The research of health education programme efficiency in changing the attitudes and behaviours of dental students in the field of oral health

Ispitivanje efikasnosti zdravstveno-vaspitnog programa u korigovanju stavova i ponašanja studenata stomatologije u oblasti oralnog zdravlja

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Abstract

Introduction/Aim. The interest in oral health quality and the tendency to evaluate, provide, improve and compare it, are constantly improving. The main aim of this research was to examine the effectiveness of health education programme to change habits, attitudes and behaviours of dental students. **Methods.** The research was conducted at the Faculty of Dentistry in Pančevo. The first stage was related to the survey, the measurement of oral health status and the implementation of targeted health education. The second stage was conducted after the health education intervention, as a survey of attitudinal and behavioural changes and clinical measurement of oral health change. The sample consisted of 65 first-year and 54 fourth-year students, a total of 119 students. The following were defined as research instruments: the research record, questionnaires [the original questionnaire, Hiroshima University Dental Behavioural Inventory (HU-DBI) questionnaire] and health education intervention for modelling factors that determine attitudes and behaviours related to oral health. The Decayed-missing-filled (DMF) index was used to evaluate oral health and hard dental tissue conditions. **Results.** At the beginning of the research we asked the students: "Do you think your mouth and teeth condition is good?" Contrary to our expectations, 15.4% of the first-year students and 37% of the fourth-year students did not know the answer, or thought they had a problem. 80% of the first-year and 85.2% of the fourth-year students had positive attitude about the statement that once in six months they should go to the dentist for a check-up. 7.7% of the first-year students did not remember the last time they had visited a dentist. The implemented health education intervention led, to some extent, to changes in habits, attitudes and behaviours of students related to oral health. **Conclusions.** Students of dental medicine do not have sufficiently clear attitudes and safe behaviour regarding oral health. Targeted health education intervention represents the method of choice to take care of one's own health.

Key words:
attitude to health; dental students; knowledge; oral health; surveys and questionnaires.

Apstrakt

Uvod/Cilj. Nedovoljno se zna o uticaju kliničke obuke o oralnom zdravlju na ponašanje studenata stomatologije. Interesovanje za kvalitet oralnog zdravlja i težnja da se ono proceni, obezbedi, unapredi i poredi, stalno je u značajnom porastu. Cilj istraživanja je bio da se ispita efikasnost zdravstveno-vaspitnog programa u korigovanju navika, stavova i ponašanja studenata stomatologije. **Metode.** Istraživanje je sprovedeno na Stomatološkom fakultetu u Pančevu. Prva etapa odnosila se na anketno istraživanje, merenje stanja oralnog zdravlja i implementaciju ciljane zdravstvene edukacije. Druga etapa sprovođena je nakon zdravstveno-vaspitne edukacije, kao anketno istraživanje promene stavova i ponašanja i kliničko merenje promena oralnog zdravlja. Uzorak istraživanja činilo je 65 studenata prve i 54 studenta četvrte godine, ukupno 119 studenata. Kao istraživački instrumenti definisani su: istraživački karton, anketni upitnici (originalni anketni upitnik i *Hiroshima University Dental Behavioural Inventory* – HU-DBI upitnik) i zdravstveno vaspitna intervencija za modelovanje faktora koji određuju stavove i ponašanje u odnosu na oralno zdravlje. Za procenu oralnog zdravlja i stanja tvrdih zubnih tkiva korišćen je *Decayed-missing-filled* (DMF) indeks. **Rezultati.** Na početku istraživanja pitali smo studente da li misle da je stanje njihovih usta i zuba dobro. Suprotno našem očekivanju, 15,4% studenata prve i 37% studenata četvrte godine nije znalo odgovor ili su smatrali da imaju problem. Pozitivno mišljenje o tome da jednom u šest meseci treba otići na kontrolu kod stomatologa imalo je

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80% studenata prve i 85,2% studenata četvrte godine, a 7,7% studenata prve godine studija nije se sećalo poslednje posete stomatologu. Sprovedeni zdravstveno-vaspitni program doveo je, u izvesnoj meri, do poboljšanja u navikama, stavovima i ponašanju studenata u vezi sa oralnim zdravljem. **Zaključak.** Studenti stomatologije nemaju u dovoljnoj meri jasne stavove i bezbedno ponašanje u pogledu oralnog zdravlja. Ciljana zdravstveno-vaspitna edukacija predstavlja metod izbora za preuzimanje brige o sopstvenom zdravlju.

Ključne reči:
stav prema zdravlju; studenti stomatologije; znanje; usta, zdravlje; ankete i upitnici.

Introduction

The importance of oral health is not emphasized enough and that represents the risk factor in terms of the occurrence of oral diseases [1, 2]. Mouth and tooth diseases, though preventable, are very common in economically less developed countries and have a significant impact on both the individuals and society as a whole [3]. The knowledge of oral health is considered one of the basic preconditions for the development of healthy habits. The prevention of oral disease is the most acknowledged and efficient method of ensuring oral health. Oral health is now considered to be equally important in relation to general health [4]. Even though a research in the related study groups indicates that only the existence of knowledge is not sufficient to make changes in people's behaviour, the link between knowledge and better oral health is essential.

Health education, as a part of the oral health promotion, contributes to raising awareness of oral and dental health importance and development of certain skills that can enable the change of risky behaviour. Unfortunately, health promotion activities in Serbia are not systematically and consistently implemented and the health care system is oriented towards treatment rather than prevention of oral diseases [5]. Due to insufficient health sector resources, it is of high importance to select the most effective prevention strategies, such as intervention health programmes that, with reasonable costs, can significantly influence behavioural change, which is relevant for students' health.

For a number of reasons, young students represent appropriate population of respondents to investigate behaviours and attitudes that affect oral health. They are a homogeneous group of a similar educational level and at the age when the aesthetic moment, conditioned by healthy mouth and teeth, is a very important social value. In many countries, students occupy important positions in public life and think as the leaders of the future. Therefore, patterns of students' health behaviour and trust in them can be of particular benefit and it is very important because they are soon to become (or already are) parents, whose role is crucial in forming healthy habits of the population [6].

Going through their studies, students of dental medicine should be able to become a positive model of behaviour towards oral health. They are expected to have a higher level of knowledge, skills and positive attitudes, as well as to possess and take better care of oral health and to be able to have higher influence on their environment, family and society in general. Likewise, their knowledge, behaviour and attitudes should change positively over the years of studies. Because professional (dental) students specialize in preventive infor-

mation and health promotion, it is important that their own oral health knowledge, attitude, and practice are adequate [7, 8].

Restructuring of dental health care system, as well as the poor realization of continuous education in preventive fields and implementation of prescribed measures of health care programme of the population endanger human oral health. That implies a need for more intensive promotion of oral health in the wider community [9]. A study that evaluates the dental students' application of dental knowledge to enhance their own oral care could be of great benefit, because students will be the ones who will convey the same knowledge and practices to their patients [10].

During their education, students meet patients of different age, different background and therefore, with the right knowledge and their own healthy habits, they can play an important role in the health education of both individuals and groups, and they could be role models to their patients and a wider community as well [4].

The aim of this study was to identify habits, attitudes and behaviours of dental students in relation to oral health, to find mechanisms of changing risk factors that affect oral health, as well as to examine the effectiveness of a health education programme to change habits, attitudes and behaviours of the students of dentistry.

Methods

Research method and plan

The research was conducted as a longitudinal cross-sectional study. Research preparations and the research itself were conducted at the Faculty of Dentistry in Pančevo in two stages: the first stage was conducted before health education intervention (during September and October of the academic year 2018) and was related to a survey, conducted through interviews and dental examination. The measurement of oral health condition was performed at the Dental Clinic of the Faculty of Dentistry in Pančevo. Health education intervention was conducted afterwards in all the examined students of the first and fourth year of studies, with a term of six months. The second stage was conducted with all students of the research sample, after the health education intervention (in March 2019), as a survey of attitude and behaviour changes and clinical measurement of oral health changes.

The research sample consisted of the students of dentistry in the first and fourth year of studies at the Faculty of Dentistry in Pančevo, a total of 119 students, out of which 65 were the first-year and 54 were the fourth-year students. Stu-

dents were selected as a compact group for the observation unit, by simple random choice.

The implementation of this study was approved by the Ethics Committee of the Faculty of Dentistry in Pančevo. Only those respondents having sent written consent in relation to the voluntary participation in the study were included in the mentioned study.

Research instruments

The following were defined as research instruments: research records of oral health condition in respondents, adjusted to the World Health Organization (WHO) parameters [6]; for the evaluation of selected oral health parameters, the Decayed missing (extracted) filled (DMF) index, was used.

For the research of habits, attitudes and behaviours, the following were used: a) the original questionnaire to record respondents' attitudes and behaviours regarding oral health, and b) Hiroshima University Dental Behavioural Inventory (HU – DBI) questionnaire, which was developed by Kawamura and is used to assess behaviour related to oral health [9].

Habits regarding oral health were tested through the group of questions where respondents were asked to express their agreement or disagreement with the provided answers, or possible reasons for certain habits. Habits were measured through two levels of agreement with the given reasons/ claims, and possible answers were affirmative or negative. The accessibility of habits was evaluated on the basis of a three-stage scale, as: health reasons, cleanliness reasons and personal hygiene reasons.

Attitudes regarding oral health were assessed through answers to a group of questions where students were asked to express their opinion about the impact of a particular attitude on behaviour in the field of oral health. Students' attitudes were measured using three levels of agreement with offered statements, and possible answers were affirmative, negative or uncertain. The acceptability of the attitudes was evaluated on the basis of three-step scale, as an acceptable, unacceptable and indefinite attitude. As acceptable attitude was considered opinion that "oral hygiene is important for oral health maintenance", that "healthy teeth and mouth affect the appearance and impression we leave", while as unacceptable or uncertain attitude was considered answer "I am not sure" with stated claims.

Health education intervention for modelling the factors that determine attitudes and behaviour in relation to oral health for the purposes of this research was defined in three stages through three complementary fields as: the importance of oral health, oral hygiene, health-safe habits, and included:

method (group health education work and communication methods – live demonstrations, creative workshops); *means of research* (visual, audio-visual and demonstration models); *content* (characteristics of good oral health, the importance of oral health for overall health, preventability of oral diseases, control and preventive examinations at the dentist, definition and explanation of terms such as dental plaque, decay, gingivitis, concretions, periodontal disease, oral hygiene, oral hygiene accessories, toothbrush technique, an individual goal in achieving good oral health); practical work (training in proper oral hygiene, training in the use of oral hygiene aids – dental floss, dental floss holder, proximal brush, mouthwashes, oral and dental hygiene control – dental biofilm staining method, toothpaste selection criteria for daily use – interpretation of fluoride composition declaration on toothpaste).

Statistical analysis

The statistical analyses were performed using the SPSS 19.0 software. The obtained data for numerical characteristics were presented in the tables. Out of the methods of descriptive statistics, the arithmetic mean, standard deviation, coefficient of variation and standard error were used. Out of the methods of differential statistics, parametric tests of an independent sample were used in the research (confidence interval for probability $p = 0.95$, ANOVA, Levene's test, Student's t-test), parametric test of dependent samples (Paired samples t-test), nonparametric tests of independent samples (Pearson's chi-square test, Fisher's exact tests).

Results

Students' assessment of their own oral health at the beginning of the research

Self-assessment of oral health – at the beginning of the research, we asked students if they think the condition of their mouth and teeth was good. With a statistical significance of $\chi^2 = 8.410$, at the level of $p < 0.015$, contrary to our expectations, we received the answer that 15.4% of first-year students, and 37% of fourth-year students did not know the answer to that question, or thought they had a problem (Table 1).

Referring to hard dental tissue condition – the average number of healthy teeth was 20.5, the number of decayed teeth for the entire sample was 0.58, the number of extracted teeth was 0.84, while the average number of filled teeth was 5.94. There was no significant difference between the first and the fourth-year students. The average DMF index in the study groups was 7.36 (Tables 2–5).

Table 1

Self-assessment of oral health - Answers to the question: Do you think your mouth and teeth condition is good at the moment?

Answers	Before the health education intervention			After the health education intervention		
	Year of studies		Total number	Year of studies		Total number
	first	fourth		first	fourth	
Yes, n (%)	55 (84.6)	34 (63.0)	89 (74.8)	54 (84.4)	37 (68.5)	91 (77.1)
No or I have a problem, n (%)	8 (12.3)	12 (22.2)	20 (16.8)	8 (12.5)	11 (20.4)	19 (16.1)
I don't know, n (%)	2 (3.1)	8 (14.8)	10 (8.4)	2 (3.1)	6 (11.1)	8 (6.8)
Total, n (%)	65 (100.0)	54 (100.0)	119 (100.0)	64* (100.0)	54 (100.0)	118 (100.0)
	$\chi^2 = 8.410$;	$p < 0.015$		$\chi^2 = 4.837$;	$p > 0.05$	

*The total number is different because not all students answered the questions from the interview.

Table 2

Condition of hard dental tissues /DMF

Statistical parameters	Before the health education intervention			After the health education intervention		
	Year of studies		Total number	Year of studies		Total number
	first	fourth		first	fourth	
Number	65	54	119	65	54	119
Minimum	0	0	0	0	0	0
Maximum	15	16	16	15	16	16
Mean	7.569	7.111	7.361	7.277	7.111	7.202
SEM	0.583	0.561	0.407	0.580	0.561	0.405
SD	4.704	4.119	4.435	4.679	4.119	4.416
95% Confidence interval						
lower bound	6.43	6.01	6.56	6.12	5.99	6.40
upper bound	8.71	8.21	8.16	8.44	8.24	8.00
Significance of differences						
t-test (independent samples)	$t = 0.559$;	$p > 0.05$		$t = 0.203$;	$p > 0.05$	

DMF – decayed, missing, filled; SEM – standard error of the mean; SD – standard deviation.

Table 3

Decayed teeth

Statistical parameters	Before the health education intervention			After the health education intervention		
	Year of studies		Total number	Year of studies		Total number
	first	fourth		first	fourth	
Number	65	54	119	65	54	119
Minimum	0	0	0	0	0	0
Maximum	4	3	4	3	2	3
Mean	0.692	0.444	0.580	0.569	0.241	0.420
SEM	0.122	0.114	0.085	0.116	0.083	0.075
SD	0.983	0.839	0.925	0.935	0.612	0.818
95% Confidence interval						
lower bound	0.45	0.22	0.41	0.34	0.07	0.27
upper bound	0.93	0.67	0.75	0.80	0.41	0.57
Significance of differences						
t-test (independent samples)	$t = 1.484$;	$p > 0.05$		$t = 2.216$;	$p < 0.05$	

SEM – standard error of the mean; SD – standard deviation.

Table 4

Extracted teeth

Statistical parameters	Before the health education intervention			After the health education intervention		
	Year of studies		Total number	Year of studies		Total number
	first	fourth		first	fourth	
Number	65	54	119	65	54	119
Minimum	0	0	0	0	0	0
Maximum	4	8	8	4	8	8
Mean	0.696	0.685	0.840	0.696	0.685	0.840
SEM	0.183	0.199	0.135	0.183	0.199	0.135
SD	1.479	1.464	1.473	1.479	1.464	1.473
95% Confidence interval						
lower bound	0.60	0.29	0.57	0.60	0.29	0.57
upper bound	1.34	1.08	1.11	1.34	1.08	1.11
Significance of differences						
t-test (independent samples)	$t = 1.048$;	$p > 0.05$		$t = 1.048$;	$p > 0.05$	

SEM – standard error of the mean; SD – standard deviation.

Table 5

Filled teeth

Statistical parameters	Before the health education intervention			After the health education intervention		
	Year of studies		Total number	Year of studies		Total number
	first	fourth		first	fourth	
Number	65	54	119	65	54	119
Minimum	0	0	0	0	0	0
Maximum	13	14	14	13	14	14
Mean	5.908	5.981	5.941	5.908	6.185	6.034
SEM	0.472	0.476	0.335	0.481	0.482	0.341
SD	3.803	3.499	3.653	3.880	3.545	3.719
95% Confidence interval						
lower bound	4.98	5.05	5.28	4.95	5.22	5.36
upper bound	6.83	6.91	6.60	6.87	7.15	6.71
Significance of differences						
t-test (independent samples)	$t = 0.109$;	$p > 0.05$		$t = 0.404$;	$p > 0.05$	

SEM – standard error of the mean; SD – standard deviation.

In connection to brushing there was a statistically significant difference in parameters in the study groups at the level of $p < 0.05$. Also, in the sense of a habit as a part of face washing, or personal hygiene maintenance, there was a statistically significant difference at the level of $p < 0.001$ (Table 6).

The frequency of oral hygiene maintenance in the studied groups of students was evaluated through three of-fered modalities: more than twice a day, once or twice a day, and not every day. It was found that: 77% of first-year students brushed their teeth more than twice a day, 42.6% of fourth-year students brushed their teeth once or twice a day, and 2% of students from both groups did not brush their teeth every day. There was a statistically sig-nificant difference in the studied population ($\chi^2 = 6.226$; $p < 0.05$).

Behaviour regarding oral health – students were asked to express their opinions regarding different behav-ioural modalities in oral health and the factors that may influence oral health. Students' behaviour in the field of oral health and the selected factors were evaluated ac-cording to their answers to the questions asked. We found that students in the total sample did not have acceptable or safe behaviour regarding oral health (Table 7). 80% of the first-year students and 85.2% of the fourth-year stu-dents had positive opinion about the statement that once every six months they should go for dental examination. 7.7% of the first-year students did not remember the last time they had visited a dentist. However, in daily practice, students behave in the opposite way, since half of the re-spondents visited a dentist a year ago.

The results of the examination of attitudes regarding oral health are shown in Table 8.

Changes in oral health of the respondents as a result of health education intervention

The implemented health education intervention led, to some extent, to changes in habits, attitudes and behav-iours of students (Tables 1 and 6–8).

68.5% of the fourth-year students and 84.4% of the first-year students, after the health education intervention, considered their mouth and teeth condition to be good (Table 1).

After the health education intervention, 87.7% of the first-year students and 100% of the fourth-year students stated that dental health was their reason for regular oral hygiene, and there was a statistically significant differ-ence between the studied groups of students $\chi^2 = 6.486$ at the level of $p < 0.001$ (Table 6).

57.8% of the first-year students and 96% of the fourth-year students, as a reason for regular oral hygiene, cited the fact that they saw it as a part of hygiene in gen-eral, and there was a statistically significant difference be-tween the studied groups of students $\chi^2 = 12.158$ at the level of $p < 0.001$ (Table 6). 76.9% of the first-year stu-dents and 94.3% of the fourth-year students visited their dentist for a regular check-up, and there was statistically a significant difference between the studied groups of stu-dents $\chi^2 = 4.861$ at the level of $p < 0.05$ (Table 8).

Table 6

Reasons for the habit of oral hygiene practicing before and after the health education intervention

Answers to the questions	Before		After	
	Year of studies		Year of studies	
	first	fourth	first	fourth
To remove food debris, n (%)				
yes	63 (96.9)	37 (37.0)	63 (96.9)	47 (100.0)
no	2 (3.1)	0 (0)	2 (3.1)	0 (0)
Total, n (%)	65 (100.0)	37* (100.0)	65 (100.0)	47* (100.0)
	$\chi^2 = 1.161$; $p > 0.05$		$\chi^2 = 1.472$; $p > 0.05$	
To stay healthy, n (%)			57	49
yes	56 (86.2)	50 (98.0)	87.7%	100.0%
no	9 (13.8)	1 (2.0)	8 (12.3)	0 (0)
Total, n (%)	65 (100.0)	51* (100.0)	65 (100.0)	49* (100.0)
	$\chi^2 = 5.125$; $p < 0.05$		$\chi^2 = 6.486$; $p < 0.001$	
Out of habit, as a part of face washing, n (%)				
yes	33 (53.2)	22 (91.7)	37 (57.8)	24 (96.0)
no	29 (46.8)	2 (8.3)	27 (42.2)	1 (4)
Total, n (%)	62* (100.0)	24* (100.0)	64* (100.0)	25* (100.0)
	$\chi^2 = 11.091$; $p < 0.001$		$\chi^2 = 12.158$; $p < 0.001$	

*the total number is different because not all students answered the questions from the interview.

Table 7

Behaviour regarding oral health before and after the health education intervention

Answers to the questions	Before		After	
	Year of studies		Year of studies	
	first	fourth	first	fourth
Gums often bleed while i am brushing my teeth, n (%)				
yes	5 (7.7)	4 (7.4)	10 (15.4)	4 (7.4)
no	60 (92.3)	50 (92.6)	55 (84.6)	50 (92.6)
Total, n (%)	65 (100.0)	54 (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 0.003; p > 0.05$		$\chi^2 = 1.808; p > 0.05$	
I worry/check if i have a bad breath, n (%)				
yes	61 (93.8)	47 (87.0)	61 (93.8)	45 (83.3)
no	4 (6.2)	7 (13.0)	4 (6.2)	9 (16.7)
Total, n (%)	65 (100.0)	54 (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 1.630; p > 0.05$		$\chi^2 = 3.350; p > 0.05$	
I delay visiting a dentist until my tooth starts to hurt, n (%)				
yes	13 (20.0)	9 (16.7)	13 (20.0)	15 (27.8)
no	52 (80.0)	45 (83.3)	52 (80.0)	39 (72.2)
Total, n (%)	65 (100.0)	54 (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 0.217; p > 0.05$		$\chi^2 = 0.992; p > 0.05$	
I used plaque staining methods to check if my teeth are clean, n (%)				
yes	10 (15.4)	17 (31.5)	10 (15.4)	18 (33.3)
no	55 (84.6)	37 (68.5)	55 (84.6)	36 (66.7)
Total, n (%)	65 (100.0)	54 (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 4.357; p < 0.05$		$\chi^2 = 5.281; p < 0.01$	
I use dental floss every day, n (%)				
yes	17 (26.2)	19 (35.2)	16 (24.6)	18 (33.3)
no	48 (73.8)	35 (64.8)	49 (75.4)	36 (66.7)
Total, n (%)	65 (100.0)	54 (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 1.140; p > 0.05$		$\chi^2 = 1.098; p > 0.05$	
I use mouthwash regularly, n (%)				
yes	33 (50.8)	29 (53.7)	33 (50.8)	25 (46.3)
no	32 (49.2)	25 (46.3)	32 (49.2)	29 (53.7)
Total, n (%)	65 (100.0)	54 (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 0.102; p > 0.05$		$\chi^2 = 0.236; p > 0.05$	

Discussion

The most important task of modelling behavioural factors through health education programmes is to form sustainable habits and safe behaviour for both the individuals and population as a whole.

During their basic studies, students acquire knowledge and skills that are necessary for positive attitude towards prevention. It is expected that there is a difference in oral health of the society as a whole and that of dental students, since students chose dental medicine as their profession and therefore should be able to voluntarily change their hygiene habits and accept themselves as health workers who are or will be motivated enough to improve both themselves and the community. Dental students, the future oral health professionals, play an important role in educating and promoting public oral health. Dental students' oral health attitudes reflect their understanding of the importance of disease prevention and their commitment to improving their patients' oral health. Dental students, in general, have been found to have a positive attitude towards oral health, but their own oral health behaviour must improve if they are to serve as positive models for their patients, families, and friends [11]. These habits are particularly changing after continuous health education programs [12]. However, for some of the items in our questionnaire, a rather high number of unexpected answers were obtained. This indicates that personal attitudes towards prevention are greatly influenced by academic level and gained academic knowledge. Our results demonstrate not only the obstacles, but also the need to break deep-seated prejudices and preconceptions that prevent elementary students from realizing the value and efficiency of prevention. Unsatisfactory answers were registered in students of the fourth year of studies, and this indicates that preventive education is insufficient through the curriculum of basic studies, at least in the first year of studying dental medicine.

This research has shown that personal care for oral health maintenance among students of dental medicine is low at the beginning of health education intervention, and that further educational efforts are needed to achieve an overall

Table 8

Attitudes regarding oral health before and after the health education intervention

Answers to the questions	Before		After	
	Year of studies		Year of studies	
	first	fourth	first	fourth
Oral hygiene is important for oral health, n (%)				
agree	62 (95.4)	53 (98.1)	57 (93.4)	54 (100.0)
don't agree	3 (4.6)	1 (1.9)	1 (1.6)	0 (0.0)
not sure	0 (0.0)	0 (0.0)	3 (4.9)	0 (0.0)
Total, n (%)	65 (100.0)	54 (100.0)	61* (100.0)	54 (100.0)
	$\chi^2 = 0.693; p > 0.05$		$\chi^2 = 3.420; p > 0.05$	
Healthy mouth and teeth affect the appearance and impressions i leave, n (%)				
agree	63 (96.9)	51 (96.2)	56 (91.8)	53 (98.1)
not sure	2 (3.1)	2 (3.8)	5 (8.2)	1 (1.9)
Total, n (%)	65 (100.0)	53* (100.0)	61*(100.0)	54 (100.0)
	$\chi^2 = 0.043; p > 0.05$		$\chi^2 = 2.332; p > 0.05$	
I brush my teeth regularly, n (%)				
yes	64 (98.5)	50 (100.0)	64 (98.5)	54 (100.0)
no	1 (1.5)	0 (0.0)	1 (1.5)	0 (0.0)
Total, n (%)	65 (100.0)	50* (100.0)	65 (100.0)	54 (100.0)
	$\chi^2 = 0.772; p > 0.05$		$\chi^2 = 0.838; p > 0.05$	
I visit the dentist for regular check-ups, n (%)				
yes	50 (78.1)	30 (88.2)	50 (76.9)	33 (94.3)
no	14 (21.9)	4 (11.8)	15 (23.1)	2 (5.7)
Total, n (%)	64 (100.0)	34* (100.0)	65 (100.0)	35* (100.0)
	$\chi^2 = 1.514; p > 0.05$		$\chi^2 = 4.861; p < 0.05$	

*the total number is different because not all students answered the questions from the interview.

improvement of oral health, habits, attitudes and behaviour of students [8, 13].

Political, cultural and socioeconomic factors have a great influence on the formation of certain attitudes regarding the oral health of each individual [14–17]. The study of oral health, behaviour and habits, which is influenced by different environments, is difficult because there are overlaps of cultural influences and other factors, such as the knowledge of oral health, socioeconomic status and personal experiences [18, 19].

This study has shown that 15.4% of the first-year students and 37% of the fourth-year students do not know the answer to the question: "Do you think that the condition of your mouth and teeth is good?", or think they have a problem. The results of Swedish study of 20 to 25-year-olds have shown that 59% of respondents are satisfied with the appearance of their teeth [20], while in the Jordanian study that percent was higher – 69% of students were satisfied with the condition of their mouth and teeth [11]. This indicates the need for serious and scientifically proven approaches to promote oral health in order to raise students' level of health awareness. It is the moral responsibility of all the health care personnel to provide an adequate oral care for those patients in need at primary health care institutions [21, 22].

The higher prevalence of tooth decay in our students is related to the lack of implementation of preventive measures and organized health education programmes from an early age, which is specific for most East European countries [23]. Regarding the frequency of oral hygiene maintenance, it was found that 77% of the first-year students brushed their teeth more than twice a day, and 42.6% of the fourth-year students brushed their teeth once or twice a day; however, 2% of students from both groups did not brush their teeth every day. A much higher percentage of Lithuanian dentistry students (92%) brush their teeth twice a day, while the percentage of Indian, Jordanian and Turkish students is much lower [11, 24, 25].

The students of dental medicine were expected to demonstrate good knowledge of oral health in this study, since this is an important content of their professional education and this knowledge is essential for them to educate patients and the community when they begin working in the health care system. However, it seems that there are things that have to be improved, such as practicing regular visits to the dentist, using dental floss, etc [4, 26].

Inadequate student behaviour has also been reported in other studies. This is confirmed by the statements on the existence of bleeding gums in 56% of the first-year students and 44% of the fourth-year students. 45% of Finnish students have bleeding gums, while the results of Australian, Lithuanian, Japanese or Greek students are much better [7, 27, 28].

Students often tend to underestimate the receptivity of soft and hard dental deposits to caries and periodontal disease, and they do not consider it to be a serious health problem like some other chronic medical conditions [1, 29]. Poor

periodontal status is also indicated by Japanese study, where students need dental treatment [30].

Similar to the findings in other studies [31, 32], this study also found positive attitudes regarding oral hygiene and prevention of oral diseases after a health education intervention, the importance of regular oral hygiene for oral health maintenance, healthy teeth and mouth, as well as regular check-ups at the dentist, which affects appearance and impression they leave in community.

In this research, we expected that students of higher study years will express more positive attitudes and more responsible behaviour in relation to oral health than students at the beginning of the studies, but it was completely refuted, because the opposite was the case, which was quite an unexpected finding. The more so, this requires reconsideration of basic study programmes of dental medicine. Obviously, insufficient attention is paid to the preventive risk factors for endangering oral health, i.e. the importance of preventive and promotive health behaviour when it comes to oral health and its applications in daily practice.

After the conducted program, certain changes in oral health were measured. Several studies have confirmed that oral health attitudes become more positive with age and education level [18, 33]. The results of this research show that the awareness of dental health, as measured by the HU-DBI results, increases with health education intervention. Changes in students' habits, attitudes and behaviour have been observed, which is in accordance with other authors' results [33–36]. Similar studies were conducted at different faculties and in different environments and they all showed the same – that constant professional development of students affects their oral hygiene [37, 38]. To serve as a good model, the improvement of oral health-related behaviour and attitude should start from the 1st year of education [39].

Despite the improvements obtained in our study, six months seems to be a short period to reach definite conclusions.

Conclusion

The established self-assessment of oral health in dental students at the beginning of this research indicates a low level of awareness of their own oral health. The implemented health education intervention led, to some extent, to changes in habits, attitudes and behaviours of students related to oral health. This requires some revisions in the practical training programmes of dental students.

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