Prevalence and Comparison of Dental Caries Status of Primary and Permanent Dentition in School Children of Iraq using Significant Caries Index

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ABSTRACT

Background: *Expressing caries prevalence as mean DMFT value dose not correctly reflects the skewed distribution, leaving high caries groups undiscovered in the population, based on these features, a new index called Significant Caries Index (SiC) was proposed by WHO to draw attention to individuals with the highest caries scores in each population.* **Aims:** *The aim of this study was to compare the caries prevalence and severity in school children living in rural and urban areas.* **Methods:** *The sample examined in this study consisted of 414 school children in rural and 414 school children in urban areas. All children were subjected to clinical examination to obtain information about dental caries prevalence and severity in permanent dentition DMFT/DMFS according to WHO 1997. Also, information was obtained about dental caries status in primary dentition dmft/dmfs according to Gruebbell. Significant caries index (SiC) was calculated for primary and permanent dentition. Data collection started from 20th January 2018 to 20th March 2018. Data were analyzed using a statistics package for SPSS version 24 for Windows and Excel 2007.* **Results:** *The prevalence of dental caries in permanent teeth in urban and rural areas was 56.8%, 77.6%, respectively. The mean value of DMFT in urban and rural areas was (1.40 ± 0.42), (2.24 ± 1.53) respectively. Also, statistical analysis showed significant differences between the mean value of dmfs/DMFS in an urban and rural area as well as analysis of variance showed a significant difference between the value of significant caries index (SiC) in urban (4.0) and rural (3.5) areas.* **Conclusions:** *The caries prevalence, severity, and the significant caries index (SiC) of primary and permanent dentition was higher in school children living in rural areas than in school children living in urban areas.*

Keywords: Dental caries, Prevalence, Rural and urban areas, SiC Index

INTRODUCTION

Dental caries is the outcome of multiple complex processes involving factors like diet, microorganisms, trace element, saliva, genetic predisposition and tooth morphology [1]. A part of theses, many related factors like individual, social, environmental and cultural factors are also responsible [2]. The prevalence rates and experience of dental caries are tending to increase in developing countries with a decline in caries in most industrialized countries [3]. Dental caries is one of the most common oral problems affecting children globally involving the people of all region and society, it can be seen in all age groups of children involving deciduous and permanent teeth, also dental caries is a life time disease and the highest priority risk group is between 6 years and 12 years of age [4]. Dental caries affects humans of all ages and in all region of the world, the distribution and severity of oral disease vary in different parts of the world and within the same region [5].

Epidemiological studies help in the assessment of the need for planning of oral health services or organization of public health intervention programs [6,7]. Dental caries is a major public health issue and schools remain an important setting for an efficient and effective way to reach over billion children worldwide [8]. Children in the mixed dentition stage are prone to poor oral hygiene, this period of child's age is critical from the point of the view of the normal development of occlusion and preservation of first molars from dental caries which is one of the most important responsibility of the profession, according to very extensive and Comprehensive National Oral Health Survey in 2002-2003 [9]. Despite many advances in the urban area, the rural population is still lacking its basic access to oral

health care due to a shortage of dental manpower, financial constraints and the lack of perceived need for dental care among rural masses [10]. Expressing caries prevalence as mean DMFT value dose not correctly reflect the skewed distribution, leaving high caries groups undiscovered in the population, based on these features, a new index called significant caries index (SiC) was proposed by WHO to draw the attention of the individuals towards the highest caries scores in each population [11].

PATIENTS AND METHODS

The sample examined in this study consisted of 828 school children aged 7-9 years, 414 were living in an urban area, and 414 in the rural area. All children were subjected to clinical examination to obtain information about dental caries prevalence and severity in permanent dentition by assessment of decayed teeth or surfaces, missing teeth or surfaces due to caries, and filling teeth or surfaces DMFT/DMFS according to WHO [12]. Also, information was obtained about dental caries status in primary dentition dmft/dmfs by assessment of decayed teeth or surfaces, missing teeth or surfaces due to caries, and filling teeth or surfaces according to Gruebbell [13].

The significant caries index was calculated for primary and permanent dentition [14].

- Individual were sorted according to their dmft or DMFT values

- One third of the population with the highest caries scores was selected

- The mean of dmft or DMFT for this subgroup is calculated. This value is the SiC index

Data collection started from 20th January 2018 to 20th March 2018. Data were analyzed using statistics package for social science version 24 for Windows and Excel 2007. Both descriptive and interferential statistics were used:

- Descriptive statistics: Mean+Standard deviation (SD)

- Interferential statistics: Statistical significant of mean differences between groups were analyzed using student t-test. The comparison was done with a 5% level of significance, $p=0.05$ was considered to be significant.

RESULTS

The sample examined in this study were 828 school children aged 7-9 years, 414 were living in an urban area, and 414 in the rural area in Wasit Governorate. In this study, the prevalence of dental caries in permanent teeth in urban and rural areas was 56.8 %, 77.6%, respectively. Also, the prevalence of dental caries in primary teeth in urban and rural areas was 96.1%, 96.4%, respectively. The mean value of DMFT in urban and rural areas was (1.40 ± 0.42), (2.24 ± 1.53) respectively, analysis of variance showed highly significant differences between the mean value of DMFT in urban and rural areas (Table 1).

Table 1 The mean value of DMFT in urban area with the mean value of DMFT in rural area

DMFT	Mean	SD	DF	F	t-test	p-value
Urban area	1.4	0.42	826	183.39	-5.335	0.0001
Rural area	2.24	1.53				

The mean value of DMFS in urban and rural areas was (0.01 ± 0.011), (0.02 ± 0.009) respectively, analysis of variance showed significant differences between the mean value of DMFS in urban and rural areas (Table 2).

Table 2 The mean value of DMFS in urban area with the mean value of DMFS in rural area

DMFS	Mean	SD	DF	F	t-test	p-value
Urban area	0.01	0.011	826	9.685	-3.268	0.002
Rural area	0.02	0.009				

The mean value of dmft in urban and rural areas was (4.25 ± 2.62), (4.39 ± 2.52) respectively, analysis of variance showed no significant differences between the mean value of dmft in urban and rural areas (Table 3).

Table 3 The mean value of dmft in urban area with the mean value of dmft in rural area

dmft	Mean	SD	DF	F	t-test	p-value
Urban area	4.25	2.62	826	0.070	0.390	0.792
Rural area	4.39	2.52				

The mean value of dmfs in urban and rural areas was (0.12 ± 0.05), (0.18 ± 0.01) respectively, analysis of variance showed significant differences between the mean value of dmfs in urban and rural areas (Table 4).

Table 4 The mean value of dmfs in urban area with the mean value of dmfs in rural area

dmfs	Mean	SD	DF	F	t-test	p-value
Urban area	0.12	0.05	826	50.943	-10.547	0.001
Rural area	0.18	0.01				

The value of significant caries (SiC) index of permanent teeth in urban and rural areas was (4.0 ± 0.00), (3.56 ± 0.50) respectively, analysis of variance showed highly significant differences between the value of SiC index in urban and rural areas (Table 5).

Table 5 The value of significant caries index of permanent teeth in urban area with the value of significant caries index of permanent teeth in rural area

(SiC) Index	mean	SD	DF	F	t-test	p-value
Urban area	3.56	0.50	274	1829.333	5.092	0.0001
Rural area	4.00	0.00				

The value of significant caries (SiC) index of primary teeth in urban and rural areas was (7.77 ± 1.01), (7.91 ± 1.25) respectively, analysis of variance showed no significant differences between the value of SiC index in urban and rural areas (Table 6).

Table 6 The value of significant caries index of primary teeth in urban area with the value of significant caries index of primary teeth in rural area

(SiC) Index	mean	SD	DF	F	t-test	p-value
Urban area	7.77	1.01	274	0.375	0.517	0.542
Rural area	7.91	1.25				

DISCUSSION

The significant caries index (SiC) proposed by World Health Organization (WHO) was used to draw the attention of the individuals with highest caries scores in each population as mean of DMFT/S and dmft/s, the values cannot correctly reflect the skewed distribution, leaving high caries groups undiscovered in the general population [11]. In the present study, the prevalence of dental caries in permanent teeth among school children in urban area (56.8%) was lower than the rural area (77.6%), also in this study it was found that the mean of DMFT and dmft was higher in rural areas than in urban areas [14-16]. The severity of dental caries in primary and permanent dentitions DMFS/dmfs was higher in rural area than in urban area [16]. All the results were significantly greater in school children living in rural areas compared with those living in urban areas, these differences were more pronounced in the permanent dentition, SiC values of the permanent dentition among rural school children (4.0) was higher than in urban school children (3.5) [14,15].

CONCLUSION

- The caries prevalence and severity of primary and permanent dentition was higher in school children living in rural areas than in school children living in urban areas

- The value of significant caries index was higher in school children living in rural areas than in school children living in urban areas

- Dental health care needs are high in rural areas than in urban areas

DECLARATIONS

Conflict of Interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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