Journal of Dental and Oral Health

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Research Article

The Correlation between DMFT and OHI-S Index among 10-15 Years Old Children in Kosova

This article was published in the following Scient Open Access Journal:
Journal of Dental and Oral Health
Received May 25, 2015; **Accepted** May 31, 2015; **Published** June 12, 2015

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Abstract

Introduction: The DMFT and OHI-S indexes are two of the most important quantitative factors, measuring tooth health and oral hygiene.

Aim: The aim of this study was to determine the correlation between DMFT and OHI-S indexes in 10-15 years old children treated at the University Dentistry Clinical Center of Kosova - Pediatric Dentistry Clinic.

Methods: The study has been carried out during 2 years period (2013-2014) on 695 children (51.7% females and 48.3% males), ages 10-15 years from urban and rural areas, included in this cross-sectional study.

Children's oral health status was evaluated using the WHO caries diagnostic criteria for Decayed, Missing and Filled teeth (DMFT), and simplified oral hygiene index by Green-Vermilion (OHI-S).

Results: The findings of our study demonstrated that children aged 10-15-year-old living in the urban areas had higher prevalence of caries than those in rural areas. The average and standard deviation of DMFT in children from urban areas was 2.8 and 2.1, respectively the average and standard deviation of DMFT was 2.4 and 1.7, for children from rural areas. OHI-S index, on the other hand, showed an average 1.4.

Conclusion: Based on the result of the t-test, the correlation coefficient was r= 0.70. We have concluded that there is a strong correlation between DMFT and OHI-S index in children 10-15 years old, and they had high caries prevalence. Preventive approach and measures are recommended for children due to higher caries prevalence, related to their diet and poor oral health maintenance.

Keywords: DMFT, OHI-S, 10-15 years old, Cross-sectional study

Introduction

Oral health is now recognized as equally important in relation to general health [1]. Healthy teeth and oral tissues and the need for oral health care are important for any section of society. Oral disorders can have a profound impact on the quality-of-life. Good oral health has real health gains, in that it can improve general health and quality-of-life and contribute to self-image and social interaction. Epidemiologic studies may be of value in assessing the prevalence of diseases, in disclosing trends in disease development, and in analyzing possible factors influencing the disease pattern [2].

Kosovo is the youngest European country, in Southeastern Europe. After the war in 1999, the population of Kosovo in 2000 was 2 million inhabitants, with 32.8% of the population aged 14 years or less [3]. The reorganization healthcare and educational institutions did not emphasize oral health promotion. Currently, Kosovo has an underdeveloped economy and rather poor educational and health systems. Basic education still does not include training in oral health. There are no concrete activities in preventive dentistry organized by Kosovo's Ministry of Health. Some preventive activities are accomplished by the Group for Public Oral Health Promotion, established in 2000 and supported by nongovernmental organizations [4].

It has already been mentioned that dental caries is the mostly spread disease in the world. In a study carried out in Kosovo we have assessed the prevalence of dental caries in comparison with other countries. The data from this oral health assessment of children of Kosovo showed a very high caries experience in both the primary and permanent dentitions. Caries prevalence expressed via the DMFT index was very

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high. Epidemiological data (years 2002-2005) derived from our study showed a high prevalence of dental caries among children in Kosovo (89.2% among preschool children and 94.4% among school children). The mean dmft/DMFT index was 5.86 for preschool children (ages 2 to 6) and 4.86 for all school children (ages 7 to 14) [4].

Pediatric and preventive dentists have advocated early oral examinations, appropriate interventions and parental counseling, but these have not been carried out systematically in Kosovo. Similarly, the majority of preschool-age children have never been to a dentist [4].

Dental caries is a common oral disease in children. Pain and dentoalveolar abscess are the severe complications that may arise from untreated dental caries [5]. The children visit dentists only in the case of acute pain and never on the basis of preventive measures.

The results from the same previous study show that dental health of these children in Kosovo is worse than that of children in other European countries. The low treatment rate of children in Kosovo (<2%) indicates a high treatment need. Also, the mean DMFT (5.8) of school children in Kosovo (age 12) was higher in comparison with school children (age 12) of the following developed countries: Netherlands (1.1), Finland (1.2), Denmark (1.3), USA (1.4), United Kingdom (1.4), Sweden (1.5), Norway (2.1), Ireland (2.1), Germany (2.6) and Croatia (2.6) . The mean DMFT of Kosovo's children (age 12) was similar to the mean values in Latvia (7.7), Poland (5.1) and a group of 12- to 14-year-olds in Sarajevo, Bosnia (7.18). As it was previously mentioned, the low treatment rate of the children in Kosovo is unfavorable and indicates a high treatment need [6].

Dental caries is a lifetime disease, with highest priority risk group between 11-14 years of age group. Environmental factors such as culture, socioeconomic status, life style and dietary pattern can have a greater impact on caries-resistance or development [7].

The aim of this study was to determine the correlation between DMFT and OHI-S indexes in 10-15 years old children treated at the Pediatric Dentistry Clinic of the University Dentistry Clinical Center of Kosovo. We needed this to make a presentation for the Ministry of Health of Kosovo, to demostrate the actual situation of oral health and the resulting tooth decay. We did this for the first time and our goal was to get their support in creating new projects for promotion of oral health in school aged children.

Materials and Methods

This is a cross-sectional study, that has been carried out during 2 years period (2013-2014) on 695 children (51.7% females and 48.3% males), ages 10-15 years from urban and rural areas. Prior to the start of the study, the children, their parents were informed. Informed consent was obtained from the parents of the selected 10-15-year- old children. Every child was examined separately in our clinic using dental mirror and explorer. The questionnaire included their demographic data, age, gender, residence and dental status. It was performed by dentists from the Prishtina University Dental Clinics, from the Pediatric and Preventive Dentistry Department and Periodontology and Oral Medicine Department.

Children's oral health status was evaluated using the WHO caries diagnostic criteria for Decayed, Missing and Filled teeth for permanent dentition (DMFT) [8] and simplified oral hygiene index by Green-Vermilion (OHI-S). DMFT (for permanent dentition) describe the number, or the prevalence, of caries in an individual. DMFT is method to numerically express the caries experience and is obtained by calculating the number of decayed (D), missing (M) and filled (F) teeth (T). The Simplified Oral Hygiene Index (OHI-S) differs from the original OHI (The Oral Hygiene Index) in the number of the tooth surfaces scored (6 rather than 12), the method of selecting the surfaces to be scored, and the scores, which can be obtained. The criteria used for assigning scores to the tooth surfaces are the same as those use for the OHI (The Oral Hygiene Index). The six surfaces examined for the OHI-S are selected from four posterior and two anterior teeth.

- In the posterior portion of the dentition, the first fully erupted tooth distal to the second bicuspid (15), usually the first molar (16) but sometimes the second (17) or third molar (18), is examined. The buccal surfaces of the selected upper molars and the lingual surfaces of the selected lower molars are inspected.
- In the anterior portion of the mouth, the labial surfaces of the upper right (11) and the lower left central incisors (31) are scored. In the absence of either of this anterior teeth, the central incisor (21 or 41 respectively) on the opposite side of the midline is substituted.

Criteria for classifying debris:

0-No debris or stain present

1. Soft debris covering not more than one third of the tooth surface, or presence of extrinsic stains without other debris regardless of surface area covered
2. Soft debris covering more than one third, but no more than two third, of the exposed tooth surface.
3. Soft debris covering more than two thirds of the exposed tooth surface [9].

Inclusion criteria

- School children (male and female) aged 10-15 years
- Children present on the day of examination.

Exclusion criteria

- Primary teeth present were ignored and their carious status not recorded.
- Individuals suffering from systemic illness
- Individuals who were not willing to participate in the study

Statistical Analysis

Mean DMFT index values were compared between boys and girls using Student's t-test and $P<0.01$ was considered for statistical significance. Percentages were compared by using the chi-square test ($P<0.05$). Statistical software was used for data entry (Microsoft Office Excel 2007 for Windows, Microsoft Corporation, Redmond, WA, USA) and all statistical tests were conducted using IBM SPSS software (ver.20.0; IBM, Chicago, IL, USA).

Result

The findings of our study demonstrated that children aged 10-15-year-old living in the urban areas had higher prevalence of caries than those in rural areas for P<0.01 (t=2.75; Df=639).

Based on gender and residence: 48.2% of children lives in urban areas and 51.8% of children lives in rural areas. From 695 children 51.7% are females and 48.3% are males (Table 1).

The average and standard deviation of DMFT in children from urban areas was 2.8 and 2.1, respectively, the average and standard deviation of DMFT was 2.4 and 1.7, for children from rural areas (Table 2).

It was noticed that with increase of their age, increases DMFT, so from for 1.8 in a 10 year old group in 4.2 in 15 years old group (Table 3).

Coefficient of correlation is r = 0.70 which is considered as a strong correlation between DMFT and OHI-S index value. If one increases, increases the other one too (Graph 1).

OHI-S index, on the other hand, showed an average 1.42 for female and 1.44 for male (Table 4).

Residence	Gender				Total	
	Female		Male			
	N	%	N	%	N	%
Rural	182	50.7	153	45.5	335	48.2
Urban	177	49.3	183	54.5	360	51.8
Total	359	100.0	336	100.0	695	100.0
	51.7	-	48.3	-	100.0	-

Table 1: Patients analyzed based on gender and residence.

Residence	N	Average of DMFT	SD of DMFT
Rural	335	2.4	1.7
Urban	360	2.8	2.1
Total	695	2.6	1.9

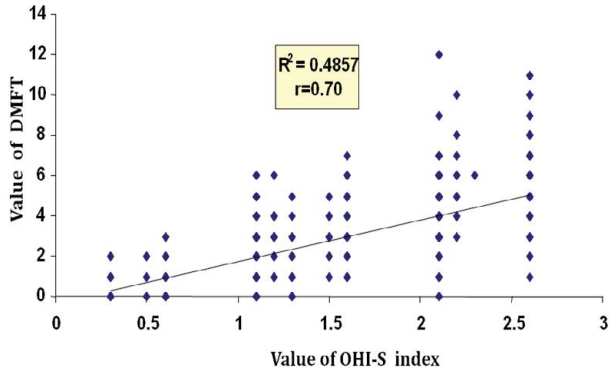
Table 2: The average and standard deviation of DMFT in children from urban and rural areas.

Age	N	Average of DMFT	SD of DMFT
9 year	2	1.5	0.7
10 year	113	1.8	1.4
11 year	123	2.1	1.4
12 year	142	2.3	1.7
13 year	146	3.2	2.1
14 year	128	3.0	2.1
15 year	28	4.2	2.7
16 year	8	3.4	2.5
17 year	3	4.7	0.6
18 year	2	2.5	0.7
TOTAL	695	2.6	1.9

Table 3. DMFT was evaluated based on age.

Gender	N	Average of OHI-S	Average of DMFT
Female	359	1.42	2.67
Male	336	1.44	2.54
Total	695	1.43	2.61

Table 4. The average of OHI-S and DMFT index according to gender



Graph 1: Coefficient of correlation between DMFT and OHI-S index

Discussion

The present study provides information on prevalence of dental caries and oral health in a representative sample (n=695), from urban and rural areas in Kosovo. A previous study the mean DMFT of school children in Kosovo aged 12 was 5.8 [2]. In the present study, the mean DMFT is 2.6 was in the moderate category according to WHO classification [10]. There was no significant difference between the genders for any age group. The mean DMFT of school children increased with age, so from for 1.8 in a 10 year old group in 4.2 in 15 years old group. The differences between adjacent age groups showed a difference for 10-year-olds vs. 11-year-olds, 11-year-olds vs. 12-year-olds, and 12-year-olds vs. 13-year-olds, 13-years old vs. 14 years old, 14 years old vs.15 years old.

Caries prevalence varies from country to country and from region to region in same country. Geographic variables like race, climate, diet, culture and economic factors also affect the caries prevalence. In spite of these variations an attempt has been made to compare the findings of present study with the other studies within and outside the country [11].

The results from the present study show that dental health of these children in Kosovo is worse than that of children in other European countries. The mean DMFT (2.3) of children in Kosovo (age 12) was higher in comparison with school children (age 12) of the following developed countries: Netherlands (1.1), Finland (1.2), Denmark (1.3), USA (1.4), United Kingdom (1.4), Sweden (1.5), Slovenia (1.8), Norway (2.1), Ireland (2.1) [2]. Tanzania and Nigeria (Lagos) reported a DMFT of 0.3 and 0.46 [12] among 12-year-old children in 2004 and 2003/04 respectively. DMFT of Kosovo's children (age 12) was similar to the mean values in Germany (2.6), Croatia (2.6) and Macedonia (3.0), but lower than Latvia (7.7), Poland (5.1) and a group of 12- to 14-year-olds in Sarajevo, Bosnia (7.18) [13]. Saudi Arabia, on the other hand, reported a DMFT of 5.9 in 2002 [14,15], which is higher than Kosovo. Although the mean DMFT (4.2) of children in Kosovo (age 15) was higher in comparison with school children in another Western European countries. For the 15-year-olds, mean values of DMFT were in a range from 3.19 in England to 1.48 in Wales, and the lowest percentage of caries free was in Denmark at 42% [16]. Slovenia was the only former Yugoslav country where a remarkable decrease in caries prevalence was recorded [16]. The notable improvement of dental health in Slovenian children

was explained by the establishment of preventive programmes, with the stress on supervised teeth brushing with concentrated fluoride gel in primary schools, improved oral hygiene, and a comprehensive programme of applying fissure sealants, particularly on first molars [17]. As previously mentioned, the low treatment rate of the children in Kosovo is unfavorable and indicates a high treatment need. The relationship between sugar consumption and caries is not strong in Western countries [18], especially in the modern age of widespread fluoride exposure [19].

OHI-S index, on the other hand, showed an average 1.42 for female and 1.44 for male. In total is 1.43 that tell us the subjects in this study had poor oral health behavior and oral hygiene. But, this index is lower in comparition with the mean oral hygiene index-simplified (OHI-S) among government school children (2.9) and private school children (0.6) in India [20]. A large number of studies have confirmed that there is connection between socio-economic status and health, as well as a relationship between socio- economic status and the incidence and prevalence of caries. Therefore, a high caries risk is associated with socio-economic factors, such as low quality of life, low educational level, and the impact of cultural life on the promotion of oral health. Traditionally, there have always been lower economic and educational levels in underdeveloped countries as well as lower accessibility to dental services [21]. Gibson et al. [22] reported that a significant relationship between dental caries and sugar consumption was present only among children with poor tooth-brushing behavior. Thus, if the subjects in this study experience a future dietary shift toward the inclusion of more products with high sugar content, their generally poor oral hygiene may leave them vulnerable [23]. The results of this study revealed that perceived general health was closely associated with perceived oral health. This result is supported by those of previous studies increased incidences of gingivitis and dental caries [24].

Conclusions

WHO European goals for oral health by the year 2000 was that at least 50% of 5-6-year-olds should be caries-free and that the population of 12-year-olds should have a mean DMFT of no more than 2 [9].

Based on the result of the t-test, the correlation coefficient was r= 0.70. We have concluded that there is a strong correlation between DMFT and OHI-S index in children 10-15 years old, but they had high caries prevalence in comparison with Western European countries. Although caries is a multifactorial disease, it seems that the level of professional engagement affects oral health improvements more than patients knowledge [25]. These results, as well as our findings related to oral hygiene habits, indicate an urgent need for increased oral health education. Because oral hygiene habits, such as tooth brushing, do not appear to be firmly established among children in this community, oral health education programs delivered through the school system may be useful.

Acknowledgment

This study was conducted independently and not sponsored by any outside body. The author would like to thank all participants for their valuable help and cooperation.

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