

ORAL HEALTH BEHAVIORS, AWARENESS, AND KNOWLEDGE AMONG UNDERGRADUATE STUDENTS AT THE FACULTY OF MEDICINE IN BOSNIA AND HERZEGOVINA - A CROSS-SECTIONAL STUDY

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ORALNO-ZDRAVSTVENE NAVIKE, SVIJEST I ZNANJE O ORALNOM ZDRAVLJU MEĐU STUDENTIMA NA MEDICINSKOM FAKULTETU U BOSNI I HERCEGOVINI – STUDIJA PRESJEKA

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ABSTRACT

Objective. The aim of this study was to assess oral hygiene habits, as well as awareness and knowledge among undergraduate students at a Faculty of Medicine in Bosnia and Herzegovina.

Methods. This cross-sectional study was conducted at the Faculty of Medicine in Foča and included 333 students across three study programs: Medicine (M), Nursing (N), and Special Education and Rehabilitation (SER). The questionnaire was used to obtain demographic information, as well as data on oral hygiene habits and knowledge of oral health.

Results. The largest proportion of students (56.2%) brush their teeth twice daily. A higher percentage of N and SER students brush their teeth longer than M students ($p=0.004$). Students most often replace their toothbrushes every 3 months or sooner (76.3%); 58.9% regularly visit a dentist; and 61% report no oral health problems. Only 14.4% of students believe that dental plaque dysbiosis is the cause of caries, while more than half of the students (53.5%) do not know the impact of dental plaque. Additionally, more than one-third of students (35.7%) are unaware of preventive measures for oral disease. A greater number of M and N students than SER students reported that oral health is related to cardiovascular disease ($p=0.002$), and more M students reported that it is related to cancer compared to SER students ($p=0.032$).

Conclusion. The results of this study indicate limited knowledge of oral health among students across all three study programs, underscoring the need to improve oral health education for health sciences students.

Key words: oral hygiene; oral health; dental plaque.

INTRODUCTION

Oral health is a vital component of overall health and an important determinant of the quality of life. Dental caries and periodontitis are the most prevalent oral diseases worldwide. Although largely preventable, these diseases continue to have high global prevalence. If left untreated, both conditions may lead to tooth loss, impaired stomatognathic function, nutritional imbalance, reduced self-esteem, diminished quality of life, and adverse effects on systemic health (1).

SAŽETAK

Uvod. Cilj ove studije bio je da se procjene oralno-higijenske navike, kao i svijest i znanje o oralnom zdravlju među studentima osnovnih studija na Medicinskom fakultetu u Bosni i Hercegovini.

Metode. Ova studija presjeka sprovedena je na Medicinskom fakultetu Foča i uključivala je 333 studenta sa tri studijska programa: medicine (M), zdravstvene njege (ZN) i specijalne edukacije i rehabilitacije (SER). Za prikupljanje demografskih karakteristika, kao i podataka o oralno-higijenskim navikama i znanja o oralnom zdravlju korišten je upitnik.

Rezultati. Najveći procenat studenata (56,2%) pere zube dva puta dnevno. Veći procenat ZN i SER studenata pere zube duže nego M studenti ($p = 0,004$). Studenti najčešće menjaju četkice za zube svaka tri meseca ili ranije (76,3%); 58,9% redovno posećuje stomatologa, a 61% ne navodi probleme sa oralnim zdravljem. Samo 14,4% studenata veruje da je disbioza zubnog plaka uzrok karijesa, dok više od polovine studenata (53,5%) ne zna kakav je uticaj zubnog plaka. Osim toga, više od jedne trećine studenata (35,7%) nije upoznato s preventivnim mjerama za oralne bolesti. Veći broj M i ZN nego SER studenata izjavio je da je oralno zdravlje povezano sa kardiovaskularnim bolestima ($p = 0,002$), a više M studenata je izjavilo da je povezano sa karcinomom u poređenju sa SER studentima ($p = 0,032$).

Zaključak. Rezultati ove studije pokazali su ograničeno znanje o oralnom zdravlju studenata sa sva tri studijska programa, što upućuje da treba raditi na unaprijeđenju oralno-zdravstvene edukacije studenata zdravstvenih nauka.

Gljučne riječi: oralna higijena; oralno zdravlje; dentalni plak.

Although dental biofilm is the primary etiological factor in the development of these diseases, these conditions are complex, chronic conditions that share numerous risk factors while differing in pathophysiology and individual susceptibility, which is influenced by both hereditary and acquired factors. The identification of these risk factors is essential for effective prevention strategies. Oral diseases, particularly periodontitis, have significant systemic health consequences. Conversely, many systemic diseases manifest in the oral cavity, highlighting the need for interprofessional collaboration (2).

Oral health has long been isolated and neglected in healthcare systems and public health policies. However, according to the 2021 World Health Assembly resolution, oral health should not be considered separately from general health and should be integrated into primary healthcare (3). Oral health is multidimensional, encompassing the physical, psychological, emotional, and social domains integral to overall health and well-being (4). Like most noncommunicable diseases, oral diseases are chronic conditions that are strongly socially determined. The prevalence of early childhood caries is estimated to be approximately 48% in the general population (5). Furthermore, reports indicate that the prevalence of untreated dental caries in both permanent and primary dentitions increased substantially between 1990 and 2021, and the total number of caries cases is projected to reach 2.26 billion by 2050. The presence of systemic conditions, including cardiovascular disease, diabetes mellitus, intestinal infections, oral cancer, and nutritional deficiencies, is significantly associated with the incidence, prevalence, and annual rates of dental caries (6). Regarding the global prevalence of periodontitis, the most recent data indicate approximately 62%, with a particularly concerning increase in severe forms, estimated at 23.6% (7). Periodontitis is a low-grade chronic inflammatory condition that contributes to the development and progression of systemic chronic diseases (8). Specifically, the results of numerous studies have demonstrated associations between periodontitis and diabetes mellitus, cardiovascular diseases, adverse pregnancy outcomes, respiratory diseases, Alzheimer's disease, autoimmune diseases, and other systemic conditions (9-11).

Given the high prevalence of oral diseases, strengthening preventive strategies is imperative. Studies in the general population have shown a clear association between knowledge and behavior, underscoring the need for ongoing education to maintain good oral health habits (12). Assessing the level of knowledge among future clinicians is particularly important, as it is crucial for developing effective preventive and educational strategies.

A study conducted among students at the Kabul University of Medical Sciences also demonstrated inadequate awareness and knowledge of oral health (13). Nevertheless, medical students are expected to possess adequate oral health awareness and contribute to the promotion of public oral health (14). Therefore, this study aimed to assess oral hygiene habits, as well as awareness and knowledge among undergraduate students at a Faculty of Medicine in Bosnia and Herzegovina.

SUBJECTS AND METHODS

This cross-sectional study was conducted using a questionnaire at the Faculty of Medicine Foca, University

of East Sarajevo, from May to July 2025. Students from three study programs - Medicine (M) (from 1st to 6th year), Nursing (N) (from 1st to 4th year), and Special Education and Rehabilitation (SER) (from 1st to 4th year), at the Faculty of Medicine Foca were invited to participate in the study.

Before participation, the study's purpose and objectives were thoroughly explained to all respondents, and written informed consent was obtained. The study protocol was approved by the Ethics Committee of the Faculty of Medicine Foca (decision no. 01-2-19/2025) and conducted in accordance with the Declaration of Helsinki. The questionnaire used to obtain demographic information, as well as data on oral hygiene habits and knowledge of oral health, was an adapted version of the instrument developed by Yao et al. (14).

Data were analyzed using SPSS 20.0 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp, USA). ANOVA with LSD post-hoc and chi-square test with post hoc Z-test with Bonferroni correction were used to determine the significance of differences between groups. Statistical significance was set at $p < 0.05$ in all analyses.

RESULTS

A total of 333 students from three study programs participated in the research: 214 M students, 53 N students, and 66 SER students (Figure 1). The mean age was 21.71 ± 1.77 years, and the majority of participants were female (78.7%) (Table 1).

Table 2 present oral hygiene habits of the students. Overall, the more than half of the students (56.2%) brushed their teeth twice daily ($p = 0.687$). The majority of the students (88.6%) reported brushing their teeth for two minutes or more. Intergroup comparisons revealed that a significantly higher proportion of N and SER students brushed their teeth for three minutes or longer compared with M students ($p = 0.004$). Most students reported changing their toothbrushes every three months or less and brushing teeth with no specific technique (76.3% $p = 0.557$; 60.7%, $p = 0.366$, respectively). Among the additional oral hygiene methods, dental floss was the most commonly used by students across all three study programs (63.7%).

Regarding dental visits, 58.9% of the students reported attending regular dental check-ups, while more than one-third of students (37.2%) visited a dentist only after experiencing an oral disease ($p = 0.436$) (Table 3).

Table 4 presents the assessment of students' awareness and knowledge of oral health. Intergroup comparisons revealed that a significantly higher proportion of M students believed that fluoride-free toothpaste causes dental caries compared with SER students ($p = 0.004$), while SER students, in comparison to M students, reported

Table 1. Demographic characteristics of students.

Variable	M (n=214)	N (n=53)	SER (n=66)	Total (n=333)	p
Age (mean \pm SD)	21.70 \pm 1.90	21.87 \pm 1.42	21.64 \pm 1.59	21.71 \pm 1.77	0.765
Gender (%)					
Male	60 (28.0%)	7 (13.2%)	4 (6.1%)	71 (21.3%)	0.064
Female	154 (72.0%)	46 (86.8%)	62 (93.9%)	262 (78.7%)	

M-Medicine students; N-Nursing students; SER- Special education and rehabilitation students

Table 2. Oral hygiene habits of students.

Oral health behaviour	M (n=214)	N (n=53)	SER (n=66)	Total (n=333)	p
Frequency of daily tooth brushing					
One time or less	3 (1.4%)	0 (0.0%)	1 (1.5%)	4 (1.2%)	0.687
Two times daily	125 (58.4%)	27 (50.9%)	35 (53.0%)	187 (56.2%)	
Three times or more	86 (40.2%)	26 (49.1%)	30 (45.5%)	142 (42.6%)	
Duration of tooth brushing					
One minute or less	33 (15.4%)	2 (3.8%)	3 (4.5%)	38 (11.4%)	0.004
Two minutes	113 (52.8%)	24 (45.3%)	31 (47.0%)	168 (50.5%)	
Three minutes or more	68 (31.8%) ^a	27 (50.9%) ^b	32 (48.5%) ^b	127 (38.1%)	
Frequency of replacing the toothbrush					
Every three months or less	160 (74.8%)	43 (81.1%)	51 (77.3%)	254 (76.3%)	0.557
About six months	46 (21.5%)	10 (18.9%)	14 (21.2%)	70 (21.0%)	
Only when it becomes unusable	8 (3.7)	0 (0.0%)	1 (1.5%)	9 (2.7%)	
Method of tooth brushing					
Horizontal scrub	11 (5.1%)	3 (5.7%)	5 (7.6%)	19 (5.7%)	0.366
Vertical scrub	8 (3.7%)	1(1.9%)	6 (9.1%)	15 (4.5%)	
Bass technique	30 (14.0%)	8 (15.1%)	9 (13.6%)	47 (14.1%)	
Gottlieb-Orban-Kürer technique	32 (15.0%)	12 (22.6%)	6 (9.1%)	50 (15.0)	
Inconsistent	133 (62.1%)	29 (54.7%)	40 (60.6%)	202 (60.7%)	
Oral hygiene methods besides tooth brushing					
Dental floss	131 (61.2%)	39 (73.6%)	42 (63.6%)	212 (63.7%)	0.245
Interdental brush	53 (24.8%)	9 (17.0%)	16 (24.2%)	78 (23.4%)	0.480
Mouthwash	77 (36%)	26 (49.1%)	23 (34.8%)	126 (37.8%)	0.183
Sugar-free chewing gum	25 (11.7%)	9 (17%)	5 (7.6%)	39 (11.7%)	0.284
None	23 (10.7%)	4 (7.5%)	4 (6.1%)	31 (9.3%)	0.462

M-Medicine students; N-Nursing students; SER- Special education and rehabilitation students

Different letters represent a statistically significant difference.

Table 3. Visits to the dentist.

Category	M (n=214)	N (n=53)	SER (n=66)	Total (n=333)	p
Regularly	118 (55.1%)	35 (66.0%)	43 (65.2%)	196 (58.9%)	0.436
Only when experiencing an oral disease	87 (40,7%)	16 (30.2%)	21 (31.8%)	124 (37.2%)	
When the oral disease persists for a long time and does not resolve	4 (1.9%)	0 (0.0%)	0 (0.0%)	4 (1.2%)	
When an oral disease significantly affects my quality of life	5 (2.3%)	2 (3.8%)	2 (3.0%)	9 (2.7%)	

M-Medicine students; N-Nursing students; SER- Special education and rehabilitation students.

Table 4. Oral health knowledge.

Question	M (n=214)	N (n=53)	SER (n=66)	Total (n=333)	p
Causes of dental caries					
Toothpaste without fluoride	25 (11.7%) ^a	2 (3.8%) ^{a,b}	0 (0.0%) ^b	27 (8.1%)	0.004
Frequent ingestion of sugar	142 (66.4%)	36 (67.9%)	34 (51.5%)	212 (63.7%)	0.071
Dysbiosis of oral microflora	38 (17.8%)	4 (7.5)	6 (9.1%)	48 (14.4%)	0.065
Inadequate tooth brushing	125 (58.4%)	31 (58.5%)	28 (42.4%)	184 (55.3%)	0.065
Don't know	23 (10.7%) ^a	10 (18.9%) ^{a,b}	15 (22.7%) ^b	48 (14.4%)	0.032
Causes of bleeding during tooth brushing					
Natural physiological phenomenon	14 (6.5%)	2 (3.8%)	5 (7.6%)	21 (6.3%)	0.679
Periodontitis	121 (56.5%)	26 (49.1%)	30 (45.5%)	177 (53.2%)	0.233
Brushing too hard	158 (73.8%) ^a	41 (77.4%) ^a	36 (54.5%) ^b	235 (70.6%)	0.005
Systemic disease	32 (15.0%)	10 (18.9%)	4 (6.1%)	46 (13.8%)	0.095
Don't know	17 (7.9%)	3 (5.7%)	10 (15.2%)	30 (9.0%)	0.131
Influence of dental plaque					
Affecting appearance	30 (14.0%)	6 (11.3)	4 (6.1)	40 (12.0%)	0.218
Inducing dental caries	69 (32.2%) ^a	17 (32.1%) ^{a,b}	11 (16.7%) ^b	97 (29.1%)	0.045
Inducing periodontitis	54 (25.2%)	6 (11.3%)	8 (12.1%)	68 (20.4%)	0.014
No big deal	1 (0.5)	1 (1.9%)	2 (3.0%)	4 (1.2%)	0.219
Don't know	103 (48.1%) ^a	29 (54.7%) ^{a,b}	46 (69.7%) ^b	178 (53.5%)	0.009
Measures that prevent oral diseases					
Application of fluoride	53 (24.8%) ^a	15 (28.3%) ^a	6 (9.1%) ^b	74 (22.2%)	0.014
Pit and fissure sealing	41 (19.2%)	16 (30.2%)	10 (15.2%)	67 (20.1%)	0.106
Tooth scaling	122 (57.0%) ^a	24 (45.3%) ^{a,b}	19 (28.8%) ^b	165 (49.5%)	<0.001
Don't know	63 (29.4%) ^a	21 (39.6%) ^{a,b}	35 (53.0%) ^a	119 (35.7%)	0.002
Systemic diseases that may be related to oral diseases					
Heart disease	53 (24.8%) ^a	15 (28.3%) ^a	4 (6.1%) ^b	72 (21.6%)	0.002
Diabetes mellitus	103 (48.1%)	26 (49.1%)	30 (45.5%)	159 (47.7%)	0.910
Hypertension	15 (7.0%)	4 (7.5%)	2 (3.0%)	21 (6.3%)	0.469
Cancer	47 (22.0%) ^a	10 (18.9%) ^{a,b}	5 (7.6%) ^b	62 (18.6%)	0.032
None of the above	6 (2.8%)	2 (3.8%)	2 (3.0%)	10 (3.0%)	0.934
Other diseases	31 (14.5%)	9 (17.0%)	4 (6.1%)	44 (13.2%)	0.142
Don't know	56 (26.2%) ^a	19 (35.8%) ^{a,b}	32 (48.5%) ^b	107 (32.1%)	0.003

M-Medicine students; N-Nursing students; SER- Special education and rehabilitation students. Different letters represent a statistically significant difference.

Table 5. Oral health problems among students.

Category	M (n=214)	N (n=53)	SER (n=66)	Total (n=333)	p
Bad breath	9 (4.2%)	6 (11.3%)	2 (3.0%)	17 (5.1%)	p=0.075
Bruxism	13 (6.1%)	3 (5.7%)	2 (3.0%)	18 (5.4%)	0.631
Bleeding gums	30 (14.0%) ^{a,b}	3 (5.7%) ^a	16 (24.2%) ^b	49 (14.7%)	0.016
Oral ulcerations	1 (0.5%)	0 (0.0%)	0 (0.0%)	1 (0.3%)	0.757
Toothache	16 (7.5%)	5 (9.4%)	3 (4.5%)	24 (7.2%)	0.573
Tooth discoloration	13 (6.1%)	2 (3.8%)	1 (1.5%)	16 (4.8%)	0.295
Tooth hypersensitivity	28 (13.1%)	11 (20.8%)	10 (15.2%)	49 (14.7%)	0.367
No complains	131 (61.2%)	35 (66.0%)	37 (56.1%)	203 (61.0%)	0.536

M-Medicine students; N-Nursing students; SER- Special education and rehabilitation students. Different letters represent a statistically significant difference.

being unaware of the causes of caries ($p = 0.035$). Only a small percentage of students (14.4%) identified dysbiosis of dental plaque as a cause of dental caries, whereas 63.7% indicated frequent sugar consumption as a contributing factor. More than half of the students (55.3%) attributed caries to inadequate tooth brushing. More than half of the students (53.2%) believed that bleeding during tooth brushing was a consequence of periodontitis. A significantly higher proportion of M and N students reported aggressive toothbrushing as the cause of bleeding compared to SER students ($p = 0.005$). Insufficient knowledge of the impact of dental plaque was observed in more than half of the respondents (53.5%). Significantly higher proportion of M students than SER students believed that dental plaque was a cause of caries ($p = 0.045$), whereas a considerably greater proportion of SER students than M students reported being unaware of the impact of dental plaque ($p = 0.004$). Insufficient knowledge of oral disease prevention measures was observed in 35.7% of participants. Regarding the prevention of oral diseases, intergroup analyses revealed that a significantly higher proportion of M and N students reported fluoride use as a preventive measure in comparison to SER students ($p = 0.014$).

Additionally, a substantially greater proportion of M students than SER students indicated that plaque removal is essential for preventing oral diseases ($p < 0.001$). A significantly higher proportion of SER students than M students lacked the knowledge about measures for preventing oral diseases ($p = 0.002$). Regarding the relationship between oral and systemic diseases, intergroup analyses revealed that a significantly higher proportion of M and N students reported an association between oral health and heart diseases ($p = 0.002$). Additionally, a substantially greater proportion of M than SER students indicated a relationship between oral health and cancer ($p = 0.032$). A considerably more SER than M students were unaware of the relationship between oral health and systemic diseases ($p = 0.003$).

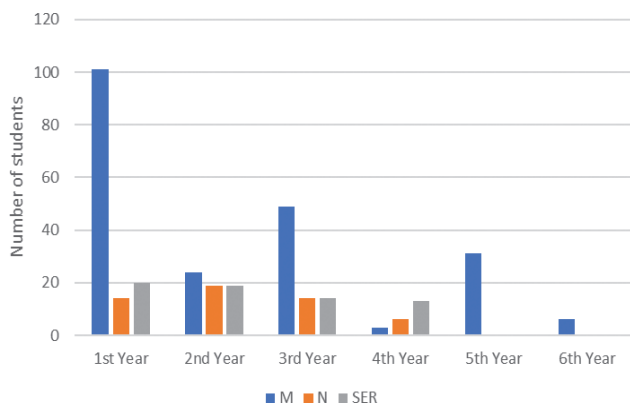


Figure 1. Distribution of students by year of study. M- Medicine students; N- Nursing students; SER- Special education and rehabilitation students.

Approximately 61.0% of students have no oral health problems. The most common oral health problems are tooth hypersensitivity (14.7%) and gingival bleeding (14.7%), with gingival bleeding being reported as a much more frequent problem among SER students compared to N students ($p = 0.016$) (Table 5).

DISCUSSION

Our findings indicate that students across all three study programs maintained generally good oral hygiene practices. Almost all participants (98.8%) reported brushing their teeth at least twice daily, and 76.3% reported replacing their toothbrushes every three months or less. Comparable findings were reported by Yao et al., who observed that nearly 90% of medical and dental students brushed their teeth at least twice a day (14). In contrast, a study by Ehsan et al. conducted among students of medicine, dentistry, pharmacy, public health, and nursing demonstrated that although more than 90% of students were aware of the importance of oral hygiene and fluoride use in caries prevention, as many as 53.8% reported brushing their teeth at least twice daily (13). In a multicenter study involving students from 26 countries, authors reported that nearly one-third of students (28.8%) brushed their teeth only once daily, and 4% did not maintain any oral hygiene (15). The study conducted by Mohammad found that 82% of medical students brush their teeth daily (16). In a study by Naseem et al., which assessed oral hygiene habits and tooth brushing techniques among medical students, it was observed that 36.7% of participants brushed their teeth once a day. Although the average duration of tooth brushing was optimal (approximately 135 seconds), the brushing techniques employed were reported to be inconsistent (17). Results of our study show that 88.6% of students reported brushing their teeth for two minutes or more, which is consistent with current oral hygiene recommendations, but 60.7% used an inconsistent tooth brushing technique. This result highlights a gap between oral hygiene behavior and proper oral hygiene practices.

In the present study, 63.7% of students reported using dental floss, whereas 24.4% reported using interdental brushes, indicating that overall use of oral hygiene methods other than tooth brushing remains suboptimal, given the importance of plaque control in caries and periodontal disease prevention. In a study conducted in Croatia among healthcare and non-healthcare students, 26.7% and 15.3% of students reported using dental floss and interdental brushes, respectively (18). In a study by Naseem et al., it was observed that only 8.1% of medical students used dental floss (17). The authors also find that 76.4% of students visit a dentist only when necessary (17). Our findings showed that 37.2% of students visited a dentist only after experiencing an oral disease, which is

lower than that reported in the aforementioned study but remains considerable, given that the participants were health science students. However, 58.9% of the students reported regular dental check-ups as the reason for their visit. Similar findings were reported by Tadin et al., who observed that 59.9% of students visited a dentist regularly, whereas nearly one-third of respondents (32.9%) reported that their most recent dental visit was due to problems related to the teeth or orofacial structures (pain or swelling) (18). In a study by Ehsan et al., although 91% of students considered regular dental check-ups important, nearly half reported visiting a dentist only when experiencing pain (13). Pelcer et al. reported that, regarding dental visits, 16.3% of students visited a dentist twice per year, 25.6% once per year, 33.9% rarely, and 24.3% never (15). Aljrais et al. reported that 40% of dentistry and pharmacy students visited a dentist twice per year (19). These results reflect a predominantly problem-oriented approach to dental care rather than a preventive one, even among students of health sciences.

Despite significant advances in understanding the etiology and pathogenesis of oral diseases, their prevalence continues to rise. It is anticipated that contemporary global strategies, with a strong emphasis on preventive measures and raising awareness of the importance of oral health through public health policies, will help slow the growth of oral diseases. Insufficient awareness and knowledge of oral health have been associated with poor oral hygiene practices and oral health status (20). Therefore, promoting oral health awareness and knowledge remains essential, particularly given the established associations between oral and systemic diseases. Lay et al. assessed levels of awareness, attitudes, and perceptions regarding oral health among first-year students in dentistry, medicine, and nursing. Most participants demonstrated good awareness, positive attitudes, and appropriate perceptions of oral hygiene (21). In a study by Janatolmakan et al., medical and nursing students demonstrated average knowledge, attitudes, and practices regarding toothbrush use and maintenance (22).

Regarding oral health knowledge, our findings indicate that students across all three examined study programs demonstrated insufficient understanding of dental plaque, the etiology of dental caries, preventive measures for oral diseases, and the relationship between oral and systemic diseases. Namely, only 14.4% of students correctly identified dysbiosis of the oral microbiota as a cause of dental caries, and 53.5% were unaware of the importance and role of dental biofilm. Approximately one-third of the students lacked knowledge of measures to prevent oral diseases (35.7%) and the association between oral and systemic diseases (32.1%). Among students, SER students demonstrated significantly lower levels of knowledge regarding caries etiology, biofilm impact, preventive measures, and the relationship between oral and systemic diseases in comparison to M and N students. Furthermore, although the majority of students reported no oral health

problems, tooth hypersensitivity and gingival bleeding were the most prevalent conditions, with gingival bleeding significantly more frequent among SER students. These differences can be explained by differences in curriculum structure, where M and N students are more frequently exposed to basic concepts of pathology, inflammation, prevention, and systemic–oral health interactions than SER students.

Although oral hygiene practices were reported as similar, inadequate biofilm control due to improper brushing techniques and limited understanding of periodontal disease may have contributed to increased gingival inflammation in this group. Additionally, lower awareness of preventive care and the oral-systemic health relationship among SER students may reduce their motivation to adopt optimal oral hygiene practices, further increasing the risk of gingival bleeding and other oral health problems. In a Croatian study, authors noted that health sciences students demonstrated greater oral health knowledge than students from different fields of education (18). A study conducted in China reported that only 2% of students were unaware that systemic diseases may be associated with oral diseases (14). Recent research has also indicated that pharmacy students have poorer oral health knowledge than dental students. Dental students (88%) showed a superior understanding of what dental plaque is compared with pharmacy students (49%), and of the causes of gingival bleeding, 77% and 54%, respectively. Furthermore, fewer pharmacy students (70%) reported being aware of the link between oral and general health than dental students (89%) (23). The study by Tadin et al. demonstrated a high level of awareness among students regarding the relationships between oral and general health (92.5%) as well as quality of life (88.1%) (18). Similarly, Aljrais et al., in a study involving dentistry and pharmacy students, observed that 78.6% of pharmacy students were unaware of the causes of dental caries and gingival bleeding, and lacked knowledge of the causes of halitosis, candidiasis, and stomatitis. (19).

As this study employed a cross-sectional design, several limitations must be acknowledged. First, it was conducted at a single center, which limits the generalizability of the findings. Expanding the research to multiple centers and incorporating follow-up focus groups after educational interventions could yield more robust data and facilitate the broader applicability of the results. Nevertheless, the findings may provide a valuable basis for enhancing curricula in medical education programs, thereby improving clinicians' awareness and knowledge of oral health and promoting interprofessional collaboration.

In conclusion, although our study indicates that medical and nursing students demonstrated greater knowledge of certain aspects of oral health than special education and rehabilitation students, it remains essential to improve overall oral health knowledge across all study programs. In addition to enhancing awareness and

knowledge, promoting changes in oral health behaviors is necessary.

NOTES

Conflict of interest: The Authors declare no conflict of interest

Acknowledgments: The Faculty of Medicine Foca, University of East Sarajevo provided administrative and logistical support for the study.

ABBREVIATIONS:

M- Medicine

N- Nursing

SER- Special Education and Rehabilitation

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