

# Oral Health Practices, Knowledge, and Attitudes among Primary Schoolchildren in Derna City, Libya: A Cross-Sectional Survey

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## Abstract

**Background and Aim:** Dental caries is a major public health problem with a high prevalence and incidence among schoolchildren, especially in low-income populations. The aim of this study was to assess the practices, knowledge, and attitude of primary schoolchildren toward oral health and dental care as well as to evaluate the factors that determine these variables. **Methods:** This cross-sectional study was conducted on 1288 primary schoolchildren of 14 schools located in Derna city, Libya, from February to May 2016. Government and private schools were selected by systematic random sampling method. All participants were asked to complete a comprehensive questionnaire adopted from Peterson *et al.* and Stenberg *et al.* Investigators explained the questionnaire, and the children independently filled up the questionnaire without giving their names. The data were coded and analyzed using SPSS 22.0. **Results:** One thousand two hundred and eighty-eight children successfully completed the questionnaire. The schoolchildren included 788 (62.3%) females and 476 (37.7%) males. Schoolchildren's age ranged from 9 to 15 years, with a mean age of  $12.20 \pm 1.91$  years. The study revealed that more than half of the children had used good correct oral health practices (55.8%), more than two-third had low knowledge (67.2%), and 74.7% were found to have bad attitude. **Conclusion:** There is a lack of knowledge and careless attitude among schoolchildren with regard to oral health. Children need to be motivated about the importance of oral health in school and at home.

**Keywords:** Attitudes, children, Derna, knowledge, Libya, oral health, practices

## INTRODUCTION

General oral health has a great impact on the individual's overall health and well-being. It was defined by the WHO as "a state of being free from chronic mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal (gum) disease, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing."<sup>[1]</sup>

Dental caries are not only causing pain, discomfort, sleeping, and difficulty in eating but also considered to be one of the main causes of absenteeism from school which consequently affects the overall school performance of the child.<sup>[2]</sup> Let alone, the psychosocial effect of these diseases on the quality of life.<sup>[1]</sup>

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Oral disease, as estimated by the Global Burden of Disease Study,<sup>[3]</sup> affected half of the world's population (3.58 billion people) in which dental caries (tooth decay) was found to be the most prevalent assessed condition. Severe periodontal disease was estimated to be the 11<sup>th</sup> most prevalent disease worldwide. Among the risk factors for most prevalent oral disease are poor oral hygiene and inadequate exposure to fluoride, notwithstanding unhealthy diet high in free sugar, tobacco, and harmful use of alcohol.<sup>[4]</sup> Oral disease is a major public health problem with a high prevalence and incidence, especially in developing countries.<sup>[5]</sup>

The relation between better oral health and increased knowledge is well documented in the literature.<sup>[6-9]</sup> Good

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understanding of oral diseases and its etiology could result in optimum health-related practice.<sup>[10,11]</sup> Adequate oral health knowledge is essential to instill appropriate oral health behavior to prevent oral diseases.<sup>[12,13]</sup>

Sustainability of healthy behavior and lifestyle can be achieved by an early intervention at younger age.<sup>[14]</sup>

It has a negative impact on the quality of children's life in terms of speaking and eating and is one of the most common reasons for pain and embarrassment.<sup>[15]</sup>

Data available from the limited epidemiological studies in Libya found the prevalence of dental caries to be 57.8% among 12-year-old schoolchildren in Benghazi.<sup>[16]</sup> Similarly, a study estimates that the prevalence of caries in 685 preschoolchildren in Benghazi showed that 58% of the children had dental caries.<sup>[17]</sup> These data indicate a high prevalence of dental caries among Libyan schoolchildren. Hence, health knowledge and education on a regular toothbrushing using adequate time should be promoted to avoid dental caries among children in schools.

Previous studies among Libyan primary schoolchildren in Alzintan city west of Libya showed that 53.3% of schoolchildren had correct practices on oral hygiene and 46.7% of schoolchildren had incorrect practices on oral hygiene.<sup>[18]</sup>

There is a need to obtain data about the oral health practices, knowledge, and attitudes among primary schoolchildren in Derna, Libya, to plan adequate national oral health knowledge management strategies and appropriate interventions to prevent oral diseases. There have been no estimates of the oral health practices, knowledge, and attitudes among primary schoolchildren in Libya. Therefore, the importance of this study is that it will provide baseline data for planning preventive programs for oral health problem.

The first aim of this study was to assess the practices, knowledge, and attitude among schoolchildren aged 9–15 years toward oral health and dental care as well as to evaluate the factors that determine these variables including the parent's education. The second aim was to estimate the prevalence of decayed teeth among schoolchildren in Derna city, Libya.

## METHODS

This cross-sectional study was conducted on 12,000 primary schoolchildren aged 9–15 years of 43 schools located in Derna city, Libya. Derna was divided into five sections as follows: central, eastern, western, northern, and southern.

Different schools were selected from each section between February and May 2016. From a list of schools, 14 government and private schools were selected by systematic random sampling method.

Approval of the directorate of education in Derna governance was obtained, and a letter was sent to the selected schools explaining the purpose of the study and the procedures that would be followed during the study. The principal of each

school was asked to inform the children and their parents about the study, and a day was set for each school to collect the data. Classes that contained children aged 9–15 years were approached to participate.

All children were asked to complete a comprehensive questionnaire adopted from Peterson *et al.*<sup>[19]</sup> and Stenberg *et al.*<sup>[20]</sup> The questionnaire was designed to evaluate the practice, knowledge, attitudes, and behavior of schoolchildren regarding their oral health and dental treatment. Children were asked about the effects of brushing and using fluoride on the dentition, the meaning of bleeding gums and how to protect against it, the meaning of dental plaque and its effects, the number of deciduous and permanent teeth, the effects of sweets and soft drinks on the dentition, and the effects of caries on the general appearance. The questionnaire also assessed the parent's involvement in maintenance of child's brushing habits and maintenance of oral hygiene. The questionnaire gathers information about the visit to the dentist, treatment sought, reasons for not visiting periodically, and the level of child's fear level for not going to see the dentist.

The questionnaire was translated into Arabic by investigators and pretested on 14 selected schoolchildren who were requested to complete the questionnaire again 1 week later. The questionnaire was found suitable for application among the schoolchildren, as there was high concurrence with the answers to the items on both occasions (kappa test coefficient for all questions = 0.73). Investigators explained the questionnaire, and the children independently filled up the questionnaire without giving their names.

Oral health practice consisted of four questions, which has been categorized into the correct practice and incorrect practice. A child who answers three questions correctly has been categorized into the correct practice.

Knowledge regarding oral health consisted of 11 questions, which has been categorized into high knowledge and low knowledge. A child who answers 7 questions of 11 has been categorized into high knowledge.

Attitude related to oral health consisted of seven questions, which has been categorized into good attitude and bad attitude. A child who answers five questions has been categorized into good attitude.

## Analysis

The data were coded and analyzed using the Statistical Package for the Social Sciences 22.0 (SPSS 22.0, Inc., Chicago, IL, USA). Descriptive statistics were obtained, and means, standard deviation, and frequency distribution were calculated. The Chi-square test was used;  $P < 0.05$  was considered as statistically significant.

## RESULTS

A total of 1313 primary schoolchildren were invited to participate in this study, and 1288 children returned the

completed questionnaires, for a response rate of 98.0%. The sociodemographic characteristics of the schoolchildren are shown in Table 1. More girls ( $n = 788$ , 62.3%) fill the questionnaire and took part in the survey than boys ( $n = 476$ , 37.7%), and the mean  $\pm$  SD age of the children was  $12.20 \pm 1.91$  years.

### Oral health practice

It was found that 48.3% (619 of 1288) of the schoolchildren brushed their teeth at least twice daily, whereas 0.8% never used toothbrush. The majority of the schoolchildren (81.3%) reported using a toothbrush and toothpaste for cleaning their teeth and only 0.3% reported using dental floss. However, slightly higher than two-third of the schoolchildren (68.9%) brush their teeth 2–3 times a day and 28.6% brushed their teeth in the morning. About 23.2% of the schoolchildren took at least 1 min to brush their teeth, whereas 17.7% took 2 min [Table 2].

This study showed that 55.8% ( $n = 718$ ) of the children had used correct oral health practices, and 44.2% ( $n = 569$ ) of the children had used incorrect oral health practices.

There was a significant difference between girls and boys in the proportion reporting correct oral health practice with more girls' children (66.2% vs. 33.8%) ( $\chi^2 = 10.434$ ,  $P = 0.001$ ) (odds ratio [OR] = 1.45; 95% confidence interval [CI]: 1.159–1.833). Correct oral health among schoolchildren was significant among all age groups ( $P = 0.007$ ) [Table 3].

Regarding the level of mother and father's education, there was no significant association between different oral hygiene practices and level of mother education. A high percentage of schoolchildren whose mothers and fathers have more than high school education level (45% and 42.6%), respectively, were following correct oral hygiene practices ( $P = 0.842$  and  $P = 0.705$ ). It was also observed that there was no significant association between parents' role in oral hygiene practices ( $P = 0.120$ ) [Table 3].

### Oral health knowledge

Among schoolchildren, only 9.70% had accurate knowledge concerning dental plaque; 56.4% know the meaning of gum bleeding (inflamed gum), and 30.5% of them know that it is important to be protected from gum bleeding using toothbrush, toothpaste, and dental floss. About 17.8% of the schoolchildren know that dental plaque leads to gum inflammation, whereas 13.8% thought that it is only a staining of the teeth [Table 4].

The majority of the children (86.6%) answered that sweets affect the teeth adversely. On the other hand, 13.4% did not think that sweets have an adverse effect on the teeth. About 72.1% said that fizzy drinks have a bad effect on the teeth, whereas 65.7% of the children knew that using fluoride strengthens the teeth, and 87.7% know that brushing teeth helps to prevent dental caries. The vast majority of the children (84.6%) know that carious teeth can affect general appearance [Table 5].

The study revealed that only 32.8% ( $n = 422$ ) of the children had high knowledge regarding oral health; on the other hand, about 67.2% ( $n = 866$ ) of the children had low knowledge.

**Table 1: Characteristics of primary schoolchildren**

Variables	Frequency (%)
Age	
9-11	461 (37.0)
11-13	408 (32.8)
13-15	376 (30.2)
Gender	
Male	476 (37.7)
Female	788 (62.3)
Level of mother education	
Less than high school	221 (19.8)
High school	399 (35.8)
More than high school	494 (44.3)
Level of father education	
Less than high school	225 (22.7)
High school	396 (35.7)
More than high school	462 (41.6)
Role of parents in oral health	
Good role	1159 (93.2)
Bad role	85 (6.8)

**Table 2: Oral health practices among primary schoolchildren**

	Frequency (%)
How often do you brush your teeth?	
Once per day	332 (25.9)
Twice per day	619 (48.3)
More than twice per day	264 (20.6)
Not regular	56 (4.4)
Never used toothbrush	10 (0.8)
What do you use for cleaning your teeth?	
Brush and toothpaste	1040 (81.3)
Dental floss	4 (0.3)
Mouthwash	8 (0.6)
Toothpicks	8 (0.6)
Others	9 (0.7)
More than one	209 (16.3)
When do you brush your teeth?	
Morning	358 (28.6)
Noon (after lunch)	68 (5.4)
Before going to bed	115 (9.2)
Other times (>2, 3 times)	711 (56.8)
For how long do you brush your teeth?	
<1 min	222 (17.4)
1 min	297 (23.2)
2 min	226 (17.7)
>2 min	134 (10.5)
Not quite sure	400 (31.3)

There was no significant difference between girls and boys in the proportion of their knowledge (62.9% vs. 37.1%) ( $\chi^2 = 0.08$ ,  $P = 0.778$ ) (OR = 1.036; 95% CI: 0.812–1.32). However, girls have more knowledge than boys.

High knowledge among children increases with age ( $P = 0.000$ ) [Table 6].

**Table 3: Association between sociodemographic characteristics and oral health practice among primary schoolchildren**

Variables	Oral health practice			$\chi^2$	P
	Correct practice, n (%)	Incorrect practice, n (%)			
Age					
9-11	236 (33.8)	224 (41.0)		10.048	0.007
11-13	228 (32.7)	180 (33.0)			
13-15	234 (33.5)	142 (26.0)			
Gender					
Male	239 (33.8)	237 (42.6)		10.434	0.001
Female	469 (66.2)	319 (57.4)			
Level of mother education					
Less than high school	121 (19.3)	100 (20.5)		0.343	0.842
High school	224 (35.7)	175 (35.9)			
More than high school	282 (45.0)	212 (43.5)			
Level of father education					
Less than high school	137 (21.9)	115 (23.7)		0.698	0.705
High school	222 (35.5)	174 (35.9)			
More than high school	266 (42.6)	196 (40.4)			
Role of parents in oral health					
Good role	659 (94.1)	499 (91.9)		2.420	0.120
Bad role	41.0 (5.9)	44.0 (8.1)			

**Table 4: Oral health knowledge among primary schoolchildren**

	Frequency (%)
What does gum bleeding mean?	
Healthy gum	188 (14.9)
Inflamed gum	714 (56.4)
Gum recession	60 (4.7)
I do not know	303 (24.5)
How do you protect yourself from gum bleeding?	
Using toothbrush, toothpaste, and dental floss	381 (30.5)
Using soft food	74 (5.90)
Using Vitamin C	225 (18.0)
I do not know	446 (35.7)
More than one	125 (10.0)
What does plaque mean?	
Soft debris on the teeth	259 (21.0)
Hard debris on the teeth	120 (9.70)
Staining of the teeth	103 (8.30)
Dental caries	219 (17.7)
I do not know	534 (43.2)
What does dental plaque lead to?	
Inflammation of the gum	222 (17.8)
Staining of the teeth	172 (13.8)
Dental caries	524 (42.1)
I do not know	327 (26.3)

With regard to the level of mother and father’s education, there was no significant association between oral health knowledge and level of mother and father education with high percentage of schoolchildren whose mothers and fathers from more than high school education level (44.5% and 42.4%), respectively, have high oral hygiene knowledge ( $P = 0.817$ ,  $P = 0.927$ ). It was observed that there was no significant

association between the roles of parents and oral health knowledge ( $P = 0.196$ ).

#### Oral health attitude

More than half of the children (54.4%) reported that they visited the dentist only when they have pain.

Approximately 42.9% of the children had visited the dentist in the past 6 months. Most of them (47.4%) reported that tooth extraction was the treatment that children sought during their last visit to the dentist. Many children (76%) reported that dental pain driving them for their last dentist visit, whereas 32.8% said that they were never afraid from the first dentist visit. The reason for last visit was due to severe pain among 45.7% of the children.

The most common cause of not visiting the dentist on a regular basis was afraid from the handpiece and dental needle (63.7%) [Table 7].

Only 25.3% ( $n = 326$ ) of the children were found to have a good attitude; in contrast, 74.7% ( $n = 962$ ) of the children had a bad attitude.

There was no significant difference between girls and boys in the proportion of their attitude (59.6% vs. 40.4%) ( $\chi^2 = 1.405$ ,  $P = 0.236$ ) (OR = 0.855; 95% CI: 0.65–1.10).

There was no significant difference between girls and boys in the proportion of the role of the parents in their attitude toward oral health ( $\chi^2 = 0.001$ ,  $P = 0.971$ ) (OR = 1.009; 95% CI: 0.61–1.66).

The good attitudes among children have a significant difference among all age groups ( $P = 0.000$ ) [Table 8].

There was no significant association between proportion of children’s attitude and level of mother education with a high

percentage of schoolchildren whose mothers have more than a high school education level (44.6%). However, there was a significant association between child attitude and father education level ( $\chi^2 = 10.53, P = 0.005$ ). It was observed that

there was no significant association between the roles of parents and children's attitude ( $P = 0.971$ ).

**Table 5: Knowledge of prevention of dental caries among primary schoolchildren**

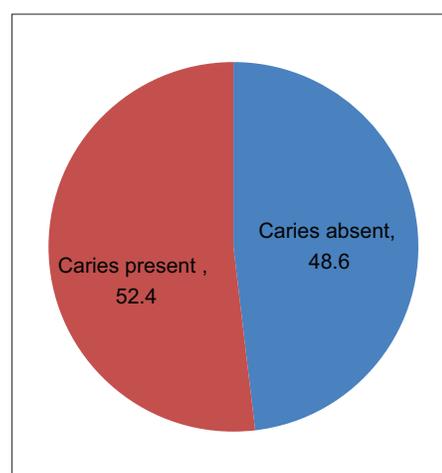
	Frequency (%)
Do you think you can decide the treatment you need?	
Yes	279 (24.2)
No	875 (75.8)
Is it necessary for patients to decide their dental treatment needs?	
Yes	373 (32.7)
No	768 (67.3)
Cariou teeth can affect teeth appearance	
Yes	1090 (84.6)
No	198 (15.4)
Sweets affect the teeth adversely	
Yes	1116 (86.6)
No	172 (13.4)
Fizzy drinks affect the teeth adversely	
Yes	929 (72.1)
No	359 (27.9)
Brushing teeth prevents dental decay	
Yes	1130 (87.7)
No	158 (12.3)
Using fluoride strengthens the teeth	
Yes	846 (65.7)
No	442 (34.3)
Regular visits to the dentist are necessary	
Yes	960 (74.5)
No	328 (25.5)

### Prevalence of self-report of dental caries

The overall prevalence of self-report of dental caries among children was estimated to be 52.4% (i.e., 646 of 1288 children) [Figure 1].

### DISCUSSION

Literature review showed a few published studies concerning the oral health practices, knowledge, attitude, and prevalence of dental caries among children in Libya. The aim of the present study was to assess oral health practice, knowledge, and attitudes of schoolchildren aged 9–15 years in Libya, which



**Figure 1:** Self-report prevalence of dental carious among primary schoolchildren in Derna, Libya.

**Table 6: Association between sociodemographic characteristics and oral health knowledge among primary schoolchildren**

Variables	Oral health knowledge		$\chi^2$	P
	High knowledge, n (%)	Low knowledge, n (%)		
Age				
9-11	121 (29.7)	340 (40.6)	17.684	0.000
11-13	137 (33.6)	270 (32.4)		
13-15	150 (36.8)	226 (27.0)		
Gender				
Male	154 (37.1)	322 (37.9)	0.08	0.778
Female	261 (62.9)	527 (62.1)		
Level of mother education				
Less than high school	72 (18.8)	149 (20.4)	0.403	0.817
High school	140 (36.6)	259 (35.4)		
More than high school	170 (44.5)	324 (44.3)		
Level of father education				
Less than high school	86 (22.6)	166 (22.7)	0.153	0.927
High school	133 (35.0)	263 (36.0)		
More than high school	161 (42.4)	301 (41.2)		
Role of parents in oral health				
Good role	393 (94.5)	766 (92.5)	1.669	0.196
Bad role	23 (5.5)	62 (7.5)		

**Table 7: Oral health attitude among primary schoolchildren**

	Frequency (%)
How often do you visit your dentist?	
Regularly every 6-12 months	95 (7.5)
Occasionally	296 (23.4)
When I have dental pain	689 (54.4)
I never visited a dentist	186 (14.7)
Last time I visited a dentist was	
6 months ago	466 (42.9)
Last 6-12 months	202 (18.6)
Last 1-2 years	219 (20.2)
Last 2-5 years	84 (7.7)
>5 years	115 (10.6)
The treatment(s) that children sought during their last visit to the dentist was (were)	
Check my teeth	303 (26.7)
Take X-rays	27 (2.4)
Have scaling/treat my gums	47 (4.1)
Have fluoride on my teeth	21 (1.8)
Have filling	72 (6.3)
Have orthodontic treatment	67 (5.9)
Have tooth extraction	538 (47.4)
Others (specify)	24 (2.1)
More than one	37 (3.3)
The reason for my last visit to the dentist was	
Dental pain	870 (76)
Family and friend advice	86 (7.5)
A dentist advised me	117 (10.2)
Another reason (specify)	72 (6.3)
When I first visited the dentist	
I was scared and reluctant	347 (29.4)
Slightly afraid	234 (19.8)
Very slightly afraid	211 (17.9)
I was never afraid	387 (32.8)
When I first visited the dentist	
There was no dental pain	162 (14.1)
There was severe dental pain	527 (45.7)
There was little dental pain	293 (25.4)
I was feeling not comfortable	59 (5.1)
I felt nothing	81 (7.0)
There was not enough time for treatment	11 (1.0)
There was enough time for treatment	19 (1.6)
If you do not visit the dentist or are afraid of him or her, the reason(s) is (are)	
I am afraid of the hand piece	390 (33.5)
I am afraid of the dental needle	352 (30.2)
Treatment cost is high	65 (5.6)
There are no dental clinics nearby	35 (3)
There is no time	29 (2.5)
There is no pain to go to dentist	240 (20.6)
I am afraid sitting in the waiting room	20 (1.7)
I am afraid even from thinking of tomorrow's appointment	33 (2.8)

in turn can provide baseline data for planning and evaluation of the oral health prevention program.

### Oral health practice

This survey found that a low percentage of the schoolchildren (25.9%) brush their teeth at least once daily, despite parent effort in supporting this effort. This finding was lower than that reported in a study conducted in Sebha, Libya (36.1%),<sup>[21]</sup> in Saudi conducted studies which found in 2003(65%) and 2015(66.5%) of students were brushing their teeth at least once daily<sup>[22,23]</sup> and surveys reported in Tanzania<sup>[24]</sup> and in Southern Thailand.<sup>[25]</sup> In comparison to the present study, the wide variation can be attributed to varied social and economic conditions.

The majority of the schoolchildren reported using a toothbrush and toothpaste for cleaning their teeth and two-third of the schoolchildren brush their teeth two times and more. Few of schoolchildren also reported irregular time of toothbrushing.

These practices were also in agreement with the findings from Peeran *et al.*,<sup>[21]</sup> Ogundele and Ogunsile,<sup>[26]</sup> Emmanuel and Chang'endo,<sup>[27]</sup> Carneiro *et al.*,<sup>[11]</sup> and Sa'adu *et al.*<sup>[28]</sup> Dental floss was rarely used by most of the participants that could be attributed to lack of knowledge or cost of the product<sup>[29]</sup> and could indicate that the importance of the use of floss is still underestimated among schoolchildren.<sup>[22]</sup>

This study found that a low percentage of schoolchildren brush their teeth in the morning. This finding was in contrast to the study done in Egypt, which found that 45.7% of primary schoolchildren prefer brushing in the morning, despite their low level of oral health knowledge and practice.<sup>[30]</sup> This finding can be explained in parts to be related to habitual behavior without proper oral health knowledge. Thus, comprehensive oral health educational programs were suggested for both children and parents to improve their oral health knowledge and practice.

More than half of the children in our study had used correct oral health practices, and other children had used incorrect oral health practices. When the results of this study were compared to European children demonstrated better dental knowledge, attitudes, and oral health practise.<sup>[20,31,32]</sup> This result is not in accordance with that reported by Ahmed *et al.*<sup>[30]</sup> who found poor practice among schoolchildren.

In general, it is important to prevent dental problems before they start. Accomplishing good oral health practice requires self-induced habits which include maintenance of dental hygiene, diet restriction, especially reduced sugar intake, use of fluoridated products as well as seeking help from the available dental services, by having a regular dental checkup, utilizing primary and preventive care and dental health education.<sup>[33-36]</sup>

However, Vishwanathaiah found that 70.42% of the children showed poor oral hygiene in a Davangere school in Saudi Arabia.<sup>[37]</sup>

There was a significant difference between girls and boys in oral health practice. The proportion of girls reporting more correct practise than male in Derna children. This was

**Table 8: Association between sociodemographic characteristics and oral health attitude among primary schoolchildren**

Variables	Oral health attitude			$\chi^2$	P
	Good attitude, n (%)	Bad attitude, n (%)			
Age					
9-11	95 (30.2)	366 (39.4)		16.82	0.000
11-13	132 (41.9)	276 (29.7)			
13-15	88 (27.9)	288 (31.0)			
Gender					
Male	129 (40.4)	347 (36.7)		1.40	0.236
Female	190 (59.6)	598 (63.3)			
Level of mother education					
Less than high school	62 (21.6)	159 (19.2)		0.76	0.683
High school	100 (34.8)	299 (36.2)			
More than high school	125 (43.6)	369 (44.6)			
Level of father education					
Less than high school	56 (19.8)	196 (23.7)		10.53	0.005
High school	86 (30.4)	310 (37.5)			
More than high school	141 (49.8)	321 (38.8)			
Role of parents in oral health					
Good role	298 (93.2)	861 (93.2)		0.001	0.971
Bad role	22.0 (6.90)	63.0 (6.80)			

different than the study conducted at Ali Raza Abad, Lahore, by Jabeen and Umbreen.<sup>[38]</sup> Girls are more concerned about their general appearance, bad breath, and tooth color.<sup>[23]</sup> Therefore, they showed more attention regarding their oral health. The correct oral health among children shows significance with age association. Young children are lacking knowledge and are not aware of the correct oral health practice.

There was no significant association between different oral hygiene practices and level of mother and father education with high percentage of schoolchildren whose mothers and fathers from more than high school education level practice correct oral hygiene. The disassociation between parent education level and their children's oral hygiene practice could be linked to other sociodemographic factors such as young age of the parents, occupation, and changes in mother or father's marital status.<sup>[39]</sup> Time constraints or a busy schedule, especially in the morning, could also impact on implementing a correct oral health practice.<sup>[40]</sup>

It was observed that there was no significant association between role of parents in oral health care and oral hygiene practices. Difficult child behavior and noncompliance in response to toothbrushing<sup>[39]</sup> were reported to be a barrier on the compliance with correct oral health practice.

### Oral health knowledge

The study revealed that few children had high knowledge, and 67.2% of children had low knowledge; among schoolchildren, only 9.70% had accurate knowledge concerning dental plaque and 56.4% know the meaning of gum bleeding (inflamed gum).

About 30.5% of the schoolchildren know that it is important to protect from gum bleeding using toothbrush, paste, and dental floss. Furthermore, dental plaque leads to inflammation of the

gum mean which was seen as correct knowledge by 17.8% of schoolchildren. In our study, most of schoolchildren were aware that sweet (86.6%), and fizzy drinks (72.1) have negative impact on dental health. This finding is similar to the study conducted in Jordan and Pakistan.<sup>[29,41]</sup>

Schoolchildren knew that brushing prevents dental decay (87.7%), using fluoride strengthens their teeth (65.7%), and regular visit to the dentist is necessary (74.5%). It seems that they know the correct information and practice about oral health. They, however, had a low knowledge level, which could be attributed to that they only know the information but were not able to use it or not understand it enough to apply it in their daily life.

There was no significant difference between girls and boys in the proportion of their knowledge ( $\chi^2 = 0.08$ ,  $P = 0.778$ ) (OR = 1.036; 95% CI: 0.812–1.32).

### Oral health attitude

In this study, majority of the schoolchildren showed bad attitude toward the dentist, which is similar to the other studies conducted in Pakistan and India.<sup>[41,42]</sup> Children do not visit dental clinics regularly, which is similar to the study conducted in China.<sup>[43]</sup>

There was no significant difference between girls and boys in the proportion of their attitude. The main listed reason by schoolchildren for not visiting dentist were (33.5%) being afraid from the handpiece and (30.2%) dental needle with 20.6% of them are not going as they have no pain. A very low percentage (<10%) of the surveyed schoolchildren have reported other reasons which include high cost of dental treatment, no dental clinic nearby, having no time, and were frightened of setting in the waiting room or thinking about tomorrow's appointment.

This finding was proved in other studies, which concluded that pain is the main driving factor for their dental visit.<sup>[29]</sup> Fear, especially the fear of needle and drilling, was found to be the prominent cause of nonvisiting the dentist.<sup>[44]</sup> This unwanted exposure to needles and pain formed a barrier for the children to avoid dental visit even for a regular checkup. The anxiety created by the previously mentioned reason could be reduced by a full explanation of the procedure by the dentist.

### Prevalence of dental caries

In the present study, the prevalence of self-report dental caries among children was high, estimated to be 52.4% (i.e., 635 of 1288 children). The reasons for this could be exposure to caries associated risk factors such as poor oral hygiene, less exposure to fluoride, poor dietary practices and increased consumption of sugars, and absence of both dental health education and caries prevention programs.

Comparing the prevalence of dental caries in this study with that found in previous studies conducted in Libya, data from a cross-sectional study of dental caries among schoolchildren aged 6–12 years in Benghazi showed that the prevalence of dental caries was 50%, which was similar to this result.<sup>[45]</sup> Another study in 2002 investigating the prevalence of caries in 685 preschoolers in Benghazi showed that 58% of the children had carious primary teeth.<sup>[17]</sup>

However, comparing the prevalence of dental caries in this study with that found in previous studies conducted in other developing countries with a similar age group, shows that the prevalence was higher than that in India 10%.<sup>[46]</sup> However, in developed countries such as the United Kingdom, Italy, and Norway, a decline in dental caries prevalence has been reported with oral hygiene enhancements and reduction in sugar consumption. Because of this finding increase their level of knowledge and established oral health care facilities.<sup>[47-49]</sup>

### CONCLUSION

There is a lack of knowledge and careless attitude among schoolchildren with regard to oral health that needs to be improved. The findings of this study also show that utilization of dental service is mainly for pain relief. Children need to be motivated about the importance of oral health in school and at home to improve oral health practice.

However, there were few limitations in this study as information was collected from a self-administered questionnaire by schoolchildren that may cause subjective bias.

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### Conflicts of interest

There are no conflicts of interest.

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