

Edentulism in the elderly in Montenegro

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SUMMARY

Introduction For the first time in Montenegro, a survey was conducted to examine the oral health status of the elderly.

Materials and methods The study included 170 subjects of both genders, average age 72.32 ± 6.85 years. The research methodology was in line with the WHO methodological guidelines for epidemiological studies of national oral pathology. For statistical analysis of data IBM STATISTICS 20 was used. Descriptive and inferential statistical methods, Tamhane T2 post hoc tests, χ^2 test were applied. The homogeneity of the dispersions was checked by the Leven test. The significance level was set to 0.05.

Results The DMFT value was 29.417 ± 3.81 (MT: 26.25 ± 6.95 ; FT: 2.68 ± 3.98 ; DT: 0.63 ± 1.56) and it was significantly higher in women, smokers and people who did not visit the dentist regularly. The percentage of edentulous persons was 46.47%. The index of dental rehabilitation - IRD was 73.86%. The average age of dentures was 11 years.

Conclusion The state of oral health of the elderly in Montenegro is not at satisfactory level, which is reflected in the high percentage of edentulous people and unfavorable structure of DMFT.

Keywords: edentulous; elderly; dental rehabilitator; Montenegro

INTRODUCTION

Improving oral health is a basic prerequisite for improving general health [1]. This is especially important for the elderly whose general health is impaired and burdened by chronic diseases. Research in the region [2], Europe [3, 4, 5] and other continents [6–9] has influenced the launch of research on the oral health status of the elderly in Montenegro. Studies of the impact of oral health on the quality of life have been conducted worldwide for more than five decades and a high degree of interdependence between quality of life and oral health has been proven [10–14]. These findings have been implemented in a new definition of oral health [15, 16]. About 30% of Europeans, aged between 65 and 74, no longer have their natural teeth [17]. There is a recommendation for the implementation of oral health in general health prevention programs, which should result in people up to the age of 65 preserving at least 20 natural teeth [18]. Numerous authors have investigated the influence of oral health habits, socio-economic status and other characteristics on the occurrence of oral diseases and consequent edentulousness [5, 6, 7, 17–23]. Demographic data indicate a decades-long trend of population aging [24]. In order to prepare the health system for the increased number of elderly patients in the future, it is necessary to collect data on the state of oral health.

The aim of the research was to examine the state of oral health of the elderly in the central region of Montenegro.

MATERIAL AND METHOD

Prior to the implementation of the research, obligatory measures were taken, such as obtaining approval from the

Ethics Committee of the Medical Faculty of the University of Montenegro in Podgorica. A research plan was made, respondents were informed and their consent to participate in the research was obtained.

All clinical examinations were performed by one dentist (a specialist in dental prosthetics, who was trained to analyze oral health data using relevant indices) according to the principles of good clinical practice. Kappa statistics were used to test the reliability of the researcher. The Kappa value estimated after retesting for intra-consistency of the investigator was 0.94.

Sample research

The study included 170 people with an average age of 72.32 ± 6.85 . The method of including respondents in the research was based on the following characteristics:

1. Persons aged 65 and over who applied for an examination at the Faculty of Medicine in Podgorica - Study program of dentistry on certain days (Mondays and Wednesdays) in the period from September to December 2016 were included.

2. All users of the services of homes for the elderly "Nana" and "Ljubav spaja" in Spuž and Danilovgrad were included, whose state of general and mental health allowed them to be examined.

All respondents voluntarily agreed to participate in the research after they were explained the purpose of the research, the method of distribution of the obtained data and the anonymity of participation.

The sample was 5% according to the number of inhabitants aged 65 and over in the central part of Montenegro and it was statistically allocated so that the expected coefficient of variation falls between 8 and 11%.

The first research instrument used was a clinical examination of oral health, according to the WHO methodology, using the methodological guidelines for epidemiological studies of national oral pathology [25].

Data related to the number of carious, extracted and filled teeth, data on present dental restorations (fixed and mobile) and the age of dental restorations were analyzed.

The state of oral health was assessed on the basis of relevant indices, showing the following:

1. Caries status was registered using Klein Palmer's DMF system (D – Decayed, M – Missing, F – Filled) [26]. Caries was diagnosed by inspection with the help of a dental probe and a flat dental mirror, in daylight. Dental caries (K) was characterized by lesions with a clearly formed cavity on the tooth surface. Changes in transparency and initial demineralization of enamel with an intact surface that did not lead to disruption of dental tissue continuity were not registered. The term filling (P) included all permanent and temporary fillings of teeth. Extracted (E) teeth were all extractions caused by caries or periodontal disease. This indicator was presented in total for all respondents, in relation to certain characteristics of the respondents.

2. DMFT index – average caries index (DT – average number of carious teeth, MT – average number of extracted teeth, FT – average number of filled teeth).

3. IRZ index – The dental rehabilitation index was used to express (in percentage) how many lost teeth were replaced by making dental prosthetic restorations (fixed and mobile). It was calculated: number of restored teeth / number of extracted teeth + number of restored teeth x 100.

4. The presence of dental prosthetic restorations (fixed and mobile) and their age were recorded.

The second research instrument was a closed-ended questionnaire with 4 questions:

Q1 – When was the last time you went to the dentist?

Q2 – What are the reasons for your last visit to the dentist?

Q3 – Are you a user of tobacco products?

Q4 – What do you recognize as the main reason for the loss of your teeth?

During the examination, the respondents were given advice on how to properly maintain oral tissue, teeth and dental restorations. Dental restorations were reviewed and advice was given on how to maintain them.

In statistical processing, the collected data were processed using the statistical program IBM STATISTICS 20. Methods of descriptive and inferential statistics were used. Of the descriptive methods, the arithmetic mean and standard deviation were used. As part of inferential statistics, the t test for two independent samples, the χ^2 test, the Tamhane T2 percent hoc test, and the ANOVA were used. The homogeneity of the dispersions was checked by the Leven test. The significance level was set to 0.05.

RESULTS

Sample structure

A total of 170 people were examined. The structure of respondents by gender showed that there were 89 (52.35%)

females and 81 (47.64%) males. The average age of the subjects was 72.32 ± 6.85 . Of which 104 (61.17%) were respondents aged 65–74, 53 (31.17%) aged 75–84 and 13 (7.6%) aged 85 and older. According to the place of residence in the cities of the central region of Montenegro: there were 114 (67.05%) from Podgorica, 20 (11.76%) from Danilovgrad, 22 (12.94%) from Nikšić, and 14 from Cetinje (8.23%). The structure of respondents by level of education showed that most respondents had secondary education – 64 (37.64%), 39 (22.94%) had an academic education, 27 (15.88%) had a college degree, 32 (18.82%) were with primary education while 8 (4.70%) were without education.

Analysis of the oral health status of the respondents

Out of 170 examined persons, 79 (46.47%) were edentulous. DMFT was 29.417 ± 3.81 (min 15; max 32). The structure of DMFT showed that the subjects had an average of 26.25 ± 6.95 extracted teeth – MT, 2.68 ± 3.98 filled teeth – FT, while the number of carious teeth per subject was on average 0.63 ± 1.56 (damaged teeth DT). Subjects had an average of 2.39 ± 3.66 healthy teeth and 7.14 ± 9.19 prosthetically unrehabilitated teeth.

The presence of remaining natural teeth expressed according to the segments of dentition (which was important for the planning of prosthetic therapy) showed that the subjects had on average a higher number of teeth in lower dental arch (1.14) compared to the upper dental arch (0.73). In the anterior segments of dental arches, the number of preserved natural teeth was higher than in the posterior. In the lower anterior segments, the average number of natural teeth was the largest and it was 2.22, while in the upper anterior segment it was 1.29. The presence of the first permanent molars was on average 0.41 per subject (25.88% of persons had between 1 and 3 first permanent molars).

DMFT analysis according to the characteristics of the respondents

The study showed that females had statistically higher value of DMFT compared to males ($t = -2.593$; $p = 0.011$) (Table 1).

Persons who were users of tobacco products had significantly higher value of DMFT compared to persons who did not use tobacco products ($t = 2.279$; $p = 0.024$) (Table 1).

The data showed statistically significant difference in the value of DMFT according to the time elapsed since the last visit to the dentist. People who have visited dentist in the last 12 months had significantly lower DMFT value compared to subjects who have not seen dentist longer (between 1 and 5 years; more than 5 years) (ANOVA; $F = 4.805$; $p = 0.009$). Leven's test indicated heterogeneity of dispersions ($p < 0.001$) (Tamhane test, $p = 0.009$) (Table 2).

There was no statistically significant difference in the values of DMFT in the subjects in relation to age ($t = -1.147$; $p = 0.253$).

Table 1. Existence of a statistical difference in the value of DMFT according to the sex of respondents and according to the use of tobacco products**Tabela 1.** Postojanje statističke razlike u vrednosti KEP-a prema polu ispitanika i prema korišćenju duvanskih proizvoda

Respondent characteristics Karakteristike ispitanika	n	Value DMFT Vrednost KEP-a	Statistical difference of average values Statistička značajnost srednjih vrednosti	Statistic test and significance Statistički test i značajnost
Gender of respondents Pol ispitanika				
Male Muški	81	28.21 ± 4.42	0.1683 ± 0.03	χ^2 test
Female Ženski	89	30.16 ± 3.14	0.1774 ± 0.02	t = -2.593; p = 0.011*
Use of tobacco products Upotreba duvanskih proizvoda				
Yes Da	54	29.33 ± 3.76	0.1784 ± 0.02	χ^2 test
No Ne	116	28.80 ± 4.24	0.1708 ± 0.03	T = 2.279; p = 0.024*

Explanation of labels in the table: *existence of statistically significant difference
Objašnjenje oznaka u tabeli: *postojanje statistički značajne razlike

Table 2. Existence of a statistical difference in the value of DMFT according to the time elapsed since the last visit to the dentist**Tabela 2.** KEP prema vremenu proteklom od poslednje posete stomatologu

Time since last dental visit (I) Vreme proteklo od poslednje posete stomatologu (I)	n	Value DMFT Vrednost KEP-a	Time since last dental visit (J) Vreme proteklo od poslednje posete stomatologu (J)	Statistical difference of average values (I i J) Statistička razlika prosečnih vrednosti (I i J)	p
up to 12 months do 12 meseci	45	28.17 ± 4.45	from 1 to 5 years od 1 do 5 godina	-0.0659	0.459
			5 years and more 5 godina i više	-0.01376*	0.009
from 1 to 5 years od 1 do 5 godina	67	29.10 ± 3.73	up to 12 months do 12 meseci	.00659	0.459
			5 years and more 5 godina i više	-0.00717	0.145
5 years and more 5 godina i više	58	30.56 ± 2.70	up to 12 months do 12 meseci	.01376*	0.009
			from 1 to 5 years od 1 do 5 godina	.00717	0.145

Explanation of labels in the table: *existence of statistically significant difference
Objašnjenje oznaka u tabeli: *postojanje statistički značajne razlike

Table 3. Presence of dental restorations**Tabela 3.** Prisustvo stomatoprotetskih nadoknada

Type of dental restoration Prisutne stomatoprotetske nadoknade	n (%)	Male – n Muškarci – n	Female – n Žene – n
Fixed prostheses Fiksne nadoknade	16 (9.41%)	11	9
Mobile prosthesis in one jaw and a fixed prosthesis in the other U jednoj vilici mobilna, u drugoj fiksna nadoknada	10 (5.88%)	5	5
Mobile dental restorations in both jaws U obe vilice mobilna zubna nadoknada	83 (48.82%)	29	54
Mobile prostheses in one jaw and no prostheses in the other jaw U jednoj vilici mobilna nadoknada, u drugoj nenadoknadeni ekstahovani zubi	34 (20.00%)	14	19

Presence of dentures

The dental rehabilitation index – IRD was 73.86%. It was found that in 83 (48.82%) persons there were mobile dental restorations in both jaws. Thirty-four (20.00%) subjects had dentures in one jaw and no dental restorations in the other jaw. There were 16 (9.41) persons with fixed prostheses. The number of persons who had dentures in one jaw and a fixed prosthesis in the other jaw was 10 (5.88%) (Table 3).

The average age of dental prostheses was 11 years: 59 were between 0–5 years old (41%), 36 were 6–10 years old (25%), 19 were 11–19 years old (13%), 18 19–20 years old (12.5%) and 12 were 30+ years old (8%).

Analysis of the answers to the questions from the questionnaire

Reasons for teeth loss: 108 (63.52%) reported caries, while 61 (35.88%) reported periodontitis. One respondent (0.58%) cited trauma as the cause (Table 4). It was noticeable that women had decay more often (63, 71.59%) compared to periodontitis 25 (28.40%). For males, approximately the same number of subjects had decay 45 (54.87%) or periodontal disease 37 (45.12%) as a reason for teeth loss.

The last visit to the dentist in 58 (34.11%) was more than 5 years ago. In 37 (21.76%) subjects 2–5 years have passed since the last visit. In 30 (17.64%) subjects the visit

to the dentist was 1–2 years ago. It has been 6–12 months since the last visit for 16 (9.41%) subjects, and less than 6 months for 29 (17.05%) persons (Table 4).

Table 4. Analysis of questionnaire results

Tabela 4. Analiza rezultata upitnika

Questions and offered answers Pitanja i ponudeni odgovori	n	%
Causes of tooth loss Uzroci gubitka zuba		
Caries Karijes	108	63.52
Periodontal disease Parodontopatija	61	35.88
Last visit to the dentist Posljednja poseta stomatologu		
< 6 months < 6 meseci	29	17.05
6–12 months 6–12 meseci	16	9.41
1–2 years 1–2 godine	30	17.64
2–5 years 2–5 godina	37	21.76
> 5 years > 5 godina	58	34.11
Reasons for last visit to the dentist Razlozi posljednje posete stomatologu		
Pain/problem with mouth teeth and dentures Bol/problem sa ustima zubima i zubnim nadoknadama	101	59.41
Need for treatment Stomatološki tretman	22	12.94
Regular control Redovni pregled	21	12.35
Consultation/advice Konsultacija/savet	26	15.29
Use of tobacco products Korišćenje duvanskih proizvoda		
Yes Da	54	31.76
No Ne	116	68.23

As the reason for the last visit to the dentist, the majority of respondents 101 (59.41%) reported pain or a problem with teeth, gums or dental prosthesis. The need for consultations as the reason for the last visit to the dentist was stated by 26 (15.29%) respondents. Treatment was the reason for 22 (12.94%) subjects and regular checkup for 21 (12.35%) subjects (Table 4).

The use of tobacco products was confirmed by 54 (31.76%) respondents, while 116 (68.23%) denied their use (Table 4). Among males, there were 33 (40.74%) smokers, while among women, tobacco use was confirmed by 21 (32.59%).

DISCUSSION

Research by Petersen PE et al. [8, 27] showed that number of edentulous people age 65 and over in the world is high. Also, WHO data from 2016 [9] showed that about 30% of Europeans (prevalence varies from 5% to 51%) between the ages of 65 and 74 do not have natural teeth. If this is

compared with data from Montenegro (46.47%), it can be seen that the situation in Montenegro is worse than the European average. According to Peterson et al. [8], the situation in Europe in 2010 was as follows: in Poland, the prevalence of edentulousness in elderly was 43.9%, in Slovakia 43%, in United Kingdom 37.5%, in Hungary and Denmark 27%, in Austria 15% while in Lithuania it was lower than 13%. On other continents, the percentage of edentulousness among elderly was: in the USA 26%, in India and Indonesia 19%, in Lebanon 20%, while in China the situation was significantly better (11%).

Numerous factors influence the values of DMFT such as demographic and other characteristics of the population, behavior related to oral health, development of health systems [22] and others. In Europe, periodontal disease is the number one problem when it comes to oral health, while the caries rate has decreased significantly compared to previous decades [1, 3]. The reduction in the incidence of caries in these countries is largely the result of decades of continuous use of oral health programs. In Montenegro, caries is the dominant cause of teeth loss. The analysis of the structure of DMFT supports the fact that dental services are available to the population. However, they are much more curative than preventive, and extracted teeth predominate in structure. The existing dental service should be further improved and directed towards preventive and prophylactic methods. Continuity in the promotion of oral health should be insisted on and directed towards all population groups. Emphasis must be placed on health literacy, information and education.

Prosthetic rehabilitation expressed by the rehabilitation coefficient in this study (73.86%) indicated similarity with the results of research in the elderly in Republika Srpska [2] where 31% had an upper complete and 18% had a lower complete dentures. There were 4.6% of persons who had removable denture in one jaw and a fixed one in the other, while a fixed prosthesis was present in 10% of the subjects. In a study by Haikol et al. in Finland [28], fixed prostheses were present in 23.7% of sixty-year-olds and 38.6% of eighty-year-olds (60% of the elderly had mobile dental restorations). Thus, in Montenegro and Republika Srpska, the presence of dentures was higher compared to fixed dental restorations, while in Finland the presence of fixed dental restorations was higher.

The value of DMFT observed in relation to the gender of the subjects in this study was consistent with the results in the study of Baumgartner et al. [4] and Pan et al. [5] and was significantly higher in women than men.

Numerous studies [20, 21, 23] have proven the negative impact of using tobacco products on the increasing incidence of oral diseases, which is in line with the results in Montenegro. A statistical association between the frequency of dental visits and the value of DMFT present in examined subjects was also demonstrated in the study of Nguyen et al. [6], Popović et al. [7], as well as in numerous other studies [17, 20, 22]. DMFT values were lower in individuals who have responsible oral health behaviors.

The significance of this research is that for the first time the state of oral health of the elderly in Montenegro was examined. The obtained results can be considered

representative for the elderly living not only in the central part of Montenegro, but in the whole territory, because close to two thirds of the country's population is concentrated in the central part. In search of a specialist dental service, patients from the other two regions are gravitating towards dental practices, most of which are concentrated in Podgorica and Nikšić.

CONCLUSION

The state of oral health of the elderly in the central region of Montenegro is not at a satisfactory level. The loss of natural teeth and its consequences may become a significant public health problem in the future given the increase in the number of older people. Oral health care needs to become an integral part of state general health care and treatment programs. The promotion of healthy lifestyles and the concept of active aging should also contribute to improving oral health status of the entire population, especially the elderly.

REFERENCES

- Peres M, Macpherson L, Weyant R, Daly B, Venturelli R, Mathur M, et al. Oral diseases: a global public health challenge. *Lancet*. 2019;394:249–60. [DOI: 10.1016/S0140-6736(19)31146-8]
- Radović I, Davidović L, Krunić J, Stojanović N. Dental Status and Prosthetic Rehabilitation in Elderly Population in Relation to Socio-economic Factors in Republika Srpska. *Serb Dent J*. 2015;62(1):14–7. [DOI: 10.1515/sdj-2015-0002]
- Konopka T, Dembowska E, Pietruska M, Dymalski P, Górska R. Periodontal status and selected parameters of oral condition of Poles aged 65 to 74 year. *Przegl Epidemiol*. 2015;69(3):537–42. [PMID: 26519852]
- Baumgartner W, Schimmel M, Müller F. Oral health and dental care of elderly adults dependent on care. *Swiss Dent J*. 2015;125(4):417–26. [PMID: 26169068]
- Pan S. Sex differences in denture satisfaction. *J Dent*. 2008;36(5):301–8. [DOI: 10.1016/j.jdent.2008.02.009] [PMID: 18394770]
- Nguyen MS, Jagomägi T, Voog-Oras Ü, Nguyen T, Saag M. Oral Health Behavior and Oral Health Status of Elderly Vietnamese. *Oral Health Prev Den*. 2018;16(2):153–61. [DOI: 10.3290/j.ohpd.a40318] [PMID: 29736494]
- Moreira GE, Silva LF, Oliveira MR, Maia LSR, Fernandes LA, Lima DA. Dental self-perception and clinical dental description of participants in the Open University programme for elderly people. *RGQ, Rev Gaúch Odontol*. 2018;66(4):297–304. [DOI: 10.1590/1981-863720180004000023482]
- Petersen PE, Kandelman D, Arpin S, Ogawa H. Global oral health of older people – Call for public health action. *Comm Dent Health*. 2010;27(2):257–68. [DOI: 10.1922/CDH_2711Petersen11] [PMID: 21313969]
- Jandial S, Kotwal B, Kotwal V, Mahajan N, Kharyal S, Tomar V. Prevalence of complete and partial edentulism in the patients visiting district hospital of Kathua, Jammu, Kashmir and Kashmir. *Int J Sci Stud*. 2017;5(7):71–4. [DOI: 10.17354/ijss/2017/498]
- Petersen PE, Ogawa H. Promoting Oral Health and Quality of Life Older People – The Need for Public Health Action. *Oral Health Prev Den*. 2018;16(2):113–24. [DOI: 10.3290/j.ohpd.a40309] [PMID: 29736489]
- Manchanda K, Sampath N, De AS, Bhardwaj VK, Fotedar S. Oral health-related quality of life – A changing revolution in dental practice. *J Cranio Max Dis*. 2014;3:124–32. [DOI: 10.4103/2278-9588.138230]
- Chahar P, Mohanty VR, Aswini YB. Oral health quality of life of elderly patients visiting special clinics in public hospitals in Delhi, India: a cross-sectional study. *Indian J Public Health*. 2019;63(1):15–20. [DOI: 10.4103/ijph.IJPH31617] [PMID: 30880732]
- Rosli TI, Chan YM, Kadir RA, Hamid TAA. Association between oral health-related quality of life and nutritional status among older adults in district of Kuala Pilah, Malaysia. *BMC Public Health*. 2019;19(Suppl 4):S47. [DOI: 10.1186/s12889-019-6867-1] [PMID: 31196031]
- Popović Z, Đuričković Đ, Ljaljević A, Matijević S, Obradović-Đuričić K. Assessment of reliability and validity of Montenegrin version of the oral health impact profile for use among the elderly in Montenegro. *Srp Arh Celok Lek*. 2019;147(9–10):534–40. [DOI: 10.2298/SARH180528049P]
- Huber M, Knottnerus JA, Green L, van der Horst H, Jadad AR, Kromhout D, et al. How should we define health? *BMJ*. 2011;343:d4163. [DOI: 10.1136/bmj.d4163] [PMID: 21791490]
- Marc L. The New Definition of Oral Health. *Restor Dent*. 2017;37(1):7. [DOI: 10.11607/prd.2017.1.e]
- Bots-VantSpijker PC, Bruers JJM, Bots CP, De Visschere LMJ, Schols JMGA. Dentists' opinions on knowledge, attitudes and barriers in providing oral health care to older people living independently in the Netherlands and Flanders (Belgium). *BDJ Open*. 2017;3:17020. [DOI: 10.1038/bdjopen.2017.20] [PMID: 29607090]
- Peltzer K, Hewlett S, Yawson AE, Moynihan P, Preet R, Wuet F, et al. Incidence of loss of all teeth (edentulism) and associated factors in older adults in China, Ghana, India, Mexico, Russia and South Africa. *Int J Environ Res Public Health*. 2014;11(11):11308–24. [DOI: 10.3390/ijerph111111308] [PMID: 25361046]
- Association of State and Territorial Dental Directors (ASTDD) Best Practices Committee. (2017). Best practice approach: oral health in the older adult population (age 65 and older) [monograph on the Internet]. Reno, NV: Association of State and Territorial Dental Directors; Mar 2017. p. 29. Available from: <http://www.astdd.org/> [30. 7. 2019]
- Popović Z, Đuričković M. Oral health behavior and oral hygiene habits of elderly population in Podgorica, Montenegro. *Serb Dent J*. 2019;66(3):120–31. [DOI: 10.2478/sdj-2019-0013]
- Shivam AK, Azam F. Association between smoking and dental caries among people of Dhanbad district, Jharkhand, India. *Int J Oral Care Res*. 2019;7:50–2. [DOI: 10.4103/INJO.INJO2719]
- Wang L, Cheng L, Yuan B, Hong X, Hu T. Association between socio-economic status and dental caries in elderly people in Sichuan Province, China: a cross-sectional study. *BMJ Open*. 2017;7(9):e016557. [DOI: 10.1136/bmjopen-2017-016557] [PMID: 28947446]
- Jha P. The hazards of smoking and the benefits of cessation: a critical summation of the epidemiological evidence in high-income countries. *eLife*. 2020;9:e49979. [DOI: 10.7554/eLife.49979] [PMID: 32207405]
- UN report Ageing in the 21st Century: a celebration and a challenge. (2012). p. 111–18; [Online]. ISBN 978-0-89714-981-5 Available from: <https://www.researchgate.net/publication/314205132> [08.7. 2019]
- WHO. Oral Health Surveys -Basic Methods. 5th Edition, WHO Library Cataloguing-in-Publication Data, World Health Organization 2013, ISBN 978 92 4 154864 9 (NLM classification: WU 30)
- Klein H, Palmer CE, Knutson JW. Studies on dental caries. I. Dental status and dental needs of Elementary School Children. *Public Health Rep*. 1938;53:751–6.
- Petersen PE. 21st Century Global Oral Health Policy - Implications for Oral Health Research of the World Health Assembly 2007, World Health Organization. Oral community epidemic Dent. 2009;37(1):1–8. [DOI: 10.1111/j.1600-0528.2008.00448.x] [PMID: 19046331]
- Haikola B, Oikarinen K, Söderholm AL, Remes-Lyly T, Sipilä K. Prevalence of edentulousness and related factors among elderly Finns. *J Oral Rehabil*. 2008;35(11):827–35. [DOI: 10.1111/j.1365-2842.2008.01873.x] [PMID: 18482342]

Bezubost kod starih osoba u Crnoj Gori

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KRATAK SADRŽAJ

Uvod Prvi put u Crnoj Gori rađeno je istraživanje koje je imalo za cilj da ispita stanje oralnog zdravlja starih osoba.

Metode Obuhvaćeno je 170 ispitanika oba pola, prosečne starosti $72,32 \pm 6,85$. Instrument istraživanja je usklađen sa metodološkim uputstvom SZO za epidemiološka ispitivanja nacionalne oralne patologije. U statističkoj obradi podataka korišćeni su program IBM Statistics 20, metode deskriptivne i inferencijalne statistike, Tamhane T2 post hoc testovi, χ^2 test. Homogenost disperzija proveravana je Levenovim testom. Nivo značajnosti je 0,05.

Rezultati Vrednost DMFT iznosi $29,417 \pm 3,81$ (MT: $26,25 \pm 6,95$; FT: $2,68 \pm 3,98$; DT: $0,63 \pm 1,56$) i statistički je značajno veća kod žena, kod korisnika duvanskih proizvoda i kod osoba koje neredovno posećuju stomatologa. Bezubih osoba je 46,47%. Indeks rehabilitacije zuba je 73,86%. Prosečna starost zubnih nadoknada je 11 godina.

Zaključak Stanje oralnog zdravlja starih osoba u Crnoj Gori nije na zadovoljavajućem nivou, što se ogleda u visokom procentu bezubih osoba i nepovoljnoj strukturi DMFT-a.

Ključne reči: bezubost; stare osobe; Crna Gora

UVOD

Unapređenje oralnog zdravlja osnovni je preduslov za unapređenje zdravlja u celini [1]. Ovo je posebno važno za stare osobe kod kojih je opšte zdravlje narušeno i opterećeno hroničnim oboljenjima. Istraživanja u regionu [2], u Evropi [3, 4, 5] i na drugim kontinentima [6–9] uticala su na pokretanje istraživanja stanja oralnog zdravlja starih u Crnoj Gori. Ispitivanja uticaja koje oralno zdravlje ima na kvalitet života sprovode se u svetu već više od pet decenija i dokazan je visok stepen međuzavisnosti kvaliteta života i oralnog zdravlja [10–14]. Ova saznanja implementirana su u novu definiciju oralnog zdravlja [15, 16]. Oko 30% Evropljana, starosti između 65 i 74 godine, nema više svoje prirodne zube [17]. Postoji preporuka za implementiranje oranozdravstvenih u opštezdavstvene preventivne programe, što uz kontinuitet njihovog sprovođenja treba da rezultira time da ljudi do 65. godine sačuvaju najmanje 20 prirodnih zuba [18]. Brojni autori su istraživali uticaj oranozdravstvenih navika, socioekonomskog statusa i drugih karakteristika na pojavu oralnih oboljenja i posledičnu bezubost [5, 6, 7, 17–23].

Demografski podaci ukazuju na višedecenijski trend starenja stanovništva [24]. Da bi se zdavstveni sistem pripremio za povećan broj starih pacijenata u budućnosti, potrebno je prikupiti podatke o stanju oralnog zdravlja.

Cilj istraživanja je da ispita stanje oralnog zdravlja starih osoba u središnjem regionu Crne Gore.

METODOLOGIJA

Pre realizacije istraživanja urađene su obavezne mere koje prethode, kao što je dobijanje saglasnosti od Etičkog komiteta Medicinskog fakulteta Univerziteta Crne Gore u Podgorici. Urađen je plan istraživanja, informisani su ispitanici i dobijena je njihova saglasnost za učešće u istraživanju.

Sve kliničke preglede obavio je jedan stomatolog (specijalista stomatološke protetike, koji je obučen da analizira podatke oralnog zdravlja pomoću relevantnih indeksa) po principima dobre kliničke prakse. U testiranju pouzdanosti istraživača primenjavana je statistika *kappa*. *Kappa* vrednosti procenjene posle ponovnog pregleda za intrakonzistenciju istraživača iznosile su 0,94.

Istaraživanje je rađeno po metodu analitičke studije preseka, u periodu od septembra do decembra 2016. u središnjem delu Crne Gore. Pregledi su obavljani na Medicinskom fakultetu u Podgorici i domovima za stara lica „Ljubav spaja“ i „Nana“ u Spužu i Danilovgradu.

Uzorak istraživanja

Istraživanjem je obuhvaćeno 170 osoba prosečne starosti 72,32 (stand. devij. 6,85). Metoda uključivanja ispitanika u istraživanje je bila zasnovana na sledećim karakteristikama:

1. Uključene su osobe starosti od 65 i više godina koje su se javile na pregled na Medicinski fakultet u Podgorici – Studijski program stomatologije određenim danima (ponedeljkom i sredom) u periodu od septembra do decembra 2016.

2. Uključeni su svi korisnici usluga domova za stara lica „Nana“ i „Ljubav spaja“ u Spužu i Danilovgradu čije je stanje opšteg i mentalnog zdravlja dozvoljavalo da budu pregledani.

Svi ispitanici su dobrovoljno pristali da učestvuju u istraživanju nakon što su im objašnjeni svrha istraživanja, način distribucije dobijenih podataka i anonimnost učešća. O dobrovoljnosti su se izjasnili potpisivanjem informisanog pristanka. Za ispitanike koji su korisnici usluga domova za stara lica prethodno je dobijena saglasnost od uprave domova.

Uzorak je 5% prema broju stanovnika starosti 65 i više godina u središnjem delu Crne Gore i statistički je alocirano tako da je očekivani koeficijent varijacije između 8 i 11%.

Prvi instrument istraživanja koji je korišćen je klinički pregled oralnog zdravlja, po metodologiji SZO, primenom metodološkog uputstva za epidemiološka ispitivanja nacionalne oralne patologije [25].

Analizirani su podaci vezani za broj karijesnih, ekstrahovanih i plombiranih zuba, podaci o prisutnim zubnim nadoknadama (fiksni i mobilni) i o starosti zubnih nadoknada.

Stanje oralnog zdravlja procenjavano je na osnovu relevantnih indeksa, pri čemu su prikazani sledeći:

1. Karijesni status registrovan je pomoću Klajn-Palmerovog sistema DMF (D – decayed, M – missing, F – filled) [26].

Karijes je dijagnostikovao inspekcijom uz pomoć stomatološke sonde i ravnog stomatološkog ogledala, pri dnevnoj svetlosti. Dentalnim karijesom (K) obeležene su lezije sa jasno formiranim

kavitetom na površini zuba. Promene u transparentiji i početne demineralizacije gleđi sa intaktnom površinom koje nisu dovele do prekida kontinuiteta zubnog tkiva nisu registrovane. Pojam plombe (P) uključuje sve stalne i privremene ispune. Pod ekshahovanim (E) zubima podrazumevaju se sve ekstrakcije nastale kao posledica karijesa ili oboljenja parodontijuma. Ovaj indikator predstavljen je ukupno za sve ispitanike, u odnosu na određene karakteristike ispitanika.

2. DMFT indeks – indeks karijesa prosečan (DT – prosečan broj karijesnih zuba, MT – prosečan broj ekshahovanih zuba, FT – prosečan broj plombiranih zuba).

3. IRZ indeks – indeks rehabilitacije zuba korišćen je da se izrazi (u procentima) koliko je izgubljenih zuba nadomešteno izradom stomatoprotetskih nadoknada (fiksni i mobilni). Izračunava se: broj nadoknađenih zuba / broj izvađenih zuba + broj nadoknađenih zuba $\times 100$.

4. Evidentirano je prisustvo stomatoprotetskih nadoknada (fiksni i mobilni) i njihova starost.

Drugi instrument istraživanja je upitnik zatvorenog tipa sa četiri pitanja:

P1 – Kada ste poslednji put bili kod stomatologa?

P2 – Koji su razlozi Vaše poslednje posete stomatologu?

P3 – Da li ste korisnik duvanskih proizvoda?

P4 – Šta prepoznajete kao glavni razlog gubitka svojih zuba?

Tokom pregleda ispitanicima su pruženi saveti kako da pravilno održavaju higijenu usta, zuba i zubnih nadoknada. Pregledane su zubne nadoknade i dati su saveti za njihovo održavanje.

U statističkoj obradi prikupljeni podaci obrađivani su statističkim programom IBM Statistics 20. Korišćene su metode deskriptivne i inferencijalne statistike. Od deskriptivnih metoda upotrebljene su aritmetička sredina i standardna devijacija. U sklopu inferencijalne statistike korišćen je t-test za dva nezavisna uzorka, χ^2 test, Tamhane T2 post hoc test i ANOVA. Homogenost disperzija proveravana je Levenovim testom. Nivo značajnosti je 0,05.

REZULTATI

Demografski podaci

Ukupno je pregledano 170 osoba. Struktura ispitanika prema polu pokazala je da je bilo 89 (52,35%) ispitanika ženskog i 81 (47,64%) ispitanik muškog pola. Prosečna starost ispitanika je $72,32 \pm 6,85$. Bilo je 104 (61,17%) ispitanika starosti 65–74 godine, 53 (31,17%) starosti 75–84 godine i 13 (7,6%) od 85 godina i starijih. Prema mestu stanovanja u gradovima središnjeg regiona Crne Gore: iz Podgorice je bilo 114 (67,05%) ispitanika, iz Danilovgrada 20 (11,76%), iz Nikšića 22 (12,94%), i sa Cetinja 14 (8,23%) ispitanika. Struktura ispitanika prema stepenu obrazovanja pokazala je da je najviše ispitanika – 64 (37,64%) sa srednjim stepenom obrazovanja, 39 (22,94%) ispitanika ima visoko obrazovanje, 27 (15,88%) ima više obrazovanje, 32 (18,82%) ima osnovno obrazovanje, dok je 8 (4,70%) ispitanika bez obrazovanja.

Analiza stanja oralnog zdravlja ispitanika

Od 170 pregledanih osoba 79 (46,47%) osoba je bezubo. DMFT iznosi $29,417 \pm 3,81$ (min. 15; max. 32). Struktura DMFT-a po-

kazuje da ispitanici u proseku imaju $26,25 \pm 6,95$ ekshahovanih zuba, $2,68 \pm 3,98$ plombiranih zuba, dok je broj karioznih zuba po ispitaniku u proseku $0,63 \pm 1,56$. Ispitanici su u proseku imali $2,39 \pm 3,66$ zdravih zuba i $7,14 \pm 9,19$ protetski nenadoknađenih zuba.

Prisutnost preostalih prirodnih zuba izražena prema segmentima zubnih nizova (što je od značaja za planiranje protetske terapije) pokazuje da ispitanici u proseku imaju veći broj prisutnih zuba u donjem zubnom nizu – 1,14 u odnosu na gornji zubni niz – 0,73. U frontalnim segmentima zubnih lukova je broj sačuvanih prirodnih zuba veći nego u bočnim. U donjem frontalnom segmentu prosečan broj prirodnih zuba je najveći i iznosi 2,22 zuba, dok je u gornjem frontalnom segmentu 1,29. Prisutnost prvih stalnih molara je prosečno po ispitaniku 0,41 (25,88% osoba ima između jednog i tri prva stalna molara).

Analiza DMFT-a prema karakteristikama ispitanika

U istraživanju se pokazalo da osobe ženskog pola imaju statistički značajno veću vrednost DMFT-a u odnosu na osobe muškog pola ($t = -2,593$; $p = 0,011$) (Tabela 1).

Osobe koje su korisnici duvanskih proizvoda imaju statistički značajno veću vrednost DMFT-a u odnosu na osobe koje ne koriste duvanske proizvode ($t = 2,279$; $p = 0,024$) (Tabela 1).

Podaci pokazuju statistički značajnu razliku u vrednosti DMFT-a prema vremenu proteklom od poslednje posete stomatologu. Osobe kod kojih je poseta stomatologu bila u poslednjih 12 meseci imaju statistički značajno nižu vrednost DMFT-a u odnosu na ispitanike kod kojih je proteklo više vremena od poslednje posete (između jedne i pet godina; više od pet godina). (ANOVA; $F = 4,805$; $p = 0,009$). Levenov test ukazuje na heterogenost disperzija ($p < 0,001$). (Tamhane test, $p = 0,009$) (Tabela 2).

Ne postoji statistički značajna razlika u vrednostima DMFT-a kod ispitanika u odnosu na godine starosti ($t = -1,147$; $p = 0,253$).

Prisustvo stomatoprotetskih nadoknada

Indeks rehabilitacije zuba je 73,86%. Utvrđeno je da kod 83 (48,82%) osobe postoje mobilne zubne nadoknade u obe vilice. Mobilnu nadoknadu u jednoj vilici i nenadoknađen zubni niz u drugoj vilici imaju 34 (20,00%) ispitanika. Zubne nizove nadomeštene fiksnim nadoknadama ima 16 (9,41%) osoba. Osoba koje u jednoj vilici imaju mobilnu a drugoj fiksnu nadoknadu bilo je 10 (5,88%) (Tabela 3).

Prosečna starost zubnih nadoknada iznosi 11 godina. Nadoknada starosti između 0 i 5 godina ima 59 (41%), 6–10 godina 36 (25%), 11–19 godina 19 (13%), 20–19 godina 18 (12,5%) i 30+ godina 12 (8%) ispitanika.

Analiza odgovora na pitanja iz upitnika

Kao razlog gubitka zuba 108 (63,52%) ispitanika navelo je karijes, dok je 61 (35,88%) ispitanik naveo parodontopatiju. Jedan ispitanik (0,58%) naveo je traumom kao uzrok (Tabela 4). Primetno je da žene češće navode karijes – 63 (71,59%) kao razlog gubitka zuba u odnosu na parodontopatiju – 25 (28,40%). Kod muških ispitanika približno jednak broj ispitanika navodi karijes – 45 (54,87%) kao razlog u odnosu na parodontopatiju – 37 (45,12%).

Poslednja poseta stomatologu kod 58 (34,11%) ispitanika bila je pre više od pet godina. Kod 37 (21,76%) ispitanika od po-

slednje posete prošlo je 2–5 godina. Kod 30 (17,64%) ispitanika odlazak kod stomatologa bio je pre 1-2 godine. Od poslednje posete kod 16 (9,41%) ispitanika proteklo je 6–12 meseci, a kod 29 (17,05%) ispitanika proteklo je manje od šest meseci (Tabela 4).

Kao razlog poslednje posete stomatologu najviše ispitanika – 101 (59,41%) navelo je bol ili problem sa zubima, desnama ili zubnim nadoknadama. Potrebu za konsultacijom ili savetom kao razlog poslednje posete stomatologu navelo je 26 (15,29%) ispitanika. Lečenje kao razlog navela su 22 (12,94%) ispitanika i redovnu kontrolu 21 (12,35%) ispitanik (Tabela 4).

Korišćenje duvanskih proizvoda potvrdilo je 54 (31,76%) ispitanika, dok je 116 (68,23%) negiralo njihovu upotrebu (Tabela 4). Među osobama muškog pola je 33 (40,74%) pušača. Žena korisnika duvanskih proizvoda je 21 (32,59%).

DISKUSIJA

Petersen i saradnici [8, 27] u svojim istraživanjima pokazuju da je broj bezubih osoba starosti 65 i više godina u svetu visok. Takođe, podaci SZO iz 2016. [9] pokazuju da oko 30% Evropljana (prevalenca varira od 5% do 51%) u dobi od 65 do 74 godine nema prirodne zube. Ako se ovo uporedi sa crnogorskim podatkom (46,47%), vidi se da je stanje u Crnoj Gori lošije od evropskog proseka. Prema podacima Petersena i saradnika [8], u Evropi je 2010. stanje bilo sledeće: u Poljskoj je zastupljenost bezubosti kod starih osoba bila 43,9%, u Slovačkoj 43%, u Velikoj Britaniji 37,5%, u Mađarskoj i Danskoj 27%, u Austriji 15% dok je u Litvaniji niža od 13%. Na drugim kontinentima procenat bezubih među starim osobama je sledeći: u SAD 26%, u Indiji i Indoneziji 19%, u Libanu 20%, dok je u Kini stanje značajno bolje – 11%.

Brojni faktori utiču na vrednosti DMFT-a: demografske i druge karakteristike stanovništva, ponašanje u vezi sa oralnim zdravljem, razvijenost zdravstvenih sistema [22] i drugo. U Evropi su oboljenja parodonticijuma problem broj jedan kada je stanje oralnog zdravlja u pitanju, dok je stopa karijesa značajno smanjena u odnosu na prethodne decenije [1, 3]. Redukcija stope karijesa u ovim državama je velikim delom rezultat višedecenijskog kontinuiranog sprovođenja oralnozdravstvenih programa. U Crnoj Gori je karijes dominantni razlog gubitka zuba. Analiza strukture DMFT-a govori u prilog činjenici da su stomatološke usluge dostupne stanovništvu. Međutim, mnogo više kurativne nego preventivne, te u strukturi prednjače ekstrahovani zubi. Postojeću stomatološku službu treba dalje unapređivati i usmeravati ka preventivnim i profilaktičkim metodama. Treba insistirati na kontinuitetu u promociji oralnog zdravlja i usmeriti je prema svim populacionim grupama. Akcenat se mora staviti na zdravstveno opismenjavanje, informisanost i edukaciju.

Protetska rehabilitacija izražena kroz koeficijent rehabilitacije u ovoj studiji (73,86%) ukazuje na sličnost sa rezultatima istraživanja kod starih osoba u Republici Srpskoj [2], gde je 31% osoba imalo gornju totalnu, a 18% donju totalnu protezu. Osoba koje u jednoj vilici imaju mobilnu, a u drugoj fiksnu nadoknadu bilo je 4,6%, dok je zubne nizove nadomeštene fiksnim nadoknadama imalo 10% osoba. Haikola B. i saradnici u svom istraživanju u Finskoj [28] pokazuju da su fiksne nadoknade zastupljene kod 23,7% šezdestogodišnjaka i kod 38,6% osamdesetogodišnjaka (60% starih su imali mobilne zubne nadoknade). Dakle, u Crnoj Gori i Republici Srpskoj veća je prisutnost mobilnih u odnosu na fiksne zubne nadoknade, dok je u Finskoj veća zastupljenost fiksnih zubnih nadoknada.

Vrednost DMFT-a posmatrano u odnosu na pol ispitanika u ovom istraživanju saglasna je sa rezultatima istraživanja koje su sproveli Baumgartner W. i saradnici [4] i Pan S. i saradnici [5] i statistički je značajno veća kod žena nego kod muškaraca.

Brojna istraživanja [20, 21, 23] dokazala su negativan uticaj koji korišćenje duvanskih proizvoda kao loša navika ima na porast učestalosti oralnih oboljenja, što je u saglasnosti sa rezultatima u Crnoj Gori.

Statistička povezanost između učestalosti poseta stomatologu i vrednosti DMFT-a prisutna kod crnogorskih ispitanika dokazana je i u istraživanju koje su sproveli Nguyen i saradnici [6], u radu Popović Z. i saradnika [7], kao i u brojnim drugim radovima [17, 20, 22]. Vrednosti DMFT-a su niže kod osoba koje imaju odgovorno oralnozdravstveno ponašanje.

Značaj ovog istraživanja je u tome što je prvi put ispitivano stanje oralnog zdravlja starih osoba u Crnoj Gori. Dobijeni rezultati mogu se smatrati reprezentativnim za stare osobe koje žive ne samo u središnjem regionu Crne Gore već na celoj teritoriji jer je u središnjem delu koncentrisano blizu dve trećine stanovništva. U potrazi za specijalističkom uslugom pacijenti iz druga dva regiona gravitiraju prema stomatološkim ordinacijama čiji je najveći broj koncentrisan u Podgorici i u Nikšiću.

ZAKLJUČAK

Stanje oralnog zdravlja starih osoba u središnjem regionu Crne Gore nije na zadovoljavajućem nivou. Bezubost i njene posledice mogu postati značajan javnozdravstveni problem u budućnosti s obzirom na porast broja starih osoba. Neophodno je da briga o oralnom zdravlju postane sastavni deo državnih opštezdavstvenih preventivnih i kurativnih programa. Propagiranje zdravih stilova života i koncepta aktivnog starenja takođe treba da doprinese poboljšanju stanja oralnog zdravlja celokupne populacije, naročito starih.