



# ATTITUDES TOWARDS AND HABITS IN ORAL HEALTH OF ADOLESCENTS IN HERZEGOVINA

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**SUMMARY** – The aim of the study was to determine attitudes towards and habits in oral health of adolescents in Herzegovina, as well as to evaluate the possible differences in habits among individuals of different adolescent categories. The study included 120 participants (35 male and 85 female) divided into three adolescent categories, as follows: early (11-14 years of age), middle (15-18 years) and late (19-21 years) adolescence, from the Herzegovina-Neretva Canton, who presented for dental examination. All participants completed the socio-demographic questionnaire and standardized Hiroshima University Dental Behavioral Inventory (HU-DBI). The answers provided by study adolescents in the HU-DBI showed statistically significant differences among particular age groups, i.e. between early and middle adolescence in items 7 ( $p=0.046$ ) and 15 ( $p=0.007$ ); between middle and late adolescence in items 8 ( $p=0.021$ ), 11 ( $p=0.04$ ) and 12 ( $p=0.027$ ); and between middle and late adolescence in item 11 ( $p=0.032$ ). Respondents in middle adolescence had poorer oral hygiene attitudes than those in early and late adolescence. In order to improve the oral hygiene habits of adolescents in Herzegovina, it is necessary to put emphasis on continuous education about oral hygiene habits during their secondary education.

*Key words: Adolescents; Oral habits; Dental health behavior*

## Introduction

Different social factors that influence oral health are social status, education, personal hygiene and health habits, employment and conditions of work, living environment, and organization of the health service<sup>1</sup>. The basic requirement for the establishment and maintenance of personal oral health is education and motivation for oral hygiene. Promoting good oral hygiene is advocated and supported by the World Health Organization and Fédération Dentaire Internationale (FDI; World Dental Federation)<sup>2,3</sup>.

Children and adolescents are particularly important target population for promoting development of

oral hygiene habits in childhood. Previous studies have shown a correlation between oral habits in childhood and later oral-dental pathology<sup>4</sup>. The modern public-health points of view advocate preventive care especially in children, when 90% of all diseases of the oral cavity can be prevented<sup>5</sup>. Oral hygiene habits established in childhood are a predictor of better oral health later in life<sup>6-8</sup>.

Studies conducted in Bosnia and Herzegovina show a high percentage of dental caries in children and adolescents that are caused by poor oral hygiene habits<sup>9</sup>.

The period of adolescence is a time of fundamental changes in terms of physical and neurocognitive development of the individual<sup>10</sup>. Most United States researches divide adolescence into three categories, as follows: early (11-14 years), middle (15-18 years) and late (19-21 years) adolescence<sup>11,12</sup>. Modern psychological literature clearly shows difference (according to

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adolescent age) in the orientation of the individual on the current state, maturity, adoption of standards, short-term and long-term judgment of risk during adolescence.

In Bosnia and Herzegovina, oral health is among the worst in Europe in all age groups<sup>13,14</sup>. Adequate funds to improve oral health of children are lacking, and due to such a health policy there is no strategic plan for promotion and protection of oral health<sup>15,16</sup>.

The primary objective of this study was to determine the attitudes towards and habits in oral health of adolescents from Herzegovina; another objective was to evaluate the possible differences in habits among different adolescent age categories.

## Subjects and Methods

The research was conducted at Jurišić Dental Polyclinic, Mostar, Bosnia and Herzegovina. The Polyclinic Ethics Committee approved the study (protocol No. 08.2016.). The target population for data collection were adolescents from the Herzegovina-Neretva Canton, who presented for dental examination.

### Subjects

There were 120 participants, 35 male and 85 female, aged between 11 and 21 (mean age 16.43±2.89) years, divided into three adolescent categories. Their education level was high school in 41 (34.2%), college in 38 (31.7%) and elementary school in 32 (26.7%) subjects. According to the place of residence, 72 (60%) participants were from urban areas and 48 (40%) from rural areas. The majority of study subjects (n=111; 92.5%) lived with their parents, whereas 8 (6.7%) participants lived alone. Regarding education of their parents, most of them had high school degree, including 73 (60.8%) fathers and 72 (60%) mothers. This prospective study was conducted from June 1, 2016 to December 1, 2016.

### Measures

Participation in the study was voluntary, anonymous, with due respect of personal confidentiality and other principles of medical ethics. Each respondent was processed in the same way, including administration of a quantitative psychometric questionnaire that consisted of two parts; a socio-demographic question-

naire was used first to collect socio-demographic variables of the sample, while the second part was a standardized questionnaire, the Hiroshima University-Dental Behavioral Inventory (HU-DBI)<sup>17</sup>. The HU-DBI was originally designed in Japanese, and was later translated into English and many other languages. The reliability of the scale was confirmed by previous studies<sup>18-20</sup>. In our research, we used the Croatian version of HU-DBI, which has already been used in previous studies<sup>21</sup>. Internal consistency of HU-DBI was tested by SPSS analysis to gain Cronbach  $\alpha=0.81$ . The questionnaire consists of 20 questions with dichotomous responses (agree-disagree), relating to oral health habits. Each correct answer is scored one point. A higher score means better oral health habits and behavior.

### Procedures

Prior to filling out the questionnaire, respondents were explained in detail the purpose of the research and method of completing it. A written consent was provided by their parent/guardian and their privacy was warranted.

Statistical analysis was conducted using SPSS 20.0 (SPSS, Chicago, USA). Mann-Whitney U-test was used to determine differences in HU-DBI score according to age groups. The level of statistical significance was set at  $p<0.05$ .

## Results

The study included 120 participants, 85 (70.8%) female and 35 (29.2%) male, mean age 16.43 years, divided into the following age groups: early adolescence (11-14 years) with 40 responses, middle adolescence (15-18 years) with 41 responses, and late adolescence (19-21 years) with 39 responses (Table 1). Table 2 shows results obtained on the HU-DBI questionnaire.

The majority of respondents from all three groups took care of the color of their teeth (97%), after brushing often used a mirror to assure whether their teeth were clean after tooth brushing (88%), and were worried because of bad breath after waking up (80%) (Table 2).

Significant differences in responses were recorded between the early and middle adolescence in the following items: I am bothered by the color of my gums ( $p=0.046$ ); and I put off going to the dentist until I have toothache ( $p=0.007$ ). Respondents in middle adolescence were less concerned about the color of the

Table 1. Descriptive analysis of study adolescents according to age groups

Age group (yrs)	Herzegovina adolescents				
	Female, n (%)	Male, n (%)	Total	Mean age (yrs)	Standard deviation
Early adolescence (11-14)	26 (65)	14 (35)	40	13.3	0.862
Middle adolescence (15-18)	32 (78)	9 (22)	41	16.61	1.181
Late adolescence (19-21)	27 (69.2)	12 (30.8)	39	19.72	0.793

Table 2. Results of the Hiroshima University–Dental Behavioral Inventory questionnaire (frequency and percentage of 'yes' answers)

Item description	Age group (yrs)						
	11-14		15-18		19-21		Total
	n	%	n	%	n	%	%
1. I don't worry much about visiting the dentist.	15	37.5	24	58.5	22	56.4	51
2. My gums tend to bleed when I brush my teeth.	13	32.5	6	14.6	6	15.4	21
3. I worry about the color of my teeth.	39	97.5	40	100	36	92.3	97
4. I have noticed some white sticky deposits on my teeth.	9	22.5	6	14.6	3	7.7	15
5. I use a child-sized toothbrush.	6	15	2	4.9	3	7.7	9
6. I think that I cannot help having false teeth when I am old.	15	37.5	19	46.3	16	41	42
7. I am bothered by the color of my gums.	6	15	1	2.4	2	5.1	8
8. I think my teeth are getting worse despite my daily brushing.	2	5	7	17.1	9	23.1	15
9. I brush each of my teeth carefully.	32	80	27	65.9	24	61.5	69
10. I have never been taught professionally how to brush.	12	30	20	48.8	16	41	40
11. I think I can clean my teeth well without using toothpaste.	10	25	7	17.1	1	2.6	15
12. I often check my teeth in a mirror after brushing.	31	77.5	37	90.2	37	94.9	88
13. I worry about having bad breath.	30	75	35	85.4	31	79.5	80
14. It is impossible to prevent gum disease with tooth-brushing alone.	21	52.5	23	56.1	18	46.2	52
15. I put off going to the dentist until I have toothache.	5	12.5	15	36.6	11	28.2	26
16. I have used a dye to see how clean my teeth are.	5	12.5	5	12.2	2	5.1	10
17. I use a toothbrush with hard bristles.	18	45	25	61	20	51.3	52
18. I don't feel I've brushed well unless I brush with strong strokes.	22	55	25	61	24	61.5	59
19. I feel I sometimes take too much time to brush my teeth.	8	20	7	17.1	6	15.4	18
20. I have had my dentist tell me that I brush very well.	28	70	23	56.1	21	53.8	60

gums than respondents in early adolescence, and often went to the doctor of dental medicine only when they had toothache (Table 3). Statistically significant differences were found between the early and late adolescence in the following items: I think my teeth are getting worse despite my daily brushing ( $p=0.021$ ); I think I can clean my teeth well without using toothpaste ( $p=0.004$ ); and I often check my teeth in a mirror after brushing ( $p=0.027$ ). Respondents in late adolescence thought that their teeth were in worse condition despite hygiene routine, thinking that teeth could not

be thoroughly cleaned without using toothpaste, and were more likely to use a mirror to check the purity of their teeth after brushing, when compared with respondents in early adolescence (Table 3).

Statistically significant differences between the middle and late adolescence were obtained in the item 'I think I can clean my teeth well without using toothpaste' ( $p=0.032$ ). Respondents in middle adolescence chose the statement 'I think I can clean my teeth well without using toothpaste' more frequently than respondents in late adolescence (Table 3).

Table 3. Differences in responses to the Hiroshima University-Dental Behavioral Inventory (HU-DBI) questionnaire according to adolescent age groups

HU-DBI item	Age (yrs)	Middle ranking	Mann Whitney U	p
7. I am bothered by the color of my gums.	11-14	43.58	717000	0.046
	15-18	38.49		
15. I put off going to the dentist until I have toothache.	11-14	35.56	602500	0.007
	15-18	46.30		
8. I think my teeth are getting worse despite my daily brushing.	11-14	36.48	639000	0.021
	19-21	43.62		
11. I think I can clean my teeth well without using toothpaste.	11-14	44.38	605000	0.004
	19-21	35.51		
12. I often check my teeth in a mirror after brushing.	11-14	36.61	644500	0.027
	19-21	43.47		
11. I think I can clean my teeth well without using toothpaste.	15-18	43.33	683500	0.032
	19-21	37.53		

p<0.05

## Discussion

A study of adolescents in Herzegovina using the HU-DBI questionnaire assessing perception of oral health clearly demonstrated the need of providing relevant knowledge for patients and increase their awareness of how to prevent oral diseases. Similar studies have been conducted around the world in countries with different socioeconomic status<sup>22</sup>. Socioeconomic factors of families influence the education, the overall psychophysical health, and adolescent habits<sup>23</sup>. Oral health is indirectly influenced by a number of factors such as the characteristics of each individual, his/her behavior and perception of oral health, socioeconomic status of the family, and the impact of traditional beliefs<sup>24</sup>.

Analyzing certain socio-demographic characteristics of the sample that are important for oral health of adolescents, parental education and socioeconomic status of families were taken in consideration. In our sample, most parents had high school education. Education of parents and their incomes have a direct impact on the general and oral health and education of their children<sup>25,26</sup>. Some of the parents had college degree. In Bosnia and Herzegovina, before the adoption of the Bologna Declaration as of 2002, the education system included university degree<sup>27</sup>. It is a category of higher education for a period of two years after finishing high school. Research shows that parents with a

higher level of education and higher socioeconomic status care more about oral health of their children than parents with lower education and lower family income<sup>28</sup>. Our research showed just opposite results from those reported in the available scientific literature. Adolescents who came to a dentist on appointment had the highest percentage of parents with secondary education, suggesting that they care more about oral health of their children than those with college or university education. The complex sociological phenomenon, as a factor of influence on oral health, should be the focus of further research. In our study, the majority of respondents were living in urban areas, which suggests that adolescents from urban areas present more often for dental examination than adolescents from rural areas. This is consistent with previous research that supports the positive attitude of the younger urban population towards oral health compared to their peers who live in rural areas<sup>29,30</sup>.

Answers of respondents indicate that their biggest concern is aesthetic appearance rather than correct oral hygiene habits. An increasing number of scientific papers in the field of dental medicine emphasize the impact of dental health on personal, social and psychosocial aspects of treatment of adolescents<sup>28</sup>. Attitudes and behaviors towards oral health change from birth to adolescence and adulthood, depending on the age, psycho-social factors and attitudes of the environment<sup>29</sup>. During adolescence, different changes occur in physical

appearance, as well as psychological changes of a person. Orofacial aesthetics in adolescence plays an important role in self-assessment<sup>30</sup>. Teens put great emphasis on physical appearance, and in accordance with this, the appearance of dental and facial area<sup>31,32</sup>. Since adolescence is also a period when young individuals create certain aspects of their own attitudes and norms, and also reject some of those already acquired, this period affects attitudes about oral health too. From the results of our study, it is evident that more than half of the respondents (52%) made inappropriate choice of toothbrush as far as the properties of the fibers are concerned, and also practiced inappropriate tooth brushing: 'If you have not made a strong pressure of the brush, they have feeling that their teeth are not well cleaned' (59%). The HU-DBI item 10: 'I have never been taught professionally how to brush' was answered 'yes' by 40% of the respondents. Similar results were obtained in the adolescent group in the study by Granville-Garcia *et al.*<sup>33</sup>. It is obvious that poor choice of toothbrush and brushing technique is a result of the respondents not being properly informed by professional staff members, reflecting the current situation in Bosnia and Herzegovina, where there is no national policy of promoting oral health. For countries with lower socioeconomic gross income, the FDI has recommended to put special emphasis on promotion of oral health and prevention of oral diseases<sup>3</sup>. Significant statistical differences were found between early and middle adolescence. Late adolescence respondents were going to the doctor more often, but presented to the dentist only when they had toothache, and were less concerned about the color of the gums.

Significant statistical differences were found between middle and late adolescence. Middle adolescence respondents were of the opinion that without the use of toothpaste they were able to clean their teeth well. These views are not considered optimal for oral hygiene. In middle adolescence, reduced parental support and control leads to worse hygiene habits than in early adolescence<sup>34</sup>. In our study, respondents in middle adolescence had poorer oral hygiene attitudes than those in early and late adolescence. This opens the possibility of implementing various educational oral-hygiene programs designed for this target population. Bosnia and Herzegovina has developed prevention programs in elementary schools, but there is no prevention program for high schools. Different socioeco-

nomie opportunities, attitudes and education of parents would have significantly less impact on the personal view and attitude of adolescents about oral health if there was systematic care at this age<sup>35</sup>.

Significant differences were found between early and late adolescence. Respondents in late adolescence were of the opinion that their teeth were getting worse despite hygiene routine, and that they could not brush their teeth well without toothpaste. The views of respondents in late adolescence may be linked with the process of maturation<sup>36</sup>, and of establishing better oral hygiene habits. Poor oral hygiene habits in middle adolescence may have consequences on the health of hard and soft dental tissues. When respondents reach physiological maturity in late adolescence, they have better oral hygiene habits and attitudes, partly because of the general maturation, and partly because of the possibility of looking to the behavior and understanding the importance of optimal oral hygiene.

A limitation of this study was the lack of objective parameter of oral health such as Decayed-Missing-Filled-Teeth (DMFT) index, which clearly shows the link between oral hygiene habits and total number of carious, extracted and filled teeth in each respondent. We will include DMFT index as a measurement parameter in our future research.

## Conclusion

Adoption of proper oral hygiene habits is a long, continuing and very complex process.

Based on the results of our study, the following conclusions can be made: adolescents are frequently unaware of the relationship between the risks for the occurrence of oral pathology and their own behavior, which is especially noticeable in middle adolescence associated with reduced parental support and an increasing need for autonomy. In order to improve oral habits of adolescents in Herzegovina, it is necessary to put emphasis on continuous education about oral hygiene habits during their secondary education. Systematic education of adolescents would improve personal oral habits and attitudes, and thereby reduce dental-oral pathology.

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### Sažetak

## STAJALIŠTA I NAVIKE ADOLESCENATA PREMA ORALNOME ZDRAVLJU U HERCEGOVINI

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Cilj ovoga istraživanja bio je utvrditi stajališta i navike adolescenata prema oralnome zdravlju u Hercegovini, kao i procijeniti moguće razlike u navikama između ispitanika različitih adolescentskih kategorija. U istraživanje je bilo uključeno 120 ispitanika (35 muških, 85 ženskih) podijeljenih u tri adolescentske kategorije: ranu (11-14 godina), srednju (15-18 godina) i kasnu (19-21 godina) adolescentsku dob s područja Hercegovačko-neretvanske županije, koji su došli na dentalni pregled. Svi ispitanici ispunili su Sociodemografski upitnik i standardizirani *Hiroshima University-Dental Behavioral Inventory* (HU-DBI). U odgovorima iz upitnika HU-DBI utvrđene su statistički značajne razlike s obzirom na dobne skupine adolescenata: između rane i srednje adolescentske dobi u 7. ( $p=0,046$ ) i 15. ( $p=0,007$ ) pitanju, između srednje i kasne adolescencije u 8. ( $p=0,021$ ), 11. ( $p=0,04$ ) i 12. ( $p=0,027$ ) pitanju te između srednje i kasne adolescencije u 11. ( $p=0,032$ ) pitanju. Ispitanici u srednjoj adolescenciji imali su lošije oralno-higijenske stavove od ispitanika u ranoj i kasnoj adolescenciji. Provedba obrazovnih programa o promicanju oralnog zdravlja tijekom srednjoškolskog obrazovanja potrebna je radi unaprjeđenja oralno-higijenskih navika kod adolescenata u Hercegovini.

**Ključne riječi:** *Adolescenti; Navike u oralnom zdravlju; Ponašanje prema oralnom zdravlju*