

Assessments of the Socioeconomic Status and Diet on the Prevalence of Dental Caries at School Children in Central Bosnian Canton

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ABSTRACT

Aim: The main aim of this research was to determine the influence of socioeconomic status and residence/living conditions on the status of oral health (e.g. health of mouth and teeth) in primary school students residing in Canton Central Bosnia. **Methods:** The study was designed as a cross-sectional study. Our research included two-phased stratified random sample of 804 participants. The quantitative research method and newly designed survey instrument were utilized in order to provide data on the oral health of the examined children. The alternate hypothesis foresaw that "there were significant statistical differences between the levels of incidence of dental caries in comparison to the incidence in children of different socioeconomic status. **Results:** The Chi square () of 22.814, degree of freedom (Df) = 8, coefficient of contingency of 0.163 and T-test (Stat) of -0.18334 showed that there were no significant statistical differences at $p < 0.05$ level between the primary school children from urban and rural areas. The obtained results showed that the caries indexes in elementary schools in Central Bosnia Canton were fairly uniform. Research showed that there were a difference in the attitudes towards a regular dental visits, which correlated with social-educational structure of the children's' families. **Conclusion:** According to the results, we can see that the socioeconomic status of patients had an effect on the occurrence of dental caries and oral hygiene in patients in relation to the rural and urban areas, because we can see that by the number of respondents, the greater unemployment of parents in both, rural and urban areas, caused a host of other factors, which were, either, directly or indirectly connected with the development of caries.

Key words: assessment, socioeconomic status, status of oral health, school children.

1. INTRODUCTION

Oral health (i.e. health of mouth and teeth) of school children represents a significant social and economic value of the modern world. Retrospective research data show that there is a difference in attitudes of examined children regarding the regular control of oral health, which is in correlation with social and educational structure of their families. The opinion that by practicing a regular preventive controls diseases of mouth and teeth can be prevented, obviously and unfortunately is not prevalent as life practice in many of primary school children's families (1, 2) Even though the children are exposed to the

oral health at the fairly young age and although the parents are increasingly aware of the importance of the oral health for the entire well-being of their children, in many instances the role of parents and children in maintaining health of mouth and teeth is not sufficient, so the necessity arises to seek the professional help. It is best to seek help of dental professionals preventively, even then when everything seems to be well with the health of mouth and teeth (3, 4).

In 2005, as an answer to the rather poor state of primary school children's oral health in Federation entity of Bosnia and Herzegovina (F.B&H), within all of its ten Cantons, a

promotional-preventive activities have been carried out with the main objective to familiarize the matriculated first grade children with the importance of proper oral hygiene and its correct application. This ambitious program was carried out in cooperation with Federal Ministry of Health, Federal Institute for Public Health, Federal Institute for Insurance and Re-insurance and primary health care institutions in F.B&H (5). In the academic school year 2004/2005 this program included 99.5 percent of all primary schools in F.B&H (i.e. 398 of central primary schools and majority of regional schools), while, at the same time education 89.2 percent of first grade children. In the academic school year 2006/2007 this program was additionally carried out to the first and second grade primary school pupils in Federation of Bosnia and Herzegovina (6, 7).

The progress of the infection process is exemplified by the penetration into the tissue around the tooth's root and development of periodontitis. Each hole in the tooth represents an additional place for keeping food, plaque formation and propagation of a large number of bacteria.

The treatment actually consists in detecting caries damage and removing softened dentin, followed by the appropriate treatment and disinfection of the oral cavity and eventually sealing (8).

While there are many theories about the origin of caries none of them give a complete answer to all the questions that come to mind when it comes to the etiopathogenesis of dental caries. According to contemporary views, some factors have greater importance in its origination, namely:

- a) The structure and roughness of enamel;
- b) Dental plaque;
- c) Properties of saliva; and
- d) Carbohydrates.

Dental plaque is of great importance, both in the development of caries, as well as in the pathogenesis of parodontopathy. It consists of desquamated epithelium of the oral mucosa, microorganisms and mucin (constituents of saliva) (9).

The accumulation of plaque on the tooth surfaces on which the physiological self-cleaning and cleaning with a brush is rather inefficient, is preceded and followed by caries. A special attention should be paid to microorganisms that are found in plaque, especially cariogenic strains of streptococci (*Streptococcus mutans* and *sangus*). Their biochemical activities carry out decomposition of carbohydrates to simple acids and synthesize different polysaccharides (i.e. dextran, levan and amylopectin) (10).

2. MATERIALS AND METHODS

The study was designed as a cross-sectional study. The survey instrument was used for the survey interview and clinical examination of the mouth and teeth to provide data on oral health of the examined children. The survey was conducted in all units of observation, in selected schools in the stage of choice within these departments-selected groups of students. This also meant that two phases stratified sample of compatible groups, where 804 students were surveyed in elementary schools and where 355 students were from urban and 449 from rural schools.

- Creating questionnaires and publicity materials;
- Working team members' education;
- Members were familiarized with the available data on oral hygiene habits and their impact on oral health, various

techniques and tools for proper oral hygiene, and tools and techniques for the determination of OHI (e.g. index hygiene oral).

- Data were collected by conducting surveys in several classrooms (i.e. one class from each age group selected among primary schools) and filling out questionnaires with the assistance of members of the survey team, in order to help to determine the status and oral hygiene index.
- At the end, the data analysis and evaluation of the project was carried out.

3. RESULTS

Below is presented the analysis of the data that we received after interviewing 804 students in elementary schools, where 355 students were from urban and 449 students from rural schools, the following results were obtained:

Assessment of the socioeconomic status in children from urban and rural areas was carried out on the basis of the group questions in the application form, which were related to employment and qualifications of father / mother, the place of residence, and on the basis of their financial status. The Chi squared had the value of 22.814, the Level of Significance of $P = 0.0001$ and Contingency Coefficient of 0.163.

The obtained responses from this group of questions are presented in the table 1 below:

	Variable 1	Variable 2
Mean	80	88
Variance	4000	5520
Observations	5	5
Pooled Variance	4760	
Hypothesized Mean Difference	0	
Df	8	
t Stat	-0,18334	
P(T<=t) one-tail	0,429546	
t Critical one-tail	1,859548	
P(T<=t) two-tail	0,859093	
t Critical two-tail	2,306004	

Table 1. *t*-Test according to the Socioeconomic status in examinees residing in rural and urban areas.

No statistical significance was observed at $p < 0.05$, and therefore there is no statistically significant difference between urban and rural primary school children according to the socioeconomic status.

From total amount of 72.37 percent of surveyed children listed that their father was employed, (i.e. 44.00 percent in urban and 28.37 percent in rural areas), 25.75 listed that their father was unemployed (i.e. 14.00 percent from urban and 11.37% from rural areas). Situation with mothers' employment status was quite different; whereas 52.5 percent of surveyed children listed (i.e. 22.25 percent in urban and 30.25 percent from rural areas) listed that their mother was employed, while 66.62 percent (i.e. 18.5 percent from urban and 48.125 percent from rural areas) listed that their mother was unemployed. 86.5 percent of examinees listed to reside in their own house or apartment (e.g. 34.37 percent in urban and 52.12 percent in rural areas). 40.50 percent of surveyed answered to have at disposal its own

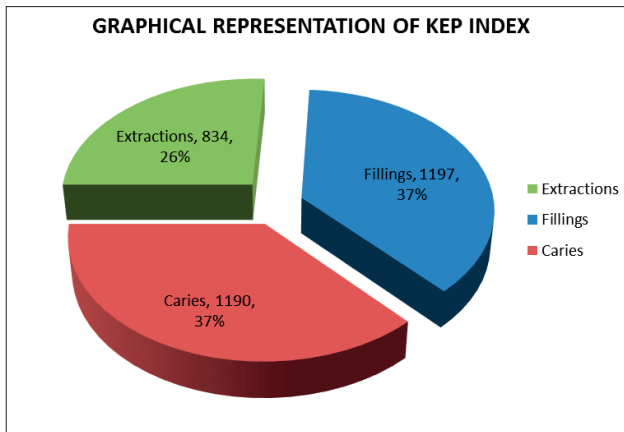


Figure 1. Graphical representation of prevalence of CAP Index (includes the prevalence of: caries, filling and extractions)

room, while 53.75 percent listed to share the room with brother or sister. By taking into consideration the answers regarding employment and socioeconomic status of examined children, where are clearly visible changed in rural and urban areas, we can ascertain that socioeconomic status (as an independent variable) was in causal relationship with the causation and development of dental caries and adverse changes in oral hygiene of examinees. Poorer socioeconomic status seems to have caused the incidence of the increasing number of examinees from rural areas who have visited dentist(s) more than four (4) times; (i.e. 19.75 percent) in comparison to the examinees from the urban areas measured at 16.5 percent. At the same time there were not a single examinee residing in the urban areas who had reported to have visited a dentist more than ten times, while there were 1.5 percent of surveyed from the rural areas who visited a dentist more than ten times.

4. DISCUSSION

When defining the socioeconomic status we can clearly see that the majority of respondents from rural and urban areas stated that their father was employed. In a small number of answers the unemployment was viewed as a direct impact on the socioeconomic status of respondents, as well as the position of the mother's employment where it was clear that there was a difference between respondents in urban and rural, where a much larger number of respondents answered that the mother was not employed, which was not the case in the urban environment. Accordingly, the city center had a much larger number of respondents who reported that their parents were employed compared to rural population (11, 12, 13).

Most of the respondents in urban and rural areas stated to have their own house / apartment, while in the middle of both had the same number of responses for respondents who were living as tenants. The largest number of respondents shared his/her room with some brother / sister, while the rural areas had a higher number of respondents who had their own room. In the city, although the higher the number was higher than in the rural areas, statistically speaking there was some difference in favor of the respondents' rural areas (14, 15).

The second group of questions related to hygiene and diet and nutrition in relation to the hypotheses of this study gave some interesting answers. When asked how often they were having breakfast on weekends most of the respondents answered that they had breakfast on both days of the weekend, in both the

city and rural areas (16, 17).

Most of the respondents stated that they were pleased with his/her weight and that there was no need or feeling the need to dedicate to a diet, and that a large number of respondents regularly consumed meals. A large number of respondents stated that they most commonly consumed fast food, and that having in mind its composition it was felt as a predictor for the occurrence of various diseases, including dental caries (18).

It is important to note that this factor had an impact on the status of oral hygiene in our patients, and that our sample consisted of a very large number of respondents who consumed sweets and snacks, each day and several times a day. Encouraging responses were in the forms of answers where the fruits were consumed more than three times in the last three days, although it was directly linked with socioeconomic status of respondents (19, 20, 21).

The high prevalence of dental caries was caused by certain safe factors, so in this case we consider diet and place of residence (e.g. rural and urban environment), where the respondents from urban areas were more susceptible to the influence of factors that lead to tooth decay, such as fast food and sugary treats, with 64.48% of the urban environment usually taking fast food during the big break at school, but also, a large number of children from rural areas at 80.95%, which meant that the predominant factors were no longer tied to regional-geographical determination (e.g. in rural and urban communities) (22).

In our sample, 45.25% of respondents from urban areas have been consuming candy daily, while 68.5% of them from rural areas also consumed sweets every day, which indicated that the predominant factors were not specific geographical locality (23).

5. CONCLUSION

On the basis of this research the following conclusions can be drawn:

- Conditions of oral hygiene habits' among school children was on a satisfactory level and no large differences were observed between respondents in urban and rural areas;
- The age group that comes to improving oral hygiene in the second half of elementary education, with a number of information, etc.
- Factors that were predominant in relation to residence and caries were: eating poor quality food during the big break at school, and in urban areas more than in rural areas, one of the essential factors of consuming sweets and snacks was equally represented in all areas. Regular brushing was the factor that had an impact on the formation of cavities, but it could not be correlated with the geographic distribution. Taking diet that was supposed to improve tooth nutrition, such as drinking glasses of milk, gave no statistically significant results in both groups, but, rather favored the rural areas.

According to the results, we can see that the socioeconomic status of patients was affected by the occurrence of dental caries and oral hygiene, in patients, in relation to their rural and urban residence areas, because we could observe that by the number of respondents and greater unemployment in both parents in rural areas than in the city, which caused a host of other factors that were directly and indirectly connected with the development of caries.

According to the type of food consumed we could see that in

urban and rural areas the responses were fairly balanced, with the city where the larger number of respondents ate foods that posed a risk factors for tooth decay and deterioration of an oral hygiene than in rural areas, while the answers to the sample size and the use of a healthy diet were conditioned with the geographical position, (i.e. housing in rural areas where fruits and vegetables more available than in the city center).

CONFLICT OF INTEREST: NONE DECLARED.

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