ORIGINAL ARTICLE

Oral health status of young adults in Serbia – Clinical and non-clinical assessment of undergraduate students in Belgrade

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SUMMARY
Introduction Since 1987, there has been little information on oral health (OH) status of young adults aged 19 to 26 in Serbia. This study aimed to investigate the trends in OH status and OH-related quality of life (OHRQoL) of undergraduate student population in Belgrade in 2012.

Materials and methods The study included a total of 699 students of different study fields who underwent a dental examination, with 530 of them agreeing to an assisted survey and 275 forgoing a periodontal assessment. The survey consisted of six sections – basic information, socio-demographic data, oral healthcare use and habits, risk factors, OH self-assessment and OHRQoL. Clinical assessment was performed using the Decayed, Missing, Filled teeth (DMFT) index; Gingival Index; Clinical Attachment Level; Community Periodontal Index, and Plaque index. OHRQoL was evaluated through a modified OH Impact Profile (OHIP-14).

Results The mean DMFT of the examined population was 10.24 (standard deviation [SD] 5.33). Students from East and South Serbia (DMFT=8.69 [SD=4.93]), technical study field (DMFT=8.84 [SD=4.94]), with mother’s having a university degree (DMFT=9.33 [SD=5.15]) and with satisfactory OH (DMFT=8.94 [SD=4.76]) were all significantly associated with lower DMFT. A significantly lower OHRQoL score was observed in students with satisfactory self-reported OH (Score=9.48 [SD=1.44]). The periodontal assessment showed no significant differences across all values of observed indexes.

Conclusion The mean DMFT of Belgrade’s young adults’ population has decreased from 1987 to 2012 from 12.5 to 10.4. Self-reported OH is significantly associated with both the DMFT values and OHRQoL.

Keywords: oral health status; oral health related quality of life; students; Belgrade

INTRODUCTION
Oral health represents an integral component of general health necessary for the overall physical and mental well-being of an individual [1]. Recently, The Global Burden of Disease (GBD) Study determined that as many as 2.5 billion people have been affected with untreated dental caries, while recent reports suggest the total costs due to dental disease amounted to $544.41 billion in 2015 [2, 3].

In 2017, the OECD study also indicated that spending on dental treatments in high-income countries accounted for 20% of out-of-pocket health expenditure [4]. In the wake of these data, most dental epidemiology studies have been focusing on gathering information on children and adolescents’ oral health status. These form a basis for preventive policy recommendations to lower the socio-economic burden of dental disease in the nearby future, especially in terms of state financed dental care plans. That said, the oral health of some age groups, such as the one of young adults aged 19 to 26 has been unjustifiably disregarded. Certainly, this is one of the most important transition periods of a person’s life, particularly seen in university students who are faced with rapid physical and social development [5]. New environments, often away from home, come with dynamic changes to their lifestyle and can have major influence on their oral and overall health [6]. There are only a handful of reports presenting data on these age groups’ dental status and oral health-related quality of life (OHRQoL). In Serbia, the oral health status of student population was evaluated in 1987 as part of a more extensive oral health assessment of general population in Belgrade, when a total of 4943 of students participated in the study [7].

Since then, two different aspects could have had significant implications. Firstly, the economic collapse and wars of the 90’s in former Yugoslavia were never explored in terms of the impact they had on this population’s oral health status. Secondly, during the country’s transition years at the beginning of the 21st century, a new Health Care Law from 2004 stopped recognizing the oral health care of students aged 19 to 26 as part of a mandatory state-financed health care plan. For the next seven years, around 250,000 students spent out-of-pocket money for their dental treatment.

This study aimed to provide new data on young adults (19 to 26 years of age) oral health status in the Republic of Serbia in 2012 and give a comprehensive overview of their OHRQoL.

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MATERIAL AND METHODS

The study comprised an assisted oral health interview, a dental status evaluation and a periodontal assessment of the participating population.

The participants in this cross-sectional study were recruited onsite between October 2011 and January 2012 at the University of Belgrade, Republic of Serbia. A total of 699 undergraduate students aged 19 to 26 gave a verbal and written informed consent and agreed to schedule a dental examination at the Department of Restorative Dentistry, School of Dental Medicine, University of Belgrade. The study population included students from the fields of medical (n=173), social (n=290), life (n=16) and technical (n=116) sciences as well as other public and private higher education institutions located in Belgrade (n=104). All students of the School of Dental Medicine, University of Belgrade were excluded from the study to avoid selection bias [8].

Of the total number of participating students, 530 agreed to an assisted oral health interview. The questionnaire used in this study comprised six sections and represented a modified version of the European Global Oral Health Indicators Development Project's (EGOHID II) “Full Standard Oral Health Interview Questionnaire for Adults” [9]. The survey was conducted at the Department of Conservative Dentistry, School of Dental Medicine, University of Belgrade before the dental status evaluation procedure. Section 1 of the questionnaire collected basic screening information (age, sex, childhood residence and faculty attended). Section 2 focused on socio-demographic variables customized for the student population – year(s) of study; parents’ education status (without a University degree/ with a University degree); parents’ employment status (employed/unemployed/inactive); means of financing the studies (by parents/ scholarship/ student loan/ self-financed/ other). Section 3 assessed the oral health care use and oral hygiene habits – last dental visit (within the past 12 months/ more than 12 months ago/ not sure); reasons of the last visit (check-up/ routine treatment/ emergency treatment/ prosthodontic reasons/ orthodontic reasons); dental care provider (private/ public/ not sure); daily tooth brushing frequency (once a day or less/ at least twice a day); toothbrush replacement frequency (monthly/ quarterly/ bi-annual/ annually); usage of fluoride-based toothpaste (yes/ no/ not sure); the use of interdental brush or floss (yes/ no). Section 4 provided data on the risk factor habits – number of food and drink meals per day (up to three times a day/ more than three times a day); sweetened beverages consumption (yes, daily or occasionally/ never/ not sure); cigarette smoking and alcohol intake frequency (yes, regularly or occasionally/ never). Section 5 gave inputs on the oral health self-assessment status (satisfactory/ unsatisfactory). Section 6 gathered data on dental anxiety presence and the OHRQoL, using a modified OHIP-14 instrument which encompassed eight items – difficulties with eating and drinking due to teeth issues; toothache and painful gums experience; bad breath experience; embarrassment because of the appearance of teeth; avoiding smiling/laughing because of the appearance of teeth; avoiding conversation with other individuals because of the appearance of teeth; difficulties with studying and other daily activities due to teeth issues; avoiding any form of social activity due to teeth issues. The frequency of each item was measured using a 4-point Likert scale (“never” = 1, “sometimes” = 2, “often” = 3, and “daily” = 4). Based on the OHRQoL students were divided into two groups – one with a low OHRQoL (at least one answer on any of the eight items was either “sometimes”, “often” or “daily”) and one without a low OHRQoL [10].

The maximum possible OHRQoL score in this study was 32 for the DMFT (DT – decayed teeth; MT – missing teeth; FT – filled teeth) index correlation and 28 for the GI (Gingival Index) and PI (Plaque Index) indexes. Reliability analysis based on Cronbach’s alpha was initiated to determine the validity and internal consistency of the given OHRQoL survey [11]. In two instances (DMFT/ GI, PI), Cronbach’s alpha for standardized items was 0.78, and 0.73, respectively. The average inter-item correlation was 0.31 (DMFT) and 0.28 (GI, PI); “bad breath” item was excluded after item correction), with no negative correlations and following the recommended threshold of 0.2 [10, 12].

Dental status evaluation

Fourth and fifth-year dental students performed the clinical dental status evaluation with a senior clinician’s verification at the Department of Restorative Dentistry. A total of 699 participants were examined. The assessment followed the standard World Health Organization (WHO) Guidelines and the Oral Health Clinical Surveys Guidelines of the EGOHID II project [13, 14]. The DMFT index was used to measure dental caries experience and a “Classification of Lesions of the Exposed Tooth Surfaces” system proposed by Mount et al. to record the tooth sites affected by caries (Site 1 – pits, fissures and minor defects on exposed enamel surfaces of all teeth; Site 2 – approximal enamel surfaces immediately cervical to the contact area between any pair of adjacent teeth; Site 3 – the cervical one-third of the crown around the full circumference of any tooth or, following a gingival recession, the exposed root surface) [15]. All the assessments were completed visually and using a standard dental explorer and mirror.

Periodontal assessment

Fifth-year dental students performed the periodontal assessment with a senior periodontist’s verification at the Department of Periodontology and Oral Medicine, School of Dental Medicine, University of Belgrade. A total of 275 participants were examined. The assessment followed the standard WHO Guidelines and the Oral Health Clinical Surveys Guidelines of the (EGOHID II) project [13, 14]. The evaluation included the identification of changes to soft gingival tissues – gingivitis (yes, type of gingivitis – catarrhal, acute ulcero-necrotic, hyperplastic, gingival fibromatosis, desquamative/ no) and periodontal disease presence (yes, type of periodontitis – chronic periodontitis, acute periodontitis, necrotizing periodontitis, periodontitis as a manifestation of systemic diseases/ no). Three indices were used to determine the state of periodontal
tissue – the Loé & Silness Gingival Index – GI; the clinical attachment level – CAL; a community periodontal index – CPI, modified for assessing periodontal pocket depth if present. All measurements were taken on six teeth (code numbers 16, 12, 24, 36, 32, 44), on four surfaces (mesial, distal, lingual and buccal) and with a WHO Community Periodontal Index probe. Additionally, the Silness & Loé Plaque Index - PI was used to record the position and the amount of dental plaque present in gingival and subgingival areas of examined teeth.

Statistical Analysis

The DMFT, GI, CAL, CPI and PI indexes are shown in their mean and standard deviation values accordingly. The Mann-Whitney U test was used to compare data between two and the Kruskal-Wallis test to compare more than two groups of students and in compliance with the interview survey results. P-values <0.05 were considered statistically significant. The chi-square and Fisher’s exact tests were applied to compare the proportion of decayed, filled, extracted and healthy teeth across two or more groups of students and in compliance with the interview survey results. P-values<0.05 were considered statistically significant. All the statistical analyses were carried out with the XLSTAT statistical software Trial Version 2021.1.1.1082 (Addinsoft, Paris, France, EU).

RESULTS

As shown in Table 1, the mean DMFT index of the total number of participating students (n=699) was 10.24 (standard deviation [SD] 5.33; range = 0-31). There were no significant differences in DMFT values between female and male students in terms of socio-demographic aspects covered in this study, while obvious ones could be seen across other observed variables (Table 2). The lowest mean DMFT was seen in students originally from the region of East and South Serbia. Mean DMFT values did not differ significantly between Belgrade, West and Central Serbia and other regions and countries. Students studying technical sciences had a significantly lower mean DMFT index, followed closely by medical field students. Life science students and ones from other higher education institutions were impacted by the highest values of the DMFT index. Mother’s education level was strongly associated with the DMFT score, with lower scores found among students whose mother possessed a university degree.

All the variables used to determine students’ oral health behavior showed no significant differences between their mean DMFT values, except for the time of the last dental visit. Students who visited a dental professional less than a year ago had a higher mean DMFT of 10.61 (SD 5.11) compared to the ones who did it more than a year ago – 8.64 (SD 4.83) The results presented in Table 3 also showed no significant differences in DMFT values of students receiving dental care from private dental professionals opposite to the ones receiving it from dental professionals working in public clinics.
When looking at various risk factor habits presented in Table 4, only the alcohol intake significantly influenced the mean DMFT of students. The students who consumed alcohol on a daily/occasional level had a significantly lower DMFT index than those who stated never to drink alcohol (9.71 & 10.69).

Students who deemed their oral health satisfactory had a lower DMFT of 8.94 (SD 4.76) than those unsatisfied with it – DMFT of 12.13 (SD 5.18). The same trend could be seen when comparing the average values of the OHRQoL score – satisfied students with a score of 9.48 (SD 1.44) and unsatisfied ones with a mean score of 11.11 (SD 2.85). Students without low OHRQoL showed no clear advantages to the ones with reported low OHRQoL. The same pattern was visible in students who confirmed they suffered from dental anxiety compared to those who did not (Table 5).

Table 4. Risk habit determinants of the student’s mean DMFT

| Variable Promenjiva | n (%) broj | DMFT mean (SD) KIP (SD) | p |
|----------------------|------------|--------------------------|---|
| Daily intake of food and drinks / Dnevni unos hrane i pića | | | |
| Up to three times / Do tri puta | 146 (28.6) | 9.31 (4.76) | | 0.063 |
| > 3 times / > 3 puta | 365 (71.4) | 10.32 (5.18) | | |
| Sweetened beverages intake / Unos zaslađenih pića | | | |
| Daily/Svakodnevno | 183 (34.9) | 9.99 (4.88) | | 0.672 |
| Occasionally/Ponekad | 248 (47.3) | 10.10 (5.02) | | |
| Never/Nikada | 93 (17.8) | 9.67 (5.70) | | |
| Smoking / Pušenje | | | |
| Daily/Svakodnevno | 96 (19.0) | 9.54 (4.82) | | 0.382 |
| Occasionally/Ponekad | | | |
| Never/Nikada | 410 (81.0) | 10.19 (5.12) | | |
| Alcohol / Alkohol | | | |
| Daily/Occasionally Svakodnevno/Ponekad | 345 (67.5) | 9.71 (5.09) | < 0.05 | (0.028) |
| Never/Nikada | 166 (32.5) | 10.69 (5.04) | | |

Table 5. DMFT index values in terms of self-assessed oral health, dental anxiety and OHRQoL

| Variable Promenjiva | n (%) broj | DMFT mean (SD) KIP (SD) | p |
|----------------------|------------|--------------------------|---|
| Self-assessed oral health / Samoprocena oralnog zdravlja | | | |
| Satisfactory Zadovoljavajuće | 338 (66.3) | 8.94 (4.76) | < 0.001 |
| Unsatisfactory Nezadovoljavajuće | 172 (33.7) | 12.13 (5.18) | | |
| Dental anxiety / Strah od odlaska stomatologu | | | |
| Yes/Da | 158 (31.0) | 10.24 (5.12) | 0.608 |
| No/Ne | 351 (69.0) | 9.92 (5.08) | | |
| OHRQoL / KŽPsOZ | | | |
| With Low / Sa niskom | 131 (24.9) | 9.39 (5.41) | 0.088 |
| Without Low / Bez niskog | 396 (75.1) | 10.20 (5.49) | | |
| OHRQoL mean (SD) / KŽPsOZ srednja vrednost (SD) | | | |
| Self-assessed oral health / Samoprocena oralnog zdravlja | | | |
| Satisfactory Zadovoljavajuće | 338 (66.3) | 9.48 (1.44) | < 0.001 |
| Unsatisfactory Nezadovoljavajuće | 172 (33.7) | 11.11 (2.85) | | |

Table 6 depicts data on the status (decayed, filled, extracted, healthy) of as many as 14,840 teeth (530 × 28) evaluated in context of several questionnaire aspects – sex (529 × 28); region (530 × 28); study field (530 × 28); mother’s education (530 × 28); self-assessed oral health (510 × 28); last dental visit (501 × 28) and dental anxiety (509 × 28).

Significant differences are seen in almost every percentage comparison of decayed, filled, extracted and healthy teeth. Female and male students had approximately the same proportion of healthy and extracted teeth (=68%; =3%), with the female ones having significantly more filled and significantly less decayed teeth. Medical students reported the lowest number of decayed teeth, while the same could be said of students originally from East and South Serbia. Greatest differences were seen in numbers of decayed and healthy teeth in groups of students who perceived their oral health as satisfactory opposite to those perceiving it as unsatisfactory. There were also no significant differences between the proportions of filled teeth in students whose mothers had a university degree and those whose mothers did not.

Among the teeth most affected, the first and second molars in both the upper and lower jaw had the highest frequency (percentage) of dental caries (Figure 1a). The least affected teeth were the ones in the lower jaw’s inter-canine region (Figure 1b). On the other hand, the teeth surfaces having dental caries were more evenly distributed across different tooth groups (Figure 2). The prevalence of site one lesions was the highest in molars, while the site two lesions dominated in premolars and the upper jaw’s inter-canine region. Site three lesions were featured mostly in lower jaw premolars.

Based on the periodontal assessment of 275 students, gingivitis was identified in 99 (36%) and periodontal disease in 20 (7.3%) of them. The most prominent type of gingivitis was the catarrhal one (Figure 3a). Localized chronic periodontitis was the most prevalent one in terms of periodontal disease presence (Figure 3b). As displayed in Table 7, the mean values of all analyzed periodontal indexes were under 1.0 (n = 275).

Figure 1. Percentages of decayed teeth per tooth group: a) highest percentages of decayed teeth, b) lowest percentages of decayed teeth.

Numbers on the x-axis are a representation of the standard human dentition code system

Slika 1. Procenati karijesnih zuba: a) najviši procenat karijesnih zuba, b) najniži procenat karijesnih zuba.
Table 6. Proportion of decayed, filled, extracted and healthy teeth across different questionnaire aspects

| Variable                  | Promenljiva          | Sex/Muški (n (%) DT n (%) K) | Female/Ženski (n (%) FT n (%) P) | p          | Region/Regija (X² p < 0.01) | Belgrade/Beograd (n (%) DT n (%) K) | West and Central Serbia / Zapadna i Centralna Srbija (n (%) FT n (%) P) | East and South Serbia / Istočna i Južna Srbija (n (%) ET n (%) E) | Other/Ostalo (n (%) HT n (%) Z) |
|---------------------------|-----------------------|------------------------------|----------------------------------|------------|-------------------------------|------------------------------------|======================================================================|==================================================================|-----------------------------|
|                           |                       | 686 (13.24)                  | 866 (16.72)                      | 150 (2.9)  | 3478 (67.14)                  | 690 (11.05)                       | 870 (13.93)                                                          | 140 (2.24)                                                        | 4544 (72.77)                |
|                           |                       |                              |                                  |            |                               | 442 (10.39)                       | 816 (19.17)                                                          | 107 (2.51)                                                        | 2891 (67.93)                |
|                           |                       |                              |                                  |            |                               | 248 (9.95)                        | 362 (14.53)                                                          | 40 (1.61)                                                         | 1842 (73.92)                |
|                           |                       | 246 (13.31)                  | 277 (14.99)                      | 29 (1.57)  | 1296 (70.13)                  | 246 (13.31)                       | 277 (14.99)                                                          | 29 (1.57)                                                         | 1296 (70.13)                |

| Study field / Oblast studiranja (X² p < 0.01) |                       |                            |                              |            |                               | 446 (10.55)                       | 779 (18.42)                                                          | 107 (2.53)                                                        | 2896 (68.5)                |
|                                               | Medical / Medicinske nauke |                              |                                  |            |                               | 770 (11.9)                        | 1215 (18.78)                                                          | 245 (3.79)                                                        | 4238 (65.52)                |
|                                               | Social / Društvene nauke |                              |                                  |            |                               | 38 (12.34)                        | 70 (22.73)                                                           | 9 (2.92)                                                         | 191 (62.01)                 |
|                                               | Life / Prirodne nauke |                              |                                  |            |                               | 253 (11.02)                       | 393 (17.12)                                                          | 48 (2.09)                                                         | 1602 (69.77)                |
|                                               | Technical / Tehničke nauke |                              |                                  |            |                               | 192 (12.47)                       | 247 (16.04)                                                          | 54 (3.51)                                                         | 1047 (67.99)                |

| Mother’s education / Obrazovanje majke (X² p < 0.01) |                       |                            |                              |            |                               | 1117 (11.98)                     | 1662 (17.82)                                                          | 311 (3.34)                                                        | 6234 (66.86)                |
|                                                     | <University degree/ <Fakultetsko |                              |                                  |            |                               | 523 (9.48)                        | 960 (17.4)                                                           | 135 (2.65)                                                        | 3898 (70.67)                |

| Self-assessed oral health / Samoprocena oralnog zdravlja (X² p < 0.01) |                       |                            |                              |            |                               | 821 (8.67)                       | 1631 (17.23)                                                          | 187 (1.98)                                                        | 6825 (72.12)                |
|                                                                     | Unsatisfactory/Nezadovoljavajuće |                              |                                  |            |                               | 779 (16.8)                        | 927 (19.25)                                                          | 154 (3.2)                                                         | 2956 (61.38)                |

| Last dental visit / Poslednja poseta stomatologu (X² p < 0.01) |                       |                            |                              |            |                               | 1062 (10.47)                     | 1948 (19.71)                                                          | 282 (2.85)                                                        | 6592 (66.69)                |
|                                                             | < 1 year / < 1 godine |                              |                                  |            |                               | 508 (12.26)                       | 583 (14.07)                                                          | 113 (2.73)                                                        | 2940 (70.95)                |

| Dental anxiety/ Strah od odlaska stomatologu (X² p < 0.01) |                       |                            |                              |            |                               | 562 (12.7)                        | 716 (16.18)                                                          | 151 (3.41)                                                        | 2995 (67.7)                 |
|                                                            | Yes/Da |                              |                                  |            |                               | 1018 (10.36)                      | 1794 (18.25)                                                          | 246 (2.5)                                                         | 6770 (68.88)                |

Figure 2. Distribution of caries lesion sites across the whole dentition (%).

Figure 3. Results of periodontal assessment: a) distribution of gingivitis per type, b) periodontal disease distribution per type.
Table 7. Mean of the GI, CAL, CPI and PI indexes for the total population of students

| Index   | n | Mean (SD) | Srednja vrednost (SD) |
|---------|---|-----------|-----------------------|
| GI      | 275 | 0.51 (0.5) |
| CAL     | 275 | 0.14 (0.38) |
| CPI*    | 275 | 0.26 (0.6)  |
| PI      | 275 | 0.55 (0.47) |

Table 8. GI and PI index values in terms of self-assessed oral health, dental anxiety and OHRQoL

| Variable                  | n (% | GI mean (SD) | GI (SD) | P     |
|---------------------------|------|--------------|---------|-------|
| Self-assessed oral health/ |      |              |         |       |
| Samoprocena oralnog zdravlja |      |              |         |       |
| Satisfactory/Zadovoljavajuće | 93 (62.4) | 0.47 (0.56) | 0.055   |
| Unsatisfactory/Nezadovoljavajuće | 56 (37.6) | 0.61 (0.53) |         |
| Dental anxiety / Strah od odlaska stomatologu | | | |
| Yes/Da | 37 (25) | 0.6 (0.59) | 0.264   |
| No/Ne | 111 (75) | 0.49 (0.53) |         |
| OHRQoL / KŽPsoZ | | | |
| With Low / Sa niskim | 101 (65.2) | 0.54 (0.54) | 0.257   |
| Without Low / Bez niskog | 54 (34.8) | 0.46 (0.54) |         |
| PI mean (SD) / PI (SD) | | | |
| Self-assessed oral health/ |      |              |         |       |
| Samoprocena oralnog zdravlja |      |              |         |       |
| Satisfactory/Zadovoljavajuće | 93 (62.4) | 0.56 (0.51) | 0.300   |
| Unsatisfactory/Nezadovoljavajuće | 56 (37.6) | 0.60 (0.43) |         |
| Dental anxiety / Strah od odlaska stomatologu | | | |
| Yes/Da | 37 (25) | 0.6 (0.51) | 0.818   |
| No/Ne | 111 (75) | 0.56 (0.47) |         |
| OHRQoL / KŽPsoZ | | | |
| With Low / Sa niskim | 101 (65.2) | 0.59 (0.47) | 0.308   |
| Without Low / Bez niskog | 54 (34.8) | 0.53 (0.49) |         |

No significant differences were found between the effect of self-assessed oral health, dental anxiety, and the OHRQoL on periodontal health of participating students (Table 8).

DISCUSSION

Mean DMFT score of the student population examined in our study was above 10 (10.24). The presented findings indicate that the lower average DMFT index value correlates to students from East and South Serbia, the technical study field, whose mothers possess a university degree, students who drink alcohol regularly and regard their oral health as satisfactory. Significantly higher DMFT index was seen in students who made a dental visit during the last 12 months. The nature of the utilized dental care, private or public, seems to play a minor role. Opposite to the proportion of decayed or filled teeth, sex and dental anxiety did not have a significant impact. Tooth brushing, interdental cleaning, use of fluoride toothpaste, sweetened beverages consumption, smoking and OHRQoL appear to have little effect on the students’ DMFT index values. As a parameter, a lower OHRQoL score that leans toward the absence of OHRQoL issues corresponds tightly with a satisfactory view students have of their oral health. On the other hand, the proportion of decayed, filled, extracted and healthy teeth in the examined population and its relation to the questionnaire offers a somewhat different perspective. Lower proportion of decayed teeth is strongly related to female students, students originally from East and South Serbia and the ones studying medical sciences. The same could be said of those whose mothers have higher level of education (university degree), who have visited dentist's office in the past 12 months, do not experience dental anxiety and students who perceive their oral health as satisfactory. It is also apparent that female students, together with those who visited dentist more regularly and did not suffer from dental anxiety, had a significantly higher percentage of filled teeth. When it comes to teeth and tooth surfaces mostly affected by caries, this study's results follow conventional trends [16]. Highest caries prevalence is seen on occlusal surfaces of molars and approximal surfaces of incisors, canines and premolars, especially in the upper jaw. The cervical one-third of canines and premolars of the lower jaw is also the surface significantly affected. In terms of periodontal disease, only a handful of students have been diagnosed with some level of periodontitis. At the same time, the average values of GI, CAL, CPI and PI indices well below one did not indicate severe periodontal issues in the examined population.

The average DMFT index value of the total number of participants in this study was higher than the same score in similar studies. The average DMFT score of 10.24 (SD 5.33) was closest to the DMFT value of undergraduate students of dentistry and medicine in Russia—7.46 (SD 4.43) followed by a score reported in Korean students—mean DMFT of 6.1 (SD 4.0) [10, 17]. When only the DMFT values of medical students from this study were analyzed, the differences became less apparent (DMFT=9.67 [SD 5.01]). Compared to the population of 30-year-olds in Adelaide, Australia (DMFT=2.1), 18-year-olds in Hong Kong, China (DMFT=1.4 [SD 1.8]) and first-year students in Okayama, Japan (DMFT=2.01 [SD 2.88]) the values were significantly higher [18, 19, 20]. It is also worth mentioning that the number of filled teeth in these studies accounts for most of the DMFT score (80-90%) while in the current study that is not the case – around 60% [10, 19]. Such finding indicates that the undergraduate students in Belgrade have more active caries lesions and extractions than their fellow students elsewhere.

Additionally, Russian students differ significantly between groups of low and without low OHRQoL, which is not typical in Belgrade students (Table 6) [10]. In that sense, undergraduate students in Belgrade were more similar to the 19-year-old Swedes [21]. Average GI index of Belgrade students was almost twice the value reported for Northwest Russian area (0.51 and 0.27) [10]. However, neither value surpassed the score of one, indicating low gum inflammation in both cases.

Compared to the 1987 oral health assessment study, the mean DMFT had decreased from 12.5 in 1987 to 10.2 in
CONCLUSION

This study’s findings suggest a decrease in the average DMFT of young adults during the last 30 years and a rise in the percentage of decayed teeth on a population level. It is also clear that students in Belgrade had worse overall oral health than their peers from Russia, China, Japan or Sweden. Furthermore, it is indicative that the student’s self-awareness on the topic of oral health could have a significant influence on some of the clinical variables examined in this study. Further research is necessary on specific socio-economic and loco-regional determinants that can potentially explain oral health discrepancies between the students from different regions observed in this study. Future studies should also focus on multi-year prospective research into changes that potentially occur over time to the same participants. That is why more active inclusion of private and public dental professionals backed by governing bodies and effective regulation is an essential aspect of a reliable and successful community approach to the nation’s wellbeing in terms of oral health.

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Oralno zdravlje mladih u Srbiji – kliničke i nekliničke determinante kod studenata osnovnih studija u Beogradu

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KRATAK SADRŽAJ
Uvod U Srbiji je malo informacija o statusu oralnog zdravlja (OZ) mladih od 19 do 26 godina. Ova studija imala je za cilj da istraži trendove u statusu OZ-a i kvalitetu života povezanom sa oralnim zdravljem (KŽPsOZ) u populaciji studenata osnovnih studija u Beogradu.

Materijal i metode Studija je obuhvatila ukupno 699 studenata sa različitih fakulteta kod kojih je analiziran status zuba. Njih 530 je uzelo učešće u anketi o oralnom zdravlju, a kod 275 je evaluiran parodontalni status. Anketni upitnik sastoji se iz šest odeljaka – osnovnih ličnih informacija, sociodemografskih podataka, oralnozdravstvenih navika i korišćenja stomatološke službe, faktora rizika, samoprocene OZ-a i KŽPsOZ-a. Klinička procena izvršena je korišćenjem prosečnog karijes indeksa (KIP); gingivalnog indeksa; nivel a pripojnog epitelia; proodontalnog i plak indeksa. Procenta KŽPsOZ-a sprovedena je kroz primenu modificovanog OHIP-14 instrumenta.

Rezultati Vrednost KIP-a ispitivane populacije iznosila je 10,24. Kod studenata iz Istočne i Južne Srbije ove vrednosti su bile nešto manje (KIP = 8,69), kao i kod grupacije fakulteta tehničkih nauka (KIP = 8,84), kod onih čija majka poseduje fakultetsku diplomu (KIP = 9,33), odnosno onih koji svoje OZ-e smatraju zadovoljavajućim (KIP = 8.94). Nije pronađena nacija ovih vrednosti KŽPsOZ-a uočena je kod studenata sa zadovoljavajućem procenom XO-a (KIP = 9,48). Procenta zdravstvenog aparata zuba nije pokazala značajne razlike u vrednostima analiziranih indeksa.

Zaključak Vrednost KIP-a u populaciji mladih u Beogradu bila je manja u periodu između 1987. i 2012. godine (sa 12,5 na 10,4). Samoprocena OZ-a značajno korelira sa vrednostima KIP-a i KŽPsOZ-om.

Ključne reči: status oralnog zdravlja; kvalitet života povezan sa oralnim zdravljem; studenti

UVOD
Oralno zdravlje predstavlja sastavni deo opšteg zdravlja neophodnog za celokupno fizičko i mentalno blagostanje pojedinca [1]. Studija globalnog tereta bolesti (GBD) iz 2015. godine utvrdila je da je čak 2,5 milijarde ljudi pogođeno nelečenim zubnim bolestima, a nedavni izveštaji sugerišu da ukupni troškovi zbog karijesa, a nedavni izveštaji sugerišu da ukupni troškovi, a nedavni izveštaji sugerišu da ukupni troškovi, udeo obaveznog zdravstvenog plana finansiranog iz državnog budžeta. Sledećih sedam godina oko 250000 studenta trčkove stomatoloških usluga finansiralo je sopstvenim prihodima. U Srbiji je malo informacija o statusu oralnog zdravlja (OZ) mladih od 19 do 26 godina. Ova studija imala je za cilj da istraži trendove u statusu OZ-a i kvalitetu života povezanom sa oralnim zdravljem (KŽPsOZ) u populaciji studenata osnovnih studija u Beogradu. Studija je obuhvatila ukupno 699 studenata sa različitih fakulteta kod kojih je analiziran status zuba. Njih 530 je uzelo učešće u anketi o oralnom zdravlju, a kod 275 je evaluiran parodontalni status. Anketni upitnik sastoji se iz šest odeljaka – osnovnih ličnih informacija, sociodemografskih podataka, oralnozdravstvenih navika i korišćenja stomatološke službe, faktora rizika, samoprocene OZ-a i KŽPsOZ-a. Klinička procena izvršena je korišćenjem prosečnog karijes indeksa (KIP); gingivalnog indeksa; nivel a pripojnog epitelia; proodontalnog i plak indeksa. Procenta KŽPsOZ-a sprovedena je kroz primenu modificovanog OHIP-14 instrumenta.

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Ključne reči: status oralnog zdravlja; kvalitet života povezan sa oralnim zdravljem; studenti

MATERIJAL I METODE
Studija je uključila anketu o oralnom zdravlju, procenu statusa zuba i stanje potpornog aparata zuba. Učesnici u ovoj studiji bili su studenti na fakultetima Univerziteta u Beogradu između oktobra 2011. i januara 2012. godine. Ukupno 699 studenata osnovnih studija uzrasta od 19 do 26 godina u Republici Srbiji za 2012. godinu i analizira sveobuhvatan pregled kvaliteta života povezanog sa oralnim zdravljem.
projekta razvoja globalnih indikatora oralnog zdravlja – EGOHID II [9]. Anketa je sprovedena na Klinici za Bolesti zuba Stomatološkog fakulteta Univerziteta u Beogradu pre sprovedenja stomatološkog pregleda. U Odeljku 1 upitnika prikupljene su osnovne informacije o učesnicima studije – starost, pol, mesto rođenja i pohađani fakulteti (medicinske naute / društvene naute / prirodne naute / tehničke naute / ostalo [druge visokoškolske ustanove u Beogradu]). Odeljak 2 se fokusirao na sociodemografske karakteristike prilagođene studentskoj populaciji – godine studija; nivo obrazovanja roditelja (bez fakultetske diplome – visoka i viša škola / sa fakultetskom diplomom); radni status roditelja (zaposleni / nezaposleni / neaktivni); sredstva za finansiranje studija (roditelji / stipendije / studentski kredit / samoinšantriranje / drugo). U Odeljku 3 fokus je postavljen na procenu korišćenja stomatološke zdravstvene zaštite kao i oralnoghiijenskih navika studenata – poslednja poseta stomatologu (u poslednjih 12 meseci / pre više od 12 meseci / nisam siguran); razlozi poslednje posete (kontrola / rutinsko lečenje / hitno lečenje / protetski / ortodontski razlozi); pružalač stomatološke zaštite (privatni stomatolog / državna služba / nisam siguran); učestaloća pranja zuba (jednom dnevno ili manje / najmanje dva puta dnevno); učestaloća zamene četkica za zube (mesečno / tromesečno / dvogodišnje / godišnje); upotreba paste za zube na bazu fluorida (da / ne / nije siguran/a); upotreba interdentalne četkice ili konca (da / ne). Odeljak 4 je uključivao podatke o prisustvu loših navika a u vezi sa potvrđenim faktorima rizika – broj obroka (hrana i pije) dnevno (do tri puta pr 자기 / više od tri puta dnevno); konzumacija zaslađenih pića (da, svakodnevno ili povremeno / nikad / nisam siguran/a); pušenje cigareta i konzumacija alkohola (da, redovno ili povremeno / nikada). Odeljak 5 pružio je podatke o samoprocenjivanju oralnog zdravlja (uzgodavljajuće / nezadovoljavajuće). U Odeljku 6 su bili podaci o prisustvu straha podatke o samoprocenjivanju oralnog zdravlja (uzgodavljajuće / nezadovoljavajuće). U Tabeli 1 prikazan je KIP indeks ukupnog broja studenata podatke o samoprocenjivanju oralnog zdravlja (uzgodavljajuće / nezadovoljavajuće). U tabeli 1 prikazano je KIP indeks ukupnog broja studenata podatke o samoprocenjivanju oralnog zdravlja (uzgodavljajuće / nezadovoljavajuće).
sociodemografskih aspekata, ali je bilo kod ostalih parametara. Najniža vrednost KIP-a zabeležena je kod studenata poreklom iz regiona Istočne i Južne Srbije. Vrednosti KIP-a nisu se značajno razlikovale između Beograda, Zapadne i Centralne Srbije i ostalih regiona i država. Ispitanci koji studiraju tehničke nauke imali su znatno niži KIP-a, a studenti medicinskih nauka. Najviše vrednosti KIP-a uočene su kod studenata prirodnih nauka i studenata drugih visokoškolskih ustanova. Nivo mačijinog obrazovanja imao je značajnu ulogu u vrednostima KIP-a studenata, pri čemu su oni čija je majka imala fakultetsku diplomu imali značajno niže vrednosti.

Ni kod jednog parametra nisu uočene značajne razlike u vrednostima KIP-a, osim u slučaju vremena poslednje posete stomatologu. Studenti koji su stomatologa posetili u poslednjih godinu dana imali su viši KIP, a to u vrednosti od 10,61, u poređenju sa onima koji su posetu obavili pre više od godinu dana – 8,64. Rezultati prikazani u Tabeli 3 takođe pokazuju da nema statistički značajne razlike u vrednostima KIP-a u odnosu na stomatološku negu dobijenu kod privatnog ili državnog stomatologa.

Kada se posmatraju navike studenata prema faktorima rizika prikazanih u Tabeli 4, samo je konzumacija alkohola značajno uticala na vrednost KIP-a kod studenata. Studenti koji su sva-kodnevno/povremeno konzumirali alkohol imali su znatno niži KIP od onih koji su izjavili da nikada ne piju alkohol na pića (9,71 i 10,69).

Studenti koji su ocenili da je njihovo oralno zdravlje zadovoljavajuće imali su niži KIP, vrednosti 8,94, od onih koji su oralnim zdravljem nezadovoljni – KIP vrednosti 12,13. Isto trend prema je kada se uporede prosečne vrednosti KŽPsOZ-a – zadovoljni studenati sa ocenom 9,48 i nezadovoljni – KIP vrednosti 12,13. Studenti koji redovno konzumiraju alkohol i onima koji smatraju svoje oralno zdravlje zadovoljavajućim. Značajno viši KIP prikriven je između studenata koji su posetiili stomatološku ordinaciju u proteklih 12 meseci i onima koji smatraju svoje oralno zdravlje zadovoljavajuće. Takođe nisu uočene značajne razlike u vrednostima KIP-a kod studenata koji su parodi stomatološku službu. Takođe je evidentno da studenti koji su oralno zdravlje nezadovoljni – KIP vrednosti 12,13, a potom kod korejskih studenata (Istočna i Južna Srbija), sa fakultetima tehničkih nauka, odnosno studentima čije majke poseduju fakultetsku diplomu.

Izjava studenta zaime da se oni čija je majka imala fakultetsku diplomu imali znatno manje izražene (KIP = 9,71) u odnosu na onima koji su posetili stomatološku ordinaciju u proteklih 12 meseci i kod onima sa fakultetima tehničkih nauka.

Bivše studenata medicine koji su učestvovali u ovoj studiji, razlike u vrednosti KIP-a, koje podrazumevaju odsustvo teškoća i problema, potpuno odgovaraju uočenim trendovima. Značajno niži KIP od onih koji su posetili stomatologa u proteklim 12 meseci i nezadovoljni – KIP vrednosti 12,13. Kada je reč o zubima i zubnim površinama koje su uočene u studijama sličnog područja, niže vrednosti prosečnog KŽPsOZ-a, koje podrazumevaju odsustvo teškoća i problema, potpuno odgovaraju uočenim trendovima. Značajno niži KIP od onih koji su posetili stomatologa u proteklim 12 meseci i nezadovoljni – KIP vrednosti 12,13. Kada je reč o zubima i zubnim površinama koje su uočene u studijama sličnog područja, niže vrednosti prosečnog KŽPsOZ-a, koje podrazumevaju odsustvo teškoća i problema, potpuno odgovaraju uočenim trendovima. Značajno niži KIP od onih koji su posetili stomatologa u proteklim 12 meseci i nezadovoljni – KIP vrednosti 12,13. Kada je reč o zubima i zubnim površinama koje su uočene u studijama sličnog područja, niže vrednosti prosečnog KŽPsOZ-a, koje podrazumevaju odsustvo teškoća i problema, potpuno odgovaraju uočenim trendovima.
30-godišnjaka u Adelejdu, Australija (KIP = 2,1), 18-godišnjaka u Hong Kongu, Kina (KIP = 1,4) i studenata prve godine studija u Okajami, Japan (KIP = 2,01), vrednosti su znatno više [18, 19, 20]. Vredno je napomenuti da broj plombiranih zuba u ovim studijama zauzima veći udeo KIP-a (80-90%), dok u našoj studiji to nije slučaj – oko 60% [10, 19]. Takav nalaz ukazuje na to da studenti osnovnih studija u Beogradu imaju veći broj aktivnih karijesnih lezija, kao i veći broj ekstrakcija od kolega sa određenih univerziteta u inostranstvu.

Uz sve navedeno, ruski studenti se značajno razlikuju po grupama sa niskim i bez niskog KŽPsOZ-a, što nije tipično za beogradske studente [10]. U tom smislu, studenti osnovnih studija u Beogradu sličniji su 19-godišnjim Šveđanima [21]. Prosečni GI indeks beogradskih studenta gotovo je dvostruko veći od vrednosti istog parametra za studente iz severozapadne Rusije (0,51 i 0,27) [10]. Međutim, obe vrednosti ne prelaze graničnu vrednost od jedan, što ukazuje na odsustvo inflamacije gingive.

U poređenju sa studijom procene oralnog zdravlja iz 1987. godine, KIP je opao sa 12,5 u 1987. na 10,2 u 2012. U pogledu procenta zuba pogođenih karijesom, broj je porastao sa 31% u 1987. na 38% u 2012. [7]. Ostaje nejasno da li su razlozi navedenog skoka ekonomske prirode, neefikasnosti preventivnih programa u dečijom dobu, regulatornih pitanja ili individualnih faktora. Takođe, rezultati ove studije pokazuju da je veći broj zdravih zuba u mlađim studentima, nego u starijim. Navedeni rezultat podudara se sa konstatacijama da visok nivo majčine edukacije i adekvatno oralno zdravlje majke pozitivno utiču na oralno zdravlje tokom detinjstva, a kasnije i tokom odraštanja [22]. Udeo plombiranih zuba takođe se uvećao sa 46,4% na 54,5%, dok je procenat ekstrahovanih zuba zabeležio značajan pad sa 22,4% na 7,4% [7]. To potencijalno ukazuje na prelazak sa hirurškog na konzervativniji pristup u stomatološkom lečenju pacijenata studentske populacije u periodu između dve studije.

Odeljak 6 upitnika, a na temu KŽPsOZ-a, sadrži svega osam pitanja koja se odnose na originalni OHIP-14 obrazac. Iako se unutrašnja konzistentnost primenjene ankete na temu KŽPsOZ može smatrati prihvatljivom (Kronbahova alfa > 0,7 [0,778; 0,703]), ona je i dalje značajno ispod nivoa vrednosti iznad 0,85 dostignutog u studijama koje primenjuju originalni koncept OHIP-14 obrasca [8, 16]. Drugi evidentan nedostatak ove studije jeste i činjenica da su procenu stomatološkog statusa i stanja parodoncijuma sprovodili studenti stomatologije. I pored neposrednog nadzora kliničkih lekara, ostaje nejasno da li je kvalitet obavljenog pregleda u svim slučajevima bio na zadovoljavajućem nivou.

ZAKLJUČAK

Nalazi ove studije ukazuju na smanjenje KIP-a kod mladih starosti od 19 do 26 godina tokom poslednjih 30 godina i porast procenta karijesom zahvaćenih zuba na nivou populacije. Na osnovu komparativnih analiza uočava se da populaciona grupa studenata u Beogradu sveukupno ima lošije oralno zdravlje od svojih kolega iz Rusije, Kine, Japana ili Švedske.

Panorama oralnog zdravlja ima značajan uticaj na neke od kliničkih determinanti analiziranih u okviru ovog istraživanja. Dalja ispitivanja neophodna su u kontekstu određenih socio-ekonomskih i lokalno-regionalnih specifičnosti koje mogu objasnjiti razlike u oralnom zdravlju između studenata porekлом iz različitih regiona. Buduća istraživanja takođe je neophodno usredsrediti na prospektivna istpitivanja promena koje se potencijalno dešavaju u funkciji vremena kod istih ispitanika. Iz tih razloga akcent je potrebno staviti na aktivnije uključivanje privatnih i državnih stomatologa i na obezbeđivanje podrške regulatornim tela radi pouzdanijeg i uspešnijeg pristupa zajednici u pogledu oralnog zdravlja.

Zahvalnica: Ova studija izvedena je u okviru projekta „Zaigriz Znanje Zdravim Zubima“ finansiranog sredstvima Ministarstva prosvete, nauke i tehnološkog razvoja Republike Srbije (Projekat br. 451-02-266 / 2011-05). Želimo da se zahvalimo osobljim Klinike za bolesti zuba i Klinike za parodontologiju i oralnu medicinu Stomatološkog fakulteta Univerziteta u Beogradu na njihovom predanom radu, ali i do programa koji su ovoj studiji između dve studije.

Odeljak 6 upitnika, a na temu KŽPsOZ-a, sadrži svega osam pitanja koja se odnose na originalni OHIP-14 obrazac. Iako se unutrašnja konzistentnost primenjene ankete na temu KŽPsOZ može smatrati prihvatljivom (Kronbahova alfa > 0,7 [0,778; 0,703]), ona je i dalje značajno ispod nivoa vrednosti iznad 0,85 dostignutog u studijama koje primenjuju originalni koncept OHIP-14 obrasca [8, 16]. Drugi evidentan nedostatak ove studije jeste i činjenica da su procenu stomatološkog statusa i stanja parodoncijuma sprovodili studenti stomatologije. I pored neposrednog nadzora kliničkih lekara, ostaje nejasno da li je kvalitet obavljenog pregleda u svim slučajevima bio na zadovoljavajućem nivou.

ZAKLJUČAK

Nalazi ove studije ukazuju na smanjenje KIP-a kod mladih starosti od 19 do 26 godina tokom poslednjih 30 godina i porast procenta karijesom zahvaćenih zuba na nivou populacije. Na osnovu komparativnih analiza uočava se da populaciona grupa studenata u Beogradu sveukupno ima lošije oralno zdravlje od svojih kolega iz Rusije, Kine, Japana ili Švedske.

Panorama oralnog zdravlja ima značajan uticaj na neke od kliničkih determinanti analiziranih u okviru ovog istraživanja. Dalja ispitivanja neophodna su u kontekstu određenih socio-ekonomskih i lokalno-regionalnih specifičnosti koje mogu objasnjiti razlike u oralnom zdravlju između studenata porekлом iz različitih regiona. Buduća istraživanja takođe je neophodno usredsrediti na prospektivna istpitivanja promena koje se potencijalno dešavaju u funkciji vremena kod istih ispitanika. Iz tih razloga akcent je potrebno staviti na aktivnije uključivanje privatnih i državnih stomatologa i na obezbeđivanje podrške regulatornim tela radi pouzdanijeg i uspešnijeg pristupa zajednici u pogledu oralnog zdravlja.

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