

Distribution of Dental Caries Among 12 Years Old Adolescents According to Severity, Gender and Dental Arches

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Abstract: ***Background:** Healthy teeth and oral tissues and the need for oral health care are important for any section of society. Dental caries is an infectious microbial disease of multifactorial origin in which diet, host, and microbial flora interacts over a period of time in such a way so as to encourage demineralization of the tooth enamel with resultant caries formation. **Aims and Objectives:** to measure the distribution of the severity of dental caries among 12 years old adolescents of primary school children in Baghdad. And to measure the distribution of dental caries in upper and lower jaws and in male and female. **Materials and Methods:** Sample (30 girls, 30 boys) was collected from two primary schools ((Al-Thaqafa and Al-Badya)) in Baghdad city. DMFS and DMFT indices were used in this study. The subjects were examined for dental caries according to WHO 1997 assessment form. Significant Caries Index was also used to assess the prevalence of dental caries, that suggests that the DMFT index for 12-year-old children can be utilized as an indicator of the state of health between different populations. **Conclusion:** The dental caries distribution was Higher in females. Caries was Moderate according to WHO, while the dental caries distribution was Higher in lower jaw.*

Keywords: Dental caries, DMFS, DMFT

1. Introduction

Dental caries is one of the most prevalent diseases afflicting human beings and persists till date as a challenge to the medical and dental profession in particular and the society in general. Information on epidemiological figures of dental caries is a fundamental requirement which updates our knowledge on changing trends of the disease, its treatment needs and helps in understanding ways and means to prevent its onset, limit its progression, and consequences [1].

Oral health is now recognized as equally important in relation to general health. The major oral health problems around the world are generally considered to be dental caries and periodontal diseases. Studies show that most individuals seek dental care with complaints of pain mainly because of tooth ache related to dental caries [2]. Age of 12 years has been universally accepted as global monitoring age for caries since all permanent teeth except third molars would most likely have erupted by this age [3].

Dental caries is a post-eruptive, infectious disease characterized by a gradual dissolution and destruction of the mineralized tissues of the teeth. Invariably, the absence of treatment will lead to worse and more extended lesions, progressing toward the dental pulp, resulting in a progressive increase of the pulp's inflammation, coexisting with pain symptomatology [4].

In most of the developed countries, the prevalence of high severity dental caries has been decreasing to moderate and low, while in developing countries there has been an increasing of its severity, from low to moderate. This is due to a group of preventive measures carried out in the populations, leading to a significantly improvement of their oral health[5].

Dental caries is differing in its distribution between upper and lower jaws because of many factors such as the early eruption of teeth in lower jaw, also clearance action of saliva and the presence of tongue in lower jaw. According to gender, dental caries distribution differs from male to female due to earlier eruption of teeth in females [6]. The severity of dental caries different between individual because of the socioeconomic and environmental factors and the motivation.

2. Materials and method

2.1 Study of population

This oral health survey was conducted among 60 pupils of primary school aged 12 years old living in Baghdad city, Iraq. The sample (30 girls, 30 boys) was collected between February and March 2015 from two primary schools (Al-Thaqafa and Al-Badya) with acceptance of the managers.

2.2 Materials and instrument

- 1) Disposable dental mouth mirrors
- 2) Disposable dental probe.
- 3) Towel.
- 4) Gloves and masks.

2.3 Oral examination

Examination and dental caries assessment were performed according to the basic methods of oral health surveys of World Health Organization (1987). Children were examined in their classroom. Each child was seated in a straight chair and day light was used for illumination. Clinical examination was performed using dental mirror and probe. Systemic approach of examination for dental caries were performed starting from upper right permanent molar to the upper left permanent molar in orderly manner, then to the

lower left permanent molar to the lower right permanent molar. During recording data, the DMFT index was obtained for each locality. The municipalities were then divided according to a severity scale (Murray JJ. O, 1992; WHO, 2000) that suggests that the DMFT index for 12-year-old children can be utilized as an indicator of the state of health between different populations. This scale indicates very low prevalence when the DMFT is between 0 and 1.1; low prevalence between 1.2 and 2.6; moderate prevalence between 2.7 and 4.4; high prevalence between 4.5 and 6.5; and very high prevalence when the DMFT is greater than or equal to 6.6. Statistical analysis was done by calculator.

3. Results

3.1 The distribution of severity of dental caries of children

The distribution of dental caries in the sample was 91.6% and 8.4 % was found to be free caries. The severity of dental caries performed according to the basic methods of oral health surveys of World Health Organization (1997).

The total DMFT was (6.36), and the severity of dental caries is moderate according to WHO criteria. As shown in table (1).

Table 1: Severity of dental caries

Severity	Very low	Low	Moderate	High	Very High	Total
No.	21	17	16	3	3	60
%	35	28.3	26.6	5	5	100
Mean DMFT	1.28	3.7	6.18	6.3	14.3	6.36

3.2 Distribution of dental caries according to gender

Table (2) demonstrates the distribution of dental caries in association with the gender. The total sample consisted of 60 children (30 females and 30 males). The study found that the dental caries was higher in females than in males. In which mean DMFS in females was (4.36 ± 3.8), and in male mean DMFS was (4 ± 3). As shown in Table (2).

Table 2: Distribution of dental caries according to gender

Gender	Girls	Boys
No.	30	30
%	50%	50%
DMFS	4.36	4
SD	3.8	3
DS	89	99
SD	2.7	2.8
MS	5	0
SD	0.8	0
FS	37	22
SD	2.89	1.09

3.3 Distribution of dental caries in upper and lower jaws

Table (3) demonstrate distribution of dental caries in upper and lower jaws. In which the occurrence of dental caries was higher in lower jaw than upper and mean DMFS in lower was (3.23 ± 2.4), while in upper was (0.95 ± 1.8).

Table 3: Distribution of dental caries in upper and lower jaws

Jaws	Upper	Lower
No.	60	60
Mean DMFS	0.95	3.23
SD	1.8	2.4
DS	48	141
SD	1.48	2.2
MS	0	5
SD	0	0.6
FS	9	49
SD	1.15	1.29

4. Discussion

This oral survey was designed to investigate the prevalence and severity of dental caries in primary school children aged 12 years old which was considered as an index age according to (WHO, 1997)[7]. For the diagnosis and recording of caries-experience, DMFS index was used in present study. The index allows measuring past dental experience indicated by missing and filled fraction, and the present caries by decayed fraction, and the comparison between upper and lower jaws. The comparison of data with other studies around the world, however, may not be completely valid due to variation in methods of examination used by different researchers, variation in environment of other countries and the level of motivation of children ,while comparison with other Iraqi epidemiological studies may give more accurate results because the majority of studies follow the criteria of WHO in the diagnosis and dental health recording and living opportunity in same environment.

In this study, the prevalence of dental caries in this study was found to be 91.6% for the children of 12 years old. This percentage was high. It may be attributed to lower fluoride level in drinking water in Iraq that was ranging between 0.12-0.22[8], in addition to implementation of preventive measure such as water, fluoridation, introduction of fluoridated tooth paste, mouth rinses and changes in diet habits to dental education. And may be also related to other factors related to socioeconomic condition and living style of the families in Iraq [9].

The severity of dental caries was moderate according to WHO criteria of DMFT index in which mean DMST was (6.18 ± 2.42). The prevalence groups were made as following: 35% within very low prevalence of caries, 28.3% with low prevalence, 26.6 with moderate prevalence, 5 with high prevalence and 5 with very high prevalence.

The result is higher than Khamrco et al. study [10], Jones et al. study[11], and It is lower thanLucian Petcu et al. study [12], Bajali M. et al. study [13], Mohammed Al-Darwishet al. study [14].

In this study, females had higher caries-experience than male in which mean DMFS was (4.36 ± 3.8) while mean DMFS of male was (4 ± 3), this result is similar to the records of Wan Salina et al study [15],Jose et al. study [16]; FotedarShailee et al. study[17] andSulafa K. El-Samarrai study [6]. And disagreed withN.Al-Sadam study [18], A.Al-

Hassnawy study [19], N. Al-Anistudy [20] and Mohammed Al-Darwish study [14].

Higher caries prevalence among females is often explained by eruption of teeth in girls, hence longer exposure of girls' teeth to the cariogenic oral environment [21].

The distribution of dental caries in lower jaw is higher than upper jaw in which the mean DMFS value in lower jaw was (3.23 ± 2.4) and upper jaw (mean DMFS was 0.95 ± 1.8), this study is agreed with (Ahmed M. Al-Haddad et al. study [22]). The relative high incidence of dental caries among the teeth of the lower jaw could be attributed to the early eruption of such teeth than those of the upper jaw or could be again related to multiple factors that include early eruption of lower teeth, socio-economic status, oral hygiene and others.

5. Conclusion

Dental caries is a disease where bacterial processes damage hard tooth structure (enamel, dentin, and cementum). These tissues progressively break down, producing dental caries. If left untreated, the disease can lead to pain, tooth loss, infection, and, in severe cases, death. Today, caries remains one of the most common diseases throughout the world. When dental caries rates are reported by sex, females are typically found to exhibit higher prevalence rates than males and the prevalence in lower jaw is higher than upper jaw. The severity of dental caries was moderate according to WHO criteria.

References

- [1] Munjal, Vaibhav, et al. "Dental caries prevalence and treatment need in 12 and 15-year-old school children of Ludhiana city." *Indian Journal of Oral Sciences*, vol. 4, no. 1, 2013, p. 27. *Gale Academic Onefile*, Accessed 21 Nov. 2019.
- [2] L. C. Carneiro and M. N. Kabulwa, "Dental Caries, and Supragingival Plaque and Calculus among Students, Tanga, Tanzania," *ISRN Dentistry*, vol. 2012, Article ID 245296, 6 pages, 2012. <https://doi.org/10.5402/2012/245296>.
- [3] Maen Mahfouz and Albina Abu Esaid, "Dental Caries Prevalence among 12–15 Year Old Palestinian Children," *International Scholarly Research Notices*, vol. 2014, Article ID 785404, 4 pages, 2014. <https://doi.org/10.1155/2014/785404>.
- [4] Nélio Veiga, Carlos Pereira, Odete Amaral. "Prevalence and determinants of dental caries in a sample of schoolchildren of Sátão, Portugal". *REV PORT ESTOMATOL MED DENT CIR MAXILOFAC*. 2014; **55**(4):214–219.
- [5] BASTOS, Tássia Fraga et al. Income inequalities in oral health and access to dental services in the Brazilian population: National Health Survey, 2013. *Rev. bras. epidemiol.*, Rio de Janeiro, v. 22, supl. 2, E190015.SUPL.2, 2019.
- [6] Sulafa El-Sammarrat, Neamat M. Al-Ani, Dental caries and treatment need among 12 years old school children in Heet city\ Al-Anbar governorate\ Iraq. B.D.S., M.Sc.,

- PHD. Orthodontics, Pedodontics and Preventive Dentistry\ University of Baghdad 2014;26(3): 160-163.
- [7] World Health Organization Oral Health Surveys, Basic Methods, 4th edition, 1997.
- [8] Al-Azawi L. Oral health status and treatment needs among Iraqi five-year old kindergarten children and fifteen-year old students (A national survey). Ph.D. thesis, College of Dentistry, University of Baghdad, 2000.
- [9] Brown LJ, Wall TP, Lazar V, Trends in untreated caries in primary teeth of children 2-10 years old. *JADA* 2000 Jan; 131: 93-99.
- [10] Khamarco T, Al-Salman K, Dental health status among school children in the center of Mousil city. Accepted for publication in: *Journal of Dental College, University of Baghdad*, 1998.
- [11] Jonnes, NT. Gombe, BMM. Nkomo, D. M. Wellington. Epidemiology of dental caries among 12- years old school children in Bulawayo city, Zimbabwe. Faculty of health sciences. Department of Community Medicine university of Zimbabwe Harare. *Epidemiology of dental caries*; 2007:30-35.
- [12] Lucian Petcu, Cristina Nuca, Corneliu Amariei, Annerose Borutta. Prevalence and severity of dental caries in 6 and 12 years old children in Constanta District (Urban Area), Romania. Department of oral health and dental management. *OHDMBSC-2009*;3(8): 19-24.
- [13] Bajali M, Sgan- Cohen HD, Abdulgani E, Steinberg D. Oral health status of Palestinian children in West Bank- Preliminary Data. *Middle east J Oral Health* 2007;1:10-12.
- [14] Mohammed Al- Darwish, Walid Al-Ansari, Abdulbari Bener. Prevalence of dental caries among 12–14-year-old children in Qatar. *The Saudi Dental Journal* 2014.26(3): 115-125.
- [15] Wan Salina W Sa, Nizam Ab, Naing L. The association of birth order and sociodemographic factors with caries experience among adolescents in Tumpat. *Archives of Orofacial Sciences* (2007) 2, 45-50.
- [16] Jose O, Carlo E, Juan P, Jorge A. Dental caries' experience, prevalence and severity in Mexican adolescents and young adults. *Rev. salud publica*. 2009;11 (1): 82-91.
- [17] Fotedar Shailee et al., 2012 Fotedar Shailee, GM Sogi, KR Sharma and Purthi Nidhi. Dental caries prevalence and treatment needs among 12 and 15-year-old school children. Department of Public Health Dentistry. Shimla city, Himachal Pradesh, India; 2012.
- [18] N. Al-Sadam. Oral health status in relation to nutritional and social status in Karbala Governorate of primary school children aged 12 years old. A master thesis, College of Dentistry, University of Baghdad, 2013.
- [19] Al-Hassnawy A. Socioeconomic and nutritional status in relation to oral health status and treatment need in Al-Dewanyiah governorate among 12 years old school students. Master thesis submitted to the College of Dentistry\ University of Baghdad; 2013.
- [20] N. Al-Ani. Oral health status, treatments need and dental anomalies in relation to nutritional status among 12 years old school children in Heet city\ Al-Anbar governorate\ Iraq, Master thesis, College of Dentistry\ University of Baghdad; 2013.

- [21] Lukacs J. and Largaespada L. "Explaining sex difference in dental caries prevalence: saliva, hormones and "life history" etiologies " **American journal of Human Biology**, Vol. 18(4), P.540-50 , access at 11\1\2014
- [22] Al-Haddad, Ahmed & Bin Ghouth, Abdulla & Hassan, Hs. Distribution of Dental Caries among Primary School Children in Al-Mukalla Area, Yemen. *Journal of Dentistry, Tehran University of Medical Sciences*. 2006;3(4) 195-198.