



PREVALENCE OF DENTAL CARIES AMONG PRIMARY GOVERNMENTAL SCHOOL CHILDREN IN AL-MANSURA DISTRICT, ADEN GOVERNORATE, 2016

Taraji Ali Abdallah
Mohmed

ABSTRACT The study is design to highlight the burden of dental caries among primary school children(12-15 year old) in AL-Mansura district, Aden governorate. The aim of this study is to determine the prevalence of dent al caries, to find out the relation between dental caries and age and gender. Out of 406 children examined, 223 (54.9%) were males while 183 (45.1%) were females. There is no difference between them, $p=0.999$. The mean of age of males was (13.49 ± 1.119) and females (13.50 ± 1.124) . In conclusion: Caries prevalence is high among primary school children in AL-Mansura. The decayed missing and filled teeth (DMFT) index is 3. Attention should be given to the oral health of the children. Protective measures should be clearly addressed.

KEYWORDS : Dental caries, school children, DMFT(decayed, missing, filling) Index.

Introduction

Oral health is an important element of general health for all children. One important disease which can affect oral health is dental caries. Dental caries is an infectious disease that can occur when cariogenic bacteria colonize a tooth surface in the presence of dietary carbohydrates, especially refined sugars. The bacteria metabolize the carbohydrates, producing lactic acid, which over time demineralizes the tooth structure [1,2].

Dental caries is a severe problem that affects pre-school and high-school children world-wide, leading to pain, chewing difficulties, speech troubles, common healthiness disorders, psychological problems, and lower quality of life [3,4,5].

In developing countries, whose health resources are limited , instead of beginning with caries prevention in adolescent age, it may be given less priority in favor of preserving the permanent dentition of older individuals [6], extraction of badly decayed teeth is the predominant treatment used to cure toothache to adolescent age[7].

Dental caries remains a major oral health disease affecting children world-wide. While the prevalence and severity of dental caries in most industrialized countries have declined substantially in recent years, in developing countries like Sub-Saharan Africa the prevalence is predicted to increase. This disparity between industrialized and developing countries has been attributed to preventive oral health care programs adopted by the former and changes in dietary habits coupled with inadequate exposure to fluorides in developing countries [8]. According to the World Health Organization (WHO) the prevalence of dental caries among school aged children is estimated to be as high as 90% in some countries [9]. For children in particular, poor oral health can have negative impacts on quality of life and academic performance at school [10]. Apart from causing chronic pain and discomfort, untreated dental caries can impact daily activities in terms of play, sleep, eating and school activity [11].

The WHO suggests indexes for oral health assessment; it was reported that at the age of 12years, permanent teeth (except third molar) would have been erupted, so this is the appropriate age to apply the indexes [12].

The current study is intending to estimate the prevalence of dental caries and it's related to age and gender among primary school children(12 to 15 years old) in Al-Mansura district, Aden governorate.

This data might be useful to policy makers and stockholders for the design and implementation of strategies to increase oral hygiene and oral health in children.

Methodology

A cross-sectional study, the study was carried out in the governmental schools in AL-Mansura district-Aden during the period from January to December 2016 and the target population consisted of children from 12 to 15 years attending to primary governmental schools in AL-Mansura district-Aden (Yemen). Approval and permission for the study were given from the ethical research committee and Public

Health Department, and a letter was obtained from the university and sent to the Education Directorate authorities, which explained the aim of the study. Subsequently, a consent to perform the study was obtained from the directors of the selected schools. . Also an oral informed consent obtained from each participating child, after explaining the aims of the study. Inclusion criteria children who are attending selected primary governmental schools aged 12-15 years and children who accepted to participate in the study. The sample was selected by multistage sampling method, at first we determined the total number of governmental schools in Al-Mansura district, then we selected four governmental primary schools from total eight governmental primary schools by lottery, that consisted of children at age of 12-15 years; they were distributed according to educational levels and their ages Then stratified random sampling was applied to select children by gender the fraction of each gender is proportionate and represented in the intended sample.

Dependent variables were Clinical status of permanent teeth: Sound, Decayed, Missing, Filling, DMFT(decay, missing, filling teeth index) [13].

Dental Caries [Yes (DMFT >0), No (DMFT=0)] and Prevalence of dental caries (percentage of pupils with dental caries, DMFT>0). Independent variables were gender (female and male) and age (12, 13, 14, 15). The main researcher, a qualified dentist, was carry out the clinical examination to avoid inter-examiner variability and recording of data was done by a trained dentist who was assist the main researcher throughout data collection. The children were examined in a supine position on the table in the class room. The clinical examination was carried out using disposable mouth mirrors, sharp explorers, spoon wood while dentist was wear head light, mask and gloves. The presence of caries determined according to the WHO criteria, by using the decayed, missing and filled tooth index (DMFT). Data were registered and elaborated by statistical package for social sciences version 15(SPSS).

Results

the detailed results of this study are presented in the following tables:

Table 1 display Distribution of the studied population according to gender and age

Age (years)	Gender				Total	
	Males		Females		No.	%
	No.	%	No.	%		
12	55	24.7	46	25.1	101	24.9
13	56	25.1	46	25.1	102	25.1
14	56	25.1	45	24.7	101	24.9
15	56	25.1	46	25.1	102	25.1
Total	223	54.9	183	45.1	406	100
Mean age (years)	13.49±1.119		13.50±1.124			
Percent calculated by columns						
Total calculated by the row						
t- test for comparing mean age ($p=0.972$) X2 for comparing gender, $p=0.999$						

Table 1. shows the distribution of the studied population according to gender and age. Out of 406 children examined, 223 (54.9%) were males while 183(45.1%) were females . There is no difference between them, $p=0.999$. The mean of age was 13.495 ± 1.1215 . The mean age of males was (13.49 ± 1.119) and females (13.50 ± 1.124) which was statistically insignificant, $p=0.972$, Table 1.

Table 2. Distribution dental status of permanent teeth among primary school children from Al-Mansura district, Aden governorate

Dental status	No. (n=406)	%
Sound	189	46.6
Decayed	186	45.8%
Missing	3	0.7%
Filling	2	0.5%
More than one	26	6.4%

Table 2 displays the dental status of the children. Caries is present by 217 children making 53.5 %. It distributed as decayed, missing, filling and a combination of them making 45.6%, 0.7%, 0.5% and 6.5% respectively.

Table 3. Prevalence of dental caries among primary school children from Al-Mansura district, Aden governorate, according to age

Age (years)	No.	Caries prevalence+ (n=406)				X ²	Caries Index DMFT++		
		Yes		No			Mean	SD	P
		No	%	No	%				
12	101	46	45.5%	55	13.5%	10.60	3.34	1.935	0.086
13	102	47	46%	55	13.5%	0	3.29	1.948	
14	101	58	57.4%	43	10.6%	P=0.0	2.88	1.961	
15	102	66	64.7%	36	8.9%		14	2.77	

+ chi-square test, $p=0.014$ (df=3)

++ Anovatest, $p=0.086$

This table 4.4. shows that the prevalence of caries increased with increasing of age, while the caries index (DMFT) decreased with increasing age. This increasing in prevalence is statistically significant, $P=0.014$, but the caries index is insignificant, $p=0.086$.

Table 4. Prevalence of dental caries among primary school children from Al-Mansura district, Aden governorate, according to gender

Gender	No.	Caries prevalence+ (n=406)				X ²	Caries Index DMFT++		
		Yes		No			Mean	SD	P
		No	%	No	%				
Male	223	109	48.8%	114	28.1%	3.754	3.22	1.945	0.100
Female	183	108	59%	75	18.5%	P=0.053	2.90	1.929	

+ chi-square test, $p=0.053$ (df=1) //chi-square incorporating Yates' correction for continuity used since df=1& (2*2) table

++ t-student test, $p=0.100$

Table 4.5. illustrates the caries index and prevalence according to gender. Caries prevalence in this study was higher in females than males and statically insignificant, $p=0.053$. The cries index is statically insignificant.

Discussion

Dental caries is the most common chronic disease of the oral cavity and the common condition affecting the general health of children. Since a large proportion of the population experience it in their life span. The estimation of its prevalence becomes important to improve oral health. The current study has been conducted to determine the prevalence of caries and its relation to age and gender, among primary school children in Al-mansura district, Aden .The results of the present study revealed a high prevalence 53.5% of caries among school children in Al-mansura district. This finding is similar to Ingle et al who reported 53%. [14] .and almost similar to Cote et al who found 51.3% among refugee childre[15].as well as Dawani et al who mentioned 51% caries prevalence[16]. Less than our finding was stated by Kaur et al 44.6% [17]. and Ferro et al [18].In which the prevalence of dental caries was

almost by 40%.Moreover, Gathecha from Kenya recorded that the prevalence of dental caries was 37.5% in Nairobi West District 24% in Mathira West District [11], both of which less than this finding. Higher prevalence than this finding is reported by Petersen et al 70% [19].Naser et al, 60.8%[20] and Mafuvadze et al (59%)[21]. These data show that dental caries is a public health problem at global and regional levels [22].

In many industrialized countries, the rate of caries free teeth is high. Caries free or sound teeth were presented in this study by 46.6% among school children. This result is less than that found by Beresescu et al 61.4% [23], and Weusmann et al 60.9% from Germany [24].

The study sample was randomly selected from four governmental primary schoolchildren representing all governmental primary school children in Al-Mansura district. In the present study, males were more than females. This finding disagrees with Lagana et al [25]. Beresescu et al,[26]. and in which females (54%) were more than males (46%).

Moreover, Gathecharecorded that, a total of 639 children participated in the study. Of those, 351 (55%) were females while 288 (45%) were males[11], this outcome is dissimilar to our results.

The distribution of study children in each age is almost equal 25% of the total children.

The caries affected teeth appear as decayed, missing, filling or a combination of both or more which are estimated by DMFT.DMFT index is a routine indicator used to evaluate dental health status in many studies for over 50 years[27]. According to the results of the present study, the mean DMFT of 12–15 years children was 3.06 ± 1.93 which means the average affected children have 3 affected teeth which may be decayed, missed or filled. This is similar to that reported by Alhadad et al in which DMFT index of 12-14 year old children was 3.22 ± 1.92 [28]. Shekar et al recorded that there was no statistically significant difference in caries prevalence and the mean DMFT scores between 12 and 15 years old children were 0.85 ± 0.94 and 0.82 ± 0.89 , respectively [29]. This is lesser than this finding. Lagana et al [25]. recoded the total DMFT index was 2.327 which is also lesser, too. Lagana et al registered the highest DMFT value (3.6) with the age of fifteen years [25]. This agrees with this finding that caries prevalence increases with increasing age with its highest in age 15. Al-Darwish from Qatar reported similar result [30], but Samira et al found dissimilar result in which DMFT decreases with increasing age [31].

In this study, decayed, missed or filled teeth were found by 45.8%, 0.7% and 0.5% respectively. Lagana et al also reported higher outcomes than this data which were 47%, 17.56% and 16.1% for decayed, missed or filled teeth respectively [25].

The results of the present study reveal that caries prevalence increases with increasing age. This tendency to increasing caries with increasing age is similar to Al-Darwish from Qatar, [30] but dissimilar to Samira [31]. in which DMFT decreases with increasing age. Concerning 12 year old children, caries prevalence was by 45.5% of total 12 year old children. This result is higher than that found by Wandera et al from Uganda, [32]. Mwakatobe et al from Tanzania, [33]. and Samira et al [31]. Thapa recoded that the point prevalence of dental caries among the 12-13 years children stood at 42.2% with a DMFT score of 2.3 [34]. In this study, DMFT index (3.2) for 12 year old children stood at higher than that. In addition, higher than this finding among 12 years children was reported by Elfaki et al. from Sudi Arabia [35]. and by Al-Akwil and Maweri from Yemen [36].

Caries prevalence in this study was higher in females than males which is similar to that reported by Lagana et al [25].

The present study also showed that the total DMFT index was 3.06 ± 1.937 and related to gender was 3.22 ± 1.945 for males and 2.90 ± 1.929 for females which are higher than data of Lagana et al [25], and much higher than that found by Mwakatobe et al [33], Zhanget al [37] in which DMFT for males was 0.23 and females 0.45.

Conclusions

At the end of this study we could conclude the following:

1. The prevalence of dental caries among primary school children in Al-Mansura district, Aden is high.

2. The decayed missing and filled teeth (DMFT) index is 3 with almost no difference between male and female values
3. The prevalence of caries increases with increasing age, while the caries index (DMFT) decreases with increasing age
4. Caries index and prevalence are not affected by gender.

References

- [1] Ozdemir D. Dental Caries : The Most Common Disease Worldwide and Preventive Strategies. *International Journal of Biology*; 2013; 5(4):55-61.
- [2] Garg N, Garg A. *Textbook Of Preclinical Conservative Dentistry*. Jaypee Brothers Medical Publishers (P) LTD 2011. Chapter 4, page 53.
- [3] Rosenblatt A, Zarzar P. The prevalence of early childhood caries in 12- to 36-month-old children in Recife, Brazil. *ASDC J Dent Child*. 2002;69:319-24, 236.
- [4] Filstrup SL, Briskie D, da Fonseca M, Lawrence L, Wandera A, Inglehart MR. Early childhood caries and quality of life: child and parent perspectives. *Pediatr Dent*. 2003;25:431-40.
- [5] Sheiham A. Oral health, general health and quality of life. *Bull World Health Organ*. 2005;83:644.
- [6] Mobarak EH, Shabayek MM, Mulder J, Reda AH, Frenken JE. Caries experience of Egyptian adolescents: Does the atraumatic restorative treatment approach offer a solution? *Med Princ Pract*. 2011;20:545-49.
- [7] Wissa AA, Zahran MA: Evaluation of governmental dental health services in rural health centers in Egypt. *Community Dent Oral Epidemiol* 1988; 16:16-18.
- [8] Petersen PE, Lennon MA. Effective use of fluorides for the prevention of dental caries in the 21st century: the WHO approach. *Community Dent Oral Epidemiol*. 2004; 32(5): 319-321.
- [9] Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The Global burden of oral disease and risks to oral health. *Bull World Health Organ*. 2005; 83(9): 661-669.
- [10] Kwan SYL, Petersen PE, Pine CM, Borutta A. Health-promoting school; an opportunity for oral health promotion. *Bulletin of the World Health organization*. 2005; 83(9): 677-685.
- [11] Gahecha G K. Dental caries and its relationship to oral health knowledge and practice among 12 year old children in Nairobi West District, Kenya. A thesis submitted in partial fulfillment for the Degree of Master of Science in Applied Epidemiology in the Jomo Kenyatta University of Agriculture and Technology (2012).
- [12] Al-Samadani KHM, Ahmad MS. Prevalence of first permanent molar caries in and its relationship to the dental knowledge of 9-12-year olds from Jeddah, Kingdom of Saudi Arabia. *ISRN Dent*. 2012; 2012:391068.
- [13] John J. *Preventive and community dentistry*. Third edition. India: Satish Kumar Jain for CBS Publishers and Distributors; 2006. Chapter 10, Indices for Oral Diseases page 109-110 use Vancouver rules for books.
- [14] Ingle NA, Dubey H V, Kaur N, and Gupta R. Prevalence of dental caries among school children of Bharatpur city, India. *J Int Soc Prev Community Dent*. 2014; 4(1): 52-55.
- [15] Cote S, Geltman P, Nunn M, Lituri K, Henshaw M, Garcia RI. Dental caries of refugee children compared with US children. *Pediatrics*. 2004; 114(6): 733-40.
- [16] Dawani N, Nisar N, Khan N, Syed Sand Tanweer N. Prevalence and factors related to dental caries among pre-school children of Saddar town, Karachi, Pakistan: a cross-sectional study *BMC Oral Health* 2012; 12:59.
- [17] Kaur S, Maykanathan D, Lyn NK. Factors associated with dental caries among selected urban school children in Kuala Lumpur, Malaysia. *Arch Orofac Sci* 2015; 10(1): 24-33.
- [18] Ferro R, Besostri A, Meneghetti B and Stellini E. Prevalence and severity of dental caries in 5- and 12-year old children in the Veneto Region (Italy). *Community Dental Health*. 2007; 24: 88-92.
- [19] Petersen PE, Hoerup N, Poomviset N, Prommajan J, Watanapa A. Oral health status and oral health behavior of urban and rural schoolchildren in Southern Thailand. *International Dental Journal*. 2001; 51(2): 95-102.
- [20] Nasr AM, Moheb DM, El Masry ES. Prevalence of dental caries in child school from two Libya's western cities with different levels of fluoride in their drinking water. *Nat Science*. 2014; 12(1): 28-34.
- [21] Mafuvadze B T, Mahachi L, Mafuvadze B. Dental caries and oral health practice among 12 year old school children from low socio-economic status background in Zimbabwe. *The Pan African Medical Journal*. 2013; 14:164.
- [22] Cote S, Geltman P, Nunn M, Lituri K, Henshaw M, Garcia RI. Dental caries of refugee children compared with US children. *Pediatrics*. 2004; 114(6): 733-40.
- [23] Petersen PE, Hoerup N, Poomviset N, Prommajan J, Watanapa A. Oral health status and oral health behavior of urban and rural schoolchildren in Southern Thailand. *International Dental Journal*. 2001; 51(2): 95-102.
- [24] Weusmann J, Mahmoodi B, Azaripour A, Kordmeyer K, Walter C and Willershausen B. Epidemiological investigation of caries prevalence in first grade school children in Rhineland-Palatinate, Germany Weusmann et al. *Head & Face Medicine*. 2015; 11:33.
- [25] Laganà G, Fabi F, Abazi Y, Kerçi A, Jokici M, Nastasi EB, Vinjollì F, Cozza P. Caries prevalence in a 7- to 15-year-old Albanian school children population. *Ann Stomatol (Roma)*. 2012; 32(3): 38-43.
- [26] Beresescu L, Pacurar M, Blanka P. Clinical-Statistical Study Regarding the Decay Frequency of the First Permanent Molars *Romanian Journal of Oral Rehabilitation*. 2012; 4(4): 22-26.
- [27] Broabent JM, Thomson WM. For debate: problems with the DMF index pertinent to dental caries data analysis. *Community Dent Oral Epidemiol* 2005; 33:400-9.
- [28] Al-Haddad KA, Al-Hebshi NN, Al-Ak'hali MS. Oral health status and treatment needs among school children in Sana'a City, Yemen. *Int J Dent Hyg*. 2010; 8: 80-85.
- [29] Shekar C, Cheluvaiiah MB, Namile D. Prevalence of dental caries and dental fluorosis among 12 and 15 years old school children in relation to fluoride concentration in drinking water in an endemic fluoride belt of Andhra Pradesh. *Indian J Pub Health*. 2012; 56(2): 122-8.
- [30] Al-Darwish M, El Ansari W, Bener A. Prevalence of dental caries among 12-14 year old children in Qatar. *Saudi Dent J*. 2014; 26(3): 115-125.
- [31] Samira M, Ebrahim, Omran S, Habib. Prevalence of Dental Caries Among Primary School Children in Basrah. *MJBU*, 2005; 23(2): 26-29.
- [32] Wandera M, Twa-Twa J. Baseline survey of oral health of primary and secondary schools in Uganda. *African Journal of Health Science*. 2003; 3(1): 19-22.
- [33] Mwakatobe AJ, Mumghamba EG. Oral health behavior and prevalence of dental caries among 12-year-old school-children in Dar-es-Salaam, Tanzania. *Tanzania. Dental Journal*. 2007; 14(1): 1-7.
- [34] Thapa P, Aryal KK, Dhimal M, et al. Oral Health Condition of School Children in Nawalparasi District, Nepal. *J Nepal Health Res Coun* 2015; 13(29): 7-13.
- [35] Elfaki NK, Elgarraï ASE, Shwail AI, Brair SL, Alsheikh MA. Prevalence of Dental Caries among Primary School Attendees in Najran-Saudi Arabia *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)* 2014; 13(11): 37-41.
- [36] Al-Akwai AA, Al-Maweri SA. Prevalence of Dental Caries among Yemeni Schoolchildren: A large School-Based Survey *Global Journal of Health Science* 2016; 9(5): 1916-9736.
- [37] Zhang S, Chau AMH, CM Lo. E. Chu. C-H. Dental caries and Erosion Status of 12-year-old Hong Kong children. *BMC Public Health* 2014; 14: 1-7.