



## PARENTAL EDUCATION LEVEL ON THE DEVELOPMENT OF CHILDREN'S ORAL HYGIENE SKILLS

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**Keywords:** tooth brushing, oral hygiene, parents, education.

**Introduction.** Dental caries is a significant public health issue due to its high incidence among the population. While modern scientific research highlights effective treatments for this condition, prevention remains crucial, directly impacting health and quality of life, especially when early preventive habits are instilled. This study aims to explore how parents' educational levels and other factors influence the acquisition, use, and proper application of oral hygiene knowledge among primary school children.

**Material and methods.** The study surveyed 678 parents of primary school children across 9 administrative regions, including both urban and rural areas of the Republic of Moldova. It employed a randomized approach, involving respondents from all social groups.

**Results.** This study found that parental education level is a crucial factor influencing the proper development of oral hygiene skills, which can prevent dental conditions. Higher parental education was positively associated with urban living environment and family income. Additionally, well-educated parents tend to visit dentists more regularly, which also reflects in better oral hygiene practices at home for their children.

**Conclusions.** Children's oral hygiene habits are strongly shaped by socioeconomic factors and the care parents show. Increasing parental education levels, whether in urban or rural settings, plays a pivotal role in fostering correct dental hygiene practices early in life, thereby ensuring long-term oral health habits into adulthood.

**Cuvinte-cheie:** periaj dentar, igiena orală, părinți, educație.

**NIVELUL DE EDUCAȚIE AL PĂRINȚILOR PRIVIND DEZVOLTAREA ABILITĂȚILOR DE IGIENĂ ORALĂ LA COPII**

**Introducere.** Caria dentară este o problemă importantă de sănătate publică din cauza incidenței înalte în rândul populației. În pofida faptului că studiile științifice moderne demonstrează existența tratamentului eficient a acestei maladii, totuși profilaxia rămâne a fi primordială, având un impact direct asupra sănătății și calității vieții, în special dacă abilitățile de prevenire se cultivă încă din copilărie. Scopul studiului constă în determinarea rolului nivelului educațional al părinților și a altor factori care pot influența dobândirea, utilizarea și aplicarea corectă a cunoștințelor în igiena orală a copiilor din învățământul primar.

**Material și metode.** În cadrul studiului, au fost chestionați 678 de părinți ai copiilor din învățământul primar din 9 regiuni administrative – urbane și rurale ale Republicii Moldova. Studiul a fost unul randomizat, care a inclus respondenți din toate grupurile sociale.

**Rezultate.** În acest studiu am stabilit, că nivelul de educație al părinților este un factor esențial care determină dezvoltarea corectă a abilităților de igienă orală, capabile să prevină afecțiunile dentare. Creșterea nivelului de educație al părinților a fost asociată pozitiv cu mediul de trai urban și cu venitul familiei. Părinții cu un nivel ridicat de educație vizitează mai frecvent medicul stomatolog. Nivelul de educație a influențat pozitiv și parametrii legați de igiena orală a copilului la domiciliu.

**Concluzii.** Abilitățile de igienă orală ale copiilor sunt fortificate de factorii socio-economici și de atitudinea, grija pe care părinții le manifestă față de copii. Creșterea nivelului de educație al părinților din orice zonă geografică – urbană sau rurală influențează pozitiv formarea deprinderilor de igienă dentară corectă la copii, fiind astfel garantul sănătății orale la vârsta adultă.

## INTRODUCTION

Pre-pubertal children (6-11 years old) have an increased incidence of dental conditions, including dental caries. At the same time, this period is critical because it lays the foundation for lifelong oral hygiene skills and habits. During this period, children also begin school, where their ability to acquire knowledge can facilitate education and promote proper oral hygiene practices. However, the specialized literature data show that school-based education through traditional readings primarily increases knowledge about oral health, without significantly improving actual oral hygiene habits (1). A series of other factors, such as the socio-economic status of the parents, the family income, the gender of the parent, and the number of parents, can influence the child's oral hygiene skills (2). Currently, various programs aimed at preventing or treating oral diseases in children are being implemented across different countries, though their effectiveness and outcomes often remain controversial.

*The purpose of this study* was aimed to determine how parental education levels and other factors influence children's acquisition, use, and proper application of oral hygiene knowledge in primary school. This study is particularly crucial given Moldova's significant socio-economic decline, which adversely affects the education levels of its population. The findings can help set priorities for medical care planning and the implementation of preventive measures.

## MATERIAL AND METHODS

**Research design.** To ensure data quality, a total of 678 printed questionnaires were randomly distributed across nine different urban and rural administrative regions in the Republic of Moldova. The questionnaires were distributed in primary and secondary schools, targeting parents of primary school children. Additionally, 37 questionnaires were distributed to parents accompanying their children to the Municipal Dental Center for Children in Chisinau during dental visits. The questionnaire contained a series of multiple-choice questions designed to elicit information relevant to the study. 6 questionnaires were excluded from the analysis due to their incorrect completion. Finally, the analyzed cases (672) included the opinions of 310 respondents from rural and 362 from urban regions of Moldova.

The study was carried out between December 2022 and March 2023.

In the "General Information" chapter, parents provided details on various family characteristics, including:

- Gender of the parent and child (1 for female, 2 for male).
- Parents' education level: both higher education; one higher education and one professional background; one upper and one middle school education; both professional backgrounds; one professional background and one other; both middle school education; one middle school education and one incomplete middle school education; both incomplete middle school education (rated from 8 to 1)
- Living environment: rural or urban (1 for rural, 2 for urban).
- Family income: very low, low, medium, high, very high (rated from 1 to 5).
- Child's age: 6-11 years.
- Whether they have ever taken the child to the dentist: yes (1) or no (0).

In the "Guidelines for Your Child's Oral Hygiene at Home" chapter, parents were asked to provide answers to the following questions:

- How often does your child brush the teeth each day? Response options included: I don't know; never; once in the morning; once in the evening; twice; three times or more (from 0 to 4).
- What type of toothbrush does your child use? Options included: manual; electric; sonic (from 1 to 3), with multiple selections allowed.
- How frequently do you replace your child's toothbrush? Options ranged from: when it's worn out; monthly; every 3 months; every 6 months (from 1 to 4).
- What brushing techniques does your child use? Options included: I don't know; horizontal; vertical; circular; mixed (from 1 to 4).
- How long does your child typically brush the teeth? Response choices included: I do not know; up to one minute; up to two minutes; more than two minutes (from 1 to 4).
- Have you ever taught your child how to floss and supervised them doing it? Responses included: never; no, because I didn't see the need; yes, once a week; yes, once a day; another response (from 1 to 5).

- Does your child brush the tongue after brushing the teeth? Options included: I don't know; no; yes (from 1 to 3).
- Do you use mouthwash with your child? Answer options included: I don't know how to use it; we don't use it; yes, daily after brushing their teeth; yes, instead of brushing teeth (from 1 to 5).

When asked about their participation in oral hygiene information sessions conducted by the dentist, either at school or elsewhere, respondents were given the option to choose yes or no. Similarly, they were given the same response options when asked whether children should be informed about oral health at school. The final question related to parents' opinions on whether their child's oral hygiene skills had improved due to attending school (yes/no).

Each of the respondents completed only one questionnaire. The study was a randomized one, which included respondents from all social strata. Incomplete forms were excluded from the analysis.

**Statistical analysis** involved recording and organizing responses from questionnaires using MS Access 2007. WINSTAT software (R. Fitch Software, DE), being focused on determining the frequency and incidence of each response type. Additionally, Spearman's rank correlation coefficient ( $r_s$ ), was used to examine statistical associations, while differences between groups were assessed using the Chi-squared test. Linear regression analysis with 95% confidence interval was applied, with correlation (R) and determination coefficients ( $R^2$ ). Evans' (1996) recommendations were followed to interpret the degree of association: correlations were categorized as very weak (0-0.19), weak (0.20-0.39), moderate (0.40-0.59), strong (0.60-0.79), or very strong (0.80-1.0) (3).

A statistically significant threshold value of  $p \leq 0.05$  was applied across all analyses. Bibliographic references were managed automatically using Zotero 6.0.18 software integrated with Word 2007 and Chrome ([www.zotero.org](http://www.zotero.org)).

## RESULTS

This study revealed that children primarily visit the dentist with mothers (526 or 78.3%) compared to fathers (146 or 21.7%). Girls constituted 353 (52.5%), while boys made up 319 (47.5%) of

the sample. Respondents' educational backgrounds were categorized as follows: higher education only – 130 (19.3%); higher education and professional backgrounds – 76 (11.3%); upper and middle school education levels – 86 (12.8%); professional backgrounds only – 100 (14.9%); professional backgrounds and middle school education – 84 (12.5%); middle school education only – 121 (18%); middle school and incomplete middle education – 40 (6%); incomplete middle school education only – 35 (5.2%). The majority indicated an average income (458 or 68.2%), followed by low-income (137 or 20.4%), very low-income (35 or 5.2%), high-income (26 or 3.9%), and very high-income (16 or 2.4%) families. Most of parents (573/85.3%) reported joint visits with their child to the dentist as part of their medical history.

Of the total number, 384 children (57.1%) reported brushing their teeth twice daily, both in the morning and evening. Following them are children who brush once in the morning (146 children, 21.7%), once in the evening (91 children, 13.5%), never (19 children, 2.8%), and three times or more per day (13 children, 1.9%). However, 19 parents (2.8%) admitted they do not know if their child brushes their teeth.

Manual toothbrushes were the most commonly used (506 children, 75.3%), followed by electric toothbrushes (116 children, 17.3%), sonic toothbrushes (2 children, 0.3%) and a combination of manual and electric toothbrushes (48 children, 7.1%).

About half of the respondents (319 children, 47.5%) reported changing the brush every 3 months, followed by those who change monthly (168 children, 25%), every 6 months (115 children, 17.1%), when the brush is damaged (69 children, 10.3%), or at random intervals (1 child, 0.1%).

While brushing their teeth, 314 parents (46.7%) observed that their child used mixed movements, 132 (19.6%) noticed rotary movements, 58 (8.6%) observed only horizontal movements, 57 (8.5%) noted vertical movements, 16 (2.4%) – combined horizontal and vertical movements, 8 (1.2%) – vertical and rotary movements, 1 (0.1%) – horizontal and rotary movements, and another one (0.1%) noticed rotary and mixed movements. Meanwhile, 85 parents (12.6%) admitted that they do not know how their child brushes their teeth.



Among all respondents, 271 (40.3%) timed their child's brushing at 2 minutes, 187 (27.8%) at 1 minute, 143 (21.3%) more than 2 minutes, and 71 (10.6%) were uncertain.

Half of the parents (342, 50.9%) stated that neither they nor their children use dental floss, followed by 119 (17.7%) who reported using it once a day, 106 (15.8%) who had used it but did not like it, 65 (9.7%) who used it once a week, and 39 (5.8%) who selected another option without specifying. Only one respondent (0.1%) reported using floss as needed.

The number of children who brush their tongues after brushing their teeth (296/44%) was close to those who do not clean their tongues (270/40.2%). About 15.8%, or 106 parents, indicated they do not know if the child brushes the tongue.

Another dental hygiene product, mouthwash, was not used by the vast majority of respondents (412/61.3%), followed by 198/29.5% who use it after brushing, 40/6% instead of brushing, 21/3.1% who do not even know how to use it and one person (0.1%) mentioned sometimes using mouthwash, as needed.

More than half of the parents (427/63.5%) indicated that they did not participate in sessions related to oral hygiene, in contrast to 245/36.5% who answered positively. However, most respondents (640/95.2%) considered it necessary to inform schoolchildren about oral hygiene during their school years. Moreover, 519/77.2% of parents noticed that oral hygiene skills changed after they started attending school. Among them, 500/96.3% rated these changes as significant, scoring them above 5.

The correlation analysis highlighted, in all cases, statistically significant associations between the parents' level of education and the parameters included in the study.

Thus, higher levels of parental education were positively correlated with living in urban areas ( $r_s=0.41$ ,  $p=0.000$ ,  $R=0.41$ ,  $R^2=0.17$ ) and family income ( $r_s=0.35$ ,  $p=0.000$ ,  $R=0.37$ ,  $R^2=0.13$ ). Parents with higher education levels were also more likely to emphasize their children's dental visits ( $r_s=0.29$ ,  $p=0.000$ ,  $R=0.31$ ,  $R^2=0.09$ ). The level of education also positively influenced the parameters related to the child's oral hygiene at home, including frequency of brushing per day ( $r_s=0.24$ ,

$p=0.000$ ,  $R=0.26$ ,  $R^2=0.07$ ), the type of toothbrush used ( $r_s=0.27$ ,  $p=0.000$ ,  $R=0.27$ ,  $R^2=0.07$ ), brush change frequency ( $r_s=0.13$ ,  $p=0.0003$ ,  $R=0.16$ ,  $R^2=0.03$ ). Also, the parents' educational level impacted oral hygiene behaviors such as brushing technique ( $r_s=0.18$ ,  $p=0.000$ ,  $R=0.16$ ,  $R^2=0.03$ ), duration of brushing ( $r_s=0.25$ ,  $p=0.000$ ,  $R=0.26$ ,  $R^2=0.07$ ), and tongue cleaning ( $r_s=0.21$ ,  $p=0.000$ ,  $R=0.21$ ,  $R^2=0.04$ ). Children of parents with higher education were more likely to use dental floss ( $r_s=0.30$ ,  $p=0.000$ ,  $R=0.27$ ,  $R^2=0.07$ ) and mouthwash ( $r_s=0.21$ ,  $p=0.000$ ,  $R=0.21$ ,  $R^2=0.04$ ) on a regular basis.

The studies positively influenced the parents' decision to participate in oral hygiene information sessions ( $r_s=0.21$ ,  $p=0.000$ ,  $R=0.21$ ,  $R^2=0.05$ ). Furthermore, the studies also positively impacted parents' decision to promote oral hygiene information courses within the school curriculum ( $r_s=0.06$ ,  $p=0.05$ ,  $R=0.06$ ,  $R^2=0.00$ ). At the same time, Parents with higher education critically examined the absence of these courses, noting that children's oral hygiene skills did not improve despite attending school ( $r_s=-0.16$ ,  $p=0.000$ ,  $R=0.16$ ,  $R^2=0.02$ ).

When comparing the values depending on the parent's gender, women were more likely than men to accompany children to dental visits and were also more attentive to certain aspects of oral care quality (tab. 1, tab. 2).

Moreover, respondents' place of residence emerged as a significant factor, revealing statistically significant differences in oral care quality (tab. 1, tab. 2).

Other factors, such as living environment, family income, and visiting the dentist with the child, also influenced oral hygiene skills, as demonstrated by varying degrees of statistical correlational associations (tab. 2).

## DISCUSSIONS

Dental caries morbidity is one of the primary indicators in assessing the level of medical care and the population's health status. The World Health Organization recommends the implementation of prevention, detection, and treatment programs to avoid oral diseases (4). Untreated, these conditions can have systemic repercussions. Literature data indicate the influence of several factors on the caries incidence, including geographic locati-

on, dietary habits, water quality, and inadequate oral hygiene practices (5). Moreover, a 2011 study revealed that over half of children and adolescents in the Republic of Moldova seek dental

care only during emergencies or when complications arise (6). This trend worsens with age, as approximately eight out of ten adults in Moldova suffer from tooth decay.

Table 1. Statistical differences between the analyzed parameters based on parental gender and place of residence via the Chi-squared test.

Variables	Parent's gender ( $\chi^2$ )	Place of residence ( $\chi^2$ )
Education level	<b>356.59</b>	<b>607.73</b>
Living environment	44.55	-
Family income	79.89	131.79
Visit with children	<b>321.01</b>	68.02
Frequency of brushing	65.55	72,01
Brush type	75.54	142.64
Brush change frequency	<b>219.06</b>	<b>400.56</b>
Type of brushing	<b>772.79</b>	<b>1054.20</b>
Brushing time	128.47	209.51
Flossing	<b>312.16</b>	<b>708.15</b>
Tongue brushing	103.67	163.78
Mouthwash use	<b>253.75</b>	<b>401.89</b>
Oral hygiene meetings	60.09	85.53
Need for information	5.74	14.58
School -acquired skills	36	79.34

Notes: Statistically significant differences ( $p \leq 0.05$ ) were highlighted with **bold**.

This is the first study on the territory of the Republic of Moldova that considers socioeconomic factors that influence oral hygiene in children.

According to Gurav et al. (2022), school-based oral health education programs based on modern technologies and traditional courses could strategically promote oral health behavior in developed and developing countries (5). Nevertheless, the question remains whether these initiatives alone ensure satisfactory oral hygiene outcomes in children.

Poulton et al. (2002) present data indicating that the severity of tooth decay and periodontal diseases in childhood correlates with socioeconomic status, leading to long-term consequences (7). On the other hand, Castilho et al. (2013) consider that parents play a fundamental role in establishing oral hygiene practices for children, whether through direct teaching or by influencing their attitudes towards dental care (8).

A recent study conducted by Dumitrescu et al. (2022) in Romania showed that children whose

parents have higher education levels are less likely to develop cavities. Consequently, these children are more likely to receive early and effective treatment when needed (9). Thus, parental education level can serve as a valuable predictor for assessing the incidence of dental caries in children. Conversely, there is a correlation suggesting that children from families with lower parental education levels tend to experience more cavities. These data are supported by the results of our study, which suggest that parents' level of education influences children's oral health. Although the statistical associations typically fall within expected ranges, they still meet the conventional statistical thresholds ( $p \leq 0.05$ ). Thus, the present study revealed that children are more likely to adopt regular oral hygiene practices as parental education levels increase; in particular, children from families with parents with higher education practiced brushing their teeth more frequently. At the same time, these children, mostly guided by their parents, opted to use contemporary brushing methods, opting for electric brushes or com

Table 2. Impact of parental gender, education level, and socio-economic factors on oral hygiene – correlations based on Spearman's rank coefficient.

INDICATORS	Cohort	Education level	Living environment	Income	Visit with children	Frequency of brushing	Brush type	Brush change frequency	Type of brushing	Brushing time	Flossing	Tongue brushing
Parental gender	G	-0.01	-0.03	-0.06	-0.09	-0.07	0.01	-0.02	0.04	0.04	0.01	-0.06
	R	-0.01	0	-0.11	-0.09	-0.06	-0.01	-0.07	0.11	0.07	0.05	-0.07
	U	-0.01	0	0	-0.06	-0.07	0.03	0.12	-0.03	0.03	-0.01	-0.06
Education level	G	0.41	0.41	0.35	0.29	0.24	0.27	-0.13	0.18	0.25	0.30	0.21
	R	0	0	0.30	0.26	0.16	0.13	-0.28	0.13	0.23	0.22	0.19
	U	0	0	0.34	0.14	0.20	0.25	0.01	0.12	0.12	0.12	0.06
Living environment	G	0.41	0.16	0.16	0.29	0.20	0.22	-0.05	0.15	0.22	0.37	0.23
	G	0.35	0.16	0.16	0.12	0.17	0.15	-0.06	0.05	0.16	0.23	0.15
	R	0.30	0	0.13	0.13	0.16	0.04	-0.03	0.03	0.08	0.20	0.15
Income	U	0.34	0	0	-0.01	0.11	0.18	-0.06	0.02	0.16	0.17	0.08
	G	0.29	0.29	0.12	0.23	0.23	0.12	-0.22	0.29	0.16	0.22	0.23
	R	0.26	0	0.13	0.24	0.24	0.02	-0.27	0.30	0.09	0.14	0.20
Visit with children	U	0.14	0	-0.01	0.08	0.08	0.12	-0.13	0.21	0.15	0.12	0.12
	G	0.24	0.20	0.17	0.23	0.09	0.09	-0.17	0.21	0.23	0.20	0.25
	R	0.16	0	0.16	0.24	-0.05	-0.05	-0.15	0.23	0.16	0.08	0.21
Frequency of brushing	U	0.20	0	0.11	0.08	0.10	0.10	-0.17	0.14	0.23	0.18	0.21
	G	0.27	0.22	0.15	0.12	0.09	0.08	-0.04	0.08	0.27	0.22	0.16
	R	0.13	0	0.04	0.02	-0.05	0.01	-0.09	0.01	0.26	0.22	0.18
Brush type	U	0.25	0	0.18	0.12	0.10	0.1	0	0.1	0.22	0.12	0.1
	G	-0.13	-0.05	-0.06	-0.22	-0.17	-0.04	-0.28	-0.23	-0.16	-0.07	-0.23
	R	-0.28	0	-0.03	-0.27	-0.15	-0.09	-0.28	-0.28	-0.21	-0.05	-0.29
Brush change frequency	U	0.01	0	-0.06	-0.13	-0.17	0	-0.18	-0.18	-0.1	-0.08	-0.17
	G	0.18	0.15	0.05	0.29	0.21	0.08	-0.23	0.22	0.22	0.18	0.24
	R	0.13	0	0.03	0.30	0.23	0.01	-0.28	0.28	0.28	0.16	0.30
Type of brushing	U	0.12	0	0.02	0.21	0.14	0.09	-0.18	0.12	0.12	0.10	0.15
	G	0.25	0.22	0.16	0.16	0.23	0.27	-0.16	0.22	0.24	0.24	0.29
	R	0.23	0	0.08	0.09	0.16	0.26	-0.21	0.28	0.13	0.26	0.26
Brushing time	U	0.12	0	0.16	0.15	0.23	0.22	-0.10	0.12	0.19	0.19	0.26



	G	0.30	0.37	0.23	0.22	0.20	0.22	0.18	0.24	0.26
<b>Flossing</b>	R	0.20	0	0.20	0.14	0.08	0.22	0.16	0.13	0.17
	U	0.12	0	0.17	0.12	0.18	0.12	0.10	0.19	0.22
<b>Tongue brushing</b>	G	0.21	0.23	0.15	0.23	0.25	0.16	0.24	0.29	0.26
	R	0.19	0	0.15	0.20	0.21	0.18	0.30	0.26	0.17
	U	0.06	0	0.08	0.12	0.21	0.10	0.15	0.26	0.22

Notes: results ( $r_s$ ) selected with **Bold** registered  $p \leq 0.05$ ,

G – general cohort,

R – rural,

U – urban.

binning them with manual ones. Parental education also positively impacts the frequency of toothbrush replacement, which contributes to better brushing quality through various brushing techniques and increased time spent on oral care. Furthermore, children from these families prove awareness on the importance of tongue brushing.

Parental education also influences the higher prevalence of children who, in addition to brushing, also use other hygiene practices. Thus, dental floss and mouthwash have become essential tools for children whose parents are well-educated. According to Chen et al. (2020), this phenomenon can be explained by educated parents possessing greater knowledge in the field of oral health, and who have more demands on the quality of the dental service, as well as learn and check their children's oral hygiene skills more rigorously (2).

Moreover, highly educated parents not only understand the benefits of preventive methods but also have an analytical thinking, reflected in thoughtful decisions regarding healthcare facilities (location, distance), the components used, and their characteristics, paying less attention to children's complaints.

Among the socioeconomic factors influencing oral hygiene, Tas et al. (2017) identified parents' educational level as the most significant, surpassing family income and occupational status (10). A higher level of maternal education was positively correlated with a lower incidence of minor caries. At the same time, lower levels of paternal education, family income, and occupational status (employed/unemployed) were associated with more severe cases of dental caries. Walker et al. (2017) studied 130 respondents and found that mothers, compared to fathers, are generally more attentive to their children's diet and hygiene practices, including the frequency and quality of brushing (11). Branden et al. (2013) also found that children of more educated mothers consumed fewer sugary drinks, brushed their teeth more frequently, and visited the dentist regularly for preventive care, resulting in a lower incidence of dental caries (12). To examine potential differences in the education process based on the gender of the parent, the study found that mothers more frequently visited the dentist with their children. Additionally, mothers were more attentive to the frequency of changing toothbrushes, the brushing techniques used, flossing habits, and the use of mouthwash (tab. 1).

Clinical Significance. The study results highlight several concerning issues, including existing social inequalities in dental pathologies, emphasizing the need for preventive strategies. The findings revealed an uneven distribution of oral health habits across different social strata, which can be used towards the development of targeted national strategies.

The study has several limitations. According to Gurav et al. (2022), prophylactic interventions such as classes, games, and animations have proven effective in improving oral hygiene

and reducing caries. However, these interventions did not reduce plaque formation and gingival inflammation compared to the group having regular dental checkups.

Therefore, the results do not refer to the number of dental visits per year or the reasons for attending the dentist. Additionally, no data were collected on the severity of the injuries or the thera-

peutic or prophylactic procedures performed. Another limitation was related to the degree of correlation, which, although mostly statistically significant within the 95% range, showed a very weak association. However, the arguments were supported by the regression results. Although various factors contribute to children's oral hygiene, the educational level of parents should be regarded as fundamental.

## CONCLUSIONS

1. Children's oral hygiene skills are improved by socio-economic factors as well as the attitude and care parents show towards them.
2. Raising the parental education level, whether from urban or rural areas, positively influences the development of proper hygiene habits in children, thus ensuring oral health in adulthood. Educated parents positively influence various aspects of a child's oral hygiene at home, including the number of brushings per day, the type of toothbrush used, the frequency of replacing brushes, brushing techniques, tongue cleaning, and the use of dental floss and mouthwash. Additionally, higher education levels lead parents to visit the dentist more often, thus supporting the promotion of oral hygiene courses in school curriculum.
3. Prioritizing effective oral health literacy programs is essential for both the educational community and society as a whole.

## CONFLICT OF INTERESTS

The authors declare no conflict of interest regarding this article.

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There is no information.

## ETHICAL APPROVAL

The design of study was discussed and approved in the Scientific Forum Report no.10 of 25.05.2023, according to the master's higher studies program, cycle II in Public Health Management, within the School of Public Health, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova.

## REFERENCES

1. Angelopoulou MV, Kavvadia K, Taoufik K, Oulis CJ. Comparative clinical study testing the effectiveness of school based oral health education using experiential learning or traditional lecturing in 10 year-old children. *BMC Oral Health*. 2015;15:51. doi:10.1186/s12903-015-0036-4
2. Chen L, Hong J, Xiong D, et al. Are parents' education levels associated with either their oral health knowledge or their children's oral health behaviors? A survey of 8446 families in Wuhan. *BMC Oral Health*. 2020;20:203. doi:10.1186/s12903-020-01186-4
3. Evans JD. *Straightforward Statistics for the Behavioral Sciences*. Thomson Brooks/Cole Publishing Co; 1996:xxii, 600. Available at: <https://search.worldcat.org/title/32465263> [Accessed 16.05.2024].
4. Decay WEC on EI for OHPC or, Organization WH. *Educational Imperatives for Oral Health Personnel: Change or Decay?, Report of a WHO Expert Committee [Meeting Held in Geneva from 7-13 November 1989]*. World Health Organization; 1990. Accessed October 3, 2023. Available at: <https://iris.who.int/handle/10665/39281> [Accessed 10.04.2024].
5. Gurav KM, Shetty V, Vinay V, Bhor K, Jain C, Divekar P. Effectiveness of Oral Health Educational Methods among School Children Aged 5–16 Years in Improving their Oral Health Status: A Meta-analysis. *Int J Clin Pediatr Dent*. 2022;15(3):338. doi:10.5005/jp-journals-10005-2395
6. Lupan I, Spinei A, Spinei I. Morbiditatea prin carie dentară și starea igienei orale la copii in Republica Moldova [Dental caries morbidity and the state of oral hygiene in children in the Republic of Moldova]. *Med Stomatol*. 2011;3(20): 48-53. Available at: [https://ibn.idsi.md/sites/default/files/imag\\_file/48-53\\_40.pdf](https://ibn.idsi.md/sites/default/files/imag_file/48-53_40.pdf) [Accessed 16.05.2024].
7. Poulton R, Caspi A, Milne BJ, et al. Association between children's experience of socioeconomic disadvantage and adult health: a life-course





- study. *The Lancet*. 2002;360(9346):1640-1645. doi:10.1016/S0140-6736(02)11602-3
8. Castilho ARF de, Mialhe FL, Barbosa T de S, Puppin-Rontani RM. Influence of family environment on children's oral health: a systematic review. *J Pediatr (Rio J)*. 2013;89(2):116-123. doi:10.1016/j.jpmed.2013.03.014
  9. Dumitrescu R, Sava-Rosianu R, Jumanca D, et al. Dental Caries, Oral Health Behavior, and Living Conditions in 6–8-Year-Old Romanian School Children. *Children*. 2022;9(6):903. doi:10.3390/children9060903
  10. Van der Tas JT, Kragt L, Elfrink MEC, et al. Social inequalities and dental caries in six-year-old children from the Netherlands. *J Dent*. 2017;62:18-24. doi:10.1016/j.jdent.2017.04.008
  11. Walker KK, Martínez-Mier EA, Soto-Rojas AE, et al. Midwestern Latino caregivers' knowledge, attitudes and sense making of the oral health etiology, prevention and barriers that inhibit their children's oral health: a CBPR approach. *BMC Oral Health*. 2017;17(1):61. doi:10.1186/s12903-017-0354-9
  12. Van den Branden S, Van den Broucke S, Leroy R, Declerck D, Hoppenbrouwers K. Oral health and oral health-related behaviour in preschool children: evidence for a social gradient. *Eur J Pediatr*. 2013;172(2):231-237. doi:10.1007/s00431-012-1874-6

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