

# Socioeconomic status in relation to dental caries in Dewanyiah governorate among 12 years old school students

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## ABSTRACT

**Background:** The socioeconomic is important factor that effect in the severity and prevalence of most predominant and wide spread oral disease named dental caries, since this oral disease effects children, adolescents, adults and elderly peoples especially in developing countries as in Iraq. This survey was aimed to investigate the prevalence and severity of dental caries in relation to socioeconomic status.

**Materials and Methods:** This oral health survey was conducted among primary and secondary school students aged 12 years old in Dewanyiah governorate in Iraq. The total sample composed of 804 (401 boys and 403 girls) selected randomly from different schools in Dewanyiah governorate. Diagnosis and recording of dental caries was assessed according to the criteria described by WHO (1997). The modification of Kuppuswamy's index (1976) was applied for measurement of socioeconomic status.

**Results:** The most of low socioeconomic category was occupied by rural students. The prevalence of dental caries was 70.65 % for the total sample. The mean DMFT was equal to (1.83 ± 0.068) and DMFS (2.89 ± 0.126). No significant difference was seen between socioeconomic status and DMFS.

**Conclusion:** A high prevalence of dental caries was recorded. Socioeconomic status may affect dental caries indicating the need for public and health preventive programs among school students.

**Key words:** Dental caries, socioeconomic status, prevalence. (J Bagh Coll Dentistry 2014; 26(2): 131-134).

## الخلاصة

**المقدمة:** الحالة الاجتماعية الاقتصادية من العوامل المهمة التي تؤثر على شدة وانتشار ابرز الامراض الفموية ووسعها انتشارا المسماة بتسوس الاسنان طالما هذا المرض الفموي يصيب الاطفال , المراهقين , البالغين و المسنين خصوصا في البلدان النامية كالعراق. البحث الميداني هدف الى تشخيص نسبة وانتشار تسوس الاسنان وعلاقته بالوضع الاجتماعي الاقتصادي.

**المواد والطرق :** البحث الميداني تم ما بين طلاب المدارس الابتدائية والمتوسطة بعمر 12 سنة في محافظة الديوانية. العينة الكلية تكونت من 804 طالب (403 بنات و401 بنين) تم اختيارهم عشوائيا من مختلف مدارس محافظة الديوانية. تشخيص تسوس الاسنان تم وفق مقاييس منظمة الصحة العالمية (WHO, 1997). تشخيص الوضع الاجتماعي الاقتصادي تم باستخدام تعديل لمقياس (Kuppuswamy's, 1976).

**النتائج :** اظهرت الدراسة ان نسبة الطلاب الذين ينتمون للفئة الاجتماعية المتدنية كانت ضمن فئة المناطق الريفية. كما اظهرت الدراسة ان نسبة تسوس الاسنان للعينة كلها كانت (70.65%). كانت قيمة المتوسط الحسابي لتسوس الاسنان الدائمة DMFT مساوي الى (1.83 ± 0.068) بينما DMFS مساوي الى (2.89 ± 0.126). لم توجد فروقات معنوية بين الوضع الاجتماعي الاقتصادي مع DMFS.

**الاستنتاجات:** لقد وجدت الدراسة ان نسبة تسوس الاسنان كانت عالية. الوضع الاجتماعي الاقتصادي قد يؤثر على صحة الفم مما يشير الى حاجة طلاب المدارس لبرامج وقائية عامة لتعزيز صحة الفم.

## INTRODUCTION

Socioeconomic is an important determinant of the livelihoods as it influences levels of knowledge, skill and income conditions which mean for their living. Socioeconomic status is an economic and sociological combined total measure of a person's work experience and of family's economic and social position relative to others based on income, education and occupation. Socioeconomic status is typically broken into three categories, high SES, middle SES and low SES to describe the three areas of families <sup>(1)</sup>.

Dental caries continues to be one of the most common infectious diseases known to man, despite widespread preventive measure, this disease exerts a social, physical, mental and financial burden on a global scale especially in developing countries <sup>(2)</sup>.

The disease is a chronic irreversible progressive in nature, untreated lesions may progress to cause pain, infection and discomfort to the subject, and finally it might end with the loss of the tooth <sup>(3)</sup>.

As far as it is known, there is no previous epidemiological study concerning students aged 12 years old in Dewanyiah governorate, in order to increase the knowledge concerning oral health status of this age group. This in turn may focus some light on the availability and effectiveness of preventive programs and dental services among this population.

## MATERIALS AND METHODS

Permission was obtained from the General Direction of Education of Dewanyiah governorate to conduct the survey without obstacles. It was conducted among primary and secondary school students aged 12 years old. The age was taken according to the criteria of World Health Organization (1997), according to the last birth day. The number of 12 year school students living

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in Dewanyiah city was (12462) as the General Direction of Education of Dewanyiah governorate was labeled in both rural and urban areas.

The examination done for about (812) students and (8) was neglected because incomplete information so the representative sample was calculated to be 804 school students whom selected randomly, 403 girls and 401 boys. Schools selection was randomly as they were distributed in different geographical areas in Dewanyiah governorate (urban and rural). Also for each school students were selected randomly. A random sample of a maximum of 20 students (10 from each gender) was included in the sample. Students who looked healthy and without any medical disease were only examined. Dewanyiah city was divided into four sectors each sector contained rural and urban schools according to the division of the General Direction of Education of Dewanyiah governorate, these sectors are: Al-Dewanyiah center, Al-Hamza, Al-Shamiyah and Efaq.

#### Socio economic status assessment

SES information was taken from the examined students and from their own school document as follow:

- Mother and father education level.
- Mother and father occupation.
- Type of housing.
- Crowding index ( persons number/ rooms number)

According to the quartile categorization, the sample was divided to three quarters 25%, 50% and 25%, representative low, average or middle and high socioeconomic status respectively. The cut of value for the composite index used by this research was as the following:

- Score 1 for students with low socioeconomic status ( $\leq 10.5$ ).
- Score 2 for students with average socioeconomic status (10.6 - 15).
- Score 3 for students with high socioeconomic status ( $> 15$ ).

#### Dental caries

Diagnosis and registration of dental caries was conducted following the criteria of WHO (1997). The clinical examination was achieved by dental mouth mirror and (CPI) dental explorer.

The clinical diagnosis of the dental caries was carried with starting from the upper right second molar in an organized serial manner from tooth to the adjacent tooth till reaching the upper left second molar, then to the lower left second molar until ending with the lower right molar.

As concerned the examination of the tooth surfaces, it was done by starting with the mesial surface, then the occlusal, distal, buccal and ended with lingual for the examined teeth. If primary and permanent teeth occupied the same tooth space, the status of permanent tooth only was considered<sup>(4)</sup>.

#### DMFS index

For all surfaces of the teeth involved carious lesions were recorded. Missing teeth were counted as a five "involved surfaces" for posterior teeth and four for anterior teeth. Retained roots were counted as a five decayed surfaces for posterior teeth and four decayed for anterior teeth. Temporary crowns were recorded as 5 and 4 decayed surfaces for posterior and anterior teeth respectively.

## RESULTS

The table (1) shows the low level of socioeconomic status students were higher in rural than urban while the high level of socioeconomic status students were higher in urban than rural areas. Statistically, highly significant differences between socioeconomic status and residency with p value  $< 0.001$  was found.

In relation to socioeconomic status, caries free was higher in low level followed by average and lastly high level that had higher caries experience than other socioeconomic status levels. Statistically, no significant differences between caries free with socioeconomic status as shown in table (2).

Table (3) reveals the mean value and standard error of the caries experience of DMFT, DMFS and its components (DS, MS, FS) for the total sample according to socioeconomic status. It was found that caries experience represented by DMFT was higher among average level of socioeconomic students as compared with high and low level students and it was same for DMFS and DS. Concerning the FS fraction, it was higher in high level students while, MS fraction was higher in low level students. No statistical significant differences were found.

**Table 1: The distribution of the sample by socio economic status and residency**

Residency	Socioeconomic status						P-value
	Low		Average		High		
	No	%	No	%	No	%	
Rural	150	74.6	212	47.3	40	25.8	<0.001**
Urban	51	25.4	236	52.7	115	74.2	
Total	201	100	448	100	155	100	

\*\*Highly significant

**Table 2: The distribution of caries-free and caries experience in relation to socioeconomic status**

Study sample		Caries experience		Caries free		P-value
		No	%	No	%	
SE status	Low	129	64.1	72	35.8	[NS]
	Average	323	72.1	125	27.9	
	High	116	74.8	39	25.2	

**Table 3: Mean value and standard error of DS, FS, MS, DMFS, DMFT for total sample in relation to socioeconomic status**

Caries experience	Socioeconomic status			P-value
	Low	Average	High	
	Mean ± SE	Mean ± SE	Mean ± SE	
DS	2.04±0.19	2.60±0.14	2.27±0.20	[NS]
FS	0.04±0.02	0.08±0.02	0.10±0.03	[NS]
MS	0.47±0.13	0.45±0.08	0.26±0.11	[NS]
DMFS	2.55±0.26	3.13±0.17	2.63±0.24	[NS]
DMFT	1.56±0.13	1.96±0.09	1.84±0.15	[NS]

## DISCUSSION

This study was achieved in Dewanyiah governorate because there is no previous epidemiological study concerning the 12 years old students carried in this governorate. It was occupied all geographic locations including urban and rural areas and the size of total sample was (804) with approximately equal numbers for girls and boys as well as rural and urban students to be representative and comparative to these areas.

The target study group was the age at which children leave primary school in most countries. It is also the last age at which reliable sample may be obtained easily through the school system. Also, it is likely at this age that all permanent teeth except third molars have been erupted. For these reasons, 12 years old students had been chosen as the global monitoring age for caries for international comparisons and monitoring of disease trends<sup>(4)</sup>.

The current study applied a modification of Kuppaswamy's index 1976 for socioeconomic status. The index used in this study was based on variables such as educational level, occupation, crowding index and housing quality, while the income was not included because of difficulty of its estimation. The type of housing and occupation was classified in harmony with the nature of Iraqi society and to represent as much as possible the income status, as there is no internationally endorsed SES index in Iraq.

In the present study, the rural was shown to have a lower SES while urban had the highest SES with highly significant differences between SES and area of residency. The rural students in the current study were selected from a demographically distinguished residential sector on the periphery of Dewanyiah center and on the periphery of the large three other sectors. These students were socially and economically disadvantaged living in slums and agricultural areas (since their residence was considered as illegal).

The educational level of those people was expected to be low, which does not help them in improving their economic level and changing residence to better urban areas. Most of their fathers work as a farmer in agricultural areas and their mothers as housewife. Polyandry was common with large number of people living in the same tiny house. Many studies referred to rural areas are disadvantaged in SES when compared to urban areas, this observation is a general one in Iraq<sup>(5)</sup>.

In the current study, caries free was higher in low level followed by average and lastly high level that had higher caries experience than other socioeconomic status levels although the association between SES and caries free failed to reach the level of statistical significance. This finding agreed with a case-control study in Baghdad by Al-Eissa whom measured the

socioeconomic status by using crowding index and education in addition to other variables<sup>(6)</sup>. These results are similar to findings of Al-Sadam whom measured the socioeconomic status by using housing type and education while excluded other variables<sup>(7)</sup>. Abdul Razzaq found a positive correlation between SES and caries free<sup>(8)</sup>. The SES index used in that study depended on education only and the explanation was that better education leads to increase caries free prevalence. In the current study, the type of housing, crowding index and occupation had an important contribution to SES measured. This might have explained the differences between this study and Abdul-Razzaq's finding.

The DS, DMFS and DMFT mean values were higher in average SES than other SES groups while MS mean value was higher in low SES that may due to poor knowledge about dental treatment. The FS mean value was slightly higher in high SES than other SES groups this was expected since the high SES students are more able to obtain quality dental treatment. This conclusion was also reported by above studies<sup>(6-8)</sup>.

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