

Parents' knowledge about food additives and the assessment of snack food consumption by school-aged children – a preliminary study

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ABSTRACT

Introduction: Parents play an important role in shaping the eating habits of their children through: appropriate selection of food products, snacking between meals and appropriate exposure to information from television advertisements, the press or the Internet. The level of parents' knowledge about proper nutrition and substances added to food is therefore crucial in promoting appropriate dietary choices in children in order to prevent diet-related diseases. The aim of the research was to analyze the relationship between parents' knowledge about food additives and the consumption of snacks by school-aged children.

Materials and methods: The study was conducted among 129 parents of students from selected primary schools. The research tool was an original survey questionnaire consisting of 24 questions. The survey interviews were carried out in person with parents during scheduled meetings at the schools. Statistical

analysis was performed using the Pearson χ^2 test, the significance level was set to $p < 0.05$.

Results: Parents most often indicated sweets, confectionery products and sweetened drinks (25%) and vegetables or fruit (21%) as the form of snack for their children. Forty-six percent of children drank sweetened drinks at least once a day. Parents had an average level of knowledge about food additives. Significant correlations were found between the level of knowledge of parents of school-age children about food additives and their level of education.

Conclusions: No correlation was found between parents' knowledge of food additives and their children's consumption of snacks. It is important to provide intensive nutritional education for both children and parents to raise awareness of the additives present in snack foods and to improve the diet quality of school-aged children.

Keywords: children; consumption; snacks; parents' knowledge; food additives.

INTRODUCTION

Proper nutrition of children and adolescents is one of the most important environmental factors that affects the proper growth and development of the young body, and also prevents the occurrence of many diet-related diseases, m.in. obesity, type 2 diabetes, atherosclerosis. Parents largely determine their children's eating behavior. Shaping eating preferences and behaviors, the ability to make conscious and appropriate food choices, including reading labels, as well as avoiding excess high-energy products that can contribute to an increased risk of developing overweight and obesity or other diseases – should start from the earliest years of a child's life [1, 2, 3].

Increasing obesity is a serious threat to the health of children around the world. The problem of excessive body weight among Polish children and adolescents is also growing and concerns approx. 10–30% of the developmental population depending on age group and gender [4]. Excessive energy intake is a major factor in inappropriate weight gain among children, which is often linked to eating between meals. In the literature, snacks are defined as foods eaten between meals and are usually identified as foods with a higher energy density and low in nutrients. Snack foods include: sweets, cookies, chips, sweet drinks [5, 6]. Sweet and salty snacks are one of the most popular and favorite products among children [7]. Excessive consumption of sugary foods may be due to the affordability, palatability, and convenience of sugary

foods [8]. It is important to note that excessive consumption of sugary/salty snacks replaces the consumption of important foods in the diet, such as fruit and vegetables, fermented dairy products, and thus leads to lower intake of key nutrients and lower diet quality [6]. On the other hand, insufficient intake of important nutrients by children and adolescents over a long period of time may result in impaired growth and development, as well as many other long-term health consequences [5, 7, 8].

The latest pyramid and nutritional recommendations for children and school youth (4–18 years old) emphasize the positive role of fruit and vegetables in the daily food ration – as a source of vitamins, minerals and fiber, and limiting highly processed foods and beverages – providing larger amounts of sugar, salt and fat or additional substances, e.g. preservatives, dyes [2, 9]. However, numerous studies conducted in recent years among children and adolescents indicate that the diet of this population group significantly differs from the recommendations. The most common nutritional malpractices among children and adolescents include skipping meals (including breakfast, dinner), snacking between main meals of particularly high-calorie snacks, and not eating enough vegetables and fruit [1, 6, 7, 10].

A key issue in shaping proper eating habits in children is therefore paying attention to the proper selection of snack food by children and parents, including reading food labels, especially in terms of energy value and the content of essential nutrients, or additional information [8, 11]. Parents/guardians, as well as teachers and staff

at care and educational centers/schools, should have knowledge about the principles of proper nutrition for children and adolescents of school age and the impact of various products, snacks, and beverages on the growth and development of a young organism [12, 13]. Children and adolescents often eat sweet or salty snacks (e.g., sweets, chips) or drink sugar-sweetened beverages during the day [12, 14]. Most snacks consumed by children are highly processed and rich in sugar, fat or salt, and contain many additives, such as colorants. There is evidence that snacking on such foods is associated with increased energy intake, low nutrient intake, and weight gain [11]. Many data also suggest a negative impact of various additives found in snack food on the health and development of children and adolescents [11, 15]. Due to the frequent consumption of snack foods (such as sweets, candy bars, and sweetened/colored drinks) by children, it is important for parents to be knowledgeable about food additives, particularly their impact on health and their content in food products.

Additives are defined as substances added to food in order to preserve and improve the taste, texture, appearance and safety of food products, their use should not mislead the consumer. The most commonly used groups of additives in food for children and adolescents are food colorings, sweeteners, preservatives and flavor enhancers [16]. Many factors that influence snacking behaviors have been identified, among which knowledge, parents' education, and availability of unhealthy food at home play a significant role [12, 14].

Current data suggests that parents/guardians should introduce healthy eating habits among children and adolescents by maintaining a balance between setting reasonable limits, providing healthy food, and having the appropriate knowledge to implement recommendations/advice in their daily practice [5, 12, 14].

For this reason the aim of the study was to assess the consumption of snack foods by children and analyse of parents' knowledge about additional substances in food.

MATERIALS AND METHODS

Study participants

The study was aimed at parents of school-aged children. A random selection of towns in the Łódź and Mazowieckie voivodeships was made, followed by a random selection of schools based on the list of primary schools available on the Ministry of National Education website. Five schools located in 4 towns – Radom, Łódź, Jedlińsk, and Pruszków – were randomly selected. The school principals gave their consent to conduct the study on school premises after the questionnaire administrator presented the application along with the purpose of the study and the proposed questionnaire for parents to complete, and obtained their informed consent.

Research tool

The research tool was a custom-designed questionnaire consisting of 24 questions, including 8 questions assessing knowledge about food additives. The remaining 16 questions focused on the frequency of snack food consumption by children.

Questions related to knowledge about food additives focused on important issues, including: identifying the correct definition of a food additive (single-choice question); how the safety of using food additives is assessed (multiple-choice option); whether the use of food additives is regulated and controlled (single-choice question); choosing an answer regarding the functions of food additives; providing an example of natural/synthetic additives. The survey questionnaire was previously validated among 10 parents of children attending one of the primary schools in Łódź to verify: the clarity and comprehensibility of the questions asked. The following criteria were used to assess the parents' level of knowledge:

- high level: 6–8 correct answers;
- intermediate level: 4–5 correct answers;
- low level: fewer than 4 correct answers.

Course of the study

The study was conducted in 2019 in the 5 aforementioned primary schools. Parents (or guardians) were informed about the purpose of the study, they gave consent to participate in the study (a sample parental consent questionnaire was attached to the information for the Editorial Board/Reviewers) and completed a paper version of the author's questionnaire during meetings in schools (selected questions from the questionnaire are presented in the annex/additional materials). Parents who gave their consent and correctly completed the survey questionnaire were included in the study. All parents were invited to participate in the study, so a minimum sample size was not defined beforehand. The survey was conducted in person by the researcher, who explained all questions and clarified any doubts directly with the participants. Ultimately, 129 questionnaires were qualified for analysis (2 were rejected due to incomplete data).

Statistical analysis

The statistical analysis was conducted in Microsoft Office Excel 2007, and the results were developed using the Pearson χ^2 test in the Statistics program; the significance level was $p < 0.05$.

RESULTS

The characteristics of the study group are presented in Table 1. The parents/guardians who completed the survey had children aged 6–15. The largest group were children aged 9–11 (54%), followed by 6–8 years (25%), 12–15 years constituted 19% of the respondents. The average age of the children was 10 ± 2.3 years.

Parents were asked what types of products their children chose as daily snacks (this was a multiple-choice question). The responses were highly varied. Approximately 25% of children consume sweets, confectionery products, or sugary drinks (such as flavored water, cola, or nectar-based beverages) on a daily basis. Meanwhile, 21% of children choose vegetables or fruits as their snack. Among the other responses, parents also indicated that their children regularly consume 100% fruit or vegetable juices, as well as salty snacks. The response options are presented in Figure 1.

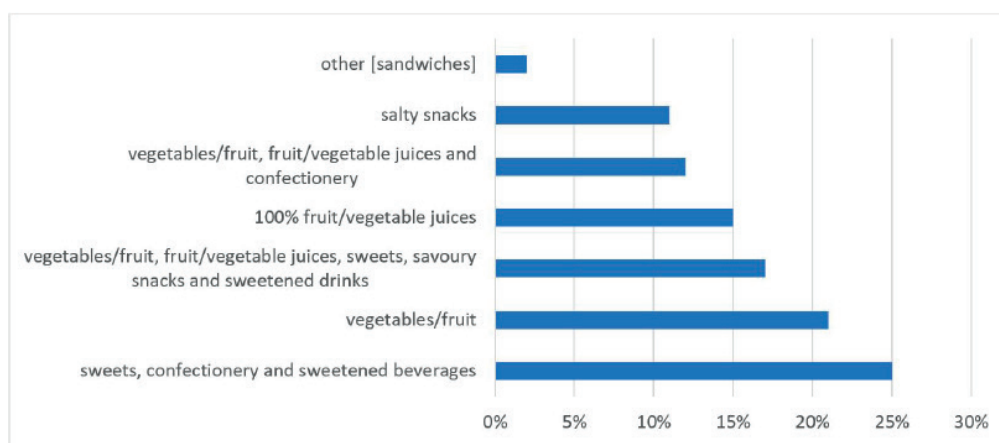


FIGURE 1. The type of product as a snack – chosen by children in the opinion of parents (parents could have chosen more than one answer)

TABLE 1. Characteristics of the parent/guardian participants

Variable	n	%
Gender		
Woman	101	78.3
Man	28	21.7
Level of education		
Basic	14	10.9
Professional	21	16.3
Average	29	22.4
Higher	65	50.4

In the survey, parents were asked how often their children consumed sweets, salty snacks or sweetened drinks. At least once a day („once a day” or „several times a day”) approx. 42% of children consumed sweets, 46% drank sweet drinks, and approx. 18% ate salty snacks between meals (chips, sticks, crackers). The answers are summarized in Table 2.

TABLE 2. Frequency of consumption of sweets, salty snacks and sweet drinks by children (%)

Frequency of intake	Sweets		Salty snacks		Sweet drinks	
	n	%	n	%	n	%
Several times a day	12	9.3	4	3.1	35	27.1
Once a day	43	33.3	19	14.7	25	19.4
Several times a week	49	38.0	47	36.4	30	23.3
Once a week	15	11.6	0	0.0	0	0.0
Several times a month	10	7.8	54	41.9	30	23.3
Not at all	0	0.0	5	3.9	9	6.9

Respondents were also asked how often they pay attention to food product labels. Thirty-eight percent of participants indicated that they only occasionally check labels, while nearly

33% reported that they do so very often. Additionally, almost 20% of parents always check the ingredients of products by reading their labels (Fig. 2).

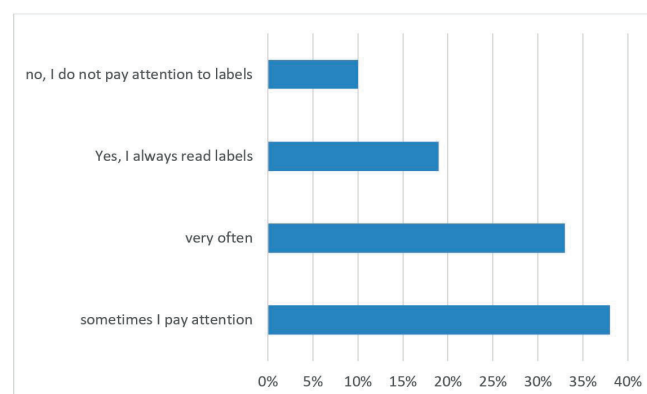


FIGURE 2. Frequency of reading food labels by parents

Knowledge of food additives was assessed using 8 single- or multiple-choice survey questions. The main findings are summarized below. In the opinion of almost half of parents, additives are subject to legal regulation and control. However, 36% of respondents do not know about it. According to parents, food additives are mainly used to improve the attractiveness of food products and to reduce production costs – this was indicated by 23% of respondents. When asked whether food additives could be used in all foods, 43% of the parents admitted they were unfamiliar with the topic. Fewer than 1/5 respondents (17%) provided the correct answer regarding the legal use of additives in all food products.

The average number of correct answers was 4.15 ± 1.41 . Almost half of the parents (49%) demonstrated a moderate level of knowledge about food additives. One-third of respondents answered fewer than 4 questions correctly, indicating a low level of knowledge. Only 18% of parents answered at least 6 questions correctly, which corresponds to a high level of knowledge (Fig. 3).

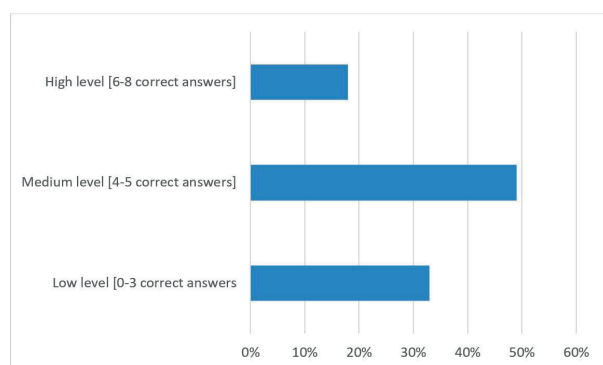


FIGURE 3. Parents' level of knowledge about food additives

As a result of the analysis of the data presented in Table 3, a statistically significant relationship was found between parents' level of knowledge about food additives and their level of education ($p < 0.05$).

Only 8.6% of the respondents with primary or vocational education, 13.8% with secondary education and 24.6% of the parents with tertiary education had a high level of knowledge about food additives. On the other hand, 45.7% of the respondents with primary or vocational education and 48.3% with secondary education had a poor level of knowledge about additives, and only 20.0% of the parents with higher education (Tab. 3).

The relationship between parents' knowledge of food additives and the frequency of children's consumption of snacks such as fruit, vegetables, sweets, sweetened drinks and salty snacks was also analysed. The results are presented in Table 4. There were no statistically significant health-beneficial relationships for children's consumption of fruit/vegetables, sweets, sweetened beverages and salty snacks ($p > 0.05$). In this case, the percentages of favourable behaviour were similar for different levels of knowledge of the subjects and almost the same for sweets (Tab. 4).

TABLE 3. Assessment of the relationship between parents' knowledge of food additives and their education

Parents' level of knowledge	Level of education						Total
	higher		average		basic and professional		
	n	%	n	%	n	%	
High	16	24.6	4	13.8	3	8.6	23
Average	36	55.4	11	37.9	16	45.7	63
Weak	13	20.0	14	48.3	16	45.7	43
Total	65	100.0	29	100.0	35	100.0	129

$\chi^2 = 11.992$; $p = 0.0174$

TABLE 4. Assessment of the relationship between level of knowledge of parents and the frequency of snack consumption by children (vegetables/fruit, sweets, sweetened drinks, salty snacks)

Consumption of snacks (behaviour)	Level of knowledge of parents						Total
	high		average		low		
	n	%	n	%	n	%	
Vegetables/fruit							
Beneficial	8	34.8	16	25.4	7	16.3	31
Negative	15	65.2	47	74.6	36	83.7	98
Comparison	$\chi^2 = 2.936$; $p = 0.230$						
Sweets							
Beneficial	4	17.4	11	17.5	8	18.6	23
Negative	19	82.6	52	82.5	35	81.4	106
Comparison	$\chi^2 = 0.027$; $p = 0.987$						
Sweet drinks							
Beneficial	9	39.1	20	31.8	11	25.6	40
Negative	14	60.9	43	68.2	32	74.4	89
Comparison	$\chi^2 = 1.317$; $p = 0.518$						
Salty snacks							
Beneficial	11	47.8	32	50.8	15	34.9	58
Negative	12	52.2	31	49.2	28	65.1	71
Comparison	$\chi^2 = 2.707$; $p = 0.258$						

The relationship between parents' knowledge of food additives and their choice of food products and reading labels was also assessed. The results of this analysis are presented in the Table 5.

TABLE 5. Assessment of the relationship between parents' level of knowledge of food additives and choice of food products, reading of labels

Pay attention to labels before buying	Level of knowledge						Total
	high		average		low		
	n	%	n	%	n	%	
Always	7	30.5	10	15.9	7	16.3	24
Very often	8	34.8	23	36.5	12	27.9	43
Sometimes they pay attention	7	30.4	23	36.5	19	44.2	49
Does not pay attention	1	4.3	7	11.1	5	11.6	13
Total	23	100.0	63	100.0	43	100.0	129

$$\chi^2 = 4.428; p = 0.619$$

There was no statistically significant correlation between the level of parents' knowledge about additives and the reading of labels ($p > 0.05$). However, it is worth noting that those who read them are always most likely to have a high level of knowledge (30.5%), while among those with a medium or low level of knowledge, the percentages paying attention to product labels are 15.9% and 16.3%, respectively. In turn, among those who do not pay attention at all, the respondents with low or medium level of knowledge dominate: 11.6% and 11.1%.

DISCUSSION

Snacks – choice and frequency of consumption among children

Children in our own study show abnormal and highly unsatisfactory eating behaviors. Parents were asked if and what foods their children prefer as snacks between main meals. The analysis of the study shows that as snacks children most often consumed sweets, confectionery products and sugary drinks (25%), followed by vegetables or fruits (21%). These parents create the environment in which their children develop, which has the greatest influence on the type, quantity and quality of snacks that their children consume [5, 7], so it is worthwhile to form the correct taste preferences and nutritional choices of children from a young age. Unhealthy snacks (e.g. sweets, crisps) can be replaced with fruit, vegetables or nuts, and carbonated and sweetened beverages such as water, fresh juices or milk drinks can be considered beneficial nutritional behaviors [6, 7]. At least once a day – 42% of children in our own study consumed sweets, and sugary drinks were consumed by 46% of children.

In Poland the frequency of consumption of snacks is quite high, as confirmed by other studies. At least once a day or

more is consumed by 98.8% of 4-year-olds and 70–96% of school children and adolescents [10, 11, 17, 18]. Snacks classified as unhealthy, consumed in excess, are primarily sweets (44% of younger children and 35–65% of adolescents), followed by cakes, cookies, biscuits and salty snacks (25.6%). Healthy snacks were most often consumed as fruits/vegetables (50–76%), followed by cereal snacks and dairy products [10, 18, 19, 20]. In 2023, compared to 2018, there was a significant increase in the number of children consuming carbonated beverages sweetened with sugar (41.4%) and energy drinks (32%) [12].

The eating habits of adolescents in Poland differ little from those of children and adolescents in other countries, primarily due to widespread access to a wide variety of food products and similar consumption preferences. In recent decades, children and adolescents in the United States have experienced an increase in both the number of daily eating occasions and the total energy intake from snacks [9, 21]. The most recent data from the U. S. National Health and Nutrition Examination Survey (NHANES) in 2017–2020 shows that 93% of children aged 2–19 eat at least one snack per day, and snacks provide a quarter (25%) of total daily energy. Eating is also common among children in Australia and Canada, where more than 95% of children eat snacks every day. Moreover, even in countries where undereating rates were lower, such as China, Mexico and Brazil, snack prevalence has increased significantly in recent years [6], as has Denmark, where consumption of sugary snacks has increased [3], highlighting the importance of this behaviour for public health. As Al-Zalabani et al. point out, the consumption of sugar-sweetened beverages has also increased worldwide over the past decade [22]. In the population studied by Leung et al., 22.5% of children aged 2–18 years in the US drank more than 2 servings of sugar-sweetened beverages per day [23]. Sugar-sweetened beverage consumption is also common among New Zealand school-aged children (8–12 years old) [24] and 12–18 year-old adolescents participating in the study in the Persian Gulf countries – 10.6–26.8% of adolescents consumed sugar-sweetened soft drinks 3 or more times a day [22].

Selection of food products – labels

The food products chosen by consumers form the basis of their daily diet. Therefore, it is essential that consumers read and understand the information provided on food labels in order to make informed and health-conscious purchasing decisions [25]. In our own study, parents were the most likely to report (38%) that they sometimes read labels; only 33% said they did so very often, and 10% did not pay attention to food labels at all. Reading food labels helps consumers make better choices by selecting foods with higher nutritional value and greater health benefits [25].

In Poland, the frequency with which adults read food labels varies significantly, ranging 27–84% of respondents. There is also a substantial group of individuals who report never reading labels at all [25, 26, 27]. When buying food, 40.0% of consumers in one of the cities in Turkey rarely paid attention to labels, and only 34.9% read them with every purchase [28]. The results of this study [28] and the study by Żarnowski et al. [29] indicate

an urgent need to promote the use of food labels, especially among respondents without higher education.

Young consumers in the study Pfladderer and et al. [30] who always/or almost always used nutrition labels to make food choices were significantly more likely to eat healthy foods and significantly less likely to eat unhealthy foods, including chips, cakes, sweets and fizzy drinks. That's why it's so important for parents to know the rules of proper child nutrition and to pay more attention to reading food labels.

Food additives – impact on health – knowledge of parents

Parents' knowledge of snack foods, including food additives, is an important aspect shaping the eating habits of the family, especially children, as it allows them to choose the best food (snacks) composition. The surveyed parents, on the other hand, demonstrated an average level of knowledge regarding food additives, similar results were obtained in studies conducted by some researchers: Lemanowicz [31], Januś et al. [32], and Bayram et al. [28]. Important conclusions were also reached in the studies by Polak et al., who observed that for the majority of parents of children aged 3–12 years from the Silesian Voivodeship, the potential health effects of consuming foods containing selected food additives were not known [33]. Our own results and those of other authors [28, 32, 33] encourage conducting nutritional education among the public, increasing awareness about food additives and their impact on health.

Our findings revealed a significant positive correlation between the level of knowledge of children's parents about food additives. Similarly, in the study by Januś et al. [32], individuals with higher education exhibited a higher level of knowledge about additives. However, in the current authorial study, it was not shown that higher parental knowledge about additives present in food translated into better nutritional choices for their children, as further research on a larger group of parents is needed.

Based on the findings of many researchers, we know that sweet or salty snacks, including sweetened/coloured drinks consumed between main meals, contribute to higher energy and certain nutrients (e. g. sugars, glucose-fructose syrup, saturated fatty acids, sodium) or additional substances (dyes, preservatives, flavour enhancers, sweeteners) by children, which is associated with poorer overall diet quality [6, 23]. Food additives improve the taste of snacks, making the child much more likely to reach for them than for an apple or carrot [7], and sweets are considered treats and enjoyed by children of different age groups [15]. Consuming high-calorie foods that contain numerous additives can contribute to weight gain, an increased risk of cardiovascular disease, and the development of type 2 diabetes or other health problems (including hormonal disruption, gastrointestinal and mental disorders) in children and adolescents. A connection was observed between high sugar intake, particularly added sugar from beverages, and a decrease in concentration and attention in children, including children with ADHD, as well as weight gain [12, 23, 34].

In the current study, children often chose sweets as a snack and very frequently drank sugary drinks throughout the day, and these snacks contain many additives in their composition.

The available data on the effects of food additives on the health of children and adolescents are increasingly concerning. Therefore, it is essential to read product labels carefully and opt for minimally processed foods with simple, short ingredient lists [3, 6, 11, 16, 35]. Food additives are found in most foods in Europe, Australia and Brazil. Consumption of food and beverages containing additives in the U.S. is also high and still growing. Most worrying is a 20% increase in the percentage of purchases of infant food containing additives and a more than 15% increase in purchases containing three or more dietary supplements [36]. Therefore, ensuring that parents have sufficient knowledge and awareness regarding nutrition and health is essential when planning meals or managing their children's snack consumption. Particular focus should be placed on both the nutritional quality and the amount of snacks children consume. It is also very important to promote healthy food choices in children related to the consumption of different types of liquids and to increase preferences for water and unsweetened drinks [12].

In our study, parents with higher education had greater knowledge about food additives, but we did not find such a correlation that it would be associated with limiting the consumption of sugary drinks by their children. There is a lack of research analyzing the level of parents' knowledge about food additives and the consumption of snack foods among children.

On the other hand, greater general knowledge about nutrition and food, associated with higher parental education, in many other studies translated into healthier eating habits related to the choice of beverages. This is very important, considering that children and adolescents often drink sugary drinks that contain various additives, including colorants or sweeteners. According to some researchers, children and adolescents are more likely than adults to consume products containing dyes [37]. The main source of colouring but also of sugar/sweeteners in the diet of children and adolescents are sweets, confectionery and beverages [38]. These observations are also corroborated by a study conducted in Saudi Arabia among the population of developmental age (6–17 years), which showed that the highest proportion of dyes was found in juices and other beverages, as well as in ice creams and cakes, which were frequently consumed by the subjects [39]. In recent years, the consumption of sweeteners, the main source of which are beverages, has also increased. Consumption is higher among obese people and increases with age. Studies have shown that children may exceed safe levels of sweetener intake by consuming large quantities of artificially sweetened foods [12, 34].

The level of adult education plays a fundamental role in overall health, particularly in shaping eating habits. The results showed that young people with a higher education have a higher rate of healthy eating and are less likely to consume sugary drinks compared to those with only a primary level of education [40]. In turn, parents' eating behaviors, both positive and negative, have a strong influence on the products they

consume, including their children's choice of appropriate snack quality [41, 42].

Parents with higher education tend to have greater nutritional knowledge and are more attentive to which products should be included in the diet and which should be limited. Similar trends regarding healthier dietary choices are associated with higher education of parents – as observed in the study by Piasecka and Lesiów [7]. The vast majority of children of people with higher education eat fewer snacks compared to children of people with lower education. The beneficial behaviours involved a higher proportion of children consuming fruit and vegetables in various forms as a snack between main meals, as well as children who were more restricted in the consumption of high-calorie products. The vast majority of parents with higher education are more effective in implementing nutritional recommendations for their children compared to parents with secondary or primary education. In the study by Kostecka et al. – children of less educated parents consumed more energy drinks [12].

Many similar studies can be found in the literature, which confirm the relationship between the higher education of parents, especially mothers, and healthier eating patterns in their children [38, 43, 44, 45, 46]. It is also stated that a number of factors, including cultural diversity, socioeconomic status, caregiver habits, children's preferences, media, and perceptions of what constitutes a snack, influence parents/caregivers in providing snacks to their children [13, 47].

It is therefore very important to provide continuous education to parents, children and young people in order to increase their knowledge of the presence and potential risks of additives present in foods, especially those intended for children. Active monitoring of the emergence of newly registered additives and harmonisation of existing legislation is necessary. Studies are also needed to better determine the impact of additives on children's health much better, given their widespread prevalence and daily consumption. By consuming many products at the same time, it is not possible to unequivocally determine how much of the additives we actually consume and absorb and what will be the long-term effect of accumulation in the body [11, 16, 33].

Limitation of the study

This study did not use a validated international questionnaire of nutritional knowledge, but used an authorial questionnaire of the survey, which was independently developed for the necessary research. We also didn't get enough of a study group (without parental consent) to be representative and draw binding conclusions. These are only important observations, results that should be carried out – confirmed on a larger group of parents.

The current study should be treated as a preliminary, pilot study to observe the tendency of children to eat snack food, read food labels, and assess parents' knowledge about food additives. When designing future studies, they should be conducted on a larger group of parents/caregivers, taking into account the assessment of parents' knowledge about snack food and various factors/determinants of snacking among children.

CONCLUSIONS

Parents of school-aged children demonstrated an average level of knowledge about food additives. A correlation was shown between parents' knowledge of additives and their level of education. The parents' knowledge about additives did not affect behaviors related to the consumption of snack foods, especially sweets and sugary drinks, which children frequently consumed.

Nutritional education conducted intensively among children and parents is essential to raise awareness about additives found in snack foods and to improve the quality of the diet of school-aged children. Particular attention should be focused on education carried out by dietitians at school, and dietary interventions should be aimed at highlighting products of significant nutritional value such as vegetables, fruits, and dairy products as valuable, 'health-promoting' snacks.

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