



## PARENTAL SOCIO-DEMOGRAPHIC INFLUENCES ON SCHOOL-AGED CHILDREN'S DIETS: A QUANTITATIVE STUDY IN THE REPUBLIC OF MOLDOVA

Iulia RODOMAN<sup>1,2</sup>, Alina TIMOTIN<sup>3</sup>, Oleg LOZAN<sup>3</sup>

<sup>1</sup>Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

<sup>2</sup>PMSI Mother and Child Institute, Chisinau, Republic of Moldova

<sup>3</sup>School of Public Health Management, Nicolae Testemitanu State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

Corresponding author: Iulia Rodoman, e-mail: iulia.rodoman@gmail.com

DOI: 10.38045/ohrm.2024.2.03

CZU: 613.2.03-053.2:314/316(478)

**Keywords:** knowledge, attitudes, practices, parents, children's nutrition, nutritional education.

**Introduction.** The transition from childhood to adulthood significantly impacts overall health and requires adequate nutrition to facilitate physical and cognitive development. Managing children's weight and fostering an environment that promotes healthy eating habits are significantly influenced by parents' knowledge, attitudes, and practices.

**Material and methods.** In February – March 2023, a quantitative study was conducted, involving 472 parents of school-aged children. The questionnaire, developed according to the Knowledge, Attitudes, and Practices methodology, was completed both online, in electronic format, and on paper.

**Results.** The results of the KAP study regarding the nutrition of school-aged children show that parents have a significant level of knowledge (76.9±19.07%) about their children's nutrition. Regarding attitude, the score is moderate (59.99±10.7%), indicating that parents may not prioritize healthy eating habits for their children or may not be sufficiently motivated to act. However, there is a low level of practice: 45.43±16.6%. Statistical analysis indicates significant correlations between: gender and knowledge ( $\tau=0.175$ ,  $p<0.01$  and  $\rho=0.185$ ,  $p<0.01$ ), gender and attitudes ( $\tau=0.111$ ,  $p<0.05$  and  $\rho=0.111$ ,  $p<0.05$ ), age and knowledge ( $\tau=-0.055$ ,  $p<0.05$  and  $\rho=-0.062$ ,  $p<0.05$ ), living environment and knowledge ( $\tau=0.227$ ,  $p<0.01$  and  $\rho=0.240$ ,  $p<0.01$ ), region and knowledge ( $\tau=-0.162$ ,  $p<0.01$  and  $\rho=-0.185$ ,  $p<0.01$ ), indicating the importance of these factors in influencing dietary behavior.

**Conclusions.** The study's findings reveal a discrepancy between the level of knowledge and the positive attitudes of parents regarding children's nutrition and their practical implementation.

**Cuvinte-cheie:** cunoștințe, atitudini, practici, părinți, nutriția copiilor, educație nutrițională.

**INFLUENȚE SOCIO-DEMOGRAFICE ALE PĂRINȚILOR ASUPRA DIETEI COPIILOR DE VÂRSTĂ ȘCOLARĂ: UN STUDIU CANTITATIV ÎN REPUBLICA MOLDOVA**

**Introducere.** Tranziția de la copilărie la vârsta adultă influențează semnificativ starea de sănătate și impune un regim alimentar adecvat pentru a facilita dezvoltarea fizică și cognitivă. Gestionarea greutateii copiilor și cultivarea unui mediu care promovează obiceiuri alimentare sănătoase sunt influențate semnificativ de cunoștințele, atitudinile și practicile părinților.

**Material și metode.** În februarie – martie 2023, a fost desfășurat un studiu cantitativ, ce a inclus 472 de părinți ai copiilor de vârstă școlară. Chestionarul, elaborat conform metodologiei Cunoștințele, Atitudini și Practici, a fost completat atât online, în format electronic, cât și pe suport de hârtie.

**Rezultate.** Rezultatele studiului CAP, referitoare la nutriția copiilor de vârstă școlară, arată că părinții au un nivel de cunoștințe semnificativ (76,9±19,07%) despre nutriția copiilor lor. În ceea ce privește atitudinea, scorul este mediu (59,99±10,7%), indicând că părinții ar putea să nu acorde suficientă importanță alimentației sănătoase a copiilor sau să nu fie suficient de motivați să acționeze. Cu toate acestea, se observă un nivel scăzut al practicii: 45,43±16,6%. Analiza statistică indică corelații semnificative între: gen și cunoștințe ( $\tau=0,175$ ,  $p<0,01$  și  $\rho=0,185$ ,  $p<0,01$ ), gen și atitudini ( $\tau=0,111$ ,  $p<0,05$  și  $\rho=0,111$ ,  $p<0,05$ ), vârstă și cunoștințe ( $\tau=-0,055$ ,  $p<0,05$  și  $\rho=-0,062$ ,  $p<0,05$ ), mediul de trai și cunoștințe ( $\tau=0,227$ ,  $p<0,01$  și  $\rho=0,240$ ,  $p<0,01$ ), regiune și cunoștințe ( $\tau=-0,162$ ,  $p<0,01$  și  $\rho=-0,185$ ,  $p<0,01$ ), indicând importanța acestor factori în influențarea comportamentului alimentar.

**Concluzii.** Concluziile studiului relevă o discrepanță între nivelul de cunoștințe și atitudinile pozitive ale părinților privind nutriția copiilor și implementarea lor practică.

## INTRODUCTION

The group of school-age children stands out due to their unique nutritional requirements, which are greater than those of adults, yet their dietary intake must simultaneously meet the needs for energy, recovery, and growth. A distinguishing characteristic of school-age children is their limited autonomy in making dietary decisions. Instead, their diet is influenced by parents, relatives, school personnel, friends, and aggressive marketing (1).

The transitional stage from early childhood to adulthood is critically significant in shaping an individual's overall health. This period, known as "middle childhood" (6-11 years) and "adolescence" (12-18 years), is marked by notable changes in physical and cognitive development, where proper nutrition is essential to support these changes and mitigate any negative impact of nutritional deficiencies or excesses (2).

In the Republic of Moldova, school meals are accessible; however, the quality of nutrition in educational institutions, particularly in rural areas, remains suboptimal. Menus are often overloaded with bakery products and oils but lack fruits, vegetables, and good fats. The Ministry of Health of the Republic of Moldova, in collaboration with the Ministry of Education and Research of the Republic of Moldova, has revised nutrition recommendations for school and preschool institutions. However, the ongoing issue of insufficient funding for children's meals in schools persists (3).

Although there are recommendations for a healthy diet and adequate physical activity in educational institutions in the Republic of Moldova, developed in 2016, and updated specifically for kindergartens in 2023 (4), as well as the "*Guide to Good Practice: Rational Nutrition, Food Safety, and Changing Nutrition Behaviors*" from 2019 (5), there is no clear and consistent message to parents regarding the nutritional quality of foods consumed by children at home. Consequently, children heavily rely on the knowledge and capabilities of others to ensure they receive proper nutrition (1).

Currently, the world is facing a dual challenge of childhood weight issues, with a rising trend in the prevalence of overweight children and a persistent problem of underweight children.

Malnutrition is a pathology that affects children

and adolescents, associated with various negative health outcomes, including delayed growth, impaired cognitive development, low IQ, behavioral problems, and more (6). Longitudinal studies indicate that malnutrition can serve as a precursor to stunted growth. Furthermore, stunting in early life is associated with poor cognitive development, lower rates of school enrollment and academic achievement, and ultimately, decreased productivity and learning potential (7).

Considering that the school-age period is the last and the second most rapid phase of height attainment after early childhood, this stage of life offers a final "window of opportunity" for addressing deficits and potentially achieving growth and cognitive recovery, mitigating its negative consequences for individuals and society (8). Children who remain stunted throughout their school years may face an increased risk of obesity. Growing evidence suggests that infants with rickets and children who experience rapid weight gain in childhood have an elevated risk of being overweight, obese, and developing non-communicable diseases in adulthood (9). This issue becomes increasingly important as many populations experience a secular transition from undernutrition to obesity. Under the significant global influence of the obesogenic environment and due to access to non-traditional foods, excess body weight and obesity among children and adolescents have become a major issue in developed countries, with developing nations following suit (10). According to World Health Organization data from 2018, the prevalence of overweight among adolescents has dramatically increased from 4% in 1975 to 18% in 2016. Currently, 216 million adolescents are overweight. The prevalence of obesity has risen from 0.7% in 1975 to 5.6% in 2016 among girls and from 0.9% to 7.8% among boys, affecting 124 million children in 2016. These figures highlight a concerning global trend of increasing overweight and obesity rates among adolescents (11).

In the Republic of Moldova, unhealthy eating is a significant risk and is classified among modifiable behavioral risks alongside smoking, alcohol consumption, and physical inactivity. According to statistics, nutrition contributes to 20% of the disease burden in the country, significantly impacting the onset of most major chronic diseases (5). A study conducted in 2022 at the School of Pub-

lic Health Management reveals a lack of knowledge and practices regarding nutrition among parents with young children (0-3 years). The research results show that 94% of parents are aware that candies are unhealthy, yet 58% of them introduce sweets into their children's diets by the age of 3 (12).

A study conducted in the Republic of Moldova in 2017, focusing on children aged 10-16 years, revealed the following findings: disturbances in body mass index were identified in 20.7% of cases. This demonstrated a predominance of children with excess weight in 16.2% of cases, compared to underweight children in 4.5% of cases. Of the total cases, overweight accounted for 13.5%, with obesity present in 2.8% of cases. Abdominal obesity was observed in 71.43% of obese children (13).

According to the Health Behavior among School Children studies conducted in 2014, 2017, and 2022 in the Republic of Moldova, the prevalence of overweight teenagers was observed to plateau, maintaining a steady rate of about 11-13% between 2014 and 2017, before rising to 17.2% in 2022 (14). Overall, about a third of adolescents have an abnormal body mass index – 1 in 7 adolescents is overweight and 1 in 5 is underweight. Among male adolescents, a higher prevalence of overweight is observed (14%) compared to females (9%). The mathematical model for diabetes and hypertension predicts that nearly 1,000 cases annually for each condition could be prevented if the prevalence of overweight in the country were to decrease by 5% (15).

The direct consequences of obesity on health encompass conditions such as dyslipidemia, hypertension, and dysglycemia, ultimately leading to the development of metabolic syndrome. A long-term consequence is the onset of arteriosclerosis, which begins in childhood. The clinical manifestations of cardiovascular diseases may not be immediately apparent, representing conditions without evident clinical symptoms. Another study conducted in the Republic of Moldova by Esanu V. et al. asserts that metabolic syndrome is a risk factor in children aged 10-18 years and is positively correlated with the initiation of left ventricular myocardial remodeling (RR: 1.7, 95% CI: 1.3–4.2,  $p < 0.05$ ) (16). In addition to cardiovascular risk factors, overweight and obesity in children also

contribute to the development of type II diabetes, bronchial asthma, sleep apnea, fatty liver disease, gallstones, and menstrual irregularities. Until recently, many of the mentioned health conditions were primarily associated with adults; however, they are now highly prevalent among obese children (17).

Parental knowledge, attitudes, and practices related to health are crucial in managing children's body weight (18). Given the challenges associated with treating obesity, experts recommend that prevention efforts should begin in childhood (19). Furthermore, greater attention should be directed towards parents, who are often the primary caregivers of young children. In this role, parents establish a contextual environment that significantly influences their child's dietary and physical activity habits. Through their understanding of nutrition and feeding practices, parental behaviors profoundly affect their children's eating behaviors (20). These dietary patterns, established during childhood, tend to persist and may even continue into adulthood (21).

The relationship between diet and health is becoming increasingly clear, yet it remains complex, with many unanswered questions. Nonetheless, consumer segmentation and social marketing techniques assist health professionals in understanding their target audience and tailoring specific messages to different segments (22). Furthermore, the data provided by the KAP studies are invaluable. Additionally, these may serve to ground the Product, Price, Placement and Promotion policy within a social marketing program (23).

Given the lack of clear and unified messaging regarding the nutritional quality of foods consumed by school-age children in the Republic of Moldova, we hypothesize that there will be gaps in parental knowledge, attitudes, and practices concerning the dietary habits of their children. By testing this hypothesis, the study aims to assess parents' knowledge, attitudes, and practices regarding the nutrition of school-age children. This evaluation intends to offer insights into the factors influencing parental behaviors related to their children's nutrition and to inform targeted interventions designed to enhance the dietary habits and overall health outcomes of this vulnerable population.

## MATERIAL AND METHODS

This quantitative study was conducted to assess the knowledge, attitudes, and practices of parents regarding the diets of school-aged children. It was selective, including 472 parents of school-aged children who participated in the survey by completing an online questionnaire on the Google Docs platform and on paper. The questionnaire, developed in the Romanian language, featured both closed and open-ended questions with multiple response options, drawing on the format of similar studies (24 – 27) and adhering to the KAP methodology (28). It underwent preliminary testing and was adapted based on the results of a pre-test before the final data collection. The data collected from the questionnaire were entered into the SPSS software for statistical processing, utilizing both descriptive (mean, median, standard deviation) and inferential (Spearman's rho, Kendall's tau\_b, Chi-Square test) statistics.

The study sample primarily consisted of female parents, who accounted for 78% of the 472 participants included. The majority of respondents were aged between 36 and 45 years, constituting 46% of the sample. When categorized by living environment, 57% resided in urban areas, while 43% lived in rural areas. In terms of education, 35.6% of participants reported having higher education, 5.7% held a Ph.D. degree, 24.3% had completed high school, 19.9% had finished middle school, and 2.1% had primary education. Regarding employment status, 60.6% were employed, and 27.1% were not active in the workforce. The distribution of parents' body mass index (BMI) showed that 46.2% were of normal weight, 31.8% were overweight, and the remainder had various degrees of obesity (Grade I – 12.7%, Grade II – 4.7%, Grade III – 1.7%). Among the children included in the study, there was a nearly equal gender distribution, with 53% male and 47% female. The children were divided into age groups, with 47% in the younger school age group (6-11 years) and 53% in the older school age group (12-14 years). The majority of the children were of normal weight (50.2%), with the rest being underweight (33.3%), overweight (12.1%), and obesity grade I (4.4%).

## RESULTS

The results of the KAP study on parents' knowledge, attitudes, and practices concerning

the diet of school-aged children show that the respondents possess a relatively significant level of knowledge ( $76.9 \pm 19.07\%$ ) about their children's nutrition, indicating a solid foundation but also highlighting areas for improvement. However, the attitude score is below average ( $59.99 \pm 10.7\%$ ), suggesting that parents might not prioritize their children's healthy nutrition as highly as necessary or may lack sufficient motivation to act accordingly. The practice score is the lowest ( $45.5 \pm 16.6\%$ ), revealing that despite having positive knowledge and attitudes, parents often struggle to apply what they know and believe about their children's nutrition effectively.

In the context of the nutritional education strategy, it is considered that the percentage of correct responses, optimal practices, or positive/desirable attitudes should be at least 90%. From this perspective, the level of parents' knowledge is nearly satisfactory, but their attitudes and practices require substantial improvement to reach an optimal level of nutritional education.

Table 1 provides an analysis of the correlations between the level of knowledge, attitudes, and practices of parents and their socio-demographic data, as well as the BMI.

*Parents' gender:* A significant positive correlation was observed between their gender and both their knowledge ( $\tau = .175, p < 0.01; \rho = .185, p < 0.01$ ) and attitudes ( $\tau = .111, p < 0.05; \rho = .111, p < 0.05$ ) towards the nutrition of their children. This suggests that women are more involved in promoting a healthy lifestyle for children than men.

*Parents' age:* It presents a significant negative correlation with knowledge ( $\tau = -.055, p < 0.05; \rho = -.062, p < 0.05$ ), indicating that older parents tend to have less knowledge about the nutrition and health of their children.

*Parents' place of residence:* A significant positive correlation was observed between the parent's place of residence and their knowledge about nutrition and health ( $\tau = .227, p < 0.01$  and  $\rho = .240, p < 0.01$ ). However, there was also a significant negative correlation between the place of residence and parents' practices regarding nutrition ( $\tau = -.206, p < 0.05$  and  $\rho = -.206, p < 0.05$ ). As a result, urban areas, while exhibiting higher knowledge levels, pose challenges related to dietary practices.



Table 1. Analysis of correlations between the level of knowledge, attitudes, and practices of parents and their socio-demographic data.

Parents	Spearman's rho ( $\rho$ )			Kendall's tau_b ( $\tau$ )			
	Kn	At	Pr	Kn	At	Pr	
<b>Gender</b>	CC	.175**	.111*	-.089	.185**	.111*	-.090
	Sig. (2-tailed)	.000	.016	.052	.000	.016	.052
<b>Age</b>	CC	-.055*	.077	.000	-.062*	.083	.000
	Sig. (2-tailed)	.178	.072	1.000	.180	.072	1.000
<b>Place of residence</b>	CC	.227**	-.047	-.206**	.240**	-.047	-.206**
	Sig. (2-tailed)	.000	.305	.000	.000	.305	.000
<b>Region of residence</b>	CC	-.162**	.053	.104*	-.185**	.058	.112*
	Sig. (2-tailed)	.000	.212	.015	.000	.212	.015
<b>Education level</b>	CC	.011	.032	.131**	.012	.036	.145**
	Sig. (2-tailed)	.790	.441	.002	.788	.441	.002
<b>Statute</b>	CC	-.005	-.105*	-.018	-.005	-.110*	-.018
	Sig. (2-tailed)	.911	.017	.690	.920	.017	.690
<b>BMI</b>	CC	-.109**	.024	-.023	-.124**	.026	-.025
	Sig. (2-tailed)	.007	.578	.591	.007	.579	.592

\*\* . The correlation is significant at the  $p < 0.01$  level.

\* . The correlation is significant at the  $p < 0.05$  level.

CC - correlation coefficient, Kn - knowledge, At - attitude, Pr - practice

**Region of residence:** It presents a significant negative correlation with knowledge ( $\tau = -.162$ ,  $p < 0.01$  and  $\rho = -.185$ ,  $p < 0.01$ ), indicating that parents in certain regions have less knowledge about the nutrition and health of their children compared to parents in other regions. The Chi-Square test also indicates a significant relationship between parents' knowledge and the region in which they live ( $X^2 = 46.424$ ,  $df = 6$ ,  $p < 0.001$ ). Symmetric measures show a significant negative relationship between parents' knowledge and the region in which they live, with parents in the Northern and Central regions having better knowledge about nutrition and health than those in the South and the municipality of Chisinau.

**Parents' education level:** A positive correlation was observed between the parent's level of education and their knowledge and attitudes toward the nutrition of school-aged children, as well as a significant positive correlation regarding their nutrition-related practices ( $\tau = .131$ ,  $p < 0.01$  and  $\rho = .145$ ,  $p < 0.01$ ). This indicates that parents with higher levels of education have better knowledge about the nutrition and health of their children and are more likely to have positive attitudes and implement this knowledge in the nutrition of their children.

**Socio-economic status of parents:** The correlation

coefficient was very small ( $\rho = -0.005$  to  $-0.018$ ), indicating an association between the knowledge, attitudes, and practices of parents regarding the nutrition of school-aged children and their socio-economic status. However, this association is relatively weak and not always significant.

**Parents' BMI:** A significant negative correlation was observed between their BMI and their knowledge about nutrition and health ( $\tau = -.109$ ,  $p < 0.01$  and  $\rho = -.124$ ,  $p < 0.01$ ). In other words, parents with a higher BMI have less knowledge about nutrition and health compared to those with a lower BMI.

In accordance with Table 2, which outlines the statistical correlations between children's BMI scalar values and parents' nutritional knowledge, attitudes, and practices, the Pearson correlation coefficient of 0.016 suggests a weak positive correlation between parents' knowledge and children's BMI, with a non-significant p-value of 0.730. This indicates a lack of substantial association between parents' knowledge levels and their children's BMI. In contrast, the Pearson correlation coefficient of  $-0.154^{**}$  reflects a statistically significant moderate negative correlation between parents' attitudes and children's BMI at the  $p < 0.01$  level ( $p = 0.001$ ). This suggests that an increase in positive parental attitudes is associated

with a decrease in their children's BMI. Similarly, the Pearson correlation coefficient of  $-0.119^{**}$  indicates a statistically significant moderate nega-

tive correlation at the  $p < 0.01$  level ( $p = 0.010$ ) between parents' practices and children's BMI, implying that favorable parental practices are linked to a reduction in their children's BMI.

Table 2. Statistical correlations between children's BMI scalar values and parents' nutritional knowledge, attitudes, and practices.

Parameters		Parents' knowledge	Parents' attitude	Parents' practices
Children's BMI	Pearson correlation	.016	-.154**	-.119**
	Sig. (2-tailed)	.730	.001	.010

\*\* . The correlation is significant at the  $p < 0.01$  level.

## DISCUSSIONS

The identified factors – gender, age, place of residence, education level, and parents' BMI – emphasize their pivotal roles in shaping parental knowledge and attitudes toward child nutrition and health.

Our research supports the finding of Arlinghaus et al. regarding a gender disparity in the promotion of healthy lifestyles for children, showing that women are more involved than men (29). This gender gap in health information behavior, with women being more proactive in seeking health-related information, emphasizes the need for gender-sensitive interventions that particularly focus on engaging fathers in promoting healthy behaviors (30).

Thakur et al., in a recent review, emphasize that while nutrition knowledge is crucial, it alone is insufficient to guarantee healthy eating habits in children (31). Other factors, such as age, gender, nutritional status, lifestyle, and parents' education level, also show associations with knowledge and practices.

Our research shows a correlation: parental age is inversely related to knowledge of children's nutrition, suggesting that as parents get older, their comprehension of children's nutrition and health tends to decline. These results imply that age constitutes a significant factor influencing parents' awareness of nutritional and health-related matters concerning their children. This phenomenon may be explained by the limited access to and education on nutrition and health for older generations compared to the more informed younger ones. Additionally, older individuals often adhere to conservative dietary habits, which could affect their levels of nutritional knowledge.

Limited research directly comparing obesity determinants in urban and rural children has yielded conflicting results (32). Our study suggests that parents living in urban environments are more informed about new trends in nutrition and health, thereby possessing higher knowledge levels. However, the dietary practices of parents in urban areas might be influenced by the availability and accessibility of unhealthy fast-food options.

Research consistently shows a strong interconnection between parents' education level and their knowledge of children's nutrition, which is also confirmed in our study. Fadare found that higher levels of a mother's education are positively associated with child nutrition outcomes, suggesting that education can reinforce knowledge to produce better nutrition outcomes for children (33). Xu and Romanos-Nanclares both highlight the influence of parents' food knowledge and healthy-eating attitudes on their children's understanding of food and nutrition, as well as their diet quality and micronutrient intake (34, 35). Thakur further emphasizes the need for holistic behavior change strategies, including supporting food skills, to encourage healthy eating habits among children (31).

Our study aligns with a consistent body of research indicating that individuals with a higher BMI tend to have lower knowledge about nutrition and health compared to those with a lower BMI. This may be due to individuals with a higher BMI often being less concerned about their diet and overall health, leading to less knowledge on these topics. Additionally, parents with a higher BMI may be less inclined to adopt healthy lifestyles and make positive food choices for their



children, which can also affect their knowledge about nutrition and health. Kocaadam-Bozkurt found that children's BMI was negatively correlated with their physical activity and positively correlated with their mothers' and fathers' BMI (36). Vaitkeviciute identified associations between children's BMI and dietary behavior, as well as nutrition-related parenting practices (37). Williams further supported this by showing that families with overweight or obese parents had a less healthy nutrition and physical activity environment (38). Lee found that parental BMI was positively associated with their children's BMI, fat mass, and waist circumference, and negatively associated with their physical fitness (39). These studies collectively underscore the significant influence of parents' BMI on children's nutrition and health.

There are numerous research findings that underscore the significant impact of parents' nutritional knowledge, attitudes, and practices on children's BMI. However, our study found no significant correlation between parental knowledge and children's BMI. Possible explanations for this lack could include other influential factors not considered in the analysis, the complexity of the relationship, or the need for a more comprehensive investigation incorporating additional variables. Conversely, there is a correlation between unfavorable parental attitudes and practices and elevated BMI in children, suggesting that parental habits may influence their children's weight. Vaitkeviciute and Nordin both found that unhealthy dietary behavior and nutrition-related parenting

practices, such as the control of unhealthy food and the use of food as a reward or punishment, were positively associated with children's BMI (37 – 40). Conversely, positive practices like encouragement and a liberal attitude were negatively associated with BMI. Larsen further emphasized the importance of the home food environment, influenced by parental dietary behavior and food parenting practices, in shaping children's dietary behavior and BMI (41). Kocaadam-Bozkurt highlighted the role of parenting in influencing children's dietary intake and BMI, focusing on the importance of balanced nutrition and the family environment (36). These findings and our study results serve as a basis for developing social marketing programs aimed at inducing behavior change regarding nutrition in parents and their children.

#### **LIMITATIONS OF THE STUDY**

It is important to note that the data collection method, through self-administration of the questionnaire, has certain limitations, such as the possibility of untrue or idealized responses (e.g., about weight and height) due to factors like the lack of supervision or guidance from the researcher. It is crucial to acknowledge these limitations and strive to mitigate them by incorporating additional data collection methods. Additionally, the current study focused on children aged 6 to 14 years; therefore, future studies should assess how parents understand the importance of healthy nutrition and encourage good eating habits among their adolescents.

#### **CONCLUSIONS**

1. The conducted research enabled the assessment of parents' knowledge, attitudes, and practices regarding the nutrition of school-aged children, highlighting the obstacles and issues that make implementing this crucial process challenging in children's development.
2. The parents' knowledge level regarding the nutrition of school-aged children is high, with an average level recorded in the attitudes section and a low level of practice. Concerning the nutritional education strategy, the parents' knowledge level is almost satisfactory, but their attitudes and practices require significant improvement to achieve an optimal level of nutritional education.
3. Our statistical analysis highlights several significant correlations between demographic factors and parental knowledge and attitudes towards children's nutrition. Gender, age, place of residence, and region all play crucial roles in shaping parental understanding and perceptions regarding dietary habits. These findings underscore the importance of considering socio-demographic factors in designing targeted interventions aimed at promoting healthier dietary behaviors among children.

#### **CONFLICT OF INTEREST**

The authors declare no conflict of interest.

## FUNDING ACKNOWLEDGEMENT

The study was conducted as part of a Master's research project within the School of Public Health Management.

## REFERENCES

- Moreno M. Advertising and Youth. *JAMA Pediatr.* 2018;172(5):504. doi:10.1001/jamapediatrics.2018.0075
- Bundy D, de Silva N, Horton S, Jamison DT, Patton GC. *Disease Control Priorities, Third Edition (Volume 8): Child and Adolescent Health and Development.* Washington, DC: World Bank; 2017. doi:10.1596/978-1-4648-0423-6 3.
- Programul național de prevenire și control al bolilor netransmisibile prioritare în Republica Moldova pentru anii 2023-2027 [The national program for the prevention and control of priority non-communicable diseases in the Republic of Moldova for the years 2023-2027]. Available at: [https://www.legis.md/cautare/getResults?doc\\_id=136642&lang=ro](https://www.legis.md/cautare/getResults?doc_id=136642&lang=ro) [Accessed: January 05th 2024].
- Tabunșic O, Babenco C. *Ghid metodologic culinar organizarea alimentației copiilor în instituțiile de educație timpurie* [Culinary methodological guide for the organization of children's nutrition in early childhood education institutions]. Primăria municipiului Chișinău, Direcția Generală Educație, Tineret și Sport. Chișinău: SEP ASEM, 2023.
- Croitoru C, Ciobanu E. *Ghid de bune practici: alimentație rațională, siguranța alimentelor și schimbarea comportamentului alimentar* [Good practice guide: rational eating, food safety and dietary behavior change]. 2019. Available at: [https://library.usmf.md/sites/default/files/2019-06/ghid\\_nutritie\\_romana\\_CIP\\_electronic.pdf](https://library.usmf.md/sites/default/files/2019-06/ghid_nutritie_romana_CIP_electronic.pdf) [Accessed: December 12th 2023].
- Onyango A. Promoting healthy growth and preventing childhood stunting: a global challenge. *Matern Child Nutr.* 2013;9(S2):1-5. doi:10.1111/mcn.12092
- Schoenbuchner S, Dolan C, Mwangome M, et al. The relationship between wasting and stunting: a retrospective cohort analysis of longitudinal data in Gambian children from 1976 to 2016. *Am J Clin Nutr.* 2019;110(2):498-507. doi:10.1093/ajcn/nqy326
- Prendergast AJ, Humphrey JH. The stunting syndrome in developing countries. *Paediatr Int Child Health.* 2014;34(4):250-265. doi:10.1179/2046905514Y.0000000158
- Schott W, Aurino E, Penny ME, Behrman JR. The double burden of malnutrition among youth: Trajectories and inequalities in four emerging economies. *Econ Hum Biol.* 2019;34:80-91. doi:10.1016/j.ehb.2019.05.009
- Gupta N, Goel K, Shah P, Misra A. Childhood Obesity in Developing Countries: Epidemiology, Determinants, and Prevention. *Endocr Rev.* 2012;33(1):48-70. doi:10.1210/er.2010-0028
- Kyle UG, Earthman CP, Pichard C, Coss-Bu JA. Body composition during growth in children: limitations and perspectives of bioelectrical impedance analysis. *Eur J Clin Nutr.* 2015;69(12):1298-1305. doi:10.1038/ejcn.2015.86
- Ani A, Timotin A, Lozan O. Knowledge, attitudes, and practices of parents regarding food diversification for children under 3 years old. *One Health & Risk Management.* 2023;4(3):18-22. doi:10.38045/ohrm.2023.3.03
- Dolapciu E, Revenco N. Factorii de risc în dezvoltarea excesului de masă corporală la copii în perioada de pubertate: studiu retrospectiv, de tip caz-control [Risk factors in the development of overweight in children during puberty: a retrospective, case-control study]. *Revista se Științe ale Sănătății din Moldova.* 2017;14(4):62-71. Available at: [https://ibn.idsi.md/sites/default/files/j\\_nr\\_file/MJHS\\_4\\_2017.pdf](https://ibn.idsi.md/sites/default/files/j_nr_file/MJHS_4_2017.pdf) [Accessed: December 17th 2023].
- UNICEF and Youth Clinic Moldova launch the campaign "Eat healthy!" Available at: <https://www.unicef.org/moldova/en/press-releases/unicef-and-youth-clinic-moldova-launch-campaign-eat-healthy> [Accessed: December 13th 2023].
- Webber L, Divajeva D, Marsh T, et al. The future burden of obesity-related diseases in the 53 WHO European-Region countries and the impact of effective interventions: a modelling study. *BMJ Open.* 2014;4(7):e004787-e004787. doi:10.1136/bmjopen-2014-004787
- Esanu V, Paliu I, Mocanu V, Vudu L, Esanu V. Left ventricular remodeling patterns in children with metabolic syndrome. *One Health & Risk Management.* 2020;2(2):41-49. doi:10.38045/ohrm.2020.1.15
- Kelishadi R, Mirmoghtadaee P, Najafi H, Keikha M. Systematic review on the association of abdominal obesity in children and adolescents with cardio-metabolic risk factors. *J Res Med Sci.* 2015;20(3):294-307. <http://www.ncbi.nlm.nih.gov/pubmed/26109978> [Accessed: December 15th 2023].
- Straughan PT, Xu C. Parents' Knowledge, Attitudes, and Practices of Childhood Obesity in Singapore. *Sage Open.* 2022;12(4):215824402211444. doi:10.1177/21582440221144436
- Baidal JAW, Taveras EM. Childhood Obesity. *Arch Pediatr Adolesc Med.* 2012;166(12):1179. doi:10.1001/2013.jamapediatrics.358

## ETHICAL APPROVAL

The study does not present ethical risks and does not require examination and approval by a Research Ethics Committee.



20. Lim SL, Teoh C, Zhao X, et al. Attitudes & beliefs that influence healthy eating behaviours among mothers of young children in Singapore: A cross-sectional study. *Appetite*. 2020;148:104555. doi:10.1016/j.appet.2019.104555
21. O. Onur O, N. Nomikos G, N. Nomikas N, A. Gerda S, A. Paleviciute G. The Role of Nutrition Education in School-age Children in the Prevention of Global Obesity Epidemic. *Am J Public Health Res*. 2021; 9(3):114-119. doi:10.12691/ajphr-9-3-5
22. Brennan L, Klassen K, Weng E, et al. A social marketing perspective of young adults' concepts of eating for health: is it a question of morality? *International Journal of Behavioral Nutrition and Physical Activity*. 2020;17(1):44. doi:10.1186/s12966-020-00946-3
23. Savciuc O, Timotin A. The Integration of behavioural change models in social marketing programs in Public Health. *Marketing – from Information to Decision Journal*. 2019;2(1):30-39. doi:10.2478/midj-2019-0003
24. Tang Q, Lin Q, Yang Q, Sun M, Liu H, Yang L. Knowledge, Attitude, and Practice of Adolescent Parents on Free Sugar and Influencing Factors about Recognition. *Int J Environ Res Public Health*. 2020;17(11):4003. doi:10.3390/ijerph17114003
25. Mumena WA. Maternal Knowledge, Attitude and Practices toward Free Sugar and the Associations with Free Sugar Intake in Children. *Nutrients*. 2021;13(12):4403. doi:10.3390/nu13124403
26. Hoteit M, Yazbeck N, Al-Jawaldeh A, et al. Assessment of the knowledge, attitudes and practices of Lebanese shoppers towards food labeling: The first steps in the Nutri-score roadmap. *F1000Res*. 2022;11:84. doi:10.12688/f1000research.75703.2
27. Malek Mahdavi A, Abdolahi P, Mahdavi R. Knowledge, Attitude and Practice between Medical and Non-Medical Sciences Students about Food Labeling. *Health Promot Perspect*. 2012;2(2):173-179. doi:10.5681/hpp.2012.020
28. Yvette Fautsch Macías PG. *Guidelines for Assessing Nutrition-Related Knowledge, Attitudes and Practices*. Food and Agriculture Organization of the United Nations; 2014. Available at: <https://www.fao.org/3/i3545e/i3545e00.htm> [Accessed: October 15th 2023].
29. Arlinghaus KR, Johnston CA. Engaging Fathers in the Promotion of Healthy Lifestyle Behaviors. *Am J Lifestyle Med*. 2017;11(3):216-219. doi:10.1177/1559827617690724
30. Pederson A, Greaves L, Poole N. Gender-transformative health promotion for women: a framework for action. *Health Promot Int*. 2015;30(1):140-150. doi:10.1093/heapro/dau083
31. Thakur S, Mathur P. Nutrition knowledge and its relation with dietary behaviour in children and adolescents: a systematic review. *Int J Adolesc Med Health*. 2022;34(6):381-392. doi:10.1515/ijamh-2020-0192
32. Jackson J, Smit E, Manore M, John D, Gunter K. The Family-Home Nutrition Environment and Dietary Intake in Rural Children. *Nutrients*. 2015;7(12): 9707-9720. doi:10.3390/nu7125495
33. Fadare O, Amare M, Mavrotas G, Akerele D, Ogunniyi A. Mother's nutrition-related knowledge and child nutrition outcomes: Empirical evidence from Nigeria. *PLoS One*. 2019;14(2):e0212775. doi:10.1371/journal.pone.0212775
34. Xu T, Jones I. An Investigation of Children's Understanding of Food and Nutrition. *Early Child Educ J*. 2016;44(4):289-297. doi:10.1007/s10643-015-0716-3
35. Romanos-Nanclares A, Zazpe I, Santiago S, Marín L, Rico-Campà A, Martín-Calvo N. Influence of Parental Healthy-Eating Attitudes and Nutritional Knowledge on Nutritional Adequacy and Diet Quality among Preschoolers: The SENDO Project. *Nutrients*. 2018;10(12):1875. doi:10.3390/nu10121875
36. Kocaadam-Bozkurt B, Sözlü S, Macit-Çelebi MS. Exploring the understanding of how parenting influences the children's nutritional status, physical activity, and BMI. *Front Nutr*. 2023;9. doi:10.3389/fnut.2022.1096182
37. Vaitkeviciute J, Petrauskiene A. The Associations between Body Mass Index of Seven- and Eight-Year-Old Children, Dietary Behaviour and Nutrition-Related Parenting Practices. *Medicina (B Aires)*. 2019;55(1):24. doi:10.3390/medicina55010024
38. Williams JE, Helsel B, Griffin SF, Liang J. Associations Between Parental BMI and the Family Nutrition and Physical Activity Environment in a Community Sample. *J Community Health*. 2017;42(6): 1233-1239. doi:10.1007/s10900-017-0375-y
39. Lee CY, Ledoux TA, Johnston CA, Ayala GX, O'Connor DP. Association of parental body mass index (BMI) with child's health behaviors and child's BMI depend on child's age. *BMC Obes*. 2019;6(1):11. doi:10.1186/s40608-019-0232-x
40. Nordin R, Said N, Nordin FF, Adnan NF. influence of parental feeding attitude, style and environmental factors on BMI among school children. *Environment-Behaviour Proceedings Journal*. 2018;3(7):19. doi:10.21834/e-bpj.v3i7.1291
41. Larsen JK, Hermans RCJ, Sleddens EFC, Engels RCME, Fisher JO, Kremers SPJ. How parental dietary behavior and food parenting practices affect children's dietary behavior. Interacting sources of influence? *Appetite*. 2015;89:246-257. doi:10.1016/j.appet.2015.02.012

**Date of receipt of the manuscript: 05/02/2024**

**Date of acceptance for publication: 24/03/2024**