Analysis of labels in prepackaged food for children in the light of Traffic Light Labelling

Análise da rotulagem de alimentos industrializados destinados ao público infantil à luz da proposta de semáforo nutricional

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ABSTRACT

Children are strongly exposed to food marketing and the Traffic light labelling allowed the accessibility and understanding of the information on the labels. The objective of this study was to classify the processed food labels targeted at children, for the amounts of sodium, sugars, fat (total, saturated and trans) and fiber. To this end, product labels presenting abusive advertising features in children and adolescents –as defined by AnvisaNVISA's RDC nº24/2010 and ConandaONANDA's RDC nº163/2014- were collected. The 85 products selected were from different brands in order to enable comparison of the labels and nutrients between the same food group, considering the proposal of Traffic Light Labelling. There were alarming results in the groups of instant noodles and stuffed biscuits regarding the inadequacy of saturated fats, sodium and fiber. The fibers were the nutrients that presented greater amount of red ratings, and trans fats more adjustments (green) in the food groups. As for the sugars, it was not possible to evaluate their presence, as it is not required to present sugars information in Brazil. The products analyzed appear to be nutritionally inappropriate in the context of a healthy diet and their consumption appears as a risk factor to the health of children.

KEYWORDS: Food Advertising; Food Labeling; Children; Sanitary Surveillance

RESUMO

As crianças estão fortemente expostas ao *marketing* de alimentos e o Semáforo Nutricional apresenta-se como possível aliado na acessibilidade e compreensão das informações contidas nos rótulos. Objetivou-se classificar os rótulos de alimentos industrializados direcionados ao público infantil, quanto às quantidades de sódio, açúcares, gorduras (totais, saturadas e trans) e fibras. Foram coletados rótulos de produtos com características de publicidade abusiva à criança e ao adolescente conforme descrito pelas RDC nº 24/2010, emanada pela Anvisa, e RDC 163/2014, disposta pelo Conanda. Os 85 produtos selecionados pertenciam a diferentes marcas, a fim de possibilitar a comparação dos rótulos e nutrientes entre alimentos do mesmo grupo, considerando a proposta do Semáforo Nutricional. Observou-se resultados alarmantes nos grupos macarrão instantâneo e biscoitos recheados em relação à inadequação de gorduras saturadas, sódio e fibras. As fibras foram os nutrientes que receberam maior quantitativo de classificações vermelha, e as gorduras trans, mais classificações verde nos grupos de alimentos. Houve impossibilidade de avaliação dos teores de açúcares pela sua presença não ser obrigatória na informação nutricional no Brasil. Os produtos avaliados parecem inapropriados nutricionalmente no contexto da alimentação saudável e seu consumo configura-se como fator de risco à saúde do público infantil.

PALAVRAS-CHAVE: Publicidade de Alimentos; Rotulagem de Alimentos; Criança; Vigilância Sanitária

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INTRODUCTION

Eating habits are changing fast in most countries, particularly in economically emerging countries like Brazil. The main changes involve the replacement of freshly produced food of vegetable origin and culinary preparations based on that by ready-to-eat processed products. These changes lead to imbalance in nutrient supply and excessive calorie intake, triggering the emergence of cases of obesity concomitant with chronic diseases, such as high blood pressure, cardiovascular diseases and certain types of cancer. Formerly associated with older people, many of these complications now affect young adults and even adolescents and children[1].

In Brazil, for over 20 years, the prevalence of obesity in children between five and nine years old increased fourfold among boys (4.1% to 16.6%) and virtually five times among girls (2.4% to 11.8%)[2]. The consequences of obesity are related to psychosocial aspects like discrimination, negative self-image, depression and poor socialization; as well as physical complications such as hyperlipidemia, high blood pressure, hyperinsulinemia and diabetes mellittus type 2[3]. With that in mind, Madruga et al.[4] reinforce the importance of building adequate eating habits even in childhood, stating that they may change substantially during growth, but the record and importance of early learning as well as some acquired social behavior remain throughout their life cycle.

Children, dependent as they are on their parents, have their eating experiences heavily influenced by their family's food choices, which include, for example, when they will be fed, the contexts in which they will be fed, what types of food and serving sizes are given to the children and what practices will be used to encourage or discourage their feeding habits[5].

This fact is corroborated by Rossi et al.[6], stating that parents play a key role in purchasing and preparing food. In other words, in addition to controlling the quality of the food, children's food preferences are influenced by their parents' choices and eating habits. They also highlight the importance of an educational policy that addresses nutritional information and the demystification of issues related to food. They say this policy should be targeted at the families due to their fundamental importance in children's education.

Several authors argue that the knowledge that much of the children today have about food is directly related to food advertising seen on television, the internet and other media[3,6,7]. In view of this, children are an attractive audience to marketing, because, in addition to their vulnerability, they influence family purchases and enable early consumer loyalty to a certain brand that may extend into adulthood[7,3].

Part of the process of sanctioning marketing regulations is to decide whether or not a campaign is really directed at children. Making this assessment is not always a simple matter[8].

In this context, there is the Brazilian Advertising Self-Regulation Code (Conar), a civil society organization run by a non-governmental council formed by agencies, advertisers and media channels to promote freedom of expression and advocate the constitutional prerogatives of commercial advertising, preventing misleading or abusive advertising from causing embarrassment to consumers or businesses[9].

Regarding the defense of the rights of children and adolescents, including health, the National Council for the Rights of Children and Adolescents (Conanda) recently approved Collegiate Board Resolution (RDC) n. 163, of March 13, 2014, which deals with abuses in advertising and marketing communication targeted at children and adolescents[10].

In this context, it is worth mentioning RDC n. 24, of June 15, 2010, which deals with the offer, advertisement, publicity, information and other related practices whose purpose is the dissemination and commercial promotion of food considered to contain high amounts of sugar, saturated fat, trans fat, sodium, and beverages with poor nutritional content[11].

Currently, the main current rulings related to nutrition labeling are:

a. RDC n. 54 of November 12, 2012, which provides for the Technical Regulation on Complementary Nutrition Information[12];

b. RDC n. 360, of December 23, 2003, approving the Technical Regulation on Nutrition Labeling of Packaged Food, making nutrition labeling mandatory. The following nutrients must be declared in the nutrition facts: calories, carbohydrates, proteins, total fats, saturated fats, trans fats and sodium[13].

Pontes et al.[14] state that 70% of the people refer to food labels at the time of purchase, but more than half do not fully understand them, concluding that although the population considers it important that the food label contains nutrition facts, most people do not know how to use that. Another important point raised by Machado et al.[15] was the information consumers pay attention to on food labels, with calories and nutritional composition reported by 5% and 2% of respondents, respectively.

In view of this landscape, which reflects inadequate label information for consumer understanding, the Food Standards Agency (FSA) of the United Kingdom created a simple and intuitive proposal to guide consumers in choosing healthier products. This tool, which has already expanded to other European countries, is called *Traffic Light Labeling*, which suggests that the food label should display a very simple graphic scheme, based on the colors of the traffic light, informing whether the content of sugar, sodium and fat in processed foods is high (red color), medium (amber color) or low (green color). This can make the understanding of labels more accessible to laypeople and children[16,17]. That is, the proposal of the Traffic Light Labeling can be a useful and applicable tool in the food education process through food labeling, reflecting relevant nutritional characteristics that often go unnoticed to the eyes of the consumers.

Senate Bill (PLS n. 489/2008) proposed the Traffic Light Labeling (green, amber, red) on food labels. However, it was considered inadequate by 58% of the respondents, with low priority[198,189].

At the end of 2014, this project was filed due to the end of the evaluation period by the Senate. In 2015, at the request of the author of the bill, the process was analyzed by the Committee on the Environment, Consumer Protection and Inspection and Control. In September of that year, CMA Request n. 80 was approved with the proposal of a public hearing to discuss the bill. Currently, the project is still waiting for this public hearing. Among the arguments used to elaborate and approve the bill, we highlight the change in the food profile of the Brazilian population, reflecting in alarming numbers of childhood obesity in comparison with the world scenario, as well as the fast growth of chronic-degenerative diseases associated with it, especially diabetes and cardiovascular diseases. Furthermore, the indication of nutrient contents such as sugar, salt and fat through the color scheme enables the population to understand labels more easily, helping in the choice of healthier foods[19,20].

Ecuador has recently become the first Latin American country to introduce the Traffic Light Labeling into its labeling system to alert consumers about fat, sugar and salt content. However, the position of the traffic lights is optional, in other words, they may be present on the front or the back of the label, unlike the pioneer United Kingdom, where the traffic lights must stay on the front part of the label[21].

The present study aimed to classify the labels of processed food directed at children regarding the amounts of sodium, sugar and fats (total, saturated and trans) and fiber, according to the model of Traffic Light Labeling, adapted from Longo-Silva, Toloni and Taddei[22], in relation to the compliance values for trans fats, in accordance with the parameters of current Brazilian legislation regarding complementary nutritional information[12].

METHOD

This study considered products that meet the definition of advertising/publicity/commercial promotion of food intended for children: food of direct use or employed in home preparation, intended directly for consumption by children, or that is in some way marketed or presented as appropriate for this population group, established by RDC n. 24/2010[11].

The inclusion criterion also included the processed foodstuffs that presented in their labeling and/or commercial marketing aspects that characterize abusive advertising to children and adolescents, according to RDC n. 163/2014 of Conanda[10], namely:

III)   children's language, special effects and excess color;

IV)   soundtracks of children's songs or sung by children;

V)   children's representation;

VI)   people or celebrities that appeal to children;

VII)   children characters or hosts;

VIII) cartoons or animation;

IX)   dolls or the like;

X)   promotions with distribution of prizes or collectible gifts or with appeal to children; and

XI)   promotions with competitions or games with appeal to children.

According to the established inclusion criteria, the following food groups were selected for the study because they contained a greater number of samples: instant noodles; sandwich cookies; packaged snacks; processed juices and dairy drinks (dairy product resulting from the mixture of milk and whey added or not with product or food substances such as vegetable fat, fermented milk, selected starter cultures and other dairy products).

The samples were collected between September and October 2014, and we observed the brands and nutritional information (whether in table or in running text) of the food under analysis. The field of research included visits to three commercial establishments (supermarkets and hypermarkets) located in the northern side of the city of Rio de Janeiro, Brazil. We selected 85 product labels that were available for purchase on the shelves and that met the above inclusion criteria. Data was collected and put into tables for the purposes of this research project.

The information we collected was organized and analyzed with the aid of a spreadsheet on *Microsoft Excel 2007®*.

For this study, we adopted the adaptation of the concept of Traffic Light Labeling to the standards established by the Brazilian legislation elaborated by Longo-Silva, Toloni and Taddei[22]. Nutrients were classified as: green color (small amount of the nutrient), amber color (average amount of the nutrient) and red color (excess nutrient), except for fiber, for which red indicates insufficient nutrient and green means a sufficient amount of the nutrient. The suggested cut-off points for determination of the nutrient classification in green, amber and red were based on the standards of the Brazilian Health Surveillance Agency (Anvisa), and for those without standardization, the FSA ratings were maintained. The adaptation of the proposal of Longo-Silva, Toloni and Taddei[22] was made regarding the green values of trans fats, according to the claim of "does not contain" designated by the current Brazilian legislation as referring to supplementary nutritional information, which attributes such claim to values lower than or equal to 0.1 g of trans fats[12]. It should be noted that all values refer to 100 g or 100 ml of the food in the way it is exposed for sale.

The parameters suggested by Longo-Silva, Toloni and Taddei[22] adopted in this study are described in Table 1.

RESULTS

A total of 85 food labels were analyzed for various food groups: dairy drinks (n = 14, 16.5%), instant noodles (n = 9, 10.6%), sandwich cookies (n = 23; 27.06%), packaged snacks (n = 12, 14.1%) and processed juices (n = 27, 31.8%), as explained in Table 2.

One can see that the groups of sandwich cookies and processed juices represent the largest portions of the analyzed samples. This

is because these are the items with the widest variety of brands and flavors available in the market and directed at children.

All the samples from the group of instant noodles were rated red in terms of saturated fats, sodium and fiber. The total fats item obtained amber and red ratings, while trans fat was 100% adequate. The amount of sugar was not reported by any sample.

The group of sandwich cookies was rated red in all items, except trans fat. The amber classification was also frequent, present in the categories of total fats and saturated fats, trans fats, sodium and fiber. Sugar content was informed by five samples, all with the red rating.

In the group of packaged snacks, the samples were adequate in terms of trans fats, in contrast to their total inadequacy in terms of sodium content. Total fats, saturated fats and fiber stroke some balance between the amber and red ratings. The sugar content reported by four samples was rated green.

The group of processed juices presented adequate samples in relation to total fats, saturated fats, trans fats and sodium. On the other hand, 100% inadequacy was observed in the fiber category. No sample of this group informed sugar content on their labels.

In relation to dairy drinks, the amber rating was predominant in the categories of total fats, saturated fats and sodium. In 100% of the samples of this category we observed adequacy for trans

fat and inadequacy for fiber. Regarding sugar, only one sample informed the content on its label, however, it was rated red.

DISCUSSION

We could verify that the groups of foods with worse nutritional composition based on the application of the Traffic Light Labeling were: instant noodles and sandwich cookies, with red ratings in four and five nutrients, respectively. In relation to nutrient evaluation, fiber obtained the highest percentage of inadequacy in the food groups we evaluated, two of them with 100% inadequacy.

The Brazilian legislation in force does not require mandatory information on sugar content in nutrition labeling (RDC n. 360/2003)[13]. This is reflected in the present study, in which we could not apply the classification to the framework of the Traffic Light Labeling for the great majority of the samples evaluated for this item. This fact is extremely worrying, since sugar is a nutrient that contributes to the increase in the energy density of the food, besides having a high glycemic index and being free of important nutrients for the child's growth and development, such as vitamins and minerals. Its consumption is also associated with an increase in cariogenic levels[23].

The absence of information on the sugar content of all the labels analyzed was noted in the group of processed juices, although the addition of sugar is permitted under the legislation in force,

Table 1. Cut-off points for the classification of 100 g or 100 ml of food, according to adaptation of the Traffic Light Labeling model to Brazilian standards (Adapted from Longo-Silva, Toloni and Taddei[22]).

Nutrients	Green		Amber		Red	
	Solid	Liquid	Solid	Liquid	Solid	Liquid
Total fats (g)[1,2]	≤ 3.0	≤ 1.50	> 3.0 and ≤ 20.0	> 1.50 and ≤ 10.00	> 20.0	> 10.0
Trans fats (g)[1]	0.1	0.05	> 0.1 and ≤ 1.0	> 0.05 and ≤ 1.00	> 1.0	> 1.0
Saturated fats (g)[1,2]	≤ 1.5	≤ 0.75	> 1.5 and ≤ 5.0	> 0.75 and ≤ 2.50	> 5.0	> 2.5
Sodium (mg)[1]	≤ 40.0	≤ 40.00	> 40.0 and ≤ 120.0	> 40.00 and ≤ 120.00	> 120.0	> 120.0
Sugar (g)[1,2]	≤ 5.0	≤ 2.50	> 5.0 and ≤ 12.5	> 2.50 and ≤ 7.50	> 12.5	> 7.5
Fiber (g)[1]	≥ 6.0	≥ 3.00	≥ 3.0 and < 6.0	≥ 1.50 and < 3.00	> 3.0	< 1.5

[1]National Health Surveillance Agency (2012); [2]*Food Standards Agency* (2007).

Table 2. Percentages of the analyzed items and their respective ratings according to the adaptation of the Traffic Light Labeling model for all the food groups evaluated.

Food groups	Nutrients (%)												
	Sugar		Total fats		Saturated fats (g) 1.2			Trans fats		Sodium		Fiber	
Instant noodles	100[a]		33[b]	67[c]	100[b]			100[d]		100[b]		100[b]	
Sandwich cookies	22[b]	78[a]	44[b]	56[c]	87[b]	9[c]	4[d]	9[c]	91[d]	83[b]	17[c]	87[b]	13[c]
Packaged snacks	33[d]	67[a]	42[b]	58[c]	42[b]	58[c]		100[d]		100[b]		42[b]	58[c]
Processed juices	100[a]		100[d]		100[d]			100[d]		100[d]		96[b]	4[c]
Dairy beverages	7[b]	93[a]	86[c]	14[d]	71[c]	29[d]		100[d]		93[d]	7[c]	100[b]	

[a]Not stated on the label; [b]Red rating in the adapted Traffic Light model; [c]Amber rating in the adapted Traffic Light model; [d]Green rating in the adapted Traffic Light model.

provided that the expression "sweetened" is written on the fruit juice label, as was the case of the collected samples[24].

Nevertheless, this industry maneuver was banned in December 2014. The Ministry of Agriculture, Livestock and Food Supply (MAPA) adopted new rules, making it mandatory to inform the percentage of ingredients on non-alcoholic beverage labels, in order to clearly inform the amount of fruit juice, vegetable juice or fruit pulp (Regulatory Instructions - IN n. 17, n. 18 and n. 19/2013). Another adjustment for beverage manufacturers was related to increasing the minimum amount of juice in grape and orange nectar. From 2015 on, the percentage of juice in nectar-type beverages rose from 30% to 40%, and by 2016, the quantity rose to 50% (IN n. 42/2013). These measures directly affect the amount of added sugar in these products, which is currently high and largely unknown to the consumers. However, in spite of this progress, it is important to point out that the ideal is that most of the nectar was only juice, with the minimum of water necessary and without sugar; after all, the consumption of heavily sugared beverages contributes to the increase in the obesity rate of the population, and these are not drinks that should be consumed freely, especially by children[25].

The composition of this food product reflects not only the results concerning sugar, but also fiber, since all the samples of processed juices presented were rated red in this item. This finding is corroborated by data from the 2008-2009 Family Budget Survey (POF), which indicates the consumption of reconstituted powder juice/soda/juice among the highest daily consumption averages *per capita*: 145 mL/day, with no differences between the income brackets. This is associated with the prevalence of excessive consumption of sugar and below the recommended intake of fiber, as mentioned by 61% and 68% of the population, respectively[26].

As observed in the processed juice group, none of the samples from other remaining food groups achieved the green rating for the fiber content, which causes a negative impact on the children's diet. Research on dietary fiber consumption by Mello et al.[27] with children and adolescents with chronic constipation observed an insufficient consumption of fiber in 85.9% of the 38 patients studied, demonstrating how the consumption of this nutrient is important and deficient in this group.

Instant noodles is a food product that has been showing a strong tendency to increase consumption, especially among children, as it is easily accepted, fast, convenient and affordable. According to the Brazilian Association of Biscuit, Pasta and Processed Buns and Cakes Industries (Abimap), demand for this product increased by 11.5% in volume and 36.8% in value over the last three years[28]. However, a commercial unit in this group exceeds 459% of the 2000 mg daily sodium recommendation by the World Health Organization (WHO), equivalent to 5 g of salt per day, and reaches 40% of the total fat level for this age group[23].

In this context, it is relevant to discuss voluntary agreements between the food industry and the federal government between 2011 and 2013 to reduce the sodium content in processed foods. These agreements were preceded by an articulated movement

initiated in 2007 for the reduction of trans fats in processed foods. The official document was the Rio de Janeiro Declaration of June 2008, in which the region's governments and food industries agreed to drastically reduce the levels of trans fats in oils and margarines, as well as in processed foods in general[29].

In 2009, the initiative to reduce salt consumption emphasized the need to establish partnerships and a gradual plan to reduce sodium levels. It also encouraged greater awareness through labeling and consumer education. The goal is to gradually and sustainably reduce salt intake in the diet with the objective of achieving national or, if not recommended, international targets of consumption of less than 5 g/day/person by the year 2020[29,30].

Children and adolescent protection was also decisive in the choice of the food categories covered by this initiative. Through data from the 2008-2009 POF we can learn which food categories are most consumed by this population. Instant noodles, packaged snacks (fried potatoes and snacks) and sandwich cookies are included in the priority list prepared by the Ministry of Health[30,26].

We found in the present study that the groups of instant noodles and packaged snacks were 100% inadequate in terms of sodium content, with all samples rated red. This data is corroborated by Toloni et al.[23] when they claim that snacks and sandwich cookies have high levels of fats, salt and sugar, as well as preservatives, dyes and other food additives. Continued and excessive ingestion can define deeply rooted and inadequate eating habits that persist from childhood to adulthood, contributing to childhood obesity and the increasingly early onset of Chronic Noncommunicable Diseases.

In a study carried out with 62 children enrolled in the Nutritional Surveillance System (Sisvan) in a city in the state of Rio Grande do Sul, Brazil, it was verified that potato chips/fried snacks, crackers/packaged snacks, sweet cookies, sweets in general and soda were consumed up to three days per week. And 50% of the children evaluated consumed processed or powdered juices in the month preceding the survey[31]. This landscape could change if they had a better understanding the nutritional facts contained in the labels of these products, as demonstrated by the work of Babio et al.[32], in which products with 6.7% and 9.2% less sugar and salt, respectively, were chosen when using the Traffic Light Labeling compared to the monochromatic complementary labeling system. However, the authors point out that more research is needed to assess the impact of the use of color-coded nutrition labeling schemes in relation to consumer habits, purchases and actual consumption.

The current nutritional information on the labels of most processed products does not distinguish between the nutritional needs of adults and children. The Brazilian Institute of Consumer Defense (IDEC) analyzed labels of eight products such as cookies, breaded chicken, instant noodles, sweet cakes, corn chips and other processed foods, and concluded that in half of them children consume up to eight times as much sodium than the recommended daily amount for an adult. However, in view of the increase in cases of childhood obesity, IDEC proposed a public

debate so that the values indicated in foods with appeal to children - those with character designs, lively colors, gifts, and other items - are adapted to the specific nutritional needs of children[34].

Regarding the evaluation of trans fatty acids (TFA), the evaluated samples achieved good ratings for the contents of this type of fat. This attracts attention since most processed products present such nutrient in their composition due to the very nature of industrial processing.

TFAs are a specific type of fat derived from the industrial or natural hydrogenation process (occurring in the rumen of animals). Its main purposes are food preservation and improvement of sensory and physical characteristics (appearance, aroma, flavor, color, texture)[34].

In this context, Proença et al.[35]suggest:

- The standardization of the name of components with trans fat in the list of ingredients. In Brazil trans fat can be found in the list of processed food ingredients like: partially hydrogenated fat, partially hydrogenated vegetable fat, hydrogenated vegetable fat, partially hydrogenated vegetable oil, hydrogenated vegetable oil, hydrogenated oil and partially hydrogenated and/or interesterified fat. It is not possible to be certain of the presence of trans fatty acids, since it is not known whether they have undergone the partial hydrogenation process that forms these fatty acids;

- Notification of trans fat content per 100 g in nutritional information independent of value, with no minimum reference value for this notification;

- Highlight on the front of the package only when the product is free of trans fat (both in its ingredients and manufacturing process), with the standard sentence: "trans fat free".

From this perspective, the industry has used as an alternative to the hydrogenation process the enzymatic interesterification process, which produces, for example, margarines free of trans isomers[36]. Perhaps this is why cookies made with vegetable fat plus margarine do not have trans fats.

Excessive consumption of TFA is mainly related to the development of cardiovascular diseases and changes in fetal and child growth and development[34]. To date, there is no scientific evidence to conclude the effect of the rearrangement of fatty acids in interesterified fat in metabolic processes, development of atherosclerosis, and cardiovascular outcome. However, it should be noted that there is a high predominance of saturated fatty acids in interesterified industrial fat[37].

A study carried out comparing the fatty acids composition of margarines based on hydrogenated and interesterified fat found that the interesterified ones would be more recommended for human consumption, because they have a lower content of trans fatty acids than the others. Futhermore, although it is not mandatory information in the nutrition facts (only in the list of ingredients), the declaration of the types of oils used is of interest to the consumer, since depending on the type of oil there are modifications in the contents of trans fatty acids in the final product[38].

In a study of the trans fat content of sandwich cookies, the authors emphasize that greater attention and care should be given to the ingestion of this type of cookie, since trans fat is present in the composition of most of these products. Additionally, cheaper cookies have a higher amount of trans fat than of saturated fat[39]. Still in relation to this product, another important factor to be considered is the size of the serving on the nutrition label (30 g), yet another trick used by the food industry to deceive the consumers, since despite levels of trans fats within the recommendation for children, rarely does a child consume only this amount of the product.

Saturated fats are necessary for the body for structural and energetic functions; however, excessive intake of saturated fatty acids can pose risks to the body, such as elevated plasma LDL-c and plasma cholesterol levels, leading to increased exposure to cardiovascular risks. In order to minimize such risks through the reduction and control of plasma cholesterol and LDL-c, several international guidelines recommend restriction of total fats and cholesterol[37].

In a study addressing nutritional assessment and risk of cardiovascular disease in children, it was observed that 41% of the 204 individuals evaluated had high intake of saturated fat[40].

There is no consensus on which stage of life and how prevention for atherosclerosis should begin, but, according to the mechanisms of origin and development of the disease, the concept that this treatment should begin in childhood is consolidated[41].

A report recently issued by the Pan American Health Organization (PAHO) points to an increase in sales of ultraprocessed foods in all Latin American countries, including Brazil, which may be closely related to the poor quality of food and represent yet another risk factor for obesity and CNCD. Faced with such a scenario, the document highlights the importance of reducing the consumption of ultraprocessed products through the implementation and enforcement of fiscal policies and regulations in food advertising and labeling[42]. From this last point emerges the need to research and evaluate auxiliary tools in the accessibility of nutritional information to consumers, like as the proposed Traffic Light Labeling.

CONCLUSIONS

Nutrition information on labels is one of the main means of encouraging consumers to make healthier choices when buying food. The application of the Traffic Light Labeling requires deep changes in the legislative system and in the industries, and further studies are needed in underdeveloped or developing countries, since these are still scarce. To follow up this research project, we intend to study private schools in the city of Macaé, Brazil, using the game-like technique of the Traffic Light Labeling. Our intention is to contribute to the research on the use of this communication strategy on nutritional facts. In this sense, the objective is to raise children's awareness about the importance of healthy eating habits. However, other studies must be

carried out in view of the adoption of this strategy by the food industry, since this sector also plays a fundamental role in the adoption of food habits by the population.

The ratings obtained through the application of the adapted Traffic Light Labeling model enable us to conclude that the products destined to the evaluated public and currently available in the market are nutritionally inappropriate in the context of a healthy diet. Its consumption is a risk factor for the health of this age group, which has been presenting high rates of Chronic Non-communicable Diseases. Finally, children and adolescents are in a phase where they are building their eating habits, which can last until their adult age.

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Conflict of Interest

Authors have no potential conflict of interest to declare, related to this study's political or financial peers and institutions.