

# Oral Health Status among 9 years old school Children in Al-Diwaniyah City/Iraq.

Zahraa A. Al-Awadi, B.D.S. <sup>(1)</sup>

Baydaa Hussien, B.D.S., M.Sc. <sup>(2)</sup>

## ABSTRACT

**Background:** Although they are not life threatening, dental caries and periodontal disease are the most predominant and widely spread oral diseases throughout the world. Another most common dental problem seen in children is dental trauma. The aims of the study included the investigation of the prevalence and severity of dental caries, gingivitis and dental plaque in relation to gender, furthermore, the prevalence and severity of the traumatized anterior teeth were assessed.

**Materials and Methods:** This oral health survey was conducted among primary school children aged 9 years old in Al-Diwaniyah city in Iraq. The total sample composed of 600 child (320 males and 280 females) selected randomly from different school in Al-Diwaniyah city. Diagnosis of dental caries was according to the criteria described by WHO (1987). Plaque index of Silness and Loe (1964) was used for plaque assessment, gingival index of Loe and Silness (1963) was followed for recording gingival health condition. Diagnosis and recording of traumatic dental injuries was according to Garcia-Godoy's classification (1981).

**Results:** Results showed that the prevalence of dental caries was 85% for 9 year-old school children. Regarding primary and permanent dentition, dental caries was higher among females compared to males with statistically significant difference ( $P<0.05$ ) for primary dentition, on the other hand, males showed higher values of filled surfaces compared to females with statistically significant difference ( $P<0.05$ ) for primary dentition and highly significant difference ( $P<0.01$ ) for permanent dentition. Finding of this study revealed that 100% of the children had gingival inflammation. Furthermore, the values of plaque and gingival indices were higher among males compared to females with statistically highly significant differences ( $P<0.01$ ). The prevalence of children with traumatized anterior teeth was 10.5% of the total sample. Males were more affected than females, the difference was statistically significant ( $P<0.05$ ). Simple enamel fracture was the most common type of injury among traumatized teeth among children. The maxillary central incisors were the most commonly injured teeth.

**Conclusion:** A high prevalence of dental caries and gingivitis were recorded.

**Keywords:** Dental caries, periodontal disease, gingivitis, dental trauma. (J Bagh Coll Dentistry 2018; 30(2): 92-97)

## INTRODUCTION

Dental caries is a localized, progressive destructive, microbial based disease of multifactorial nature, affecting the calcified tissue of the teeth characterized by dissolving the tooth minerals (inorganic portion) in a process called demineralization and destruction of the organic portion leading to tooth cavitation <sup>(1)</sup>. The disease is a chronic irreversible 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>(2)</sup>.

Periodontal disease, a preventable and treatable disease and considered to be second prevalent after dental caries in children and adolescents <sup>(3)</sup>. most common type of periodontal disease that can seen in children is gingivitis, which may start early in life and may increase in severity with advancing age <sup>(4, 5)</sup>. It has been defined as an infectious disease affecting the teeth in their sockets.

The majority of periodontal diseases can be classified as either gingivitis or periodontitis, which affecting the periodontium, but the Gingivitis is a reversible condition, however, if not treated may progress later in life to periodontitis and if this progress, it may end with loss of teeth <sup>(6)</sup>. Several epidemiological Iraqi studies recorded high prevalence and severity of dental caries and gingivites among different age groups of school children in different geographic locations <sup>(7, 8, 9)</sup>. Another most common dental problem seen in children is dental trauma that reach large number of people <sup>(10)</sup>. Traumatic dental injury is injury to teeth and their supporting structure, it may vary in its severity from simple enamel fracture to a multiple type of trauma affecting both soft and hard tissue, it is one of the main reasons for dental emergencies among children and adolescent. It has impact on child quality of life, due to physical and psychological discomfort <sup>(11)</sup>. World wide epidemiological studies of dental trauma have been reported prevalence of dental trauma <sup>(12,13,14)</sup> As there are no previous epidemiological studies concerning school children aged 9 years old in Al-Diwaniyah city, therefore, this study was designed.

1) MSc student, dep. Of preventive Dentistry, College of Dentistry, University of Baghdad.

2) Assist Professor, dep. Of preventive Dentistry, College of Dentistry, University of Baghdad.

## MATERIALS AND METHODS

This oral health survey was conducted among Primary school children aged 9 years old living in urban areas in Al-Diwaniyah governorate, Iraq. The data collection extended between November (2015) till the end of the March (2016). Permission was obtained from the General Direction of Education of Al-Diwaniyah governorate to conduct the survey without obstacles, the aims of this study were explained to school authority to obtain cooperation as much as possible and that was done by a formal document, also an informed consent prepared and distributed before doing the oral examination, it was given to the student's guardian (parents for example) to get permission for including their students in the study and to have their full cooperation.

The sample consisted of (600) children including (320) males and (280) females, schools were chosen by systematic random sampling design. For each school, (20) children were selected randomly<sup>(15)</sup>. Children who looked healthy and without any medical disease that recorded in the school chart were included in the study. Diagnosis and recording of dental caries were assessed according to the criteria described by WHO<sup>(16)</sup>. Plaque index of Silness and Loe<sup>(17)</sup> was used for plaque assessment, gingival index of Loe and Silness<sup>(18)</sup> was followed for recording gingival health condition. Diagnosis and recording of traumatic dental injuries were assessed according to Garcia-Godoy's classification<sup>(19)</sup>. Statistical analyses were computer assisted using SPSS version 21 (Statistical Package for Social Sciences). The statistical types that used were Mann-Whitney, Z-test and P-value.

## RESULTS

A total sample of (600) consisted of 320 (53.3%) males and 280 (46.7%) females examined in this study. Results showed that the prevalence of dental caries was found to be 85%.

Caries-experience in primary dentition (dmfs) and its components (ds, ms and fs) are illustrated in Table (1). Caries-experience (dmfs) was found to be higher in females compared to males, the difference was found to be statistically significant ( $Z=-2.502$ , Mann-Whitney=0.012,  $P<0.05$ ), decayed surfaces (ds) was found to be higher in females compared to males, difference

were statistically significant ( $Z=-2.734$ , Mann-Whitney=0.006,  $P<0.05$ ).

Table (2) demonstrates the median and mean rank values of DMFS and its components (DS, MS, FS) in permanent dentition. Caries-experience (DMFS) was found to be higher in females compared to males, the difference was found to be statistically not significant ( $P>0.05$ ), decayed surfaces (DS) was found to be higher in females compared to males, difference was found to be statistically not significant ( $P>0.05$ ), on the other hand, mean rank values of (fs/ Fs) component was higher among males compared to females and the difference was statistically significant ( $Z=-2.715$ , Mann-Whitney=0.007,  $P<0.05$ ) for primary dentition and statistically highly significant ( $Z=-4.695$ , Mann-Whitney=0.0001,  $P<0.01$ ) for permanent dentition.

Table (3) shows the median and mean rank values of plaque and gingival indices of children by gender. The mean rank values of plaque and gingival indices for males were higher than females with statistically highly significant difference ( $Z=-7.541$ , Mann-Whitney=0.0001,  $P<0.01$ ), ( $Z=-8.911$ , Mann-Whitney=0.0001,  $P<0.01$ ) respectively.

The prevalence of gingivitis was found to be (100%). The correlation coefficient between plaque and gingival index was very strong and statistically highly significant in a positive direction ( $r=0.93$ ,  $P<0.01$ ).

Table (4) illustrates the prevalence of children with traumatized anterior teeth. Males shows the high prevalence of dental trauma compared to females, the relation between gender and prevalence of traumatic dental injuries was statistically significant (Chi-square =6.296,  $df=1$ ,  $P<0.05$ ). The most common type of dental injuries among children was the simple enamel fracture, followed by enamel and dentin fracture and then enamel and dentin fracture with pulp exposure. No case was recorded concerning enamel-dentin-cementum fracture, concussion, luxation, intrusion, extrusion and avulsion. Root fractures were excluded Figure(1). Figure (2) shows that the maxillary central incisors are the most affected teeth by dental trauma followed by maxillary lateral incisor and maxillary canine respectively, while lower teeth not affected by dental trauma.

**Table (1): Caries- experience (dmfs) and its components (ds, ms, fs) among children by gender.**

Gender	ds		ms		Fs		Dmfs	
	Median	Mean rank	Median	Mean rank	Median	Mean rank	Median	Mean rank
Males	9	282.5	0	293.0	0	308.6*	10	284.0
Females	11	321.1*	0	309.0	0	291.2	13	319.4*

\* statistically significant (P<0.05)

**Table (2): Caries -experience DMFS and its components (DS, MS, FS) among children by gender.**

Gender	DS		MS		FS		DMFS	
	Median	Mean rank	Median	Mean rank	Median	Mean rank	Median	Mean rank
Males	2	291.0	0	300.8	0	316.8**	3	296.5
Females	3	311.3	0	300.2	0	281.9	3	305.0

\*\* statistically highly significant (P<0.001)

**Table (3): Plaque and gingival indices among children by gender.**

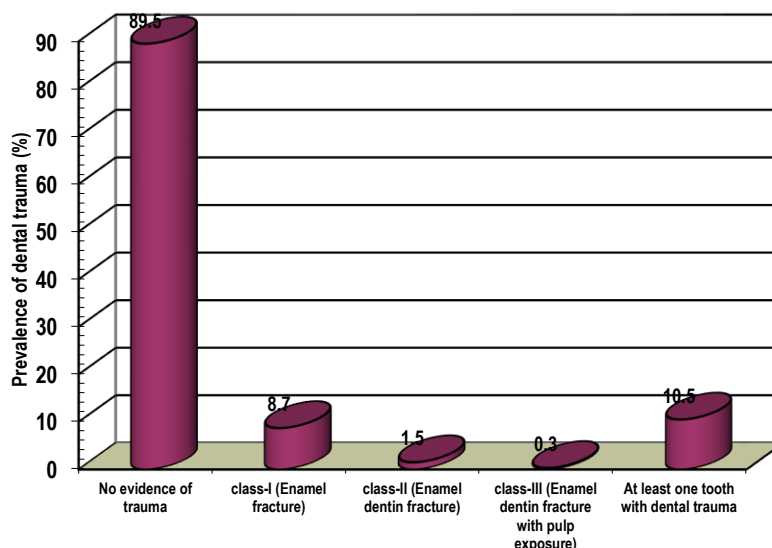
Gender	PIL		GI	
	Median	Mean Rank	Median	Mean Rank
Males	2	350.3**	2	357.3**
Females	1	243.5	1	234.3

\*\* statistically highly significant (P<0.001)

**Table (4): Distribution of children according to traumatized anterior teeth.**

Gender	Total No	Dental trauma	
		No	%
Males	320*	43	13.4
Females	280	20	7.1
Total	600	63	10.5

\* statistically significant (P<0.05)



**Figure (1): Distribution of children according to type of traumatic dental injuries.**

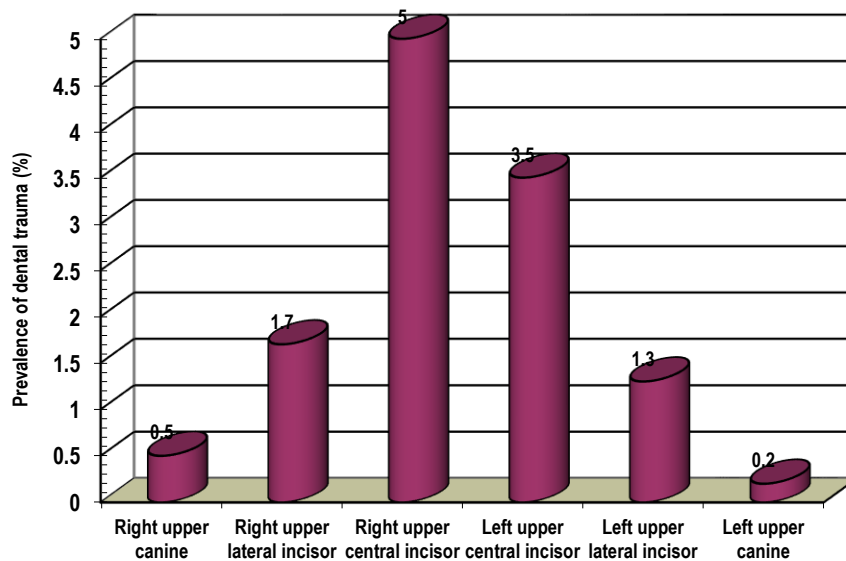


Figure (2): Distribution of children according to type of the teeth affected by the trauma.

## DISCUSSION

In this study, the prevalence of dental

caries was found to be 85% for 9 year-old school children. This was higher than that reported by others (7, 8, 20). On the other hand, the prevalence of dental caries was lower than that reported by others (21-23). Differences in caries prevalence among studies could be attributed to variation in sample size, geographic areas and differences in dietary habits, oral hygiene measurements as well as dental health services among governorates in addition to cultural, social, environmental and genetic variation (24). In Iraq, the fluoride concentration in drinking water is considered very low (25) that may explain a relatively high prevalence of dental caries.

Regarding primary and permanent dentition, females in this study had a statistically higher caries-experience than males, the same finding was reported by previous studies (14, 20, 26, 27), and this is probably because of earlier tooth eruption pattern in females than in males of the same age, thus, exposed more to environmental factors for caries to occur (28). This study showed that the decayed fraction (ds/DS) was the major component of dmfs/DMFS indices and this may reveal the poor demand for dental treatment for both primary and permanent dentition. Furthermore filled surfaces (fs/FS) found to be higher among males compared to females, this may give an indication that parents were more concerned about treatment of the teeth of the boys rather than those of the girls.

Males showed a higher mean rank value of plaque index than females with statistically highly significant difference, and this may partly be explained by better oral hygiene among females because they are more oriented towards dental hygiene behavior like brushing and visiting the dentist. The same finding was reported in previous studies (26, 27), While other studies showed that there is no significant difference between males and females (12, 14, 29).

Result in this study showed that the prevalence of gingivitis was 100%, which was higher than that reported by others in different part in Iraq (14, 30), variation among studies could be attributed to variation in oral hygiene measure among governments (14). The very high prevalence of gingivitis reported in present study may be attributed to the poor oral hygiene of those students which is represented by high prevalence of dental plaque (100%) and this is supported by the result of present study in which a positive, highly significant correlation was found between plaque and gingival indices.

The prevalence of traumatic dental injury was 10.5%, this was higher than that reported by others (11, 31). Additionally, this prevalence was higher than that recorded by some Iraqi studies regarding permanent anterior teeth (13, 32). On the other hand, the prevalence of traumatic dental injury was lower than that reported by others (14, 33). The difference in the prevalence of traumatic dental injury could be attributed to differences in ages between studied populations.

Results demonstrated that males were more affected by dental trauma than females and the difference was statistically highly significant, this result could be explained by fact that males may tend to be more active and had more energetic action than females who tend to be more concerned about their physical appearance and esthetic<sup>(10)</sup>, the same finding was reported by previous Iraqi studies<sup>(13, 14)</sup>.

Children with simple enamel fracture was seen to be the highest followed by those with enamel and dentin fracture, the same finding was recorded in previous studies on permanent teeth<sup>(13, 14)</sup>

The upper maxillary central incisors were the most common involved teeth with dental trauma. The same finding was reported by other studies<sup>(14, 32)</sup>, this could be explained by fact that the prominent position of the maxillary incisors in the face was responsible for their more frequent involvement in fracture than the lower teeth<sup>(33)</sup>.

Finally, one important observation of the present study is the relatively high prevalence of both chronic diseases (dental caries and gingivitis). Thus improvement in the prevention and educational programs are needed among school children. Further, observations are needed especially among boys to prevent over acting to reduce the prevalence of dental trauma.

## REFERENCES

- Marya .A textbook of public health dentistry.1<sup>st</sup> ed. Jaypee Brothers, NewDelhi, 2011.
- Caufield P, Li Y, Dasanayake A. Dental caries: an infectious and transmissible disease. *Compend Contin Educ Dent* 2005; 26(5):10-6.
- Dumitrescu AL. Etiology and pathogenesis of periodontal disease. Springer, New York, 2010.
- Dhoble A. Pedodontics (Questions&Answers). Bangalore New Delhi, 2008.
- Damle SG. Text book of pediatric dentistry. 3rd ed. Darya Ganj, New Delhi, 2009.
- Chestnutt IG, Gibson J. Clinical dentistry. 3<sup>rd</sup> ed. Churchil livingstone, Elsevier, 2007.
- Hasan Z. The effect of nutritional status on dental health, salivary physiochemical characteristics and odontometric measurement among five years old kindergarten children and fifteen years old students. Ph.D. thesis, College of Dentistry, University of Baghdad, 2010.
- Al-Hassnawy A. Socioeconomic and nutritional status in relation to oral health status and treatment needs in Dewanyiah governorate among 12 years old school students. Master thesis, College of Dentistry, University of Baghdad, 2013.
- Mughamis, A. 2014. Oral health status among fifteen years-old students in Maysan governorate\Iraq. Master thesis submitted to College of Dentistry, University of Baghdad.
- Rao A. Principle and practice of pedodontics. 2<sup>nd</sup> ed. New Delhi, 2008
- Tasneem S, Saima S, Owais G. Prevalence of traumatic dental injury to anterior teeth of 12 years-old-school children in Kashmir, India. *Oral Health Prev Dent* 2016; 5(1): 10-19.
- El-Samarrai SK. Oral health status and treatment needs among preschool children. Master thesis, College of Dentistry, University of Baghdad, 1989.
- Farhan H. Traumatized anterior teeth among 13-15 years old intermediate school students in Hilla city, Babylon Government/ Iraq. Master thesis, College of Dentistry, University of Baghdad, 2008.
- Al-Galebi S. Oral health status and treatment need in relation to nutritional status among 9-10 year-old School Children in Nassirya City/Iraq. Master thesis, College of Dentistry, University of Baghdad, 2011
- .Peter S. Essential of preventive and community dentistry. 2<sup>nd</sup> ed. New Delhi, Darya Ganj, 2004.
- World Health Organization. Oral health survey, basic methods. 3<sup>rd</sup> ed. Geneva, 1987.
- Silness J, Loe H. Periodontal disease in pregnancy. Correlation between oral hygiene and periodontal condition. *Acta Odont Scand* 1964; 22: 121-35.
- .Loe H, Silness J. Periodontal disease in pregnancy I. *Acta Odonto Scand* 1963; 21: 533-551.
- Garcia-Godoy F. Prevalence and distribution of traumatic injuries to the permanent teeth of Dominican children from private schools. *Community Dent Oral Epidemiol* 1984; 12(2):136-139.
- Diab BS. Nutritional status in relation to oral health condition among 6-10 years primary school children in the middle region of Iraq. PhD thesis, College of Dentistry, University of Baghdad, 2003.
- Al-Salman F. Prevalence of dental caries among primary school children age 6- 12 years old in Mosul city/Ninewah. Master thesis, College of Dentistry, University of Mosul, 1998.
- Al-Hadad K. Oral health status and treatment needs among (6-14) years old school children in Sana'a city (Yemen). Master thesis, College of Dentistry, University of Baghdad, 2002.
- Ali D. Oral health status and treatment needs among 12 year-old school children in Urban and Rural areas of Baghdad-Iraq Master thesis, College of Dentistry, University of Baghdad, 2001.
- Murray J, Nunn J, Steel J. The Prevention of oral disease. 4<sup>th</sup> ed. Oxford, New York, 2003.
- Al-Azawi LA. Oral health status and treatment needs among Iraqi five-years old kindergarten children and fifteen-years old students (A national survey) Ph.D. thesis, College of Dentistry, University of Baghdad, 2000.
- Baram A. Oral health status and treatment needs among primary school children in Sulaimani city. Master thesis, College of Dentistry, University of Baghdad, 2007.
- Droosh MK. Protein- Energy Malnutrition in Relation to oral health condition among 6 and 9 years old primary school children in Sulaimania city in Iraq. Master thesis, College of Dentistry, University of Baghdad, 2007.
- McDonald RE, Avery DR, Weddell JA. Gingivitis and periodontal disease. In: Ralph McDonald and David R Avery. Dentistry for child and adolescents. 6<sup>th</sup> ed. Mosby 1994b: 455-502

29. Hassan Z. Oral health status and treatment needs among Institutionalized Iraqi children and adolescents in comparison to school children and adolescents in Iraq. Master thesis, College of Dentistry, University of Baghdad, 2002.
30. Al-Sayyab MA. Periodontal treatment needs among Iraqi children living in two Iraqi villages (Sheha and Al-Bu Etha). J of college of dentistry 1998; 2: 219-224.
31. Onetto J, Flores M, Garbarino M. Dental trauma in children and adolescents in Valparaiso, Chile. Endod Dent Traumatol 1994; 10(5):223-7.
32. Al-Kassab A. Evaluation of primary schools students with traumatized anterior permanent incisors in relation to different variables in Mosul city. Master thesis, College of Dentistry, University of Baghdad, 2005.
33. Falomo B. Fractured permanent incisors among Nigerian school children. ASDC J Dent Child 1986; 53(2): 119-140.

#### الخلاصة

**المقدمة:** بالرغم انها ليست امراض قاتلة، الا أن تسوس الاسنان و التهاب انسجة ما حول الاسنان تعتبر من اكثر الأمراض شيوعا في العالم اضافة الى اكثر مشاكل الاسنان شيوعا عند الاطفال هي رض الاسنان الامامية. الهدف من هذه الدراسة يتضمن التعرف على نسبة وشدة تسوس الاسنان، التهاب اللثة، الصفيحة الجرثومية، الاصابات الرضية للاسنان الامامية.

**طريقة العمل:** اجري هذا البحث الميداني على اطفال المدارس بعمر 9 سنوات في مدينة الديوانية في العراق. اختيرت عينة بحجم 600(320 ولدا و 280 بنت) من عدة مدارس ابتدائية بصورة عشوائية من مناطق مختلفة في مدينة الديوانية.

اجري تشخيص وتسجيل تسوس الاسنان حسب مقاييس (WHO, 1987). مقياس (Silness and Loe, 1964) استخدم لتحديد تراكمات الصفيحة الجرثومية، مقياس التهاب اللثة (Loe and Silness, 1963) اتبع لتحديد التهاب اللثة. في حين تم تشخيص الاصابات الرضية للاسنان الامامية وتسجيلها طبقا لتصنيف (Garcia-Godoy, 1981)

**النتائج:** اظهرت الدراسة ان نسبة الاطفال المصابين بالتسوس للعينة كلها هو 85 % لاطفال المدارس بعمر 9 سنوات، بالنسبة للاسنان اللبنة والدائمة كانت نسبة إصابة الإناث بتسوس الأسنان أعلى مما في الذكور ويفارق معنوي بالنسبة للاسنان اللبنة ( $P < 0.05$ ), من جهة اخرى كانت حشوات اسطح الاسنان (fs/FS) للذكور أعلى مما في الإناث ويفارق معنوي بالنسبة للاسنان اللبنة ( $P < 0.05$ ) ويفارق معنوي كبير بالنسبة للاسنان الدائمة ( $P < 0.01$ ) سجلت نسبة عالية بالإصابة بالتهاب اللثة حيث كانت 100 %، كانت نسبة الصفيحة الجرثومية والإصابة بالتهاب اللثة عند الذكور أعلى مما في الإناث ويفارق معنوي كبير ( $P < 0.01$ ). كما لوحظ بان نسبة انتشار كسر الأسنان كانت 10.5 % وكان الذكور أكثر إصابة مقارنة مع الإناث ويفارق معنوي كبير ( $P < 0.01$ ). كما وجد أن كسر العاج البسيط هو الأكثر شيوعا بين الأطفال وإن القواطع العليا كانت الأكثر إصابة من بقية الأسنان.

**الاستنتاج:** بينت هذه الدراسة النسبة المرتفعة لأكثر الأمراض شيوعا في الأطفال هما تسوس الأسنان، التهاب اللثة و الاصابات الرضية للاسنان الامامية.