

Adolescents and diet and light foods: definition, frequency and reasons for food consumption

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Abstract

The aim of this study was to characterize diet and light food consumption by adolescents from public and private schools and to identify the level of knowledge about the definition, frequency and reasons for consumption of these foods. A cross-sectional study was conducted with 284 adolescents aged 13-18 years, of both sexes, in a public school and a private school in the south of São Paulo/SP. The self-report questionnaire was administered with objective questions about the definition of diet and light foods, frequency and reasons for consumption. The answers of boys and girls about diet and light food consumption were similar for each type of school. Diet and light food consumption was higher among adolescents from the private school than the public school, both boys and girls. Light food was consumed in greater proportion than food diet by the adolescents of both sexes and schools. Public school boys consumed more diet and light food than girls, which was the opposite in the private school. In both schools, frequency of weekly consumption was higher among boys. Although most adolescents of both sexes and schools have marked the correct concept for diet and light food, they showed not knowing how to identify differences in these foods. The most mentioned reason for diet and light food consumption by adolescents from both schools and by private school girls was health benefits, and for the public school girls was weight maintenance.

Key words: Food Consumption. Adolescent Behavior. Dietetic Sweeteners.

Introduction

Consumption of diet and light foods has grown significantly in last years and increased their space on the consumers' table.¹⁻³ Demand for these foods is made up of special consumers, but also people interested in maintaining good health and good physical condition.⁴

According to the legislation, diet foods are foods that do not contain, or are low in, a given ingredient, such as sucrose, protein, fat or sodium, so that their composition meets the needs of people under specific metabolic, physiological or pathological conditions.⁵

To be considered light, food must present at least 25% of reduction of a given ingredient or nutrient, compared to the conventional food, and may involve calorie, sugar, sodium, total or saturated fats, and cholesterol.⁶ The word *light* is a kind of complementary nutritional information for processed foods, is synonymous for *reduced* and must be followed, on the food label, by the percentage of reduction and to which nutrient it refers.⁶

Population in general has shown lack of knowledge regarding the use of these products. Among adults, demand is related to maintaining good health, while young people consume these products because they are concerned about their body image.⁷ In adolescence, such concern seems to be greater due to the changes in the body, resulting from the growth and development process.⁸

Adolescence is a period of transition between childhood and adult life, from 10 to 19 years old, and is marked by biological, psychological, cognitive and social changes that interfere with the adolescent's eating behavior.^{9,10} There are numerous factors that interfere with food consumption during adolescence, including sociocultural values, body image, social influence, financial situation, the habit of eating out of the home, increased consumption of semi-ready meals, media influence, eating habits, food availability, and ease of preparation.¹¹

Due to the great availability of diet and light products in the marketplace, along with the concern about body image, there has been a rising consumption of these products by adolescents.¹² Reports show that adolescents use these products with the purpose of losing or maintaining the body weight, sometimes without having adequate knowledge to support this choice.¹³

The aim of this study was to characterize the consumption of diet and light foods by adolescents from public and private schools, identifying the level of knowledge about the concept of these foods, frequency and reasons for consumption.

Methodology

This is a cross-sectional study with convenience sampling. Participants were students of both sexes, aged 13 to 18 years, enrolled in a public and private school, both located in the same neighborhood in the south region of São Paulo/SP. All adolescents within the study teenage, in both schools, were invited to participate. The Research Ethics Committee of the Adventist University Center of São Paulo approved the study under protocol number 20869913.9.0000.5377.

The sample consisted of 210 adolescents from a public school (21% of the population, 99 being girls) and 74 from a private school (30% of the population, 37 being girls). Losses were due to the refusal of some students to participate, missing parent signature on the Free Informed Consent Form, absence from school on the days of data collection and improperly filled out forms. As criteria for exclusion, it was defined that adolescents suffering from Diabetes *mellitus* would be excluded from the study, which did not happen in the study sample. Data was collected from October to December 2013.

A questionnaire developed by Santos,⁷ properly adapted to meet the objectives of this study, was administered. It was a self-response instrument and contained questions regarding the frequency and reason for consumption, besides the adolescents' notion on the concept of diet and light foods. The questionnaire was administered in the classroom, with the researchers' support and guidance.

For analysis of the data analysis, the responses of both sexes were compared by type of school, and compared between both sexes and in the same school. To compare the results between sexes and types of school, Pearson' chi-square test was used and $p < 0.05$ was adopted as significance level.

Results

The characterization of consumption and identification of the concepts of diet and light foods by the adolescents, comparing gender per type of school, are presented in Table 1. The proportion of girls who did not consume diet foods was significantly higher in the public school than in the private school ($p=0.0305$), with 43.2% of the girls from the private school reporting consumption. Most of the girls who reported using this kind of food mentioned a frequency of consumption of 1 to 3 times a week, in the private school (54.1%), and rarely, in the public school (43.8%), without a statistically significant difference in any frequency. The percentage of girls who marked the correct concept of diet food was similar in both schools (62.2% in the private school and 55.6% in the public school), with no significant difference.

Table 1. Consumption characterization and identification of the concepts of diet and light foods by adolescents, according to sex and type of school. São Paulo-SP, 2013/2014.

	Female adolescents		<i>p</i> *	Male adolescents		<i>p</i> *
	Public (n=99)	Private (n=37)		Public (n=111)	Private (n=37)	
	n (%)	n (%)		n (%)	n (%)	
Diet foods						
Consume						
Yes	24 (24.2)	16 (43.2)	0.0305	34 (30.6)	12 (32.4)	0.8371
No	75 (75.8)	21 (56.8)		77 (69.4)	25 (67.6)	
Frequency of consumption						
1 to 3 times/week	13 (54.1)	5 (31.2)	0.1535	16 (47.0)	5 (41.7)	0.7472
4 to 7 times/week	2 (8.4)	4 (25.0)	0.1481	6 (17.8)	2 (16.6)	0.9588
Rarely	9 (37.5)	7 (43.8)	0.6926	12 (35.2)	5 (41.7)	0.6942
Concept						
Correct	55 (55.6)	24 (62.2)	0.3275	59 (53.2)	23 (62.2)	0.3397
Wrong	44 (44.4)	13 (37.8)		52 (46.8)	14 (37.8)	
Light foods						
Consume						
Yes	41 (41.4)	25 (67.5)	0.0066	51 (46.0)	23 (62.1)	0.0875
No	58 (58.6)	12 (32.5)		60 (54.0)	14 (37.9)	
Frequency of consumption						
1 to 3 times/week	15 (36.5)	8 (32.0)	0.7045	17 (33.3)	9 (39.1)	0.6288
4 to 7 times/week	6 (14.7)	8 (32.0)	0.0941	11 (21.6)	12 (52.2)	0.0085
Rarely	20 (48.8)	9 (36.0)	0.3102	23 (45.1)	2 (8.7)	0.0022
Concept						
Correct	51 (51.5)	21 (56.7)	0.4881	61 (55.0)	24 (64.8)	0.2911
Wrong	48 (48.5)	16 (43.3)		50 (45.0)	13 (35.2)	

	Female adolescents			Male adolescents		
	Public (n=99)	Private (n=37)	<i>p</i> *	Public (n=111)	Private (n=37)	<i>p</i> *
	n (%)	n (%)		n (%)	n (%)	
Reason for eating diet and light foods						
It is good for health	21 (41.2)	23 (69.7)	0.0106	38 (56.7)	19 (73.0)	0.1460
Prescribed by doctor or nutritionist	1 (2,0)	2 (6.0)	0.3227	5 (7.5)	2 (7.7)	0.6960
Not to gain weight	29 (56.8)	8 (24.3)	0.0033	24 (35.8)	5 (19.3)	0.1211

*Chi-square test

Regarding light foods, the proportion of private school girls who reported consumption was significantly higher than the public school girls (67.5% and 41.4%, respectively; $p=0.0066$). Of the girls who used this kind of food, the frequency of consumption with the highest percentage was “rarely” in both schools and without significant difference (36.6% in the private school and 48.8% in the public school). The correct concept of light food was marked in similar proportion by the girls of both schools and involved half of the participants (56.7% in the private school and 51.5% in the public school). When asked about the difference between diet and light food, most of the girls from both schools said that it was the same product (73/99 in the public school and 24/37 in the private school; data not shown).

The majority of the private school girls (69.7%) marked the option *health benefits of diet and light foods* as the reason for consuming these products, at a significantly higher proportion than that observed in the answers of the girls from the public school ($p=0.0106$). The latter mentioned, in a larger proportion (56.8%), as reason for consuming these foods, the contribution of these products to maintain weight, a statistically significant result when compared to the private school girls ($p=0.0033$).

Regarding the boys, the majority of them, in both schools, reported not using diet foods (67.6% in the private school and 69.4% in the public school), without significant difference. Frequency of consumption of 1 to 3 times in the week was reported in larger proportion by the boys in both schools (41.7% in the private school and 47% in the public school), without significant difference. Regarding the concept of diet food, most of the boys in both schools marked the correct concept (62.2% in the private school and 53.2% in the public school), also without significant difference.

The proportion of boys who did not consume light foods was larger in the public school than in the private school ($p=0.0875$). Of the boys who reported consuming this kind of food, differences between the type of school appeared in the frequency of consumption of 4 to 7 times a week (larger proportion in private school $p=0.0085$) and rarely (larger proportion in the public school, with $p=0.0022$). Similar to what was observed in the girls' answers, most of the boys in both schools marked the correct concept of light food (64.8% in the private school and 55% in the public school). Similar proportions were found in the answers of the boys from both schools regarding the difference between diet and light foods, about which most of them mentioned that they were similar products (92/111 in the public school and 26/37 in the private school; data not shown).

Regarding the reason for consuming diet and light foods, most of both schools boys mentioned the benefits of these products for the health (73% of private school and 56.7% of public school boys), without significant difference.

Table 2 shows the characterization of diet and light foods consumption and the identification of the concept of these foods by the adolescents, comparing the responses of the adolescents of both sexes in the same type of school. The proportions of answers relating to all questions were similar between the sexes, in the same type of school, without a statistically significant difference in most of the questions. Differences appeared in the frequency of weekly consumption of light foods in the private school, where the girls reported *rarely* in a significantly larger proportion than the boys did ($p=0.0245$). There was a statistically significant difference in the proportion of girls in relation to the boys in the public school, who pointed as the reason for consumption of diet and light foods the contribution of these products for maintaining weight ($p=0.0228$).

Table 2. Consumption characterization and identification of the concepts of diet and light foods by adolescents, according to the type of school and sex. São Paulo-SP, 2013/2014.

	Public School		p*	Private School		p*
	Female (n=99)	Male (n=111)		Female (n=37)	Male (n=37)	
	n (%)	n (%)		n (%)	n (%)	
Diet foods						
Consume						
Yes	24 (24.2)	34 (30.6)	0.3013	16 (43.2)	12 (32.4)	0.3377
No	75 (75.8)	77 (69.4)		21 (56.8)	25 (67.6)	
Frequency of consumption						
1 to 3 times/week	13 (54.1)	16 (47.0)	0.5939	5 (31.2)	5 (41.7)	0.5692
4 to 7 times/week	2 (8.4)	6 (17.6)	0.3110	4 (25.0)	2 (16.6)	0.5949
Rarely	9 (37.5)	12 (35.3)	0.8647	7 (43.8)	5 (41.7)	0.9195
Concept						
Correct	55 (55.6)	59 (53.2)	0.7272	24 (64.9)	23 (62.2)	0.8094
Wrong	44 (44.4)	52 (46.8)		13 (35.1)	14 (37.8)	
Light foods						
Consume						
Yes	41 (41.4)	51 (46.0)	0.5088	25 (67.5)	23 (62.1)	0.6263
No	58 (58.6)	60 (54.0)		12 (32.5)	14 (37.9)	
Frequency of consumption						
1 to 3 times/week	15 (36.5)	17 (33.3)	0.7045	8 (32.0)	9 (39.1)	0.6288
4 to 7 times/week	6 (14.7)	11 (21.6)	0.3943	8 (32.0)	12 (52.2)	0.1567
Rarely	20 (48.8)	23 (45.1)	0.7250	9 (36.0)	2 (8.7)	0.0245
Concept						
Correct	51 (51.5)	61 (55.0)	0.6179	21 (56.7)	24 (64.8)	0.4750
Wrong	48 (48.5)	50 (45.0)		16 (43.3)	13 (35.2)	

	Public School		p*	Private School		p*
	Female (n=99)	Male (n=111)		Female (n=37)	Male (n=37)	
	n (%)	n (%)		n (%)	n (%)	
Reason for eating diet / light foods						
It is good for health	21 (41.2)	38 (56.7)	0.0944	23 (69.7)	19 (73.0)	0.7761
Prescribed by doctor or nutritionist	1 (2.0)	5 (7.5)	0.3227	2 (6.1)	2 (7.7)	0.8047
	29 (56.8)	24 (35.8)	0.0228	8 (24.2)	5 (19.3)	0.6447

*Chi-square test

Discussion

In this study, the responses regarding the consumption of diet and light foods were similar for both sexes and the same type of school, both in the private and public schools. However, there were differences in the comparison of the responses from the same sex and by type of school. This suggests a similar behavior of boys and girls in the same type of school, but different in some aspects when compared by type of school.

Consumption of diet and light foods was higher by the private school adolescents than by the public school ones, in both sexes. Study developed by Santos⁷ with 155 adolescents from private and public school also found a higher consumption of diet and light foods in private schools. In the present study, adolescents of both sexes and schools consumed light foods in larger proportion than diet foods. In the public school, boys consumed a greater proportion of diet and light foods than girls did, as opposed to the private school boys. The higher consumption by the public school boys differs from the Novaes' findings,¹⁴ who observed a larger consumption of diet and light foods by female adolescents also from public school. With respect to the private school results, they were similar to the ones observed in study conducted by Meira,¹⁵ in which female adolescents reported consuming both types of foods more than boys did.

A survey conducted in Cotia/SP found that adolescents of both sexes used to drink sodas with two or three daily meals, whether sweetened with sugar or artificial sweeteners.¹⁶ The 2008-2009 Household Budget Survey,¹⁷ considering all Brazilian regions, identified that 40.1% of the population consumed diet and light beverages, and 48.3% consumed light and diet breads and the like. Between 2000 and 2010, a decline in purchase of sugary foods was observed in the United States, with a concomitant growth of foods containing artificial sweeteners, and this was more significant among households with children.¹⁸ Study conducted in Caxias do Sul/RS with adults of both sexes observed an intake of diet foods by 26% of the participants and light foods by 41% of them.¹⁹ Such proportions were similar to the reported consumption by the public school adolescents that participated in this study (27% and 44%, respectively) and lower than the private school adolescents (38% and 65%, respectively). All these data show that the purchase of diet and light foods by the population is considerable and that this same behavior is found in different ages and different Brazilian regions.

The significant presence of women in the consumer's market of diet and light products seems not to be restricted to adolescents or Brazil, as observed in the present study and in other studies mentioned herein. A North-American study, which analyzed the purchase of foods and beverages containing artificial sweeteners in the United States during 2007 and 2008, found that the proportion of use of these products increased significantly among females, including female adolescents and adults, whereas among males it remained stable.²⁰

Rarely was the most reported frequency of consumption by the private school girls, for both diet and light foods. Santos⁷ observed this same frequency in private school. However, when we added up the consumption frequency intervals of 1 to 3 and 4 to 7 times a week, the proportion observed in the present study reached more than 50% of the adolescents, of both sexes and schools. As to the frequency of 1 to 7 times a week, the boys reported a higher percentage of consumption, compared to the girls, in both schools, reaching 91.3% in the private school. In the study by Santos⁷, the adolescents also showed a percentage over 50% for the consumption frequency of 1 to 7 times a week and similar frequencies in both types of school.

Although the majority of the adolescents of both schools and sexes have chosen the correct concept for both diet and light foods, they showed not to be able to differentiate one food from the other. Smaller proportion was found in study conducted by Branco,¹² in which 38% and 33% of the adolescents identified correctly the concepts of diet and light foods, respectively. The findings of the present study relating to the concept identification were also more significant than those

mentioned in the survey carried out by Tebaldi,¹³ which involved adolescents from a public school in Corbélia-PR, and observed that the correct concept of diet food was mentioned by 12% of the girls and 51.3% of the boys, and regarding light products, 28% of the girls and 48.9% of the boys responded correctly. With respect to the ability of differentiating diet from light products, results from other studies were similar to the findings of the present study. Meira¹⁵ found that adolescents of both sexes did not know the difference between these types of foods. Among adults, Nunes¹⁹ also identified doubts in differentiating these foods and low level of knowledge of the concept of light (39%) and diet (44%) foods.

According to Branco,²¹ the population in general has difficulties in discerning the appropriate use of diet and light foods, which was also identified among the adolescents in the present study. Both the access to and the understanding of the content and type of processed food, as well as its indication of use, represent an issue of food and nutrition safety, besides contributing to the population health. If the differences between diet and light foods are not clear, the use of these products can cause damages to the health of individuals, as is the case of diabetics who consume sugars named light and contain sucrose in their formula. Just the mention of the words diet and light in the product labels is not enough for consumers to identify its differences and indications for use.¹⁹

The public school girls revealed choosing diet and light foods for its contribution in maintaining the body weight, and the private school girls for their health benefits. The majority of the boys of both schools mentioned health benefits as the reason for consuming these products. These two reasons for consumption were reported in various similar surveys. Santos⁷ identified that most of private and public school adolescents mentioned as motivation the fact that these foods are good for health, followed by their contribution in maintaining or losing weight. Likewise, Meira¹⁵ observed that, among adolescents from a private school in João Pessoa/PB, the girls chose these products to lose weight, and the boys for considering them healthy. Other similar studies demonstrated that the major motivations for purchasing diet and light products include the concern about one's health,²² particularities of specific diseases that require diet foods, and healthy eating associated with light foods.¹⁹ According to Novaes,¹⁴ girls tend to be more concerned than boys with body weight, which was also observed in the present study, in which 27.2% of the girls of both schools reported choosing these products to maintain weight, and 19.5% of the boys mentioned the same reason. This reflects on the foods choice, which many times allows identifying indiscriminate and improper use of diet and light foods by the young population with the purpose of losing and/or maintaining body weight.¹² Adolescence is a period when major changes occur in the

body, added by the concerns of young people about their body image and in having the ideal body, according to social standards. The relationship between satisfaction with the body image and consumption of diet and light foods has already been identified in studies with adolescents, noting that regardless of sex, the higher the degree of dissatisfaction with the body the higher the consumption of these products.²¹

The role that the foods containing artificial sweeteners play in reducing the body weight is controversial. Consumption of industrial sugary beverages showed a relationship with overweight in studies involving children and adolescents.^{23,24} Additionally, there are researches that found that the consumption of beverages containing artificial sweeteners by adolescents also has association with overweight^{25,26} and diets high in calories, carbohydrates, fats and foods rich in sodium and sugar.²⁷ The physiological mechanisms associated with the use of artificial sweeteners and satiety or with the loss of body weight are not entirely clear, nor there is consensus about it. Evidences suggest that the body ability to compensate for calories intake is not efficient and/or constant, regardless of the food being solid or liquid, and that the individual may compensate for the reduced calories of foods containing artificial sweeteners in the next meal, making it more caloric.²⁸ This would partially explain the evidences that foods containing artificial sweeteners have weak association with body loss or maintenance of the new weight, and are also associated with weight gain.²⁸⁻³⁰

Conclusion

It was observed in this study that the private school adolescents consumed more diet and light foods than those attending a public school, regardless of sex. In the comparison between the sexes in the same type of school, it was found a greater proportion of diet and light foods consumption by boys than girls in the public school, which was the reverse in the private school. In both schools, the frequency of weekly consumption was greater among the boys. Although the majority of the adolescents identified correctly the concepts of both diet and light products, the percentage of adolescents who mentioned existing a difference between these types of foods was small. The most cited reason for using these foods by the boys in both schools and girls in the private school was health benefit, and for the public school girls was weight maintenance.

It is suggested the development and adoption of educational interventions in schools, with a focus on informing and clarifying the purpose and proper and conscious use of these foods by adolescents.

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