

ORAL HEALTH RELATED KNOWLEDGE, BEHAVIOR AND ATTITUDE IN A GROUP OF 12-YEAR-OLD SCHOOL CHILDREN

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ABSTRACT

Objective: The aim of this study was to investigate the oral health knowledge, behavior and attitudes in a group of 12-year-olds in Bihać, Bosnia and Herzegovina.

Methods: The study was designed as a cross-sectional and included 434 seventh-grade students. A structured questionnaire consisted of 25 questions was constructed, probing areas such as oral health knowledge, attitudes towards oral health, behavior and socio-demographic data.

Descriptive statistics was performed and frequency distributions and percentages were used for data presenting. For the independent variables, the Chi-square test was used.

Results: The most common reason for dental visit was a regular checkup (64, 26%). Most students brush their teeth twice a day (51, 44%) or more than twice (25, 38%). Toothbrush and toothpaste are used by 68, 39%, while dental floss additionally by 31, 62% subjects. Soft drinks are consumed daily by 70, 72%, sweets by 57, 67% every day after the meal, while 10, 27% students consume sweets daily with no restrictions. Approximately half of all respondents (53, 69%) answered that they felt normal when they visited the dentist, 10, 83% students felt positive and 3% relaxed. About one third of respondents have reported negative feelings: 11, 06% responded that it was stressful, 8, 29% uncomfortable, 7, 6% worried, while 1, 84% students felt scared and terrified.

Conclusion: Introducing an oral health educational program into schools and preschool institutions could be a significant step towards improvements in oral health status of children and adolescents in our country in which dental care is predominantly based on treating existing pathology.

Key words: oral health, attitudes, behavior, knowledge, 12-year-old

Introduction

Good oral health is important part of general health and also one of its key indicators. It is well established that poor oral health can impede a child's growth and development, negatively affect diet and nutrition, deprive sleep, lead to short or prolonged physical pain and discomfort, and also disrupt psychological and social well-being and general quality of life [1-3]. Furthermore, the effects of a child's poor oral health have far-reaching consequences into adulthood [4].

Dental caries and periodontal diseases account for most of the oral disease burden in childhood and adolescence, even though both are preventable and can be treated in early stages.

Gum disease prevalence in children is very high globally. WHO (World Health Organization) data demonstrated that 90% of 12-year-old children in Portugal and 100% of 6- and 12-year-old children in Niger have signs of gum disease requiring treatment [5].

Although WHO data show a significant decline in childhood caries prevalence in previous decades in the Western European countries and the USA, in low-income countries this disease still poses a significant public health problem [6]. A most recent study among schoolchildren conducted in Bosnia and Herzegovina showed that the DMFT (decayed, missing and filled teeth) in 12-year-olds was 4.16 and that the D-component constituted a significant part of the index (45.43%) [7]. To the contrary, in numerous European countries, like Belgium, Denmark, Finland, Germany, Netherlands and Sweden, DMFT values are lower than 1 (0.9, 0.4, 0.7, 0.5, 0.6 and 0.8 respectively) [8].

Such low caries prevalence in these developed countries has been mainly attributed to the widespread use of fluoridated toothpastes and the increased awareness of the importance of maintaining high levels of oral hygiene [6], as well as to the low intake of added sugars, that are known to be correlated with an increased risk of caries [9].

Good oral health practices should be developed in early childhood. For the young children, the primary source of the proper oral health behavior is the family, which is important, since the earlier the behavior is formed, the more difficult it is to change it later.

As children grow up, oral health behavior is influenced by the process of secondary socialization in which the environment and peer groups play a leading role [10].

The school-age, lasting from childhood to adolescence, is another important period when children develop health behaviors as well as beliefs and attitudes. In this period, children can easily adopt new long-lasting knowledge and habits, especially given the possibility that oral health messages can be reinforced regularly during the school years. Health programs in schools are important for promoting the health and healthy lifestyles at children and young people. Oral health shown to be easily integrated into such school health activities [11].

School health promotion programs in developing country such as Bosnia and Herzegovina, with limited economic and health care resources and a high incidence of common oral diseases, could be an effective contribution to dental health care, especially having in mind that treatment of oral diseases result in significant costs [5] and caries is the fourth-most expensive chronic disease to treat [12].

Health care reform in Bosnia and Herzegovina is still ongoing and extensive preventive programs to protect the oral health of children are still lacking, therefore organizing an educational program for schoolchildren would be essential for improving their oral health.

Little information is available about the overall oral health knowledge and practices of children in our country, although this information is of utmost importance in designing educational programs.

The aim of this study was to investigate the oral health attitudes, knowledge and behavior of a group of 12-year-olds in Bosnia and Herzegovina.

Methods

The study was designed as a cross-sectional, using a convenience sampling method. The targeted population were 7th-grade students. In Bosnia and Herzegovina school-system those are 12 years old children on average. The study included 434 participants. The survey was conducted in four major primary schools with the highest number of students in the city of Bihać, namely: Prekounje, Gornje Prekounje-Ripač, Harmani 1 and Harmani 2. Prior to the beginning of the study, the permission of the Unsko-Sanski Canton Ministry of Education, Science, Culture, and Sports was obtained.

Students were invited to participate in the study using a group-administered structured questionnaire in the classroom setting. The questionnaires were completed anonymously by all seventh-grade students from selected schools who were present in the school on the day the study was scheduled and who accepted to participate in the study.

They were explained how to fill in the questionnaire, and the researcher was present in the classroom in case the respondents did not have a clear sense of the question and needed a clarification.

The school authorities informed the children and parents about the aim of the study and obtained the written consent from the parents. The Ethics Committee of the Faculty of Dentistry, University of Sarajevo, approved the study.

A structured questionnaire consisting of 25 questions was constructed using questions from previous similar studies, some of which were originally in students' native language and others were translated from English [13-15]. The questions were close-ended, either multiple choice or with true/false and yes/no options and they covered areas such as oral health knowledge, attitudes towards oral health, behavior and socio-demographic data (parental education and occupation).

Microsoft Office Excel 2013 worksheet was used for data entry. The data integrity check was done, and IBM SPSS Statistics v. 20.0 for Windows statistical software was used for data analysis. Descriptive statistics were performed and frequency distributions and percentages were used for data presenting. For the independent variables, the Chi-square test was used to determine the association between them. Statistical significance was set at $p < 0.05$.

Results

A total of 434 twelve-year old were included in this survey. Male respondents comprised 51.38% ($n=223$) of the sample, whereas female participated with 48.62% ($n=211$). The majority of students included in this survey were from Gornje Prekounje Ripač Elementary School - 140 of them, 113 and 103 participants were from Harmani 2 and Prekounje Elementary School respectively, and 78 from Harmani 1 school.

Socio-demographic characteristics:

Statistical analysis revealed significantly higher mothers' employment rate than those of fathers' in the whole sample ($\chi^2 = 62.206$; $p < 0.001$).

Out of total, 19, 12% mothers were unemployed and 44, 0% fathers.

The highest proportion of unemployed parents, 25, 71% mothers and 58, 57% fathers, was registered in the Gornje Prekounje Ripač Elementary School ($p = 0,032$).

Approximately half of all parents graduated from high school, 52, 76% fathers and 51, 99% mothers. Bachelor's degree is held by 20, 27% fathers and 17, 97% mothers, and 17, 05% fathers and 19, 35% mothers graduated from university. With only primary school education, there were 4, 37% fathers and 4, 14% mothers, and with postgraduate education 2, 07% fathers and mothers each. Fifteen students did not know the education level of their parents.

	School					p
	Gornje Prekounje -Ripač	Harmani 1	Harmani 2	Prekounje	X	
Frequency of dental visits						
once in 3 months	28,57%	38,46%	46,90%	29,13%	35,77%	0.209
twice a year	9,29%	10,26%	14,16%	17,48%	12,80%	
once a year	8,57%	0,00%	0,00%	0,00%	2,14%	
whenever I feel necessary	42,14%	48,72%	35,40%	47,57%	43,46%	
when I have a toothache	9,29%	2,56%	3,54%	5,83%	5,31%	
Reason for dental visit						
caries	8,57%	12,82%	13,27%	12,62%	11,82%	0.029
pain/swelling	12,86%	7,69%	7,08%	4,85%	8,12%	
dental treatment	23,57%	6,41%	8,85%	14,56%	13,35%	
extraction	5,71%	0,00%	0,00%	1,94%	1,91%	
regular checkups	47,14%	73,08%	70,80%	66,02%	64,26%	
Tooth brushing frequency						
once a day	5,71%	1,28%	0,88%	0,00%	1,97%	0.103
twice a day	39,29%	47,44%	53,98%	65,05%	51,44%	
more than twice a day	25,71%	32,05%	29,20%	14,56%	25,38%	
after each meal	27,14%	14,10%	16,81%	20,39%	19,61%	
rarely	2,14%	5,13%	0,00%	0,00%	1,82%	
never	0,00%	0,00%	0,00%	0,00%	0,00%	
Oral hygiene product use						
toothbrush and toothpaste	80,00%	60,26%	67,26%	66,02%	68,39%	0,81
only toothbrush	0,00%	0,00%	0,00%	0,00%	0,00%	
toothbrush, toothpaste, dental floss	20,00%	39,74%	32,74%	33,98%	31,62%	
Tongue cleaning						
daily	32,14%	25,64%	14,16%	19,42%	22,84%	0,271
sometimes	57,86%	73,08%	75,22%	67,96%	68,53%	
never	7,86%	3,85%	10,62%	12,62%	8,74%	
Use of fluoride supplements						
yes, every day	3,57%	0,00%	0,00%	0,00%	0,89%	0,879
yes, sometimes	18,57%	21,79%	17,70%	18,45%	19,13%	
yes, at school	0,00%	0,00%	0,00%	0,00%	0,00%	
never	77,86%	78,21%	82,30%	81,55%	79,98%	
Soft drinks consumption						
every day	71,43%	76,92%	74,34%	60,19%	70,72%	0,033
several times a week	25,71%	21,79%	25,66%	38,83%	28,00%	
once a month	2,14%	0,00%	0,00%	0,00%	0,54%	
never, I don't like soft drinks	0,71%	1,28%	0,00%	0,97%	0,74%	
other	0,00%	0,00%	0,00%	0,00%	0,00%	
Consumption of sweets						
every day, but only after meals	52,86%	60,26%	59,29%	58,25%	57,67%	0,788
every day	13,57%	12,82%	8,85%	5,83%	10,27%	
once a week	9,29%	0,00%	0,00%	0,00%	2,32%	
several times a week	22,14%	25,64%	30,09%	35,92%	28,45%	
once a month	2,14%	1,28%	0,00%	0,00%	0,86%	
never	0,00%	0,00%	0,00%	0,00%	0,00%	

Table 1. Oral health behavior patterns

	School				X	p
	Gornje Prekounje -Ripač	Harmani 1	Harmani 2	Prekounje		
Can oral health affect general health?						
yes	72,86%	82,05%	87,61%	91,26%	83,00%	0.041
no	9,29%	1,28%	0,00%	0,00%	3,00%	
I do not know	17,86%	16,67%	12,39%	8,74%	14,00%	
What is a consequence of inadequate tooth brushing?						
tooth decay	18,57%	3,85%	7,96%	0,97%	9,00%	0.038
bleeding gums	8,57%	1,28%	1,77%	0,00%	4,00%	
bad breath	10,00%	1,28%	0,00%	0,00%	3,00%	
none of the above	0,00%	0,00%	0,00%	0,00%	0,00%	
all of the above	62,86%	93,59%	90,27%	99,03%	84,00%	
I do not know	0,00%	0,00%	0,00%	0,00%	0,00%	
other	0,00%	0,00%	0,00%	0,00%	0,00%	
How can we prevent dental and oral health problems?						
avoiding sugary foods	5,71%	0,00%	0,88%	0,97%	1,89%	0.011
regular brushing	15,00%	6,41%	4,42%	2,91%	7,19%	
rinsing mouth after meals	2,14%	0,00%	0,00%	0,00%	0,54%	
regular visits to the dentist	17,86%	5,13%	7,08%	3,88%	8,49%	
all of the above	59,29%	88,46%	78,76%	92,23%	79,69%	
none of the above	0,00%	0,00%	0,00%	0,00%	0,00%	
I do not know	0,00%	0,00%	0,00%	0,00%	0,00%	
What is fluoride?						
cleans and whitens teeth	16,43%	10,26%	9,73%	12,62%	12,26%	0.011
removes deposits and calculus from the tooth	15,71%	2,56%	3,54%	7,77%	7,40%	
a natural element used to prevent tooth decay and improves caries resistance	41,43%	74,36%	78,76%	70,87%	66,36%	
Caries can be prevented by using fluoride toothpaste?						
yes	45,71%	75,64%	73,45%	69,90%	66,18%	0.039
no	2,86%	0,00%	0,00%	0,00%	0,72%	
I do not know	20,71%	2,56%	0,00%	1,94%	6,30%	
mostly yes	27,14%	21,79%	26,55%	26,21%	25,42%	
mostly not	0,71%	0,00%	0,00%	0,00%	0,18%	
The bulk of your knowledge of dental and oral health originates from:						
radio, television, newspapers, media	20,00%	16,67%	12,39%	12,62%	15,42%	0.604
your dentist	73,57%	74,36%	69,03%	68,93%	71,47%	
your doctor	9,29%	0,00%	0,00%	0,00%	2,32%	
friends, neighbors, or other relatives	2,86%	1,28%	0,00%	0,00%	1,04%	
from other sources	1,43%	7,69%	16,81%	18,45%	11,10%	

Table 2. Oral health related knowledge

Prekounje Elementary School students had the highest percentage of their mothers having secondary school ($p=0,04$), whereas students from Gornje Prekounje Ripač Elementary School had a significantly larger proportion of fathers with only primary school education ($p=0,039$) and the smallest percentage of them graduated from university.

Behavior towards oral health:

The behavior patterns toward oral health are shown in **Table 1**. The most common reason for the dental visit in the whole sample was a regular checkup, except for students from Gornje Prekounje - Ripač Elementary School who visited the dentist significantly more often because they needed the treatment ($p=0,029$).

Most students brush their teeth twice a day or more than twice and use toothbrush and toothpaste with one-third using dental floss additionally.

Fluoride supplements are rarely used. Respondents reported frequent consumption of soft drinks and sweets.

Knowledge:

Most students were aware that poor oral health can affect general health; large majority correctly recognized all of the consequences of inadequate tooth brushing and knew what were appropriate ways of maintaining good oral health (**Table 2**.)

Approximately two-thirds of respondents knew what the fluoride was and that caries could be prevented using fluoridated toothpaste.

Statistical analysis, however, revealed that all of these questions received significantly less accurate answers from students from the Gornje Prekounje-Ripač Primary School. (**Table 2**.)

The dentist was the major source of information on dental and oral health for all respondents.

Attitudes:

Analysis of students' oral health attitudes revealed that 90,16% students fully agreed and 8,

93% mostly agreed that oral and dental health was a personal responsibility. The majority of them (76,92%) agreed and mostly agreed (19,86%) that they themselves can help improve their oral health. Asked if it was possible to keep their teeth for a lifetime, 69,64% responded affirmatively - completely agreed, and 27,67% mostly agreed, whereas only 1,25% disagreed.

That regular visits to the dentist will prevent dental problems was the opinion of 67,13% students and 31,69% generally agreed with this statement, while 0,72% did not know.

Of the total number of students, 78,11% completely agreed and 17,83% mostly agreed that brushing their teeth will prevent gums bleeding, while 2,5% did not know the answer.

For the statement "I cannot prevent caries without professional help.", opinions were divided. 26,90% students answered that this statement was true, 27,37% that it was false, for 23,99% respondents it was mostly true and for 14,57% mostly false.

Approximately half of all respondents (53,69%) answered that they felt normal when they visited the dentist, 10,83% students felt positive and 3% relaxed. About one third of respondents have reported negative feelings: 11,06% responded that it was stressful, 8,29% uncomfortable, 7,6% were worried, while 1,84% students felt scared and terrified.

Discussion

This study aimed to probe the behavior, knowledge and attitudes in a group of 12-year-old regarding oral health.

So far, no studies addressing this subject in this age group in the Federation of Bosnia and Herzegovina have been published. Twelve-year-old are chosen for the study because they are determined as the global indicator age group for monitoring caries trends and international comparisons. At that age, all of the permanent

teeth except for third molars have erupted, and additionally, this group is through schools easily accessible for survey.

Respondents in our study reported very good oral hygiene habits, with more than 95% of them brush their teeth twice or more than twice a day. The results of 2001-2002 HBSC (Health Behavior in School-aged Children) survey among 11-13 old school children from 27 countries showed that only children from Switzerland showed similar results, with 84.8% of them brushing teeth more than once a day, while this applies to about 80% of children from Scandinavia, the Netherlands, and Germany. In Belgium, Croatia, Greece, Latvia and some other countries, only about 50% of children or even less brush their teeth more than once a day [9].

However, with approximately two-thirds of respondents in our study consuming soft drinks and sweets daily, the nutrition behaviors are much poorer compared to the HBSC study, in which Scottish children demonstrated the poorest results with 45% consuming sweets and 41% soft drinks every day, whereas only about 12% of Danish, 14.3% of Greek and 12.7% of Swedish children consume sweets every day, and 9.3%, 17.9% and 12.25% of them consume soft drinks daily, respectively [9].

Overall, respondents demonstrated favorable oral health-related knowledge level, although students of Gornje Prekounje-Ripač Elementary School showed poorer results. A possible reason for this is the fact that the significantly higher proportion of students from that school comes from a lower socioeconomic status, with the lowest mothers' and fathers' employment rate and significantly lower fathers' educational level.

Indirectly, these results may further confirm the findings of studies indicating that children of lower socioeconomic status are at a higher risk of developing oral diseases [16, 17].

Although positive attitudes towards oral health, as well as good oral hygiene habits were demonstrated, further improvements concerning

dietary habits and knowledge on options to prevent oral problems are necessary,

Despite rather encouraging findings in terms of oral health-related knowledge and oral hygiene practices, that should suggest a low caries rate, epidemiological studies have shown quite the opposite.

The average DMFT in twelve-year-old in Bosnia and Herzegovina in 2008, as already mentioned, was 4.167, while in the same age group in Bihać, in 2013 the recorded value was 5.39 [18].

These data support the fact that serious measures need to be taken to improve the oral health of children and adolescents in Bosnia and Herzegovina. The most commonly emphasized success in preventing and reducing caries prevalence in schoolchildren has occurred in the Scandinavian countries, which have achieved this to a large extent through school-based prevention programs [19]. Some Eastern European countries have achieved good results, too. Through supervised toothbrushing programs with concentrated fluoride preparations and an extensive oral health education program in schools and kindergartens, Slovenia achieved significant success, reducing DMFT from 6.1 in 1987 to 1.8 in 1998 [20].

In Hungary, caries prevalence was significantly reduced in the period 1985 to 1996 through school programs, by administering fluorides either in tablets or topically, giving oral hygiene instructions and advising on proper nutrition. Teeth brushing exercises in classrooms and health education sessions were held 2-4 times a year. The caries prevalence declined in that period from 92.5% to 84.5% [21].

From the previous examples, it is clear that the school is the environment which enables organized way to reach the school population and implement the necessary preventive measures to reduce the prevalence of caries and other oral diseases. Given that primary school is compulsory, oral health-related education through schools is a way to reach all children, including those of lower

socioeconomic status, who have proven to be a vulnerable category.

However, for the results of the education to last over a longer period, repeated instruction by professionals is required. Oral health promotion should be integrated into the curriculum in such a way to be extended through a significant part of schooling, with intervention sessions organized several times during a school year [22, 23].

Conclusion

Despite the positive attitudes and favorable oral health-related knowledge observed in this group of 12-year-old, recent studies of this population in Bosnia and Herzegovina show high caries prevalence. The high frequency of consumption of soft drinks and sweets demonstrated in this study is undoubtedly one of the main reasons for such poor dental health. The reported good results regarding oral-hygiene habits among students should be taken with caution because of the possible desire to provide socially acceptable answers, even though the questionnaire was done anonymously.

Given these results, as well as the absence of community-based oral health prevention programs in our country in which dental care is predominantly based on treating existing pathology, introducing an educational program into schools and preschool institutions could be a significant step towards addressing the current unfavorable epidemiological situation when it comes to the oral health status of school children.

CONFLICT OF INTEREST:

The authors declare no conflict of interest.

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