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PRESCHOOL CHILDREN: NUTRITIONAL STATUS AND EATING HABITS

CRIANÇAS EM IDADE PRÉ-ESCOLAR: ESTADO NUTRICIONAL E HÁBITOS ALIMENTARES

NIÑOS EN EDAD PREESCOLAR: ESTADO NUTRICIONAL Y HÁBITOS ALIMENTARIOS

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ABSTRACT

Introduction: The maintenance of an adequate nutritional status and a desirable development at preschool age are associated with the influence of several behaviors and lifestyles, which can be taught and modified.

Objective: To analyze the nutritional status of preschool-age children of a kindergarten in Évora and characterize their frequency and food habits.

Methodology: Cross-sectional, descriptive study, with a quantitative approach. Convenience sample consisting of 33 children and their legal representatives/relatives. Survey by an anonymous questionnaire applied indirectly to a relative of each child. To characterize the nutritional status according to the body mass index percentile, through anthropometric measurements performed in the last child health consultation.

Results: 69.7% had a normo-ponderal nutritional status and 18.2% risk of overweight. Meat, similar products and eggs are used more often than advised. Meat and fish are often eaten in breaded and fried form. Vegetables and vegetables eaten less often and, in less quantity, than the recommended proportion. Excessive intake of sweets and sugary products.

Conclusions: Importance of promoting healthy eating habits in children at risk of overweight, aiming to achieve an adequate nutritional status. The relevance of health education within the scope of school health is highlighted with the aim of promoting healthy eating behaviors and habits among children, and interventions aimed at parents/family members, within the educational context.

Keywords: Health Promotion; Healthy Eating; Obesity; Overweight; Preschool Child; School Health Services.

RESUMO

Introdução: A manutenção de um estado nutricional adequado e um desenvolvimento desejável na idade pré-escolar estão associados à influência de diversos comportamentos e estilos de vida, que podem ser ensinados e modificados.

Objetivo: Analisar o estado nutricional de crianças em idade pré-escolar de um jardim de infância em Évora, e caracterizar a frequência e seus hábitos alimentares.

Metodologia: Estudo transversal, descritivo, de abordagem quantitativa. Amostra por conveniência constituída por 33 crianças e seus representantes legais/familiares. Inquérito por questionário anónimo aplicado de forma indireta a um familiar de cada criança. Caracterizar o estado nutricional de acordo com o percentil do índice de massa corporal,

através das medições antropométricas realizadas na última consulta de saúde infantil.
Resultados: 69,7% apresentavam um estado nutricional normo-ponderal e 18,2% risco de excesso de peso. Carne, produtos similares e ovos são utilizados mais vezes do que o aconselhado. Carne e peixe são muitas vezes ingeridos através de panados e fritos. Legumes e hortícolas ingeridos com menor frequência e em menor quantidade que a proporção indicada. Ingestão excessiva de doces e produtos açucarados.
Conclusões: Importância da promoção de hábitos alimentares saudáveis nas crianças com risco de excesso de peso, visando alcançar um estado nutricional adequado. Evidencia-se a pertinência da educação para a saúde no âmbito da saúde escolar com o intuito da promoção de comportamentos e hábitos de alimentação saudável junto das crianças, e intervenções direcionadas para os pais/familiares, inseridas no contexto educativo.
Palavras-chave: Alimentação Saudável; Criança Pré-escolar; Obesidade; Promoção da Saúde; Serviços de Saúde Escolar; Sobrepeso.

RESUMEN

Introducción: El mantenimiento de un estado nutricional adecuado y un desarrollo deseable en la edad preescolar están asociados a la influencia de varios comportamientos y estilos de vida, que pueden ser enseñados y modificados.
Objetivo: Analizar el estado nutricional de los niños en edad preescolar de una guardería de Évora y caracterizar su frecuencia y hábitos alimentarios.
Metodología: Estudio transversal, descriptivo, con un enfoque cuantitativo. Muestra de conveniencia compuesta por 33 niños y sus representantes legales/familiares. Encuesta mediante un cuestionario anónimo aplicado indirectamente a un familiar de cada niño. Caracterizar el estado nutricional según el percentil de índice de masa corporal, a través de las mediciones antropométricas realizadas en la última consulta de salud infantil.
Resultados: El 69,7% tenía un estado nutricional normo-ponderal y el 18,2% riesgo de sobrepeso. La carne, los productos similares y los huevos se utilizan con más frecuencia de la aconsejada. La carne y el pescado suelen comerse empanados y fritos. Verduras y hortalizas consumidas con menos frecuencia y en menor cantidad que la proporción recomendada. Consumo excesivo de dulces y productos azucarados.
Conclusiones: Importancia de la promoción de hábitos alimentarios saludables en niños con riesgo de sobrepeso, con el objetivo de conseguir un estado nutricional adecuado. Evidencia la pertinencia de la educación para la salud en el ámbito de la salud escolar con la intuición de la promoción de comportamientos y hábitos de alimentación saludables junto a los niños, y las intervenciones dirigidas a los países/familias, insertadas en el contexto educativo.

Descriptores: Alimentación Saludable; Niño Preescolar; Obesidad; Promoción de la Salud; Servicios de Salud Escolar; Sobrepeso.

INTRODUCTION

The global prevalence of overweight and obesity in children has been increasing at an alarming rate, and it is currently estimated that, three hundred and forty million people aged between five and nineteen years, are overweight and/or obese[1,2]. Portugal is one of the main European countries with the highest prevalence of overweight in all population groups[3,4]. This problem, "(...) is probably the main public health problem in Portugal, affecting more than 50% of the adult population and having serious implications in the appearance and course of different pathologies such as diabetes, brain and cardiovascular disease, osteoarticular pathology and the generality of cancers. Diseases, as a whole, represent the main health expenditure of the Portuguese state and the main burden of the National Health Service"[3]. In this context, several studies point to obesity as one of the most difficult pathologies to treat, being the most frequent nutritional disorder in children[5,6,7]. They also demonstrate that the behavioral patterns of these children accelerate the disease process related to certain characteristics associated with lifestyles, lasting into adulthood, resulting in premature morbidity and mortality[8].

In an effective way, excessive energy intake is attributed to changes in lifestyles and eating habits of families, considered a determining factor for the loss of healthy years of life[9]. Low-processed foods have given way to totally modified and nutritionally impoverished food products. It is known that more than half of the population does not comply with the WHO recommendations on the daily consumption of fruit and vegetables, and that, in the case of children, a percentage of 69% of inadequate diet[10].

However, and despite the scenario described above, the most recent results of the COSI Portugal study, a child nutritional surveillance system integrated in the WHO/Europe Childhood Obesity Surveillance Initiative study, coordinated by the National Institute of Health Doctor Ricardo Jorge, confirm the trend of decreasing the prevalence of overweight and childhood obesity in Portugal. Between 2008 and 2019, there was a reduction of 8.2 percentage points in the prevalence of childhood overweight (37.9% to 29.7%) and 3.4% in childhood obesity (15.3% to 11.9%)[11]. This positive evolution resulted mainly from several initiatives conducted by the Portuguese State and the professionals of the National Health Service. In relation to the prevalence of underweight, the widespread data indicate that this "has remained expressionless and constant in the last 8 years, despite the severe economic crisis experienced in Portugal in this decade"[11].

In the genesis of childhood obesity, several factors have been identified that determine the onset and progression of the disease, considering as the most relevant biological, environmental/social and psychological factors[12]. It is estimated that 95% of overweight situations arise due to exogenous causes, the remaining 5% being attributed to endogenous causes, such as metabolic, hereditary or genetic changes[10,13].

The phase of child development corresponding to preschool age falls between 3-6 years of age, occurring important changes, such as the growth of the musculoskeletal system, the development of respiratory and cardiac function, weight gain (2-3 Kg/year) and height (6-8 cm/year)[14]. Changes occurring at this stage are associated with increased nutritional needs, and adequate nutrition and nutritional storage become very important with regard to the prevention of chronic diseases such as obesity and cardiovascular diseases[15,16]. At this stage of development, children acquire and develop their food preferences through the observation of other children, adults and relatives around them[14]. Most health professionals point to the family as the structuring element in the promotion of health and well-being and consequently in the adequacy of body weight[17].

In this context, the studies by Moradi *et al*[18] and Vieira & Carvalho[19] show that the prevalence of childhood obesity is directly associated with socio-economic status and that to reduce inequalities in this context, education should the focus.

Thus, to reverse this situation emerges the need to identify risk factors associated with obesity in order to optimize preventive strategies, and preschool age is considered an ideal period to act preventively[2,7,19,20]. The themes of nutritional status and eating habits in the pre-school phase have been the object of study with the objective of directing, implementing and updating interventions in the scope of obtaining health gains for this population and adult population in the future. In the context of the population of preschool age in Évora, the current investigations carried out and published on this subject are reduced, as such, it was considered important to carry out this study in a specific context of a pre-school institution school, in order to characterize the frequency and eating habits, and analyze the nutritional status of children, relating this information with different social and health determinants, identifying intervention needs in the context of promoting healthy eating habits, through the delineation of specific and contextualized strategies to be implemented in the future.

MATERIAL AND METHODS

This is a cross-sectional, descriptive, quantitative study conducted in a pre-school Social Solidarity Private Institution, located in Évora. The target population were children who attended the 4-year-old classrooms, aged 4-5 years, and a convenience sampling consisted of 33 children and their family/legal representatives.

Taking into account the intended objective with the study, we used the food frequency and healthy habits questionnaire, aimed at children from 3 to 7 years[21] as a data collection instrument. It was applied anonymously, indirectly to parents/guardians. The questionnaire contains 45 questions, however only 26 questions from the 3 sections that make up the questionnaire were used. The first section of the questionnaire concerns socio-economic data. The second section, to the data of the child related to eating habits and life habits. The third section refers to the food frequency, where the various foods divided by the respective food groups are presented, where it was requested to be marked in the column of "frequency" (never or rarely, 1x 15-15 days, 1-3x per week, 4-7x per week, more than 1x per week) the times the child ingested on average each of the foods mentioned.

In order to analyze the nutritional status according to the percentile of the children's body mass index, parents/guardians were asked to fill out a data collection form of anthropometric measurements performed in the last child health consultation, the date in years and months that the child had when it was evaluated, as well as the sex. After collecting this information, the nutritional status was characterized according to the percentile of the children's body mass index, according to the criterion of the World Health Organization (WHO).

All ethical requirements were met in accordance with the Helsinki Declaration of Ethics. For the implementation of data collection instruments were obtained authorizations from the Coordinator of the Functional Health Unit where the study was inserted, the Executive Director of the Health Centers Cluster where the functional unit was covered, and the Technical and Pedagogical Director of the pre-school school. The study obtained a favorable opinion from the Ethics Committee for Scientific Research in the areas of Human Health and Welfare of the University of Évora (Opinion-18113) and the Health Ethics Committee of the Regional Health Administration of Alentejo (Opinion-10/2018/CES). In order to respect the free and informed decision, the objective of the study and its preponderant role in its development, as well as its anonymous and confidential character, were explained to the parents/guardians.

The application of data collection instruments enabled the analysis of the phenomena surveyed through the establishment of relationships and description of the variables studied using the statistical treatment of the data obtained, using the software SPSS Statistics Version 24.0 (Statistical Package for the Social Sciences) for this purpose.

RESULTS

In the distribution by sex, 17 children (52%) were male and 16 (48%) female. Among 31 anthropometric data sheets that allowed the characterization of nutritional status, 23 children (69.7%) (13 boys and 10 girls) had a normal nutritional status, 6 (18.2%) (3 boys and 3 girls) were at risk of being overweight and one girl was underweight at the time of anthropometric assessment.

It was found that 63.6% of children ate breakfast at home, and that all performed lunch and snack at the institution. The most used means of transportation to the institution was the car (94%). Only 7 (21.3%) were walking and 2 did not use the car.

As for the practice of extracurricular exercise, 24 children (72.7%) practiced and 10 (27.3%) did not. Crossing the variables, nutritional status with physical exercise, one child had low weight, 16 (48.4%) normal-weight nutritional status and 4 (12.1%) risk of overweight. Among the children who did not practice, 7 (21.2%) had normal weight nutritional status and 2 (6%) had a risk of being overweight.

In the context of the average daily time that children started watching television, 23 (69.7%) ≤ 1 hour/day, 6 (18.2%) between 1-2 hours/day, 2 (6.1%) between 3-4 hours/day, and only 2 (6.1%) between 4-6 hours/day. On weekends, 17 (51.5%) spent up to 3 hours/weekend, 11 (33.4%) between 3-6 hours/weekend and finally 4 (12%) ≥ 7 hours/weekend. It was found that one of the children spent between 12-14 hours and another between 18-20 hours watching television on weekends. When analyzing the time children spent on average playing consoles and/or computers per day, 15 children (45.5%) ≤ 1 hour/day, and 17 children (51.5%) did not play. In the weekend, they spent an average of 8 (24.2%) ≤ 1 hour, 5 (15.2%) between 1-2 hours and 17 (51.5%) did not play.

As for the difficulties reported by family members in food intake by children, 3 adults (9.1%) felt a lot of difficulty, 15 (45.4%) felt some difficulty, 7 (21.2%) felt difficulty occasionally and 8 (24.3%) felt no difficulty.

Most of the difficulties are related to the intake of vegetables and soup (Table 1↗).

Regarding the degree of concern of the parents about the child not eating enough food at home on their own initiative, it was found that 9 adults (27.3%) answered that "no, this did not happen", 3 (9.1%) answered that "yes, I worry" and 12 (36.4%) answered "yes, I worry a little". For meals away from home and their locations, 17 children (51.5%) ate meals in cafes/restaurants 1-3x/month and 24 (72.7%) in fast-food restaurants 1-3x/month (Table 2↗), intensifying the frequency in the holidays.

In relation to parents' concern in choosing foods with "Low sugar content", 12 (36.4%) reported this concern frequently and 18 (54, 6%) only sometimes.

Concerning the intake of milk, dairy and dairy products, half-fat milk was consumed more frequently by 14 children (42.4%) between 4-7x/day and by 10 (30.3%) more than 1x/day. Most children consumed yogurts, and 12 children (36.3%) ate yogurts 1-3x/week and 14 (42.4%) 4-7x/week.

There were similarities in the intake of "red meats" and "white meats" and marked intake of industrial battering and processed meat (Table 3↗).

The intake of lean fish by 24 children (72.7%) was 1-3x/week. The intake of battered or fried fish is performed by 13 children (39.4%) 1-3x/week.

As for the group of oils and fats, 12 children (36.4%) ingested olive oil 1-3x/week and 13 (39.4%) 4-7x/week. Butter was ingested by 15 children (45.5%) 1-3x/week and by 12 (36.4%) 4-7x/week.

With regard to cereals and bread, the options fall on the intake of white bread, toast or pan loaf, since 12 children (36.4%) ate white bread or toast 1-3x/week, 7 (21.6%) 4-7x/week and 4 (12.6%) more than 1x/ day. The pan loaf presented an intake for 18 (54.5%) children, 1-3x/week. It was found that 16 children (48.5%) ingested French fries 1-3x/week. The ingestion of baby cereals type Cerelac® or Nestum® were ingested by 11 children (33.3%) 1-3x/week and by 7 (21.2%) 4-7x/week in amount equal to the average portion advised, such as the 11 children (33.3%) who ingested crunchy sugary cereals.

Concerning vegetables and legumes, it was found that 40% to 60% of children never or rarely ingested peas, grain, broad beans, savoy cabbage, Brussels sprouts and tomatoes. Lettuce, tomato and carrot were the most eaten foods weekly, but only between 18.2% and 24% of children (Table 4↗). It was also found that 36% to 45% ate only 15-15 days cooked legumes.

When assessing the fruits, it was found that 33.3% to 60.5% of the children ate 1-3x/week apple, pear, orange and tangerine, in amount equal to the recommended portion (Table 5↗). Regarding kiwi fruit intake, 16 children (48.5%), and peaches and plums, 11 (33.3%), never or rarely ingest these fruits.

In the context of drinking, the choice of children fell on the Iced Tea® or other beverages of plant extracts, and 78.9% ingest them, 14 (42.4%) ingest 1x 15-15 days and 11 (33.3%) 1--3x/week. It was found that 12 children (36.3%) ingested concentrated fruit juices.

Regarding the intake of sweets and pastries, it was found that 21 children (87.9%), ingested *Maria*®-type biscuits or toast, and 14 (42.4%) ingested these biscuits 1-3x/week, 9 (27.3%) 4-7x/week and 6 (18.2%) more than 1x/day. Regarding the intake of other cookies and biscuits, 21 children (63.6%) ate 1-3x/week and 7 (21.2%) 4-7x/week. Although croissants, pastries and cakes were ingested by 18 children (54.5%) 1x of 15-15 days, 8 children (24.2%) ate these foods 1-3x/week. Only 7 children (21.2%), did not consume chocolate, being consumed by 9 (27.3%) 1x of 15-15 days, by 13 (39.4%) 1-3x/week and by 4 (12.1%) 4--7x/week. Despite the high number of times ingested, it was found that the amount consumed is equal to the average portion advised.

DISCUSSION

Only 18.2% of the children under study had a risk of being overweight, and there were no significant discrepancies between the sexes. Regarding preschool age, in a study carried out in Maia, which determined the prevalence of overweight and obesity in 810 children, it was verified the existence of overweight in approximately 40% of the sample[22]. Another study, conducted in a group of schools in the municipality of Sintra, classified the nutritional status of 107 children, from 3 to 6 years of age, and showed that 28.74% of children were overweight, and that of these, 19.54% exhibited pre-obesity and 9.20% obesity[23].

In this study, no case of overweight was identified, compared to the aforementioned studies, and it is necessary to take into account the sample used. This only reflects the reality of an institution, being not representative of the rest of the county or the national context. However, the results show one fifth of children at risk of overweight at 4 and 5 years of age, which warns of the possible appearance of new cases and the worsening of these situations, as demonstrated by the scientific evidence that children aged 8 years were those with higher mean values of overweight when compared to children aged 6 and 7 years[11]. It is important to emphasize that the assessment of the nutritional status of chil-

dren in this study has the limitation of not enabling the current assessment of children, safeguarding that they were evaluated in the nursing consultation, the family doctor or the pediatrician, considering that the procedures necessary for the evaluation of anthropometric parameters have been correctly used. However, the possibility of occurrence of evaluation errors is not ruled out.

It was found that all children make lunch and snack in kindergarten, spending much of the day in the institution. The protective factor of the educational level in the development of healthy behaviors and lifestyles, promotes the school the privileged environment of health promotion and education[7,13,18]. The entities responsible for the supply of food, as well as for its preparation, should promote balanced diets during the lunch meal, as well as pay attention to the quality of the food that is accessible to students during the morning and afternoon snacks[11]. It was found that the car is the preferred resource to the detriment of walking or even other public transport. These data meet the recent COSI study, in which parents/guardians reported that most children (66.5%) went to school by car and 19.0%, on foot. The same scenario was observed on the return home (64.1% and 19.3%, respectively) where it was found that most children, that is, 76.6% returned by car[11]. This aspect reflects the increasing urbanization of our daily lives with the increasing use of the car, to the detriment of pedestrian movement, but also because most parents (62.7%) do not consider the way to and from school safe[11].

It was found that 72.7% of children practice physical exercise and 27.3% do not practice any extracurricular exercise activity, although in the context of the study there is a high offer of activities at the level of physical activity. The infant population is marked by a worrying inactivity/daily sedentary lifestyle[4]. According to data released by the WHO, in a study on physical activity levels in the child and adolescent population, which covered a total of 146 countries from 2001 to 2016, concluded that more than 80% did not meet the current recommendations of at least one hour of daily physical activity, and that, in general, girls (85%) are less active than boys (78%)[24]. The evidence shows that there is a positive association between the high prevalence of sedentary behaviors and overweight[25,26].

In Portugal, and reporting to the practice of extracurricular physical exercise, it was found that the region of Madeira showed the highest number of children enrolled in a sports club (61.8%) in Alentejo (59.3%) and in the Azores, there was the lowest number of children registered in any sports activity (53.5%)[11].

When crossing the variables means of transport, physical exercise and time to watch television/play computer/console, with the variable nutritional status it was not possible to determine its influence on the nutritional status; however, it is necessary to consider the benefits of physical exercise for the state of health. Although an independent association between sedentary habits and nutritional status is not evident, in the option between sedentary lifestyle or physical activity, it is expected that sedentary lifestyle results in lower energy expenditure[11,23,25].

Regarding the level of concern of parents about the behavior of children not eating enough food on their own initiative, it is evident that 9 adults (27.3%) answered "yes, but do not worry", thus admitting that they are unaware of the intake of adequate average food portions. In order to identify the places of eating out, it was found that some children accumulate different places (friends' house, traditional cafes/restaurants, fast-food restaurants) in the same interval of times a month, increasing the number of times they eat out. It should be noted that the recurrent place are fast-food restaurants, where the available foods have a higher caloric index. Scientific evidence shows that most parents do not assume or show awareness that their children are overweight, and this is one of the major obstacles to combating obesity[17,27].

In the context of food intake of the different groups of the food wheel and the frequency in which they are ingested, in relation to the group of dairy products and derivatives, appropriate behaviors were found in the level of food choice and frequency of ingestion, essentially concerning half-fat milk. Milk is considered as a beneficial food in weight control, mainly due to the existence of calcium and bioactive substances in its composition, being also considered an essential food in the growth of children and in the consolidation of bone constitution[12,15].

Regarding the intake of meat, similar products and eggs, it is concluded that this group of foods is used more times than recommended for each child, and the same occurrence is verified in other studies[11]. The intake of "red meats" is similar to that of "white meats", however, the consumption of industrial battered chicken or turkey, as well as processed meat, by a large number of children 1-3x/week. It is evident that the food and nutritional indications are to avoid processed meats, control the consumption of red meat and foods rich in salt, and this consumption should be reduced (sausages, smoked meat, chorizos, sausages, canned meat) for occasional moments throughout the month[28]. Regarding the amount of fish ingested, it was found that the vast majority of children ingest an amount less or equivalent to the defined average portion, using once again battered or fried foods. As for the group of cereals, it was found that few children eat bread more than once/day, and it is also found that most do not eat whole grain bread, opting for porridge and suga-

ry cereals. In this group, most foods are eaten 1-3x/week, falling short of the indications of the food wheel. This food group is the main supplier of the energy component of cells, so its daily consumption should constitute approximately 28% of the individual meal, as it should be present in all meals[28]. In the context of vegetables, it is found that even the foods eaten more often are used in less than the average portion indicated. Non-compliance with this daily intake affects the development of pathologies and reduction of the immune system defenses[29]. It is evident that the color of these foods can be an attraction and advantage for their use among children of preschool age[25,29], and their continued exposure, promote familiarization, acceptance and ingestion[30]. With regard to fruit, apples, pears and bananas are those that children (39.5% to 48.5%) eat between 4 to 7x/week in amount equal to the recommended average portion. Unlike the other fruits, which regardless of the intake frequency, the amount is always lower than recommended, falling short of the recommendations[29]. The systematic recurrence in the intake of fruits, vegetables and legumes in the habits of preschool children contributes to the acquisition of healthy eating habits, with health gains at the level of development and appropriate and desirable growth[11,12,29]. It was found that approximately 79% of children eat sugary drinks: these have no nutritional value and their high caloric index contributes to obesity. Children often associate the intake of sugary drinks with the replacement of water intake[28,30]. Sweets are also eaten more often than advised. Thus, given that there has been a high intake of sugary products, the interest shown by parents in choosing low sugar foods may play an important role in preventing risks associated with excessive sugar intake.

CONCLUSION

Considering that the current child population will be the adult population of the future it is important to ambition their development in a healthy and participatory way concerning individual and community health gains. It is evident the relevance of behaviors related to inadequate diet and sedentary lifestyle, as well as other health determinants related to lifestyles that can be preventable and as such cannot be devalued, as they contribute to disease states, loss of quality of life and premature mortality. It is noted the danger that overweight represents for the child's healthy development, considering that the prevention of childhood obesity is a public health challenge.

The development of this study allowed characterizing the nutritional status, food frequency and eating habits of preschool children. In the context of the diagnosis, there was a compromised infant feeding behavior, demonstrated by: a decreased dietary pattern in

daily consumption and reduced variety of vegetables, vegetables and fruits; a decreased dietary pattern in the daily consumption of vegetables without being crushed and cooked vegetables; and an excessive dietary pattern in the consumption of processed meat and sugary products. It was identified as risk factors for the adoption of unhealthy eating habits, the fact that children eat out of home, especially in fast food restaurants where they often eat foods with little nutritional interest.

Most children had a normal-weight nutritional status, but there was a risk of overweight. Therefore, it is considered crucial to take into account the problems identified and emphasize the promotion of healthy eating habits in these children, in order that in the future they will not be overweight and/or obese. Despite the vast and useful information that was possible to collect through the implemented questionnaires, it is important to highlight some limitations: the restrictions imposed by a fixed list of foods, the notion of what is equivalent to an average portion and the use of memory.

It is evident the need to continue to emerge current knowledge about the frequency and eating habits, as well as their impact on the nutritional status of children, in order to change, delineate and optimize intervention strategies. This highlights the role of health professionals, particularly nurses, in the field of school health and promoting healthy eating habits and behaviors among preschool children. These can and should act directly on children and develop interventions aimed at parents (responsible for healthy lifestyles of children) inserted in the school context, also encompassing the educational team.

Authors' contributions

RJ: Coordination of the study, study design, collection, storage and analysis of data, review and discussion of results.
EC: Study design, data analysis, review and discussion of results.
TDM: Study design, data analysis, review and discussion of results.
RS: Study design, data analysis, review and discussion of results.
All authors read and agreed with the published version of the manuscript.

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Table 1 – Difficulties reported by adults related to food intakeby children (n = 33).↖

Difficulties related to food intake	n	%
Refuse new foods	4	12.1
Eat uncooked/cooked vegetables	10	30.3
Eat soup	5	15.2
Eat fish	1	3.0
Sweets intake	4	12.1
Don't like	1	3.0
Mentioned no difficulties	8	24.2

Table 2 – Number of meals eaten away from home per month (n = 33).↖

Places where they eat	Meals/month	n	%
At friends' home	0 times	13	39.4
	1-3 times	18	54.6
	4-6 times	2	6.0
Traditional Cafes/Restaurants	0 times	8	24.2
	1-3 times	17	51.5
	4-6 times	7	21.2
	7-9 times	1	3.0
Fast food restaurants	0 times	8	24.2
	1-3 times	24	72.7
	4-6 times	1	3.0

Table 3 – Intake of meat and similar products/eggs by children (n = 33).

Intake of meat and similar products/eggs	Frequency	n	%
Beef, pork, goat	Never or rarely	1	3.0
	Once 15-15 days	3	9.1
	1-3 times a week	23	69.7
	4-7 times a week	6	18.2
Meat chicken, turkey, rabbit	1-3 times a week	17	51.5
	4-7 times a week	16	48.5
Battered industrial chicken, turkey	Never or rarely	7	21.2
	Once 15-15 days	12	36.4
	1-3 times a week	14	42.4
Meat croquettes, pastries and patties	Never or rarely	6	18.2
	Once 15-15 days	15	45.5
	1-3 times a week	12	36.4
Hamburgers	Never or rarely	7	21.2
	Once 15-15 days	14	42.4
	1-3 times a week	12	36.4
Sausages	Never or rarely	8	24.2
	Once 15-15 days	15	45.5
	1-3 times a week	10	30.3
Eggs	Never or rarely	1	3.0
	Once 15-15 days	6	18.2
	1-3 times a week	23	69.7
	4-7 times a week	3	9.1

Table 4 – Children's intake of vegetables (n = 33).

Intake of legumes and vegetables	Frequency	n	%
Pea, grain, fava	Never or rarely	14	42.4
	Once 15-15 days	12	36.4
	1-3 times a week	5	15.2
	4-7 times a week	1	3.0
	Over once a week	1	3.0
White cabbage, savoy cabbage	Never or rarely	12	36.4
	Once 15-15 days	11	33.3
	1-3 times a week	6	18.2
	4-7 times a week	3	9.1
	Over once a week	1	3.0
Rapini, turnip, spinach	Never or rarely	6	18.2
	Once 15-15 days	11	33.3
	1-3 times a week	12	36.4
	4-7 times a week	4	12.1
Green bean	Never or rarely	6	18.2
	Once 15-15 days	15	45.5
	1-3 times a week	10	30.3
	4-7 times a week	2	6.1
Lettuce	Never or rarely	9	27.3
	Once 15-15 days	5	15.2
	1-3 times a week	11	33.3
	4-7 times a week	8	24.2
Tomato	Never or rarely	13	39.4
	Once 15-15 days	4	12.1
	1-3 times a week	8	24.2
	4-7 times a week	8	24.2
Carrot	Never or rarely	6	18.2
	Once 15-15 days	7	21.2
	1-3 times a week	12	36.4
	4-7 times a week	6	18.2
	Over once a week	2	6.2

Table 5 – Children's fruit intake (n = 33).

Fruit intake	Frequency	n	%
Apple, pear	Never or rarely	1	3.0
	Once 15-15 days	13	39.4
	1-3 times a week	16	48.5
	4-7 times a week	3	9.1
Orange, tangerine	Never or rarely	7	21.2
	Once 15-15 days	3	9.1
	1-3 times a week	15	45.5
	4-7 times a week	7	21.2
	Over once a week	1	3.0
Banana	Never or rarely	1	3.0
	Once 15-15 days	4	11.1
	1-3 times a week	15	45.5
	4-7 times a week	13	39.4
Strawberries, cherry	Never or rarely	9	27.3
	Once 15-15 days	6	18.2
	1-3 times a week	11	33.3
	4-7 times a week	7	21.2
Melon, watermelon	Never or rarely	5	15.2
	Once 15-15 days	6	18.2
	1-3 times a week	14	42.4
	4-7 times a week	8	24.2
Grapes	Never or rarely	11	33.3
	Once 15-15 days	2	6.1
	1-3 times a week	15	45.5
	4-7 times a week	5	15.2