

Assessment of significant caries index and oral hygiene status in a 15-year-old student in Kerman, 2012

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Original Article

Abstract

BACKGROUND AND AIM: Dental caries is a multifactorial disease that affects people of any age, sex, and race. Significant caries index (SiC index) has been defined by World Health Organization (WHO) to evaluate caries status in different societies. The aim of this study was to determine the SiC index in 15-year-old children in Kerman.

METHODS: This descriptive cross-sectional study was carried out on 300 of 15-year-old children that had been selected by systematic clustering sampling in Kerman. Data were collected by questionnaire (parents' educational level, parents' occupation, birth rank, number of children in family, tooth brushing, fluoride use, and regular dental visits) and clinical examination. Teeth were examined by dental mirror, according to WHO criteria. Data were analyzed in SPSS by using ANOVA, t-test, and Kruskal-Wallis tests.

RESULTS: Thirty-two and nine brushed their teeth twice daily, 49.8% had never used dental floss, 47.8% had regular dental visit, 80.66% did not use fluoride mouthwash, and 34.4% were caries free. The mean of decayed, missing, and filled teeth (DMFT) was 1.83 ± 1.26 and SiC index was 3.80. There was a significant correlation between the SiC index and parents' job and birth rank of student. There was also significant correlation between regular dental visit and use of fluoride mouthwash and SiC index.

CONCLUSION: The prevalence of dental caries in 15 years student in Kerman is still high. Using DMFT and SiC indices together may help to show oral health status better than DMFT index alone. Further studies are recommended.

KEYWORDS: Decayed, Missing, and Filled Teeth, Significant Caries Index, Kerman, Oral Hygiene, Dental Caries, 15-Year-old

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Dental caries is a chronic infectious disease, which affected many people worldwide. It may affect on speech, eating and appearance, and self-confidence.¹ It is preventable diseases,² and many factors such as socioeconomic status, educational level, and oral hygiene habits have affect on oral health status.³ It is shown, prevalence of

dental caries is more than malnutrition in children.⁴ Kwan et al. showed that dental caries can have a negative impact on quality of life and academic performance at school children.⁵

World Health Organization (WHO) reported dental caries prevalence among school children is high as 90% in some

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countries.⁶ Decayed, missing, and filled teeth (DMFT) score is an accepted index for dental caries, caries free population are also in this index, so it cannot show a high rate caries groups.⁷ The significant caries index (SiC index) introduced for attention high score caries groups.⁸ Oulis et al. have reported SiC index value for the 15 years old Greek population was 7.07.⁹ In Pontigo-Loyola et al. study SiC index in 15-year-old subjects in Mexico was 3.46.¹⁰ SiC index in 12-year-old in Kerman, Iran was reported 3.16.¹¹ The aim of the present study is determination of DMFT and SiC index, and oral health habits among 15-year-old students in Kerman South East Iran.

Methods

This cross-sectional study was conducted on 300, 15-year-old students attending to Kerman (South-East city in Iran) high schools. Students who selected in this study gave written informed consent. A systematic cluster sampling for school selection was used. City was divided into three parts and then 15 high school from every parts selected. Simple random sampling used to selected students, a total of 20 students selected from each high school. Data collected by a questionnaire and dental examination. Questionnaire was including demographic characteristics (sex, parent's educational level, parents' job), number of children in their families, birth rank in their families, oral health habits (frequency of tooth brushing, using dental floss, using fluoride mouthwash), and oral health examination. Dental caries status examined with dental mirrors and tongue depression according to WHO criteria.¹²

All subjects' examination did in the classroom while they seated in an upright chair using natural daylight. All examination did by one examiner who had trained. The SiC index calculated as follows: subject in the study sorted based on their DMFT index, and one-third of them with the highest caries

scores selected. The mean DMFT for this subgroup calculated. This prevalence is the SiC.⁷ Data were analyzed by SPSS for Windows 18 (version 18, SPSS Inc., Chicago, IL, USA) software, using ANOVA, t-test, and Kruskal-Wallis tests. P-value < 0.05 was considered as significant level.

Results

This cross-sectional study was conducted on 300, 15-year-old students in Kerman, South-East Iran. A total of 21.7% (65) were boys and 78.3% (235) were girls. About 6.0% and 7.0% (20) of families had one child and 1.3% (4) had seven children, the most of them (34.4%) had two children. The most of subjects (41.7%) brushed their teeth once a day and 46.3% never used dental floss. About 80.0% and 66.0% never used fluoride mouthwash. Fifty-two and 2 percent had not regular dental visit. Oral hygiene habits have shown in table 1. Mean of DMFT index was 1.83 ± 1.26 and SiC index was 3.80. About 103 (34.4%) were caries free. There was a significant difference between the mean of SiC index and sex. There was also significant correlation between SiC and regular dental visit, mothers' job, fathers' job and ranking of birth ($P < 0.001$, $P = 0.018$, $P < 0.001$, $P = 0.001$), respectively.

Table 1. Frequency of oral hygiene behavior in subjects

Oral hygiene	Number	Percent
Tooth brush		
Never	6	2.0
Once a day	125	41.7
Twice a day	98	32.6
Occasionally	81	27.0
Dental floss		
Never	139	46.3
Once a day	53	17.7
Twice a day	40	13.3
Occasionally	78	26.0
Fluoride mouth brush		
Never	242	80.7
Once a day	46	15.3
Occasionally	12	4.0
Regular dental visit		
Yes	142	47.3
No	158	52.7

Subjects who reported using fluoride mouthwash had lower SiC, and this difference was significant. There was no significant correlation between parents' education and SiC index. Table 2 shows the correlation between sex and parents' educational level and SiC index. The mean of decay teeth (DT) in boys was higher than girls, and the mean of missing teeth (MT) in girls was higher than boys. Correlation between the mean of DMFT, DT, MT, filled teeth, and SiC indices according to sex is shown in table 3.

Table 2. Correlation between sex and parents' educational level and significant caries index

Variable	N	SiC index	P
Sex			
Girls	79	4.9	< 0.001
Boys	21	2.5	
Father's education			
Illiterate	9	4.6	0.920
Below diploma	31	3.7	
Diploma	47	3.7	
University	13	4.0	
Mothers' education			
Illiterate	8	3.7	0.210
Below diploma	63	3.5	
Diploma	14	3.8	
University	-	-	
Total		100	

SiC: Significant caries index

Table 3. Correlation between mean of decayed, missing, and filled teeth; decay teeth; missing teeth; filled teeth; and significant caries indices according to sex

Variables	Girls		Boys		P
	Mean	SD	Mean	SD	
DT	1.15	1.10	1.92	1.83	P < 0.001
MT	0.50	0.45	0.24	0.18	P < 0.001
FT	0.84	0.78	0.19	0.12	0.860
DMFT	1.65	1.62	2.15	2.22	0.240
SiC index	4.80	1.29	2.49	0.56	P < 0.001

SD: Standard deviation; DT: Decay teeth; MT: Missing teeth; FT: Filled teeth; DMFT: Decayed, missed, and filling teeth; SiC index: Significant caries index

Discussion

The present study investigated the caries prevalence in 15 years old students using both the mean DMFT index and SiC index. In

the present study, the mean of DMFT and SiC indices were 1.83 ± 1.36 and 3.80, respectively. That is lower than Oulis et al.⁹ study in Greece (7.07) and Dukic et al. study (7.40) in Zagreb,¹³ and similar to Pontigo-Loyola et al.¹⁰ (3.46) in Mexico. These differences may be due to different countries with different oral health educational program in their schools.

The caries free proportion subjects of the present study was 34.4%. It is higher than similar studies in Jordan (24.0%), Brazil (12.6%), and lower in Germany (41.9%).¹⁴⁻¹⁶ It seems proportion 15 years old caries free subjects is better than similar countries, that may be related to preventive dentistry policies such as oral health educations in Kerman schools.

SiC index in girls was 4.83 and in boys was 2.49, and this difference was significant. This finding is agree with Ditmyer et al. who reported females had higher DMFT.¹⁷ In Garcia-Cortes et al.¹⁸ study SiC index among 16-25 years old Mexican was 8.64, that is higher than the present study this difference may be related the age subjects in two studies.

There was a significant correlation between birth rank, and parents' job of subjects and SiC index. Subjects in families with a high number of children and parents with lower income had higher SiC. Studies showed low socioeconomic condition is related to high caries level.^{19,20} We cannot find a significant correlation between parents' education and SiC index, it is compatible with Hugo et al.²¹ and is disagree with Namal et al.,²² that showed low mothers' education was a risk factor for poor dental status. As dental caries is a multifactorial disease, so it may be the other factors had more influence on dental caries in the present study.

Among dental hygiene habits regular dental visit had significant correlation with SiC index, those with regular dental visits had lower dental caries, this finding is

compatible with Ismail and Sohn findings.²³ Regular dental visits can help to prevention dental caries and treatment DT in the initial stage, and also helps the patient to getting professional oral hygiene instructions. In the present study, using fluoride mouthwash was correlated to lower SiC. This finding is agree with similar studies.^{11,24}

Caries free subjects in 15-year-old girls in Kerman were 21.7%. Caries free subjects in the present study were 34.4%, that is, higher than the previous study in Kerman²⁵ it means may be the personal preventive programs were effective.

Conclusion

Although the proportion of caries free 15-year-old subjects in Kerman has

increased, but many of them suffer from high level DMFT. Using DMFT and SiC indices together may help to show oral health status than DMFT index, and help to design better preventive strategy to reduce dental caries rate.

Conflict of Interests

Authors have no conflict of interest.

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