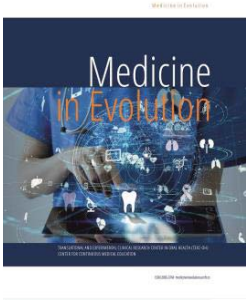
Oral health: Knowledge and practices among high school students



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Abstract

Oral health is a crucial aspect of general well-being, affecting essential bodily functions and psychosocial factors. Aim and objectives: This study aimed to assess and compare the oral health knowledge and practices of high school students in Târgu Mureș. Materials and Methods: This cross-sectional survey involved 592 high school students. The study used a 43-question online questionnaire covering socio-demographic data, oral health knowledge, hygiene habits, and dental service use. Results: The study found a good level of oral health knowledge among students. However, gaps were identified in specific areas like the role of fluoride, alcohol-related risks, and emergency dental procedures. Financial status and gender influenced knowledge and attitudes, with higher financial status and female students showing better awareness. Conclusions: High school students demonstrated good oral health knowledge, but there is a need for targeted education to fill knowledge and practice gaps.

Keywords: oral health, knowledge, practice, students

INTRODUCTION

Oral health represents an essential component of general health and well-being [1, 2]. It involves the health status of all oral cavity structures, enabling individuals to perform essential functions such as eating, breathing, and speaking. It also encompasses psychosocial dimensions such as self-confidence, well-being, and the ability to socialize and work without pain or discomfort. Oral diseases include a wide range of conditions, such as dental caries, periodontal disease, oral cancer, and orodental trauma. These diseases are among the most common non-communicable diseases worldwide, affecting approximately 3.5 billion people [3, 4].

Oral cavity diseases disproportionately affect the most vulnerable and disadvantaged populations. People with low socioeconomic status and education levels bear a higher burden of oral diseases, and this association persists throughout life, from early childhood to old age [4]. Recognized factors involved in the development of these diseases include oral hygiene, diet, smoking, and alcohol consumption. Poor oral hygiene and inadequate diet are closely related to the occurrence of caries, periodontal disease, and cancer, while smoking and alcohol consumption are associated with oral cancer, periodontal disease, halitosis, taste alteration, and xerostomia [5-8].

Adolescents are at increased risk of developing oral diseases due to the establishment of dental health habits during this period, poor motivation, and a tendency to consume large quantities of snacks, carbonated drinks, as well as alcohol and tobacco [9-12]. Given the known risk factors, the prevention of these conditions must be achieved through adequate education, providing young people with the opportunity to better understand how their bodies function and to adopt healthy and responsible habits that they will follow throughout their lives [13, 14].

Aim and objectives

The objective of this study was to analyze and compare the oral health practices and knowledge of high school students in Târgu Mureş.

MATERIAL AND METHODS

The study was conducted following all ethical principles, including the Helsinki Declaration of the World Medical Association, and was approved by the Ethics Committee of a private medical center, Denta Aur, from Tg. Mures. It was carried out as a cross-sectional survey using a questionnaire, from February to March 2024. The respondents were students from grades 9-12, both science and humanities tracks, from several high schools in Târgu-Mureş.

The questionnaire used had four sections and included 43 questions [15, 16]. The first section contained socio-demographic data of the students, the second section included 15 closed-ended questions related to their knowledge about oral health, the third section consisted of 11 questions about personal oral hygiene habits, and the fourth section comprised 3 questions related to the use of dental services and 6 questions for self-assessment of oral health. The questionnaire was administered as an online survey (conducted via Google Forms), and the link was sent to the representatives of each class to be distributed to each participant. The objectives of the study were communicated and explained to all participants at the beginning of the questionnaire. Participation was entirely voluntary and anonymous. Students who did not return or did not completely fill out the questionnaire were excluded

from the study. Thus, out of the 731 questionnaires sent, 592 were returned and fully completed.

The minimum required sample size was determined to be 517 using G-power software™, Heinrich Heine University, Dusseldorf, Germany, for Windows, for a power of 95% ($\alpha = 0.05$, $\beta = 0.05$). Statistical analysis was performed using statistical software: SPSS IBM V.23 for Windows and Microsoft Excel. The Chi-square/Fisher test was used for categorical variables to determine associations or comparisons. The significance threshold was set at 0.05, and p was considered significant when $p \leq 0.05$.

RESULTS

The total sample comprised 592 students. The demographic characteristics of the participants are summarized in table number 1.

Table 1. Demographic Characteristics

Characteristic	Category	Absolute Frequency	Relative Frequency
Gender	Female	348	58.8%
	Male	244	41.2%
Age	14-15 years	72	12.2%
	16-17 years	312	52.7%
	18-19 years	208	35.1%
Field of Study	Humanities	300	50.7%
	Mathematics and Computer Science	200	33.8%
	Natural Sciences	92	15.5%
Family Members Employed in Health Sector	Yes	188	68.2%
	No	404	31.8%
Financial Status	Low	12	2.1%
	Medium	412	70.5%
	High	160	27.4%

The assessment of adolescents' knowledge related to oral health are presented in table number 2.

Table 2. Knowledge Related to Oral Health

Knowledge Area	Key Insight	Percentage
Impact on General Health	Recognize that oral health affects overall health	93.9%
Systemic Conditions Manifested in Oral Cavity	Aware that certain systemic diseases can appear in the oral cavity	83.8%
Link between Oral Health and Quality of Life	Understand that oral health is closely linked to quality of life	84.5%
Importance of Oral Hygiene	Know that poor oral hygiene can lead to dental caries and periodontal diseases	90.5%
Role of Diet	Aware that diet affects the development of dental caries, periodontal diseases, and oral cancer	85.8%
Association of Smoking and Alcohol Consumption	Know that smoking is associated with oral cancer and periodontal diseases	85.8%
	Recognize that excessive alcohol consumption increases the risk of oral cancer	34%
Importance of Fluoride	Aware that fluoride plays a protective role in preventing dental caries	49.3%
	Uncertain about the protective role of fluoride	45.3%

The assessment of adolescents' oral hygiene habits is presented in table number 3.

Table 3. Oral Hygiene Habits

Oral Hygiene Practice	Key Insight	Percentage
Frequency of Toothbrushing	Brush teeth twice a day	63.5%
	Brush teeth more than twice a day	12.2%
	Brush teeth at least once a day	100%
Use of Fluoride Toothpaste	Use fluoride toothpaste at every brushing	38.1%
	Do not know if their toothpaste contains fluoride	44.9%
Duration of Brushing	Brush teeth for 2-3 minutes	80.4%
Type of Toothbrush	Use medium-bristled toothbrushes	51.4%
	Use soft-bristled toothbrushes	24.3%
	Use hard-bristled toothbrushes	5.4%
Type of Brushing	Use manual toothbrushes	64.9%
	Use electric toothbrushes	35.1%
Frequency of Changing Toothbrush	Change toothbrush every 3 months	55.4%
Use of Dental Floss	Never use dental floss	32%
	Rarely use dental floss	39.5%
Use of Interdental Brushes	Never use interdental brushes	56.8%
	Rarely use interdental brushes	26%
Use of Mouthwash	Rarely use mouthwash	34%
	Use mouthwash once a day	21.8%
Cleaning the Tongue	Clean tongue once a day	44.9%
	Clean tongue multiple times a day	24.5%

The use of dental services and self-assessments of oral health is presented in table number 4.

Table 4. Use of Dental Services and Self-Assessment of Oral Health

Dental Service Use and Self-Assessment	Key Insight	Percentage
Frequency of Dental Visits	Visit dentist only when a dental problem arises	44.2%
	Visit dentist every 6 months	34.7%
	Visit dentist once a year	11.6%
Reason for Last Dental Visit	Periodic check-up	49%
	Dental issues (aesthetic concerns, pain, inflammation, etc.)	31.3%
	Continuing prescribed treatment	16.3%
Last Dental Visit	In the last 6 months	59.9%
	6-12 months ago	18.4%
Number of Dental Restorations	Have had 1-3 dental restorations	53.1%
	Have had more than 3 dental restorations	29.9%
Number of Permanent Teeth Extractions	Have not had any permanent teeth extracted	67.1%
	Have had 1-3 permanent teeth extracted	26.7%
	Have had more than 3 permanent teeth extracted	6.2%
Endodontic Treatment (Root Canal)	Have not had any teeth undergo endodontic treatment	79.6%
	Have had 1-3 teeth undergo endodontic treatment	18.4%
	Have had more than 3 teeth undergo endodontic treatment	2%
Gum Problems	Have experienced bleeding gums	77.6%
Bad Breath (Halitosis)	Have experienced halitosis	63.9%
Tooth Sensitivity	Have experienced tooth sensitivity	86.4%

The analytical-inferential statistical analysis reveals the following differences with significant statistical implications.

Knowledge about the role of fluoride: there is a statistically significant difference in students' knowledge about the role of fluoride in preventing dental caries based on their financial status ($p=0.001$). Students with a higher financial status correctly answered in a

significantly higher percentage (47.6%) compared to those with a lower financial status (33.3%).

Financial status and dental visits: financial status also significantly influences the number of students who have never visited a dental office. No students with a high financial status reported this (0%), compared to 33% of students with a low financial status who have never had a dental visit (p=0.001).

Gender differences in knowledge: gender has a statistically significant impact on students' knowledge regarding the importance of using fluoride in caries prevention (p=0.003) and the importance of oral hygiene and the health of temporary teeth (p=0.009). A higher percentage of girls are aware of the importance of fluoride in preventing dental caries (51%) and the importance of hygiene and the health of temporary teeth (87.2%) compared to boys (46.8% and 66.1%, respectively).

Age differences in knowledge: age has a statistically significant influence on students' knowledge regarding the link between alcohol consumption and the development of oral cancer (p=0.035). Students aged 18-19 correctly identified this relationship at a rate of 31-44%, while only 17% of students aged 14-15 did so.

DISCUSSIONS

For many years, studies on knowledge, attitudes, and practices in public health have been conducted internationally. While numerous studies have focused on children's oral health knowledge and preventive practices, there are relatively few studies available that examine these aspects among adolescents [17-19]. Today, we recognize that adolescence is a pivotal transition period during which risky behaviors emerge, and adolescent optimism is linked to positive health outcomes [20]. Enhanced knowledge of oral health is often correlated with greater awareness and improved oral hygiene practices [21].

Our study highlights several important findings about high school students' understanding of oral health, which align with results reported in previous research [22-24]. Overall, there is a good general awareness of many aspects of oral health. However, some areas were identified where targeted educational interventions could significantly improve knowledge, particularly regarding the role of fluoride [25], the risks associated with alcohol consumption, and emergency dental procedures.

Analyzing data on oral hygiene habits, we find that similar results have been reported by other recent studies [24, 26]. Students claimed to brush their teeth twice a day and change their toothbrush once every three months, as recommended. However, there are notable gaps in their knowledge about the use of fluoride toothpaste, toothbrush bristle hardness, movements, and the time required for proper brushing with a manual toothbrush, which is predominantly used. Most students use a medium-hard toothbrush, although the literature recommends using a soft-bristled toothbrush to avoid trauma to both soft and hard dental structures. Additionally, students primarily use combined movements, which are contraindicated, as the literature has long recognized the superiority of the Bass sulcular brushing technique [27, 28]. Similar to other studies, the use of complementary hygiene means is inconsistently reported and by a small number of adolescents [29].

Data collected in the last part of the questionnaire (use of dental services and self-assessment) highlight the need to raise awareness about the importance of regular dental check-ups. Most students (44.2%) schedule dental visits only when a problem arises, while only 34.7% have regular check-ups every six months. Additionally, these data indicate a high prevalence of oral health issues: gingival bleeding (77.6%), dental sensitivity (86.4%), and halitosis (63.9%), underscoring the need for educational and preventive measures. The

necessity of implementing these measures is supported by the results of other studies in our country [16, 24].

The influence of financial status on students' knowledge and attitudes observed in this study is supported by other research, which highlights the well-known association between higher financial status and better oral health knowledge and habits [22]. Additionally, the statistically significant differences between females and males can be explained by the greater concern that women generally have for their overall and oral health [15].

CONCLUSIONS

Overall, the results indicated that high school students possess a good level of oral health knowledge, but also emphasized the need for targeted oral health education to address knowledge gaps, promote consistent oral hygiene practices, and encourage regular dental visits, ultimately improving their overall well-being.

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