MLS – HEALTH & NUTRITION RESEARCH (MLSHNR)
http://mlsjournals.com/Health&nutritionrsearch-Journal
ISSN: 2603-5820
(2025) MLS-Health & Nutrition Research, Vol(Núm), 22-37. doi.org/10.60134/mlshn.v4n1.3288

Knowledge of nutrition labelling and warning labels on foods included in school snacks by adolescents in an educational

Conocimiento del etiquetado nutricional y sellos de advertencia en alimentos incluidos en la merienda escolar por adolescentes de una institución educativa de asunción

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Manuscript information:

Recibido/Received:12/05/25
Revisado/Reviewed: 14/05/25
Aceptado/Accepted: 26/05/25

Keywords:
nutritional labeling, food labeling, adolescents, knowledge.

ABSTRACT

Food labeling and warning labels are the information presented on food products as a means of transmitting information to the consumer about nutritional value, ingredients and quality. The study evaluated the knowledge of nutritional labeling and labeling of packaged foods as a school snack option in adolescents aged 12 to 15 years in an educational institution in Asunción in 2023, through a descriptive observational study, with the application of a self-administered questionnaire to 69 schoolchildren, with an average age of 13 years. 88,4% of the students recognized the calorie information on the label, while 59,4% did not identify the information on dietary fiber. These data are similar to previous studies, where the calorie component of nutritional labeling is the data of greatest interest to the consumer and the dietary fiber content is the data of least interest. The school canteen was the place where the snack was purchased (66,77%), these data coincide with another previous study, where the school canteen or canteen is the main establishment providing food to students. 31,9% of students opted for packaged juices daily; This finding of type and frequency of packaged foods coincides with other studies, where schoolchildren show a preference for packaged fruit juice every day. In conclusion, the majority of students know the information on nutritional labeling and food labeling, although areas for improvement are identified for the identification of certain nutrients.

RESUMEN

Palabras clave:
etiquetado nutricional, rotulado de alimentos, adolescentes, conocimiento.

El etiquetado y sellos de advertencia en alimentos es la información presentada en los productos alimentarios como medio para transmitir información al consumidor sobre el valor nutricional, ingredientes y calidad.

El estudio evaluó el conocimiento del etiquetado nutricional y sello de advertencia de alimentos envasados como opción de merienda escolar en adolescentes de 12 a 15 años en una institución educativa de Asunción en el 2023, mediante un estudio observacional descriptivo, con la aplicación de un cuestionario autoadministrado a 69 escolares, con una media de edad de 13 años. El 88,4% de los estudiantes reconoció la información de calorías en el etiquetado, mientras que 59,4% no identificó la información sobre fibra alimentaria. Estos datos son similares a estudios previos, donde el componente caloría del etiquetado nutricional es el dato de mayor interés del consumidor y el contenido de fibra alimentaria el de menor interés. La cantina escolar fue el lugar de adquisición de la merienda (66,7%), estos datos coinciden con otro estudio previo, donde el comedor o cantina escolar, es el establecimiento principal proveedor de alimentos a los estudiantes. Un 31,9% de estudiantes optó por jugos envasados diariamente; este hallazgo de tipo y frecuencia de alimentos envasados coinciden con otros estudios, donde los escolares muestran preferencia por el jugo de frutas envasado todos los días. En conclusión, la mayoría de los estudiantes conoce la información del etiquetado nutricional y el sello de advertencia de los alimentos, aunque se identifican áreas de mejora para la identificación de ciertos nutrientes.

Introduction

In the context of food and nutrition education, human beings receive, from birth and throughout their lives, behavioral norms and positive or negative reinforcement, which are influential in making decisions, from food choices to food consumption. It is a pedagogical work, which allows us to become aware of the importance of human needs and leads us to revalue our own food culture. Therefore, food and nutrition education should be aimed at promoting good eating habits or modifying those eating habits, involving all members of the educational community; children, parents, teachers and administrators (1).

The nutritional concern in Latin American countries with malnutrition problems is manifested in the development of food policies and programs, as well as in educational strategies, to modify the prevalence of the two key poles: obesity and overweight, on the one hand, and malnutrition, on the other. This double burden of undernutrition throughout the life course affects individuals, households and peoples in the present and in the future, given the development of these prevalences, whose nutritional situation in Latin America is pressing (2). Therefore, Latin America and the Caribbean face innumerable challenges, one of which is the phenomenon of nutritional transition, characterized by the coexistence of chronic malnutrition (anemia and short stature) together with obesity and overweight, which are linked to the high number of chronic noncommunicable diseases (3).

In some countries, such as Brazil, Argentina and Colombia, specific pedagogical strategies are being developed that include food and nutrition education, seeking to strengthen eating habits in order to achieve comprehensiveness, diversity and access to a healthy diet. For this, it is necessary to modify the way in which school actors relate to the knowledge of families and their own, for its integration into the dynamics of daily school work (4).

Currently in Paraguay, childhood obesity and overweight constitute an emerging public health problem that requires a health promotion intervention from a preventive perspective in terms of healthy eating habits, in order to reduce morbidity and mortality due to chronic non-communicable diseases such as hypertension, type 2 diabetes, heart disease, among others (3). Some healthy behaviors during adolescence make it possible to counteract those health problems in adulthood. In childhood it is essential, since this is the stage of optimal development and growth, as well as biopsychosocial maturation, which is why it is necessary for children/adolescents to consume nutritious and healthy food. Irregular consumption of meal intervals, which has been evidenced as a consequence of unhealthy eating styles in adolescents, is also a consequence of the metabolic syndrome in adulthood. Fruits and vegetables are fundamental components of a healthy diet. Most chronic diseases were attributed in 2010 to the relationship with unhealthy eating, mainly low consumption of fruits and vegetables, and excess sodium, alcohol and physical inactivity (5).

The World Health Organization mentions that nutritional diseases due to excess can be identified through nutritional diagnosis, using the body mass index (BMI), whose formula is a division between weight (in kilograms) and height (in meters squared), this estimate can affirm the presence of overweight (BMI ≥ 25) or obesity (BMI ≥ 30) (3).

In Paraguay, the National Action Plan for the Prevention and Control of Chronic Noncommunicable Diseases 2014-2024 is underway, contemplating strategies for the prevention and monitoring of NCDs, and the accompaniment of the Paraguayan Dietary Guidelines, with recommendations to promote healthy and balanced diets for families; in

addition, the School Feeding Program has been implemented, seeking adequate food, which benefits the development of schoolchildren (6).

The latest data from Paraguay's second National Survey of Noncommunicable Diseases 2022 revealed that the prevalence of overweight and obesity among children and adolescents aged 5 to 19 years was 34% in 2016, up from 13% in 1975. In other words, both the prevalence of overweight and obesity increased significantly in all age categories (7). According to the report of the National Food and Nutrition Institute (INAN) 2022, within the Food and Nutrition Surveillance System (SISVAN), the malnutrition situation is low in schoolchildren (1.5%) and overweight presents worrying figures. Overweight and obesity were 21.1% (n=2755) and 13.0% (n=1694), respectively, which together would correspond to 1/3 of the population of overweight students (34.1%) (8).

The high prevalence of Chronic Non-Communicable Diseases (NCDs) is a global and national public health problem, the causes of which are multifactorial and associated with unhealthy lifestyles. Industrialized foods are high in simple sugars, saturated fats, trans fats, sodium and low in protein, healthy fats and fiber, so their excessive consumption predisposes to the appearance of these diseases (7).

Paraguay is characterized by a significant epidemiological transition in the area of nutritional disorders. In this sense, the coexistence of diseases due to nutritional deficit, such as malnutrition and micronutrient deficiencies, and excess, including obesity and diseases related to overweight, can be observed. This situation reflects a double burden of disease, where public health conditions must simultaneously address problems of malnutrition and overnutrition. Research has shown that the development of cardiovascular disease, especially coronary heart disease, begins in childhood. This early onset is closely linked to the same risk factors identified in adults: sedentary lifestyle, which limits the physical activity necessary for healthy development; obesity, which results from an inadequate diet and lack of exercise; high blood pressure, which can begin to manifest itself in childhood; dyslipidemia, which involves abnormal blood lipid levels; and family history, which genetically predisposes individuals to develop these conditions. This epidemiological context highlights the need to implement public health strategies that focus on both prevention and treatment of these diseases from an early age, promoting healthy lifestyle habits and managing risk factors from childhood (9, 10).

Therefore, it was essential to regulate the canteen service in the country's official and private educational institutions, since this is a service that should provide nutritious and healthy food to the educational community during different times of the day, so the Ministry of Education and Science (MEC) drafted Resolution No. 12774/03, dated September 26, 2003 (11). The School Feeding Program of Paraguay (PAEP) is currently in force. Its purpose is to contribute to the formation of a healthy lifestyle, through education and the incorporation of appropriate habits, by means of the development and promotion of food and nutrition education. The document establishes a list of permitted foods, among which are: fruits, milk and derivatives, fruit salad, cereal bars, cereals without sugar, crackers, cracker-type crackers, and sweet cookies without filling, peanuts and other types of nuts, fruit or vegetable juice, traditional milk-based desserts (Rice pudding, cream, pudding, candial, mazamorra), muffins, milk-based ice cream, chipa and chipitas, gelatins, pies (Fugazza, vegetable pies, pascualinas), pororó, hard-boiled egg, pizzas, fruit pies and tarts, vegetable, cheese, ham and cheese sandwiches, baked empanadas, foods prepared with vegetables, mineral water. In addition, there is a list of foods that are not allowed: packaged products with high salt or sugar content, very sugary or carbonated beverages are not allowed because of their high caloric content, since they favor the appearance of overweight or obesity and predispose to the appearance of Chronic Non-Communicable Diseases - NCDs (4).

Food nutrition labeling provides consumers with information on the content and type of nutrients to facilitate appropriate selection according to their needs or health conditions. At the regional level, there are several studies on the subject, although the results are divergent; today the format or presentation that is simpler and easier to interpret by the consumer is being debated, and the figure of front-of-food labeling is gaining relevance (12).

Ten countries in Latin America and the Caribbean have enacted ENPFE legislation or regulations. Five countries have implemented frontal nutrition warnings in the form of black octagons (Argentina, Chile, Mexico, Peru, Uruguay) and two countries have enacted regulations that are in the process of implementing similar systems (Colombia and the Bolivarian Republic of Venezuela). Ecuador uses a traffic-light warning seal that is not necessarily located on the main panel of the package; Brazil will implement a model with black rectangles and a magnifying glass; and the Plurinational State of Bolivia approved the adoption of a traffic-light ENPFE, which has not yet been implemented (13).

In Paraguay, Law No. 7092/23 on Frontal Warning Labeling of packaged foods has been enacted with the purpose of establishing mandatory frontal warning labeling on processed and packaged foods marketed in the national territory in the absence of the consumer, according to their nutritional composition of sugars, saturated fats and sodium. The scope of this law emphasizes that packaged foods in whose final composition the critical nutrient content of sugars, saturated fats and sodium exceeds the values established by regulation in accordance with this law, must include indelible warning seals for each critical nutrient, as appropriate, on the main surface of the product package and of the multiple or collective package: "HIGH IN SUGARS"; "HIGH IN SATURATED FAT"; "HIGH IN SODIUM". The enforcement authority is the Ministry of Public Health and Social Welfare. The characteristics of the front warning labeling:

a) Seal in the form of a black magnifying glass, white background, and in its interior the text in capital letters "HIGH IN SUGARS"; "HIGH IN SATURATED FATS"; "HIGH IN SODIUM"; and whose size will be established in the regulation of the present law, according to the characteristics of the container and the size of the main exhibition surface of the same, being able to apply the requirements of this law, through a complementary label;

b) It may not be partially or totally covered by any other element;

c) It shall be indelible and shall be written in Spanish.

The following terms are defined in the Law:

a) Sugars: are all monosaccharides and disaccharides present in a food that are digested, absorbed and metabolized by humans. Polyols are not included.

b) Consumer: natural persons who purchase or receive food in order to satisfy their food and nutritional needs.

c) Saturated fats: triglycerides containing fatty acids without double bonds, expressed as free fatty acids.

d) Critical nutrients: are those for which there is convincing or probable scientific evidence associating their excessive consumption with the development of non-communicable diseases, such as sodium, sugars and saturated fats.

e) Nutrient profiling: is the classification or categorization of foods according to their nutritional composition for reasons related to disease prevention or health promotion.

f) Front-of-package nutrition labeling: is the simplified declaration of specific nutrients on the front side of the standardized food package, provided with symbols and texts (14).

As part of the harmonization of front-of-food nutritional labeling in Mercosur, the National Institute of Food and Nutrition (INAN), under the Ministry of Public Health, conducted a survey in September 2021, to compare the preference between two models of front-of-food labeling (black octagon and magnifying glass). A total of 841 adults from all over the country participated in the online survey. The model with the black octagon was the most valued, with 71% of choice; while the version with the magnifying glass format obtained the remaining 29% of preference or approval. This front nutritional labeling shows the consumer in a graphic and simple way, such as sugar, sodium and fat levels, being a strategy in force for the fight against obesity and chronic non-communicable diseases of nutritional origin (15).

These strategies are aimed at combating obesity and chronic non-communicable diseases of nutritional origin. In the article Cardiovascular risk factors in schoolchildren and adolescents in a rural community of Amambay, Paraguay, we sought to determine the cardiovascular risk factors in children and adolescents attending two public schools in a rural community of Bella Vista Norte, and found a low prevalence of cardiovascular risk factors related to dyslipidemias. A high prevalence of cardiovascular risk factors related to sedentary lifestyle, passive smoking and low consumption of vegetables and fruits was found (9).

Data from SISVAN 2022 in Paraguay reflected data from the school population, according to age range, between 10 and 15 years of age represented the group with the highest prevalence of overweight and obesity, 23.6% and 14.6%, respectively (8).

When purchasing food at the canteen, schoolchildren are far from adult supervision to help them make their choices. The final decision is the schoolchild's, influenced by factors such as social trends, the media, peer pressure and the presence or absence of disease. The affordable price of processed or ultra-processed products often ends up being convenient, so the industry has also been busy introducing and offering visually appealing, low-cost, easy-to-buy and easy-to-consume treats (2).

For this reason, it is important to provide them with nutritional education and follow up on their food choices, since school children spend many hours of the day in educational institutions, where, in addition to acquiring academic/school training, it is an environment conducive to the development of eating habits for life.

It is considered relevant to evaluate the knowledge of nutritional labeling and labeling of packaged foods as a school snack option in adolescents aged 12 to 15 years who attend a subsidized educational institution in Asuncion in the 2023 school year, applying a self-administered questionnaire with an electronic Google form, the researcher prepared the questionnaire for the study, including sociodemographic data and data on knowledge and practices in reading the labeling and labeling of packaged foods, place of purchase, frequency and type of food preferred by adolescents as a school snack option. From the review conducted, the empowerment of the schoolchild, parental responsibility, the food industry and the protection of the state are proposed as bioethical considerations to be taken into account.

In this way, this research aims to show the imperative need to accompany the implementation of public health measures from an early age. These measures should not only focus on disease prevention and treatment, but also on the promotion of healthy habits and behaviors that can last a lifetime. By establishing healthy behavior patterns from childhood, we seek to positively influence health and well-being during adulthood, thereby reducing the incidence of chronic diseases and improving the quality of life of the general population.

Method

Type and design of research

Cross-sectional descriptive observational study.

Population

Target population: adolescents of both sexes aged 12 to 15 years.

Accessed population: adolescents of both sexes aged 12 to 15 years who attended a subsidized educational institution in Asunción during the 2023 school year.

Inclusion criteria: Adolescents of both sexes aged 12 to 15 years who attended a subsidized educational institution in Asunción a subsidized educational institution in Asunción during the school year 2023, and had the consent of their parents or legal guardians.

Exclusion criteria: adolescents who did not give their consent or were absent on the day of data collection.

Sample

Non-probabilistic simple random sampling.

Sample size considering that the total number of students enrolled for the year 2023 from seventh to ninth grade in the selected school was 130 students, this total was included to carry out the research work and it was not necessary to calculate the sample size, since it was considered a small amount.

A total of 69 adolescents of both sexes aged 12 to 15 years who attended a subsidized educational institution in Asunción during the 2023 school year participated in the study a subsidized educational institution in Asuncion during the 2023 school year, who met the selection criteria who met the following selection criteria.

Recruitment for the study was carried out among schoolchildren aged 12 to 15 years who attended a subsidized educational institution in Asunción during the 2023 school year, with the prior institutional permission of the institution's authorities, and whose parents or legal guardians gave their informed consent to participate.

Data were collected from schoolchildren if, at the time of data collection, they gave verbal assent. The informed consent form included the objectives of the study and the study methodology.

Data collection instrument and technique

The data were collected through a self-administered questionnaire using a Google® Forms electronic form, developed by the author of the research to achieve the objectives, including demographic data, and data on knowledge and practices regarding food labeling and labeling reading habits, as well as food purchasing habits for school snacks. The questionnaire had the following 3 sections, section 1: questions on demographic aspects (age and grade), section 2: questions on food labeling and labeling reading habits, section 3: questions on type and frequency of food purchases for school snacks.

Validation of the instrument

A test of the instrument was developed for a group of master's degree nutrition students familiar with the research topic to assess whether the questions successfully captured the research variables and then the terminology was adjusted to facilitate the students' understanding of the instrument.

Data processing

The data were downloaded through the Excel®™ spreadsheet and then analyzed through SPSS® version 22 software for statistical processing.

Quantitative data are presented as mean and standard deviation. Qualitative variables are expressed as absolute frequency (n) and relative frequency as a percentage (%).

Data quality control

The data were collected electronically from a Google Forms® electronic form, which ensured that the data were recorded, since the survey setup provided for the marking of fields with mandatory responses before progressing through each section of the electronic survey. Likewise, when downloaded into an Excel® 2016 spreadsheet and subsequently the database analyzed in SPSS® version 22, it guaranteed the non-modification of the data originally captured.

Ethical considerations

Data collection through the digital survey was carried out with the prior consent of the educational institution for the use of the data contained therein. The ethical aspects according to the Declaration of Helsinki were respected.

No personal data of the participants were recorded in the database used for statistical processing of the data, thus respecting confidentiality and protecting the privacy of identity and other binding personal information.

Each participant had the possibility of freely withdrawing from the survey and leaving it at any time without this having any repercussions in the school area, in terms of scores or final grades in the subjects taken at his or her school level.

In compliance with the principle of beneficence, the institution will receive a report with the results obtained from the students who were part of the investigation, once the investigation is finished.

It was ensured that participants were treated without discrimination, regardless of gender, age, race and others.

Results

Sociodemographic characteristics of the sample.

The present study involved 69 schoolchildren who attended a subsidized educational institution in Asunción during the 2023 school year, with an average age of

13 ±0.73 years, most of them female (n=37.54%), most of them belonging to the 8th grade (n=48.70%). Table 1.

Tabla 1. Características sociodemográficas de los escolares (n=69).

Variable	n	%
Edad (años)		
12	6	8,7
13	30	43,5
14	29	42,0
15	4	5,8
Sexo		
Femenino	37	53,6
Masculino	32	46,4
Nivel educativo		
Séptimo grado	14	20,3
Octavo grado	48	69,6
Noveno grado	7	10,1
Total	**69**	**100**

Knowledge of nutritional labeling and labeling of packaged foods for decision making at the time of purchase of a food for school snacks by adolescents.

When evaluating the knowledge of the nutritional labeling information on each of its components, it was found that 61 (88.4%) of the schoolchildren reported knowing this information about the calories provided by the product, while 41 (59.4%) students reported that they did not identify this information about dietary fiber. Figure 1.

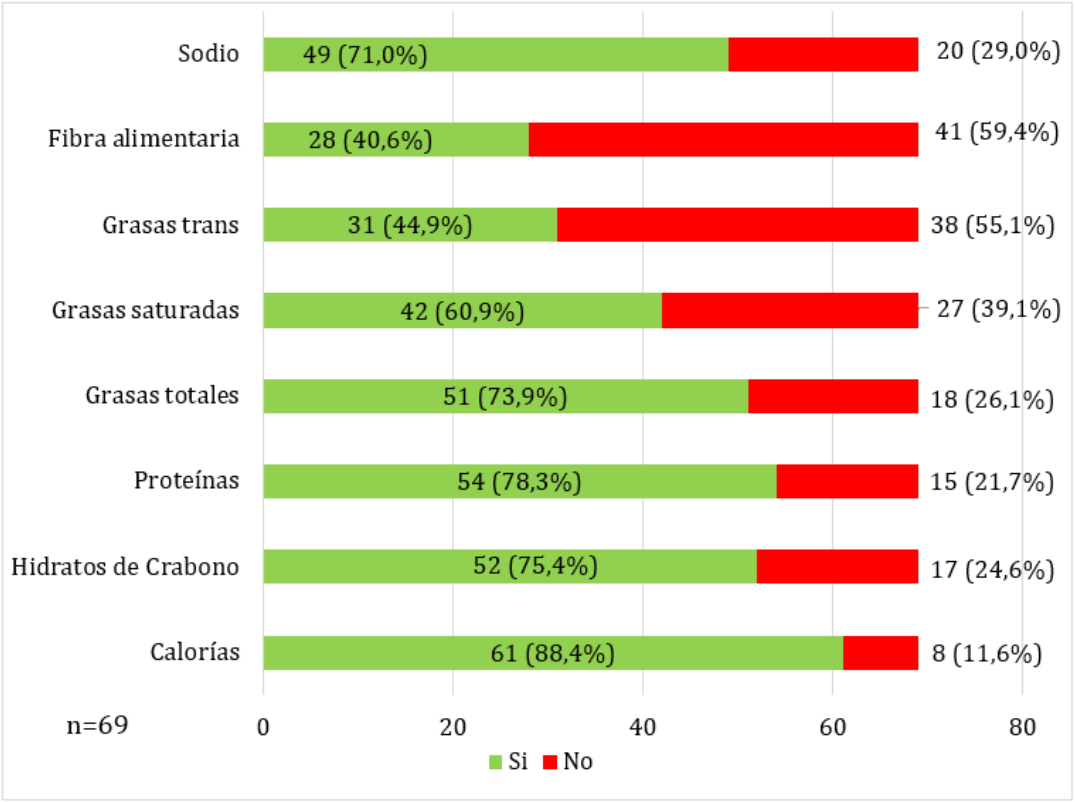

Figura 1. Conocimiento de la información del etiquetado nutricional en los productos envasados por los escolares de la muestra (n=69).

In relation to the icons on the food labeling when evaluating the knowledge of the information on the food components, it was found that 56 (81.2%) students in the sample reported knowing the information icon on the excess sugars provided by the product, while 47 (68.1%) students reported knowing the information icon on the excess sodium provided by the product. Figure 2.

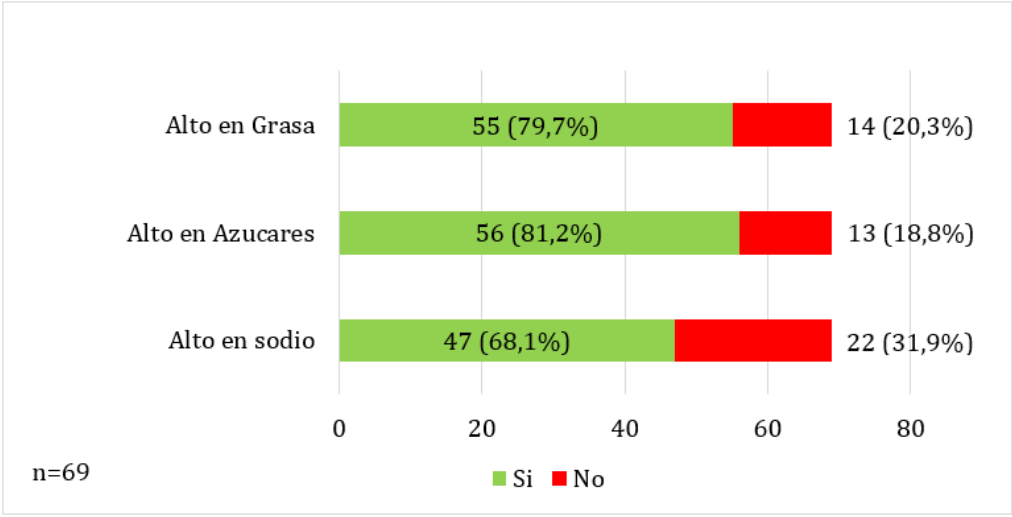

Figure 2. Knowledge of the information on the labeling of packaged school snack foods by schoolchildren in the sample (n=69).

Place of acquisition of school snack by the sampled students.

When evaluating the place the place of purchase of school snacks, it was found that 46 (66.7%) students bought food at the school canteen, while the rest of the students reported bringing their school snacks from home. Figure 3.

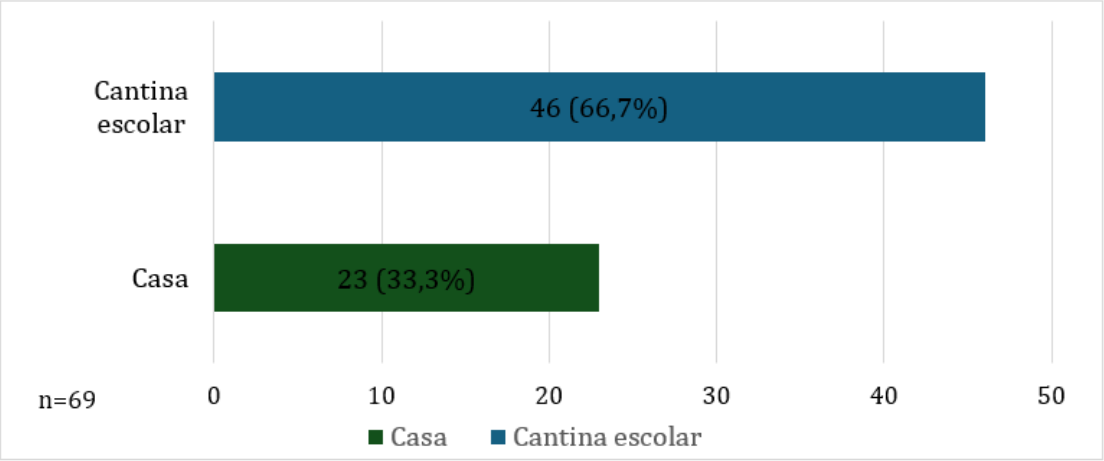

Figure 3. Place of acquisition of school snack by students in the sample (n=69).

Type and frequency of food purchases for school snack by students in the sample.

In the present study, in which 69 schoolchildren participated, it was observed that 22 (31.9%) schoolchildren consumed packaged juices every day, most of the schoolchildren 49 (71.0%) said they did not consume snacks (yes-yes) and 42 (60.9%) consumed sugary cereals as a school snack option. Table 2.

Tabla 2. Tipo y frecuencia de compra de alimentos para la merienda escolar por los estudiantes de la muestra (n=69).

Variable	Frecuencia de compra y consumo (n=69)				
Alimentos	Todos los días n (%)	Tres veces por semana n (%)	Dos veces por semana n (%)	Nunca n (%)	Total de escolares
Galletitas dulces	9(13,1%)	10(14,5%)	25(36,2%)	25(36,2%)	69
Galletitas saladas	3(4,4%)	8(11,6%)	23(33,3%)	35(50,7%)	69
Yogurt	5(7,2%)	11(16,0%)	16(23,2%)	37(53,6%)	69
Chocolatada	4(5,8%)	11(16,0%)	17(24,6%)	37(53,6%)	69
Gaseosa	18(26,1%)	14(20,3%)	24(34,8%)	13(18,8%)	69
Jugo envasado	22(31,9%)	14(20,2%)	22(31,9%)	11(16,0%)	69
Chocolate en barra	3(4,4%)	7(10,1%)	20(29,0%)	39(56,5%)	69
Yes-yes	2(2,9%)	3(4,4%)	15(21,7%)	49(71,0%)	69
Papas fritas	3(4,4%)	10(14,5%)	27(39,1%)	29(42,0%)	69
Cereales azucarados	4(5,8%)	5(7,2%)	18(26,1%)	42(60,9%)	69
Otros (empanada, hamburguesa, pizza, sándwich)	26(37,7%)	16(23,2%)	14(20,3%)	13(18,8%)	69

Discussion and conclusions

The school population of a subsidized educational institution in Asunción that participated in the study was 69 students, where the average age was 13 ±0.73 years, most of the students in the total sample were female (n=37;53.6%), mostly in the 8th grade (n=48;69.6%). These data are similar to those of the study: Reading, interpretation and use of nutrition labeling in the purchase decision of adults in a neighborhood of Asunción, where the total sample consisted of 100 respondents, most of whom were women (63%) the total sample consisted of 100 respondents, the majority of whom were women (63%), however, the difference is the adult population, with an average age of 34.6±13 years with an average age of 34.6±13 years old compared to this research, which is based only on schoolchildren (16) school children (16).

When evaluating the knowledge of the nutritional labeling information on each of its components, it was found that 61 (88.4%) of the schoolchildren reported recognizing this information regarding the calories provided by the product, while 41 (59.4%) students reported that they did not identify this information regarding dietary fiber. In other research: in the study "Knowledge of the adult population about food nutrition labeling", 44% of those studied identified the calorie component in the nutrition labeling information (17). Another finding that correlates with the results of this research is found in: "Reading, interpretation and use of nutrition labeling in the purchase decision of adults in a neighborhood of Asunción", the greatest interest of the participants was the information regarding the following components of nutrition labeling in decreasing order: calories, total fat, sodium, protein, carbohydrates and type of fat, and, finally, dietary fiber (1); similar to what was verified in the present study where the majority recognized in the labeling the information corresponding to calories, macronutrients and sodium, and in less frequency the information regarding trans fats and dietary fiber.

When assessing the place of purchase of school snacks, it was found that 46 (66.7%) students bought food at the school canteen, while the rest of the students reported bringing their school snacks from home. In "Alimentación escolar y educación alimentaria: tendencias recientes en la investigación en América Latina entre 2005 y 2021" (School feeding and food education: recent trends in research in Latin America between 2005 and 2021), the school canteen is referred to as the establishment of most of the food where quality nutrients are provided, and even more time in school (double schooling of students, for example), therefore, the canteen is the protective establishment of the nutritional status of children (2). A limitation of the present study is that it did not evaluate fruit consumption in schoolchildren.

In the present study, we evaluated the type and frequency of packaged foods as an option for school snacks. We observed that 22 (31.9%) schoolchildren consumed packaged juices every day, most of the schoolchildren 49 (71.0%) said they did not consume snacks (yes-yes) and 42 (60.9%) consumed sugary cereals as an option for school snacks. These findings relate to the study: "Food consumption habits of primary school children in two schools in Havana", where schoolchildren show preference for bottled fruit juice in 75 students (75%) (18). That is to say, depending on what the canteens offer students as snack options, they will be the options available to them, often even options without nutritional labeling and front labeling, with the absence of healthy food options, so it will be difficult to improve the eating habits of schoolchildren and the levels of obesity and overweight, if these measures are not properly controlled.

One limitation of this study is that it is a cross-sectional study, in terms of possible information bias. Another limitation is that the study was conducted in only one

educational institution with a sample size of 69 students. Nor does it address teachers, parents or guardians

The persistence of obesity rates, according to the latest SISVAN data, is striking, which is why the role of nutritional education in schoolchildren is considered important [8].

In Paraguay, health promotion educational campaigns are currently being promoted on nutritional labeling and the different product models in the region, with front labeling as a strategy to prevent and control overweight and obesity in schoolchildren, given the positive experiences in other countries in the region.

Conclusions

The school population studied, 69 students from the Subsidized Educational Institution of Asunción, was mostly female, with an average age of 13 ± 0.73 years, most of them belonging to the eighth grade.

The main place of food acquisition has been the school canteen.

Adolescents are aware of the nutritional labeling of packaged foods when selecting school snacks, distinguishing calories as the main component, while in relation to data on dietary fiber information, students reported that they did not identify this information.

In relation to the icons on food labeling, adolescents reported knowing the components of the food, mainly distinguishing the information on the excess sugars provided by the product.

This research shows that knowledge of nutritional labeling and food labeling is frequent, however, despite this familiarity with the nutritional information present on packaged products, it does not seem to significantly influence their decisions at the time of acquiring their school snack. This suggests that, although students may identify components such as calories, sugars, and fiber, this information is not the primary factor guiding their food choices during school recess. This finding underscores the need to implement more effective educational strategies that not only inform about nutrition, but also motivate students to apply this knowledge in a practical way in their daily food consumption decisions in the school environment.

Recommendations

It is considered relevant to carry out actions focused on at-risk groups, relating the socioeconomic level and associating it with a nutritional diagnosis, in order to define the relationship between nutritional status and the selection of foods for school snacks and, in turn, to follow up on other meals eaten by schoolchildren at home during the day, in order to determine in future research the average daily consumption of packaged foods versus fresh processed foods.

The reading of nutritional labeling and labeling of packaged foods occurs frequently in school children, but not their correct interpretation, even when selecting other processed foods as a school snack option, they choose very copious foods, high in fat, so it is important to establish nutritional education strategies that facilitate the interpretation of the components of the front labeling.

It is important to have a nutritionist in each educational institution to be able to carry out follow-up, nutrition education and health promotion tasks in conjunction with INAN.

Conflicts of interest

We declare that the work submitted for publication in the MLS Health & Nutrition Research Journal is original and has not been and is not currently under review by any journal or conference. Likewise, we are responsible for the content of this and I agree that our names appear as the author. Finally, we declare that we do not have any conflict of interest in those activities that could introduce bias in the results of the work.

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