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ORIGINAL PAPER

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Socioeconomic Status as Oral Health State Determinant of the Active Working Displaced Persons and Domicile Inhabitants

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ABSTRACT

Introduction: Socioeconomic changes have a significant impact on the health of the population. Socioeconomic development of society is one of the basic determinants of the health condition and needs of the individual and in the population as well. **Aim:** To explore the existence of differences in indicators of oral health status between the displaced persons and domicile population, considering the socioeconomic status (SES) of the respondents. **Patients and Methods:** A total of 310 people, aged 35-44 (mean 40.19 ± 3.60), were interviewed and examined, with 157 of them in a subsample of domicile inhabitants and other 153 respondents in displaced persons subsample. The SES of respondents was determined using a survey. After conducted examinations in study participants, determined results were recorded as dental status (DMFT Index), and periodontal status (CPI Index). **Results:** There was a significant difference in the mean value of caries existence between displaced persons of low and middle SES. In domicile inhabitants, there were no statistically significant differences in mean values of caries existence between the individuals with low and middle SES, while the differences existed between the individuals with low and high and between the middle and high SES. Domicile inhabitants with high SES had significantly less carious lesions than those with lower SES. Domicile inhabitants with high SES had significantly fewer extractions and more teeth with fillings. **Conclusion:** People with low SES have worse oral health status. Displacement and low socioeconomic status significantly influence the state of oral health.

Keywords: Socioeconomic, oral health, displaced persons.

1. INTRODUCTION

Socioeconomic changes have a significant impact on the health of the population. Socioeconomic development of society is one of the basic determinants of the health condition and needs of the individual and in the population as well. The definition of socioeconomic status implies the position of a person on a socioeconomic scale, where factors such as the level of education, income, occupation, place of residence and, in some populations, inheritance and religious affiliation, have been assessed. In this regard, the poverty, as the inability to achieve a minimum standard of living in the given circumstances, is an important determinant of health. Oral health is influenced by many social determinants: social status, education, employment and working conditions, physical environment, personal hygiene and health habits, healthy child development and health services (1).

Socioeconomic factors are the key to determining the quality of oral health. Some highly developed countries have recorded a steady decrease in caries prevalence, while in the European countries that are in transition this process is reversed. Caries prevalence can serve as an approximate measure of the socioeconomic development of a country (2).

The oral health of all age groups of the inhabitants of Bosnia and Herzegovina is among the worst in Europe (3, 4). According to studies, there is a difference in the state of oral health among people living in different life conditions (3, 5, 6).

In Bosnia and Herzegovina, besides the per-

manent resident population, there is a certain number of displaced persons who have left their homes under the influence of some kind of force. The permanent population of one place consists of all persons who permanently reside in that place, namely have their place of residence, regardless of whether they were in that place of residence at the time of the census or were temporarily absent, either at the country or abroad (7). A displaced person is a citizen of Bosnia and Herzegovina who is in the country, but who was expelled from his place of residence due to the consequences of the war, or who left his / her place of residence after April 30 1991, fearing that it will be prosecuted for his own race, religion, nationality, belonging to a social group or political opinion, and who was not able to return safely and dignified to his / her former place of residence, nor volunteered to permanently reside in another place of residence (8). The United Nations High Commissioner for Refugees (UNHCR) reported that at the end of 2016 around 65.6 million people were displaced by force globally. Currently, the UNHCR considers that forcible displacement reaches a record number nowadays and affects one of 113 people (9). According to the data of the Agency for Statistics of Bosnia and Herzegovina, the estimated number of inhabitants of Bosnia and Herzegovina is 3,511,372 individuals (10). According to the latest UNHCR data, Bosnia and Herzegovina currently have 103,000 internally displaced persons (11).

Displaced persons were not in the special focus of the researchers–one study that has been published so far show that the condition of the oral health of displaced persons was worse than in the domicile population (12).

We could not ignore the fact that a large number of displaced persons still live in collective centers, in very poor conditions, with a lack of medical and thus dental assistance. Also, they are often isolated from the local population, and they belong to a vulnerable group of people because they were exposed to certain traumas. According to the information from one of the collective centers, it could be concluded that users were placed in very poor conditions with minimal or no incomes at all, and with bad health status (13).

2. THE AIM

The aim of this research was to explore the existence of differences in indicators of oral health status between the displaced persons and domicile population, considering the socioeconomic status of the respondents.

3. PATIENTS AND METHODS

The targeted study group was the adult population of Bosnia and Herzegovina aged 35-44, which represents a standard monitoring group for the evaluation of oral health status of the adult population according to the criteria of the World Health Organization (WHO) (14). During the research, a total of 310 people were interviewed and examined, with 157 of them in a subsample of domicile inhabitants and other 153 respondents in displaced person subsample. The study was conducted in several locations and on the basis of the obtained consent of the authorized institutions. Collective centers were visited for the evaluation of displaced person subsample, and the workers of several companies engaged in various activities were involved in the domicile inhabitants subsample.

Each respondent was familiar with the way of performing of the dental examination, with a clear and understandable explanation of the purpose of the study. All study participants assigned written consent prior to their participation in the study.

The socioeconomic status of respondents was determined using a survey form containing questions about the level of education, employment, type of occupation, the amount of monthly income, the place of residence and living conditions. Based on the answers to these questions, the socioeconomic status of each person was categorized as low, medium or high.

For the record of oral health status, the WHO cards and recommendations have been used. After conducted examinations in study participants, determined results were recorded as dental status (DMFT Index), and periodontal status (CPI Index) was registered on 6 index teeth.

Dental examination was performed by one person with a standardized dental method, dental mirror and dental periodontal CPI probe (14). After the clinical examination, collected data were assigned in customized WHO patients record cards. All examinations were done on a chair under the natural light source.

In the processing of the survey results, standard ways of descriptive statistics displaying methods (tables, frequencies, percentages) were used.

KS and Shapiro-Wilk were used to test the normality of data distribution. A t-test and chi-square test were used for testing of the statistically significant differences between the observed variables.

The results were obtained using the SPSS® Statistics 17.0 and StatSoft Statistica® 8.0 software packages.

4. RESULTS

The study involved 310 subjects aged 35 to 44 years. The mean age value for all participants in the study was 40.19 ± 3.60 years. In the displaced persons subsample the mean age value was 40.44 ± 3.52 years. The domicile population subsample mean age value was 39.94 ± 3.68 years.

According to study sample sex distribution, there were 64.52% of female respondents and 35.48% of male respondents. In the group of displaced persons, there were 75.82% of women, while 24.18% were men. Also, in the group of domicile population, 53.50% of them were female participants, while 46.50% were male participants.

There was the statistically significant difference between adult displaced persons and the domicile inhabitants aged

Levels of socioeconomic status	Displaced persons		Domicile inhabitants		Total	
	n	%	n	%	n	%
low	147	96.08	54	34.39	201	64.84
medium	6	3.92	70	44.59	76	24.52
high	0	0.00	33	21.02	33	10.65
Total	153	100.00	157	100.00	310	100.00

Table 1. Distribution of respondents according to their socioeconomic status

Levels of socioeconomic status	Displaced persons					Domicile inhabitants				
	D	M	F	DMF	CPI	D	M	F	DMF	CPI
low	4.60 ±3.84	14.07 ±6.30	0.88 ±1.77	19.54 ±5.28	2.77 ±1.97	2.83 ±2.42	12.74 ±6.07	1.78 ±2.53	17.17 ±5.22	2.52 ±2.42
medium	2.50 ±2.07	10.83 ±3.43	1.83 ±1.47	15.83 ±2.04	2.83 ±0.41	2.70 ±3.13	9.16 ±5.37	3.93 ±4.38	15.47 ±4.56	2.10 ±1.22
high	-	-	-	-	-	1.12 ±1.22	7.24 ±6.17	5.39 ±3.63	13.76 ±5.43	2.21 ±2.03

Table 2. Mean values and standard deviations of the DMFT index and its components and CPI index in the study respondents in relation to socioeconomic status

indexes of oral health status	Displaced porsons			Domicile inhabitants		
	Socioeconomic status			Socioeconomic status		
	low-medium	low-high	medi-um-high	low-medium	low-high	medium-high
D	p<0.01	-	-	p>0.05	p<0.001	p<0.01
M	p>0.05	-	-	p<0.001	p<0.001	p>0.05
F	p>0.05	-	-	p<0.01	p<0.01	p>0.05
DMF	p>0.05	-	-	p>0.05	p<0.01	p<0.01
CPI	p>0.05	-	-	p>0.05	p>0.05	p>0.05

Table 3. Review of the existence of statistically significant differences in the indicatorsof oral health status between categories of socioeconomic status in displaced persons and in domicile inhabitants

indexes of oral health status	Socioeconomic status		
	low	medium	high
D	p<0.01	p>0.05	-
M	p>0.05	p>0.05	-
F	p<0.01	p<0.05	-
DMF	p>0.05	p>0.05	-
CPI	p>0.05	p<0.01	-

Table 4. Review of the existence of statistically significant differences in the indicators of oral health status between domicile and displaced persons

from 35 to 44 years according to their socioeconomic status. A significantly larger number of displaced persons had a lower socioeconomic status than the domicile population (Chi-square 129.895, $p < 0.01$).

There was a statistically significant difference in the mean value of caries existence between displaced persons of low and middle socioeconomic status, in a way that displaced persons of lower socioeconomic status had significantly more caries than those of middle-socio-economic status.

There were no statistically significant differences in displaced persons between the individuals of low and medium socioeconomic status in DMFT index (and its components) or CPI index.

There were no individuals among displaced persons who had a high socioeconomic status.

In domicile inhabitants, there were no statistically significant differences in mean values of caries existence between the individuals with low and middle socioeconomic status, while the differences existed between the individuals with low and high and between the middle and high socioeconomic status. Domicile inhabitants with high socioeconomic status had significantly less caries existence than those with lower socioeconomic status. Domicile inhabitants with high socioeconomic status also had significantly fewer extractions and more teeth with fillings than those with low socioeconomic status.

In relation to the DMFT index, study participants with high socioeconomic status had significantly lower DMFT index in relation to those of middle and low socioeconomic status.

In domicile inhabitants, there was no statistically significant difference in the value of the CPI index in terms of socioeconomic status.

There were statistically significant differences in the mean values of caries existence between domicile and displaced persons with low socioeconomic status in a way that domicile inhabitants with low socioeconomic status had significantly less caries existence than displaced persons. There was no difference in the mean values of caries existence between domicile and displaced persons with medium socioeconomic status.

In the average number of extractions, there was no difference between the displaced persons with low or middle socioeconomic status.

There were statistically significant differences in the mean values of the number of fillings between domicile and displaced persons with low and medium socioeconomic status in a way that domicile inhabitants with low socioeconomic status had significantly more fillings compared to displaced persons with low socioeconomic status. There was no difference in the mean values of the DMFT index between domicile and displaced persons, neither in the category of low nor in the category of high socioeconomic status.

The mean values of the CPI index were the same for displaced and domicile persons of low socioeconomic status, while there was a statistically significant difference in the CPI Index between domicile and displaced persons with middle socioeconomic status - the domicile inhabitants had significantly lower values of the CPI index.

5. DISCUSSION

There was very little data on the state of the oral health of the working population in Bosnia and Herzegovina. Most of the conducted epidemiological studies have placed a child population in their research focus. In the post-war period, there were significant changes in the population of our country both in the total number and in its socioeconomic structure. The total number of inhabitants was affected by migrations, which were mostly forcible. Such large population movements also had an impact on the state of oral health. The specific conditions through which the inhabitants, both displaced and domicile, were going, influenced also the state of oral health. Under such circumstances, there was no possibility for the adequate use of dental services and the implementation of basic measures of oral hygiene. That was also the case with no possibility of providing adequate therapeutic dental procedures. Previous studies have shown that oral health in the active population aged from 35 to 44 years in Bosnia and Herzegovina was at a very poor level (DMFT index = 17.52 ± 5.49, CPI index = 2.52 ± 1.92). There was the statistically significant difference in the state of oral health between the displaced persons and domicile inhabitants in a way that there was a significantly worse condition of oral health in displaced persons than in domicile inhabitants. The value of the DMFT index in displaced persons was 19.39 ± 5.24, while in the domicile population it was 15.69 ± 5.10. The status of periodontal health also was not satisfying. This was especially the case for respondents from the group of displaced persons, with only 6% of them having a healthy periodontium. A significantly higher finding of healthy periodontium was in the group of respondents within the domicile population,with the value of 25% (12).

The health condition of the population of the Federation of Bosnia and Herzegovina was characterized by significant demographic changes. In our country, there was a great migration of the population as a result of aggression and warfare, and there is still a large number of displaced persons. About 1.2 million people in our country were displaced due to aggression, and at least a million of people left the country. A large number of persons had to change their place of residence several times (15). Most of the displaced persons still live in very poor conditions, with bad general health status (13). Data from the Living Standards Measurement Survey showed that about 15% of the population of the Federation of Bosnia and Herzegovina had a standard below the general poverty line. The long-term transition in our country directly affects the sustainability of the health system and the organization of health care, and the global economic crisis poses a threat to the progress made in reducing poverty and to the health of the population (15).

The socioeconomic status of the respondents was analyzed on the basis of defined criteria. Observed on the overall sample, two thirds or 64.84% of respondents had low socioeconomic status, while 24.52% have a mean one, and 10.65% have a high one. The largest number of respondents from the group of displaced persons had low socioeconomic status(96.08%), while the medium one had a small number of respondents (3.92% of them), and no respondent belonged to the high socioeconomic status. In the group of domicile respondents, almost half had a medium socioeconomic status (44.59%), and 34.39% of them had a low one, while 21.02% of them had a high one.

A significant number of respondents had low socioeconomic status and came from rural areas. The availability of dental services in this area was limited. The data obtained during this research as well as the results of the previous studies indicated the bad state of the oral health of the adult population in Bosnia and Herzegovina, and its connection with the socioeconomic status, as was confirmed by the results of other surveys (3, 16).

The results of our study have shown a statistically significant correlation between the components of the DMFT index and socioeconomic status of respondents. The values of the DMFT index and its components were higher in lower socioeconomic status. The exception was with fillings (component F) which rose with an increase in socioeconomic status. This could indicate more frequent visits to the dentist for the treatment of persons with a higher socioeconomic status.

The high values of component M (missing teeth) in persons with low socioeconomic status indicated a low level of health education, an irregular visit to the dentist due to financial reasons, as well as the inaccessibility of dental services, because of a large part of the respondents who lived in the rural areas.

In addition to the apparent existence of differences in indicators of the state of oral health, where examinees with lower socioeconomic status had evidently poorer oral health - more caries, more extractions and fewer teeth with fillings, both in displaced persons and in domicile inhabitants, this research has shown that displacement was also a powerful contributing factor for the status of oral health. The results showed that the status of oral health was worse for displaced persons than in the domicile population. Displaced persons with low socioeconomic status had significantly worse oral health in relation to domicile persons of the same level of socioeconomic status, which could be seen in a larger number of carious teeth and fewer number of dental fillings. With the improvement of the socioeconomic status, the differences in the state of oral health between the domicile inhabitants and the displaced persons were also reduced.

Periodontal status was at a poor level in all respondents, but no statistically significant differences have been found between individual categories in terms of socioeconomic status or between domicile and displaced populations.

This research enabled the acquisition of important data that could serve as a basis for the creation of future preventive programs, in order to improve the oral health status of the active working population in Bosnia and Herzegovina. Special attention should be paid to displaced persons, as well as to persons with low socioeconomic status, as vulnerable categories of the population, and to find opportunities to provide adequate dental care and services to them.

6. CONCLUSION

Socioeconomic status is one of the key determinants of oral health. People with low socioeconomic status have worse oral health status. Displacement and low socioeconomic status significantly influence the state of oral health.

- **Author's contribution**: A.Z. conceived the idea, acquisition and coordination, contributed to design, drafting of the manuscript. J.H. recruitment of patients, data collection and statistical analyses. E.B. contributed to acquisition of data. E.H. data collection, managed database. M.A. contributed to conception and design. E.N. contributed to design, drafting of the final manuscript.
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REFERENCES

1. Locker D. Oral Health Indicators and Determinants for Population Health Surveys. Community Dental Health Services Research Unit, University of Toronto, November, 2001.
2. Lalloo R, Myburgh NG. Dental caries, socioeconomic development and national oral health policies. Int Dent Jour. 1999; 49: 196-202.
3. Vuković A. Oral health status of adult population in Canton Sarajevo in correlation with knowledge, attitudes and practice. Master thesis. University of Sarajevo, Sarajevo, 2000.
4. Selimović Dragaš M. The impact of environment to oral health condition of displaced children. Master thesis. University of Sarajevo, Sarajevo, 2002.
5. Huseinbegović A. Social-medical aspect of deciduous teeth caries in urban conditons. Master thesis. University of Sarajevo, Sarajevo, 2001.
6. Zukanović A. Efficacy of "Cariogram" model in evaluation of caries risk-factors in 12-years old children. Master thesis. University of Sarajevo, Sarajevo, 2005.
7. Federalni Zavod za statistiku, Statistički godišnjak/ljetopis Federacije Bosne i Hercegovine, Sarajevo, 2009.
8. The law for displaced and recovered persons in Federation of Bosnia and Herzegovina, and refugees in Bosnia and Herzegovina. Federal ministry of refugees and displaced persons 2015. [cited 2017 Apr 10]. Available from: http://www.fmroi.gov.ba/bosanski/zakoni/index.php.
9. The UN Refugee Agency - UNHCR. Global trends–Forced displacement in 2016. June 2017. [cited 2018 May 22]. Available from: http://www.unhcr.org/statistics/unhcrstats/5943e8a34/global-trends-forced-displacement-2016.html
10. Agencija za statistiku Bosne i Hercegovine. Demografija 2016, Tematski bilten. Sarajevo 2017. [cited 2018 May 22]. Avaible from: http://www.bhas.ba/tematskibilteni/DEM_00_2016_TB_0_BS.pdf
11. UN High Commissioner for Refugees (UNHCR), Submission by the United Nations High Commissioner for Refugees For the Office of the High Commissioner for Human Rights' Compilation Report–Universal Periodic Review: Bosnia and Herzegovina, March 2014. [cited 22 May 2018]. Available from: http://www.refworld.org/docid/5541d9304.html
12. Zukanovic A, Habibovic J, Habibovic E, Ajanovic M. Oral health status among displaced and domicile persons in Bosnia and Herzegovina. Stomatološki vjesnik. 2017; 6(1-2): 9-16.
13. The Government of the Federation of Bosnia and Herzegovina. The report about government activities in 2008. Sarajevo, March 2009. .[cited 2018 Mar 26]. Available from: http://www.fbihvlada.gov.ba/statistika/izv_vfbih_2008.
14. World Health Organization. Oral Health Surveys. Basic Methods.4th ed. Geneva: World Health Organization, 1997.
15. Smajkić A. i dr. Zdravstveno-socijalne posljedice rata u BiH–Prijedlog sanacije, IP "Svjetlost" Sarajevo i škola narodnog zdravlja Univerziteta u Sarajevu, Sarajevo. 1997: 10-11.
16. Husarić B. Uticaj socio-ekonomskih faktora na oralno zdravlje zaposlenih u proizvodnji. Magistarski rad. Univerzitet u Sarajevu, Sarajevo, 2005.