

Oral health knowledge and practice among 9–12-year-old schoolchildren in the region of Madinah, Saudi Arabia, and its impact on the prevalence of dental caries

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ABSTRACT

Background: Dental caries is one of the most common dental disorders affecting from all over the globe. Dental caries affects 60%–90% of schoolchildren in most developed countries, and in several developing countries, the prevalence rates are increasing. **Objective:** To know oral health knowledge and practice among 9–12-year-old schoolchildren and its relation with dental caries. **Methods:** This is a questionnaire-based cross-sectional studies conducted from September 20, 2015, to January 27, 2016, selecting four male and four female primary schools. Two calibrated examiners examined the students under the normal light with mirror and probe. **Results:** A total of 276 (92%) were included in this cross-sectional study. There were 118 (43%) were males and 158 (57%) were females with mean age of 10.61 years and having mean Decayed, Missing, and Filled Tooth/decayed, missing, and filled tooth (DMFT/dmft) 1.47/1.78 in male and 1.69/5.34 in female. Three-quarters of the sample (75%) reported to cleaning their teeth at least once per day, and >95% reported using a toothbrush and toothpaste. The mean DMFT/dmft and D/d scores of female were significantly higher ($P < 0.05$) than that of the males. The mean dmft and all the components decreased with age, and there was a significant association ($P < 0.01$) between oral health knowledge and the caries status. Children with a higher DMFT/dmft score tended to have poor oral health knowledge compared to those with low DMFT/dmft scores. **Conclusion:** Poor oral health knowledge contributes major role in the prevalence of dental caries in both male and female. In female higher DMFT/dmft was observed in spite of having good oral health knowledge.

Key words

Decayed, Missing, and Filled Tooth, decayed, missing, and filled tooth, oral health knowledge, toothbrush, toothpaste

INTRODUCTION

Dental caries is one of the most common dental disorders affecting the children from all over the globe.^[1,2] It is the main cause of tooth loss among children, teenagers, and young adults. Dental caries affects 60%–90% of schoolchildren in most developed countries, and in several developing countries the prevalence rates are increasing.^[2] There are many risk factors associated with the development of dental caries which include diet,

saliva flow rate, oral health knowledge, and oral health practice.^[3] In developed countries, the decline in dental caries prevalence has been attributed to population-based preventive programs with the use of fluoride, improved participation in oral health programs and changes in oral hygiene and sugar intake habits. However, in many developing countries, there is an increase in dental caries, which has resulted from unhealthy dietary habits, limited use of fluoride, and poor access to oral

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health services.^[4] In addition, most oral health services in developing countries provide symptomatic treatment with little priority given to curative and preventive services.^[5] Preventive care includes oral health education, the application of fissure sealants in permanent teeth and fluoride as preventive tools. Schools provide the ideal setting to reach millions of children and ensure strong foundations for a healthy life at an early stage of life.^[6] Oral health and general health status depend on a dynamic interplay of many factors, including the individual's personal characteristics, behaviors, and perception.

The prevalence of dental caries varies across the different part of Saudi Arabia. Studies on primary schoolchildren reported the prevalence to be between 68% and 94% with later studies showing a decreased prevalence compared to older studies due to regular visit to school by the dental staff from the health services.^[4-7] The high prevalence indicates the serious nature of dental caries among young children. Although dental services are provided both by government and private sectors, utilization patterns are still poor. Twelve-year olds represent a standard age category used by the World Health Organization (WHO) to assess and compare dental caries levels in the permanent dentition of children worldwide.^[3]

Social set up, oral health practice and oral health knowledge is important to know for the implementation of prevention of dental caries. This study was a part of outreach program of the final year BDS students from College of Dentistry, Taibah University.

The objective of the study was to know oral health knowledge and practice among male and female primary schoolchildren and its relation with the prevalence of dental caries.

METHODS

This is a cross-sectional analytical study conducted on 9–12-year-old male and female schoolchildren from Madinah, Saudi Arabia. The study was performed from September 20 to January 27, 2016. Four male and four female primary schools were selected randomly from the city of Madinah. The purpose of the study was described to the headmaster of the each selected school. Consent forms were issued to all children for their parents to complete. Only children with signed parental consent were included in the study.

A questionnaire was designed to obtain the necessary information. It consisted of three parts, oral health practice, oral health knowledge, and utilization of dental services. Totally twenty questions were asked related to oral health practice, oral health knowledge, and utilization of dental services including demographic

data. There were seven questions related to oral health knowledge, each positive answer was coded with one point while negative and do not know answers were coded as a zero. The maximum number of points that could be obtained was seven. Students who scored 0–2 points were considered “poor” those with 3–4 points were recorded as “average” and those with 5–7 were recorded as “good” knowledge. The questionnaire was in Arabic and was completed in an interview format with the principal investigator asking the questions to the participants.

The clinical oral examination was conducted in the school's classroom. The examination was conducted under the normal room light with a mirror and according to the WHO criteria.^[8] The prevalence of dental caries was recorded using the decayed, missing, and filled tooth (dmft) index and the Decayed, Missing, and Filled Tooth (DMFT) Index for primary and permanent dentitions, respectively. Four calibrated examiners (two males and two females) carried out the oral examinations and the inter- and intra-examiner reliability was measured by re-examining every 10th patient. The results of the inter- and intra-examiner agreement analysis was $\kappa = 0.79$ with $P < 0.001$. This measure of agreement is substantial. The ethical permission was obtained from the ethical committee of College of Dentistry, Taibah University.

The data were analyzed using IBM SPSS version 22 software package. The descriptive analysis included mean and standard deviations, and the statistically significant level was set on $P < 0.05$, and it is measured by *t*-test and correlation bivariate.

RESULTS

A total of 300 students were given consent forms and of these of 276 (92%) were included in the study. The remaining 24 students were excluded, as they did not have signed consent forms. There were 118 (43%) were males and 158 (57%) were females with mean age of 10.61 years.

Three-quarters of the sample (75%) reported to cleaning their teeth at least once per day, and more than 95% reported using a toothbrush and toothpaste. More than two-thirds of the sample reported not using any additional means of tooth cleaning such as dental floss or toothpicks. The majority of participants (46%) reported visiting the dentist only when necessary. Among the females, 32% reported that they had never visited a dentist before compared to 16% of males.

The mean DMFT of permanent/dmft of deciduous and D/d scores of female were significantly higher ($P < 0.05$) than that of the males as shown in Table 1.

Table 1: Prevalence of dental caries among male and female children

Gender	Mean±SD								
	D	M	F	DMFT	d	m	f	dmft	OHK
Male	1.26*±1.58	0.08±0.43	0.12*±0.46	1.47*±1.78	1.06*±1.82	0.42*±0.96	0.30*±0.77	1.78*±2.26	3.47±1.530
Female	1.54*±1.52	0.03**±0.21	0.11**±0.65	1.69*±1.61	4.37*±3.32	0.66*±1.24	0.32*±0.87	5.34*±3.71	

*Significant at the 0.01 levels, **Significant at the 0.05 level. SD – Standard deviation, DMFT – Decayed, missing and filled tooth, OHK – Oral health knowledge

Table 2: Prevalence of dental caries in relation with age

Age (years)	Mean±SD								
	D	M	F	DMFT	d	m	f	dmft	OHK
9	1.16*±1.29	0.02±0.13	0	1.18*±1.31	5.61*±3.63	0.93*±1.45	0.38*±1.07	6.91*±4.05	3.30±1.572
10	1.35*±1.29	0.02±0.12	0.08±0.44	1.44*±1.37	4.17*±2.97	0.66*±1.09	0.31*±0.79	5.41*±3.06	3.44±1.279
11	1.67*±1.71	0.07±0.34	0.12±0.68	1.86*±1.90	1.81*±2.38	0.35*±0.84	0.30*±0.77	2.45*±0.60	3.30±1.287
12	1.40*±1.73	0.10±0.49	0.23±0.73	1.73*±1.87	1.06*±1.85	0.41*±1.11	0.27*±0.70	1.74*±2.53	3.30±1.438

*Significant at the 0.01 levels. SD – Standard deviation, DMFT – Decayed, missing, and filled tooth, OHK – Oral health knowledge

Table 3: Oral health knowledge among the children by gender

Gender	Poor, n (%)	Average, n (%)	Good, n (%)	Total, n (%)	OHK (mean±SD)
Male	29 (25)	76 (64)	13 (11)	118 (100)	3.14±1.13
Female	37 (24)	80 (50)	41 (26)	158 (100)	3.47±1.53
Total	66 (24)	156 (56)	54 (20)	276 (100)	

P=0.007. SD – Standard deviation, OHK – Oral health knowledge

The mean DMFT and D scores increased significantly ($P < 0.05$) with age from 1.18 in 9-year olds to 1.73 in 12-year olds. The mean dmft and all the components decreased with age as shown in Table 2.

Table 3 shows the mean oral health knowledge scores for male and female; females had significantly ($P = 0.007$) better oral health knowledge scores compared to males. The mean oral health knowledge among the different age group was similar as shown in Table 4.

There was a significant association ($P < 0.01$) between oral health knowledge and the caries status. Children with a higher DMFT/dmft score tended to have poor oral health knowledge compared to those with low DMFT/dmft scores [Table 5].

DISCUSSION

This was the first study conducted to compare oral health knowledge and practice among 9–12-year-old schoolchildren in the region of Madinah, Saudi Arabia, and its impact on the prevalence of dental caries. The response rate was 92%, which was very much acceptable. There were not much difference between male and female students in time of cleaning and using tools to clean the teeth, but it was surprising that a great number of female

students (32%) never visited the dentist. This might be due to not getting proper access because they are dependent on the parents (male members) who take them to the dentist or they ashamed to describe the disease to parents because of social culture.^[6] Related to interdental cleaning most of the children were unaware. Among them, 68% did not use any tools to clean interdental space. Most of the previous studies also reported about unawareness of interdental cleaning aids.^[6]

The mean DMFT/dmft was relatively higher (1.69/5.34) among females as compare to males (1.47/1.78). Mean DMFT score for 9–12-year-old children were little higher as compared to study of Mahrous *et al.* among 12-year-old schoolchildren.^[8] The difference might be due to our mean DMFT was combination of 9–12-year-old children whereas there mean DMFT was only for 12-year-old children. The reason for high dmft among females might be due to poor communication with the parent, or lack of oral health awareness in addition to access to dental clinic in government hospital is not easy as waitlisted patients has long list due to shortage of pedodontists, so it results in negligence and delaying the treatment timely. The other reason might be the female child spend most of the time in home so they were consuming sweet food or drink after every small gap. They also felt ashamed to show their mouth. Female children mostly wanted to visit female dentist for the treatment. The prevalence of dental caries was 88% among both male and female students, and it showed increasing trends with the increase of age in both gender, which is slightly less than reported (94.4%) by Wyne *et al.* but their mean DMFT/dmft was similar to our study that was $1.6 \pm 3.1/6.3 \pm 3.5$.^[4] Another study conducted by Al Dosari *et al.* reported 91.2% prevalence of dental caries among 12–13-year-old schoolchildren.^[5] Farooqi *et al.* reported mean DMFT/dmft 1.94 ± 2.0 and 3.66 ± 3.13 respectively from Eastern Province of Saudi Arabia.^[6] The variation of DMFT might be due to study performed at the different province of Saudi Arabia and dental

Table 4: Oral health knowledge among the children by age

Age (years)	Poor, n (%)	Average, n (%)	Good, n (%)	Total, n (%)	OHK (mean±SD)
9	15 (27)	29 (52)	12 (21)	56 (100)	3.30±1.57
10	12 (18)	41 (62)	13 (20)	66 (100)	3.44±1.28
11	19 (23)	48 (57)	17 (20)	84 (100)	3.30±1.29
12	20 (28)	38 (54)	12 (18)	70 (100)	3.30±1.44
Total	66 (24)	156 (56)	54 (20)	276 (100)	

P=0.836. SD – Standard deviation, OHK – Oral health knowledge

Table 5: Prevalence of dental caries in relation with oral health knowledge

OHK	Mean±SD							
	D	M	F	DMFT	d	m	f	dmft
Poor	1.73*±1.68	0.02±0.12	0.18±0.89	1.92*±1.82	3.05*±3.61	0.55*±1.19	0.30*±0.78	3.89*±3.92
Medium	1.27*±1.49	0.08±0.39	0.05±0.22	1.40*±1.61	2.86*±3.26	0.55*±1.14	0.27*±0.77	3.68*±3.71
Good	1.48*±1.51	0.04±0.28	0.21±0.74	1.75*±1.65	3.09*±2.62	0.58*±1.05	0.43*±1.03	4.11*±3.01

*Significant at the 0.01 levels. SD – Standard deviation, DMFT – Decayed, missing and filled tooth, OHK – Oral health knowledge

caries prevalence varies due to different social culture in the different area of the country. In another study, Al Ansari reported higher DMFT score among 12-year-old schoolchildren compared to our study.^[7] This might be due to changing level of education and improved oral health status among the schoolchildren. This also reflects in our questionnaire where >75% cleaning their mouth once in a day and 95% using toothbrush and toothpaste to clean their teeth. Filled (F) and (f) percentage is very low in both genders.

Regarding oral health knowledge, more than 50% had average knowledge but more number of females had good oral health knowledge. The similar report was presented by Amin and Al-Abad 2008; Farsi *et al.* 2004; Togoo *et al.* 2012.^[1,9,10] The percentage of females having good oral health knowledge as more than twice as compare to male and knowledge had significant relation with gender *P* = 0.007. However, there was little difference in mean oral health knowledge among males and females. Mean oral health knowledge among males and females were 3.14 ± 1.13 and 3.47 ± 1.53, respectively. A similar study reported by Al Subait *et al.* among 10–18 years old attending Jenadriyah festival Riyadh.^[11] Mean oral health knowledge in all age group was more or less same and it was not significant (*P* = 0.836) with the age. It might be due to the getting information regularly about oral health by the teachers and the dentist visiting school time to time. Females mean DMFT/dmft was higher [Table 1] as compare to male instead of having better oral health knowledge and it had significant relation (*P* = 0.01) with the knowledge of the subjects. It was surprising that female in spite of good level of awareness suffering more in number. Actual compliance of instruction back home might be variable from male group. Mean DMFT reduced as the knowledge of oral health among the student increased.^[12-15]

CONCLUSION

It was observed that poor oral health knowledge contribute major role in the prevalence of dental caries but in female higher DMFT/dmft was observed among girl in spite of having good oral health knowledge. Maybe due to hiding the problem and not brushing regularly.

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Conflicts of interest

There are no conflicts of interest.

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