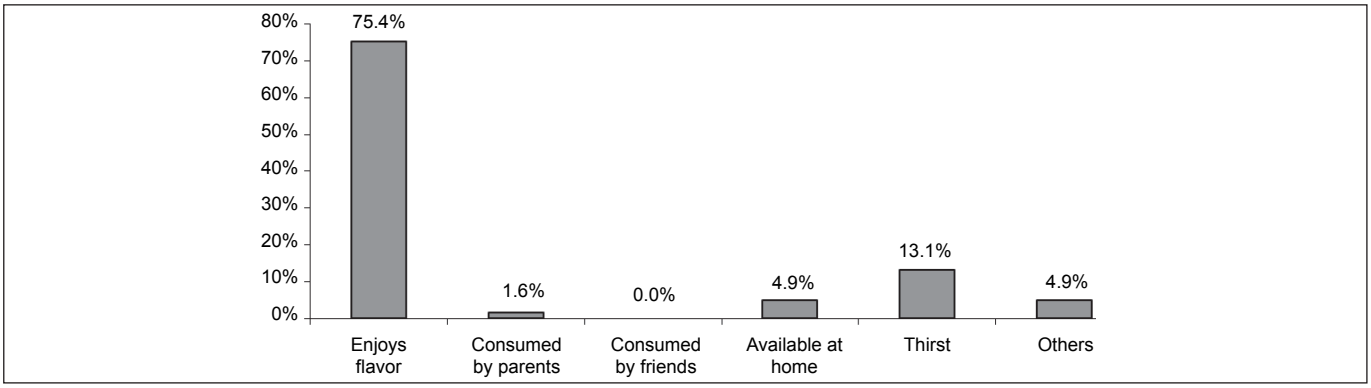

Figure 3 - Reason for soft drink consumption

between-group differences. Stratification by nutritional status showed no differences in beverage consumption patterns.

When questioned specifically as to where soft drinks were most often consumed, 38.2% of adolescents claimed to drink them most often at home, followed by school (22,1%). Again, soft drinks were consumed more often at home by girls than by boys (61.5% vs. 38.5% respectively) (Figure 2). Female respondents also drank more often at friends' homes (60% vs. 40%) and at fast food venues (83.3% vs. 16.7%), whereas males consumed soft drinks more often at school (60% vs. 40%).

Flavor was the most common reason for consumption of soft drinks (75.4%, Figure 3). Male and female respondents alike claimed to consume soft drinks because they enjoy the taste (52.2% vs. 47.8% respectively) or as a thirst quencher (50% in both genders). None of the male respondents claimed to consume soft drinks simply because they were available at home.

Discussion

In the present sample, industrialized fruit juice was the most common choice of beverage for consumption during meals (38%), followed by regular soft drinks (29%). The latter were consumed most often at home (38%), and the main reason for soft drink consumption, reported by two-thirds of respondents, was taste. It bears noting that no respondents whatsoever reported consumption of milk during meals.

Consumption of soft drinks merits some special consideration as a dietary habit, because soft drinks, as do other sugar-sweetened beverages, have a very high energy density due to their high sugar content. Consumption of liquid foodstuffs can have distinct physiological effects when compared to eating of solid foods, as drinking fluids will often not activate the satiety centers of the brain, which leads to increased energy intake. Furthermore, consumption of fluids is not always accompanied by a reduction in intake of solid foods, which also leads to increased caloric intake[2,22].

Another possible explanation for the positive correlation between soft drink consumption and energy intake is the high glycemic index of soft drinks and sodas[2]. Moreover, soft drinks often replace or reduce consumption of other nutritionally important fluids, such as milk and natural fruit juice[17]. Garcia *et al*[9], Ludwig *et al*[7], Bowman[8], Nielsen *et al*[11] and Keller *et al*[23] reported that adolescents tended to replace milk with soft drinks, both during meals and throughout the day. In the present study, no respondents reported consumption of milk during meals; however, we cannot claim that the adolescents in our sample consume soft drinks instead of milk. Respondents may have taken "meals" to mean lunch and dinner alone, disregarding breakfast; hence, the importance of always asking whether adolescents drink milk and, if so, during which meal.

Adolescents may substitute soft drinks for milk due to flavor. Taste or flavor is one of the main driving factors of dietary choices, regardless of economic status or availability[24], and is the least negotiable factor when choosing and purchasing foods and beverages[25]. Most respondents reported consuming soft drinks because they enjoyed the taste; 13% claimed they drank these beverages when thirsty.

Analyzing data from longitudinal, population-based studies conducted in the United States, Ludwig *et al*[26], Bowman[27], Nielsen *et al*[28] and Striegel-Moore *et al*[29] found that milk intake declines and consumption of other beverages increases over time; furthermore, other beverages often substituted for milk throughout the day.

In another U.S. study, Rampersaud *et al*[30] assessed consumption of 100% fruit juice and other beverages, using data from nationwide surveys conducted 1994–1996 and 1998. The authors found that soft drink intake was significantly higher than consumption of fruit juice and milk in the 5-to-13 age bracket.

Although the adolescents interviewed in the present study reported the home as the most common site of soft drink consumption, some outside environments, such as the school setting, provide soft drinks in an attractive manner – at cafeterias and from vending machines, encouraging consumption of these beverages[31]. In our sample, school was the second most common site of soft drink consumption. Fernandes[32] surveyed 2023 U.S. schools and found that soft drinks were available at cafeterias or from vending machines in 40% of these facilities. No nationwide data on soft drink availability are available, but simple observation of educational facilities leads to the conclusion that most schools sell or otherwise provide soft drinks.

The present study had some limitations, such as self-reporting of weight and height data. Youths are sometimes unaware of their actual anthropometric parameters, or may underestimate or underreport them because they feel overweight. Due to the small sample size, no significant differences were found between any of the study variables, which is also a limitation.

This investigation is relevant in that it enables reflection on current soft drink and sugar-sweetened beverage consumption, which is increasingly frequent in the population as a whole and among adolescents in particular. These beverages are widely available and consumed both at home and in the school environment, and are widely considered pleasant-tasting. Dietary education programs should consider ways of prioritizing consumption of other beverages, and should also ban sales of soft drinks and similar beverages in schools, in order to encourage intakes of healthier beverages by adolescents.

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