Evaluation of Knowledge and Consumption of diet and Light/Zero Foods in Adolescents

Avaliação do Conhecimento e do Consumo de Alimentos Diet e Light/Zero em Adolescentes

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Abstract

In recent years has increased consumption of *diet* and *light*/zero foods by adolescents due to concern about body image. But adolescents are unaware of the indications and differences of these products, consuming them without medical and/or nutritional guidance. The study aimed to evaluate the knowledge and consumption of *diet* and *light*/zero foods in adolescents enrolled at public and private schools in Tupaciguara, MG, Brazil. Cross-sectional study which weight and height of the adolescents were used for assessing the nutritional status. Dietary intake and knowledge about *diet* and *light*/zero foods were evaluated by a questionnaire. Statistical analysis comprised a descriptive analysis, Qui-square test and Fisher's exact test. The consumption of *diet* and *light*/zero foods was higher in female adolescents (50.9%), in the private school (67.4%), with a family income corresponding to or higher than five minimum wages (50.9%) and weight excess (54.3%). The knowledge of the *diet* foods was higher in female adolescents (57.4%) and the knowledge of the *light*/zero foods was the same in both genders (56.0%). The knowledge of the *diet* and *light*/zero foods was higher in the private school (76.1%), with family income corresponding to or higher than five minimum wages (60.0%) and 81.0% of normal weight female adolescents had knowledge of *diet* food and 80.1% of the *light*/zero foods. In conclusion, the adolescents usually consumed indiscriminately and incorrectly the *diet* and *light*/zero foods because of the lack of knowledge about their differences and recommendations.

Keywords: Adolescent. Diet Fads. Food Consumption. Nutritional Status.

Resumo

Nos últimos anos têm aumentado o consumo de alimentos diet e light/zero pelos adolescentes devido à preocupação com a imagem corporal. Porém os adolescentes desconhecem as indicações e diferenças desses produtos, consumindo-os sem orientação médica e/ou nutricional. O estudo objetivou avaliar o conhecimento e o consumo de alimentos diet e light/zero por adolescentes matriculados em escolas públicas e particular de ensino de Tupaciguara, MG, Brasil. Estudo transversal, com 316 adolescentes de ambas as escolas. O peso e estatura foram utilizados para avaliar o estado nutricional. O consumo alimentar e o conhecimento sobre os alimentos diet e light/zero foram avaliados por um questionário. A estatística consistiu em análise descritiva, teste Qui-quadrado e Exato de Fisher. O consumo de alimentos diet e light/zero foi maior entre alunos do sexo feminino (50,9%), da escola particular (67,4%), com renda familiar igual ou maior a cinco salários mínimos (50,9%) e com excesso de peso (54,3%). O conhecimento sobre os alimentos diet foi maior no sexo feminino (57,4%) e o conhecimento sobre os alimentos light/zero foi igual em ambos os sexos (56,0%). O conhecimento sobre os produtos diet e light/zero foi maior na escola particular (76,1%), com renda familiar igual ou maior a 5 salários mínimos (60,0%); 81,0% dos eutróficos tinham conhecimento sobre os alimentos diet e light/zero, pois desconheciam as suas diferenças e indicações.

Palavras-chave: Adolescente, Dietas da Moda. Consumo de Alimentos. Estado Nutricional.

1 Introduction

Feeding in adolescence can be influenced by several factors, such as the search for identity, need for acceptance into groups, lack of concern for the health and the overvaluation of body image, which can lead to inadequate habits¹.

In general, adolescents have little healthy feeding habits, performing some inappropriate feeding practices, such as the exclusion of breakfast, the replacement of main meals for snacks, the preference for foods with high energy density (rich in sugars and saturated fats) and the exclusion of fruits and vegetables². Thus, the bad habits and the changes in their

lifestyle have significantly contributed to the increase in the prevalence of overweight and obesity in this age range³.

On the other hand, adolescents are also increasingly concerned with their-body image, seeking "ideal of beauty" and slim body. Consequently, there was an increase in the use of "diets and fads" by adolescents, as well as the consumption of diet and light foods /zero to assist in loss and/ or maintenance of body weight⁴. However, the majority of the population, including the adolescents, ignores the differences between the food *diet* and *light*/zero and believes that such foods are synonyms, due to the difficulty understanding the statements contained in the labelling⁵.

Diet products as *classified as dietary* foods for special purposes, which may present severe reduction or even exemption of certain nutrient (carbohydrates, proteins, lipids or sodium), in their formulation. Thus, diet foods are indicated in differentiated diets, taking into account the needs of people in physiological conditions and/or metabolic disorders, such as diabetes *mellitus*, obesity, hypertension, among others. There are two other types of *diet products*: the nominees to replace a meal; and those who have control of sugars in their composition, i.e., they do not have sugar added, but rather, the sugars already derived from the raw materials of the product⁶.

The light products are conventional foods, regulated by the DRC 54/12 and have a minimum reduction of 25% of the energy value and/or carbohydrates, fats or sodium (comparative criterion) or must meet specific quantitative requirements in the energy value and the same nutrients (absolute criterion). It is worth mentioning that the attribute zero is synonymous of "Does not contain", "free", "without", "devoid of a certain nutrient" and it is present in most of times in light products ⁷.

In recent years there has been an increase of indiscriminate consumption of *diet* and/or *light*/zero food by adolescents⁸, being required new studies on this subject, because adolescents are unaware of the differences and indications of such products, consuming them inappropriately, without medical prescription and /or nutritional status. Within such context, the study aimed to evaluate the knowledge and consumption of *diet* and *light*/zero foods in adolescents enrolled at public and private schools in Tupaciguara, MG, Brazil.

2 Material and Methods

A nutritional epidemiological cross-sectional study was conducted, in the period from April to May 2014 in two schools, one state public network and the other private, in a small town in Minas Gerais.

The study population comprised adolescents of both sexes, aged 15 to 19 years, who attended during the morning period, because it is the only period to present adolescents in the age range defined for the study. All students were invited to participate in the study, being 46 of private school and 300 of public schools.

All adolescents from private schools participated in the survey. In the public school, data were collected from 270 students, since that 20 did not take the Informed Consent Form signed and 10 adolescents were absent on the day of data collection. Thus, the population of the study comprised 316 students.

The nutritional status of adolescents was assessed using the self-reported weight and height. The diagnosis of nutritional status was performed by means of the Body Mass Index, which was classified according to the curve of distribution in the form of percentiles by age and sex for each individual,

drawn up by the World Health Organization. The percentiles used were: < percentile 3= thinness; ≥ 3 percentile and ≤ 85 percentile=eutrophic; > percentile 85= weight excess 9 .

For the evaluation of knowledge and consumption of diet and light foods /zero of adolescents, a structured questionnaire was used, developed by the researchers in charge of it, composed by objective questions, addressing the following data: date of birth, gender, parents' income (in minimum wages); data on the consumption of diet and light / zero foods were evaluated through some questions, such as, for example, if the adolescent is a consumer of diet and light/ zero foods (diet or light/zero or diet and light/zero or none); various foods found in the diet versions and/or light/zero were cited and the adolescents reported the most consumed by them; they were also questioned about the reasons for the use of diet and light /zero products (to lose weight, keep fit, habit and for being healthier). And the knowledge about these products was evaluated by means of questions concerning the correct concept of diet and light food, the questions had three alternatives, being only a correct and two incorrect, another question was about the information regarding the diet and light/zero products (TV, newspaper, magazine, nutritionist, internet, books, doctor and others).

The adolescents answered the questionnaire in the classroom, with the supervision of the responsible researcher and the average time was 15-20 minutes.

Descriptive analysis of data was performed to verify frequencies, as well as mean and standard deviation. The Chi-square test and Fisher's exact test were used to compare prevalence rates. The data were analyzed with the use of the software Statistical Package for Social Sciences (SPSS) version 17, with a significance level of 5% when tested the hypotheses.

The project was approved by the Research Ethics of the Federal University of Uberlândia (Legal Opinion number 571.260). In addition, the data collection was only performed after the consent of the directors of schools and parents and/or guardians, after having received accurate and detailed information about the research project.

3 Results and Discussion

316 adolescents were evaluated from 15 to 19 years (16.6 \pm 1.1), who studied in public schools and private schools, in Tupaciguara-MG.

Most of the population was female, public school and with family income lower than five minimum wages. Regarding the nutritional status, most of the interviewed adolescents were eutrophic (Table 1). The weight ranged from 36.0 to 97.0 kg (59.0 ± 10.7) and the height from 1.30 to 1.95m (1.67 ± 9.13) .

Table 1 - Distribution of adolescents according to sex, school, income and nutritional status, Tupaciguara.

Variables	% (n)
Sex	
Female	53.5 (169):
Male	46.5 (147)
School	
Public	85.4 (270)
Private	14.6 (46)
Income	
< 5 minimum wages	63.9 (202)
≥ 5 minimum wages	36.1 (114)
Nutritional Status	
Thinness	5.1 (16)
Eutrophic	83.9 (265)
Excessive weight	11.0 (35)
Total	100 (316)

Source: Research data.

In relation to the consumption of *diet* and/or *light*/zero food, 127 (40.2%) of adolescents reported consuming them. Of these, 53 (41.7%) consume only the *light*/zero foods, 15 (11.8%) consumed only *diet* food and 59 (46.5%) consumed both.

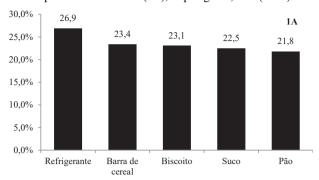
In the present study, 40.2% of adolescents interviewed reported consuming *diet* and/or *light*/zero food. In the study of Branco et al¹⁰, with 941 adolescents from 14 to 19 years, it was observed that 50.2% of adolescents consumed *diet* and/or *light* food. Santos and Miquelanti¹¹, upon evaluating 155 adolescents, being 96 of two private schools and 59 of two public schools, found that 47.7% of adolescents consumed *diet* and/or *light* food.

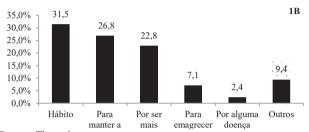
In a study conducted by Rorato et al.¹² in the city of Curitiba, with consumers of *diet* and *light* food aged between 15 and 44 years, it was found that the majority of the interviewees (58%) ate *light* food, 33% consumed both and 10% consumed only the *diet* food. Similar results were found by Perin and Uchida¹³, since 46% of the respondents consumed the *light* products, 40% consumed the diet and light foods and 14% consumed only the *diet* food.

Corroborating the findings above, in the study of Perin and Uchida¹³, *diet* food were less consumed by the adolescents (11.8%). However, differently from the literature, in the present study, the majority of students (46.5%) ate not only the *light* food, but both (*diet* and *light*/zero).

The most consumed *diet* and *light*/zero by the adolescents interviewed were soda, cereal bars and cookies (Figure 1A). The adolescents reported that the main reasons that led to the consumption of diet and light /zero foods were the habit and keep fit (Figure 1B).

Figure 1 - The consumed *diet* and *light*/zero food by adolescents (1A) and the reasons most often reported by adolescents for the consumption of those foods (1B), Tupaciguara, MG (2014).





Source: The authors.

Nowadays it is observed among adolescents, the significant increase in the consumption of industrialized beverages, especially fruit juices and soft drinks, replacing some foods, such as, for example, milk and its derivatives, water and natural fruit juices¹⁴. In the present study, soda was the most consumed zero food by the adolescents. Similar results were obtained by Santos and Miquelanti¹¹, who noted that the most consumed food by adolescents was soda, corresponding to 38.4% of the consumption. Also, in the study of Tebaldi¹⁵, soda was the most consumed zero product, corresponding to 52.8%.

In general, the sodas have high energy density, due to the large quantity of sugars present in their composition. Due to being liquid food, sodas do not activate the satiety center and thereby the consumer increases their energy intake, contributing to weight gain. In addition, sodas have significant quantities of additives, such as preservatives, acidulants and artificial colorings, which may harm the consumers health. The additives contained in sodas may increase the risk of developing diseases (cancer, for example) and allergenic processes and hyperactivity!6.17.

As sodas are quite consumed by adolescents in almost all meals, in order to reduce the energy intake, they opt for zero versions, as a strategy to maintain the body weight. However, the soft zero versions have high amounts of sodium, due to the presence of artificial sweeteners (saccharin and cyclamates), which may increase the risk for the development of hypertension and kidney damage¹⁷.

It was also found in the present study, high consumption of cereal bars (23.4%) and cookies (23.1 %) in the diet and light /zero versions, due to the fact that adolescents believe

that such foods are exempted from energy and/or sugars. However, the *diet* and *light*/zero foods may have exemption and/or reduction of certain nutrient, but not necessarily with significant reduction of energy value.

As shown in Figure 1 (1B), the most frequently reported reasons for the consumption of *diet* and/or *light*/zero foods were the habit (31.5%) and keep fit (26.8%). Different results were found in studies of Santos and Miquelanti¹¹, since the majority of the interviewees (50.9%) reported consuming these products by believing that they are healthier. In a study conducted by Meira et al¹⁸, 23.0% of the adolescents surveyed reported consuming the *diet* and *light* food because they considered them healthy. Thus, it is worth highlighting that they are usually unaware of the purposes of diet and light / zero foods, consuming them without need¹⁸.

Concerning knowledge about diet and light /zero foods, 168 (53.2%) answered correctly on the definition of diet food and 176 (55.7%) answered correctly on the definition of light food.

In a study conducted in Caxias do Sul-RS with 150 consumers of *diet* and *light* products, when asked about the differences between the *diet* and *light* food, the majority (56%) related the concept of *diet* food only with the absence of sugar. About the knowledge of *light* food, 38.7% responded to be the food that presents a minimum reduction of 25% of one of the components¹⁹.

The present study showed similar results in relation to the *light* products, in that the majority of adolescents (55.7%) responded that they had energy, sugars, fats and salt reduced by at least 25% when compared to the traditional product. Knowledge was proved to be different about the *diet* products, when 53.2% responded that they have negligible quantity or even exemption of some nutrients, such as for example, carbohydrates, proteins, fats and salt.

Different results were found in the research of Branco et al.¹⁰, because approximately 40% of the adolescents answered that the *diet* food is reduced in energy and 20% responded that the *light* food does not have sugars, fats and energy.

When asked about the information obtained from the diet and light /zero products, the majority of adolescents interviewed (41.8%) answered that obtained such information through television. This result is similar to that found by Meira et al.¹⁸, who found the percentage of 31.5% of adolescents who have obtained the information through television.

It is important to emphasize that the mass media, especially television, have a direct influence on change and/or acquisition of habits in adolescence, because the media encourages the use of strategies (diets and/or the use of diet and light products) to reach the level of beauty imposed, i.e., slender and slim body for female adolescents and strong and muscular for male adolescents^{20,22}

As shown in Table 2, the female adolescents were the ones that most consumed *light*/zero food (43.2%) and *diet* food (31.4%). Similar results were found by Friberg et al.²² thus reflecting the constant preoccupation with weight control and body image among the girls.

Table 2 - Consumption of light/zero and diet foods, by sex, school, income and nutritional status among adolescents from Tupaciguara.

	Consu	mption <i>Light</i> /Zer	o foods	Consumption Diet foods			
Variables	Yes % (n)	No % (n)	p-Value*	Yes % (n)	No % (n)	p-Value*	
Sex			0.002**			0.001**	
Female	43.2 (73)	56.8 (96)		31.4 (53)	68.6 (116)		
Male	26.5 (39)	73.5 (108)		14.3 (21)	85.7 (126)		
School			0.001**			1.000**	
Public	30.0 (81)	70.0 (189)		23.3 (63)	76.7 (207)		
Private	67.4 (31)	32.6 (15)		23.9 (11)	76.1 (35)		
Income			0.001**			0.891**	
< 5 minimum wages	28.2 (57)	71.8 (145)		23.8 (48)	76.2 (154)		
≥ 5 minimum wages	48.2 (55)	51.8 (59)		22.8 (26)	77.2 (88)		
Nutritional Status			0.075**			0.778**	
Thinness	43.8 (7)	56.2 (9)		18.8 (3)	13 (81.3)		
Eutrophic	32.8 (87)	67.2 (178)		24.2 (64)	75.8 (201)		
Excessive weight	51.4 (18)	48.6 (17)		20.0 (7)	80.0 (28)		

^{*}Chi-square test or Fisher's Exact Test

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Source: Research data.

Regarding the consumption of *light*/zero food among the adolescents of public schools and private schools, it was observed in this study that 67.4% of adolescents who were studying in a private school reported consuming these foods. The same result was observed by Santos and Miquelanti¹¹ and

by Santos et al.²³, since the highest food consumption of *light* food is among the private schools.

The differences between the consumption of *light*/zero foods among the adolescents according to income were also analyzed. The adolescents who had family income equal to

^{***}p-value <0.05.

or higher than five salaries (48.2%) were those that most consumed *light*/zero food. Also, in the research of Rorato et al.¹², the *diet* and *light* products were the most consumed by people who had high family income, above six minimum wages. These results showed the expected, since the *diet* and *light*/zero products found on the market are more expensive than conventional foods, so they are more accessible to people with higher family income.

In the present study, upon associating the knowledge

about the *diet* food and the knowledge about the *light*/zero food among adolescents of public schools and private schools it was observed that adolescents from private school (76.1%) had more knowledge about the *diet* food and also about the *light*/zero food, when compared to the public school (Table 3). This result was expected, since in the private school surveyed there was a nutritionist who performed several studies to clarify the differences among those foods.

Table 3 - Knowledge of diet and light/zero foods by sex, school, income and nutritional status.

	Knowledge Diet			Knowledge Light/Zero		
Variables	Variables Yes % (n)	No % (n)	p-Value*	Yes % (n)	No % (n)	p-Value*
Sex			0.115**			1.000**
Female	57.4 (97)	42.6 (72)		55.6 (94)	44.4 (75)	
Male	48.3 (71)	51.7 (76)		55.8 (82)	44.2 (65)	
School			0.001**			0.003**
Public	49.3 (133)	50.7 (137)		52.2 (141)	47.8 (129)	
Private	76.1 (35)	23.9 (11)		76.1 (35)	23.9 (11)	
Income			0.100**			0.238**
< 5 minimum wages	49.5 (100)	50.5 (102)		53.0 (107)	47.0 (95)	
≥ 5 minimum wages	59.6 (68)	40.4 (46)		60.5 (69)	39.5 (45)	
Nutritional Status			0.275**			0.107**
Thinness	68.7 (11)	31.3 (5)		62.5 (10)	37.5 (6)	
Eutrophic	51.3 (136)	48.7 (129)		53.2 (141)	46.8 (124)	
Excessive weight	60 (21)	40 (14)		41.6 (25)	58.4 (35)	

^{*}Chi-square test or Fisher's Exact Test

Source: Research data.

In this study, the association between the variables consumption and knowledge about diet and light /zero foods showed that 64.6% of adolescents who consumed these foods had knowledge about the *diet food* and 63.8% had knowledge about the *light food*. As there is no study in the literature that associates the knowledge to the consumption of diet and light /zero foods, it was not possible to compare these results.

The limitations encountered in this study was the absence of a questionnaire validated in the literature to assess the knowledge and the consumption of diet and light /zero foods and the great disparity in relation to the number of students enrolled in secondary education in public and private schools. In addition, due to existing few studies on the subject and also different profiles of populations studied, there was a difficulty for the discussion of the results.

4 Conclusion

More than 60% of adolescents consumers of diet and light /zero foods had knowledge about these foods, however, it is known that a large part of the interviewees are unaware of the differences and indications of such foods, consuming them without need. Educational projects should be implemented in schools, in order to clarify the adolescents about the correct concept of diet and light /zero foods, as well as their purposes.

The diet and light/zero products are considered as popular

in the Brazilian market, however, the scientific research on this subject, mainly involving adolescents are still scarce in the literature, being necessary more studies on the subject.

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