

Oral Health Knowledge and Attitude of Students In UAE

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Abstract

Objectives: To assess the oral health knowledge and attitude in school students grade 7-12, in Ajman, UAE and to identify predictors of poor oral knowledge and attitudes and to determine common barriers to oral health care.

Method: A Cross sectional study among students, grade 7 -12, whose parents signed informed consent for their participation. Random selection of schools and participants was done. Validated self-administered questionnaire was employed. Knowledge and attitudes were assessed by scoring system. Official ethical approval was obtained. Data analyzed by SPSS software. Chi- square test, Fishers' Exact test, logistic regression analysis and Mann-Whitney test were used.

Results: The study included 395 participants, mostly \leq 13- year-old, females, UAE national, having family size <5 , with higher levels of education parents. Poor knowledge was identified in 37.2% of respondents. Significant associations were noticed between poor knowledge and gender, family size, and dental insurance (<0.05 for previous variables). Being females compared to males, having large family size, lower education level father, and no dental insurance increase the risk of poor knowledge (OR=4.92, CI: 2.08-11.63, $P<0.0001$; OR=11.82, 95%CI:5.48-25.52, $P<0.0001$;

OR=2.39, 95%CI: 1.38-4.12, $P=0.002$; OR=5.04, 95%CI:2.11-11.99, $P<0.0001$ respectively). Adequate attitude score was identified in 93.7% of respondents. The risk for poor attitude was significantly increased with poor knowledge (OR=3.02, 95% CI:1.24-7.32, $P=0.01$). Discouraging parent opinion on dentist visits was the most common barrier for oral healthcare

Conclusions: Poor knowledge is identified in about one third of respondents, and adequate attitude in most of respondents. Gender, family size and lack of dental insurance were significant predictors of poor oral health knowledge. Poor attitudes are determined by poor knowledge. Discouraging parent opinion is the most common barrier

Keywords: Knowledge, Attitude, Oral health, Students.

Introduction

The WHO describes adolescents as “young people between the ages of 10 and 19 years” that are frequently considered as a healthy group.^[1] Traditionally,

numerous dental experts have regarded adolescence as a period with few dental needs.^[2] Previous studies showed the importance of knowledge to prevent oral health problem and to maintain oral hygiene.^[3-6] A survey from England, Wales and Northern Ireland, showed a strong positive association between better perceptions about oral health and regular dental checkups.^[7] A study in China showed that oral health knowledge among 12-15 year- old was poor.^[3] A study in Spain to assess the relationships between oral health knowledge, attitudes and behavior in 12-year-old schoolchildren showed that

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97.5% of children had limited oral health knowledge and reported inadequate oral healthcare habit.^[4] In India, a cross-sectional study to assess the oral health awareness of children and adolescents showed that more than half of the study subjects were aware of the significance of maintaining optimum oral hygiene, regular dental visits and damaging effects of tobacco.^[5] A study in Tanzania, showed that 72.7% of participants reported to be aware about dental examination and its importance, attitude towards dental health problems was found to be more positive among girls than boys.^[8]

Few studies are available from the GCC countries in relation to the oral health knowledge and attitudes of adolescents. In Qatar, a study among 2200 students aged 12-14 years, found that the percentage of low knowledge was about 11%, and about 35% of children thought wrongly that one should visit the dentist only in case of pain.^[9] In the UAE, a cross-sectional study was performed among school children in Ajman. The results demonstrated significant association between knowledge and good oral health practice.^[10]

Factors that determine the oral health knowledge are numerous. Inconsistent findings were reported in relation to gender. A study from Malaysia, showed that males had significantly higher average knowledge score compared to females.^[11] While in a study from Saudi Arabia, a significant higher knowledge was observed among females compared to males.^[12] Other factor is the parents' educational level. A study in Portugal showed that parents' educational level was associated with tooth brushing frequency, tooth brushing duration, parental help during tooth brushing and the frequency of dental visit arrangement.^[13] Socioeconomic status and home environment have been found to influence perceived oral health. Paula et al found strong negative relation between children's opinion of oral health status and monthly family income, parent education, and household overcrowding.^[14]

Barriers to oral health among school student are related to the availability of oral health programs, oral health care, dental appointments during school hours, socio-cultural factor, and availability of coordination between school, clinics and parents.^[15]

There are few researches regarding student knowledge and attitude towards oral health from the UAE. The present study aimed to assess oral health knowledge and attitude in school students grade 7-12,

in Ajman, UAE and to identify predictors of poor knowledge and attitudes and common barriers to oral health care.

Materials and Method

A Cross sectional study that included both male and female students in Ajman public and private schools from grade 7- 12. Four schools were selected randomly from a list of all private and governmental schools in Ajman, (2 public and 2 private) to be the site of data collection. Sample size was calculated using the equation, $n = Z^2 pq/d^2$, the estimated population proportion was based on a study done in Qatar.^[16] Sampled participants were selected randomly from list of students in these 4 schools. The study included both gender students who are in grade 7 -12, willing to participate and their parents accept their participation and signed informed consent and living in Ajman. The study excluded students who were not willing to participate/or their parent refuse to sign informed consent. A validated self-administered questionnaire was used as a tool. The questionnaire was validated by 3 experts in the field of dentistry. The questionnaire included 26 knowledge and 6 attitude questions. A scoring system was used to assess knowledge, and attitude by which a +1 score was given for correct knowledge or positive attitude response, while zero was assigned for incorrect knowledge or negative attitude response. Poor knowledge or attitude was identified if the total knowledge or attitude score was less than 50% of the total corresponding scores. Research protocol was approved by the Gulf Medical University (GMU) Institution Research Board (IRB) on 04.06.2017. Approval from Ministry of Education was obtained (June 22nd 2017) before the data collection started. Data collection was done between November 1st 2017- May 1st 2018. Informed consent was obtained from the participants' parents before enrolling them in the study. Confidentiality of the information is respected and only the research team (and IRB member if requested) can have access to the data. The study is not a funded research and there is no Conflict of Interest. Official approval from the principals in the four schools was obtained. After completing data collection, the data was fed into Excel spreadsheet. SPSS version 24 was used for analysis. Results are displayed in descriptive and inferential statistics. Chi square test and Fishers' Exact test were used, as appropriate, to find the association between variables. Simple and multiple logistic regression analysis were used to find predictors of oral health knowledge and attitudes. Mann Whitney

test was used to assess to the significance of difference between median values.

Results

In this study, 395 participants were included. Most of the participants were aged 13 year or less (n=283,71.6%), the majority were females(n=254, 64.3%), UAE national(n=249, 63.0%), having family size equal or less than 5 members (n=290;73.4%); their father and mother levels of education were college and above (n=223, 56.5% and n=215, 54.4% respectively). Crowding index was used in this study as indicator of socioeconomic status of respondents. The results showed that the median crowding index was 3 with a minimum and maximum values of 1 and 5 respectively.

The percentage of respondents who had no health or dental insurance were 48.9% and 91.1% respectively. Among participants who had dental insurance (35 participants) the coverage of expenses was less than 50% in 14 participants (40% of the dental insured respondents).

Knowledge: Distribution of participates by knowledge score level showed that 147(37.2%)

and 248(62.8%) participants had poor and adequate knowledge score respectively.

On asking the students about the perceived importance of keeping teeth\mouth clean, the most frequent response (90.1%) was “to keep oral cavity healthy”, followed by “To prevent tooth decay” (67.6%), “To prevent bad breath” (62.3%) and “To keep teeth beautiful” (60.8%)respectively.

Table 1 shows the percentage of correct responses in knowledge questions regarding general oral health, gum health and teeth alignment. Only 8.6% and 24.8% of the students knew the correct frequencies of cleaning teeth and of visiting the dentist respectively. Around 40% of students lack the knowledge regarding signs/symptoms of tooth decay. Less than 60% of students were aware that smoking has adverse effect on the gum (57.7%) and about the symptoms of gum diseases (59.5%). Profound lack of knowledge was noticed in relation to teeth alignment effect on cleaning of the teeth and speech and only 2.5% of the student had aforementioned knowledge. About one third of the participants (31.4%) knew that teeth alignment problems should be corrected early.

Table 1. The Percentage of correct responses regarding oral health, gum health, and teeth alignment

Questions regarding teeth	No. of correct responses	%
General knowledge questions regarding oral health		
The importance of keeping teeth/mouth clean	395	100
The importance of cleaning teeth to keep oral cavity healthy	356	90.1
Whether smoking can adversely affect teeth	285	72.2
The importance of cleaning teeth to prevent bad breath	267	67.6
How to avoid tooth decay	251	63.5
The importance of cleaning teeth to prevent tooth decay	246	62.3
The importance of cleaning teeth to keep teeth beautiful	240	60.8
The signs/symptoms of tooth decay	235	59.5
The frequency of visiting the dentist	98	24.8
The frequency of cleaning teeth	34	8.6
Knowledge questions regarding gum health		
Signs of gum disease	318	80.5
Symptoms of gum diseases	235	59.5
The best way to keep the gums healthy	343	86.8
Whether smoking can adversely affect gum	228	57.7

Questions regarding teeth	No. of correct responses	%
Knowledge questions regarding teeth alignment		
Teeth alignment problem affect the cleaning of the teeth	10	2.5
Teeth alignment problem affect the speech	10	2.5
Teeth alignment problems should be corrected early	271	68.6

Figure 1. Shows the percentage of correct responses in knowledge questions regarding teeth cleaning aids. While most of the participants knew that tooth- brush is among the best cleaning aid (94.9%), however, much less percentage of respondents knew that floss and mouth wash are also important aids (30.6% and

49.1% respectively). Less than quarter of the students (23.8%) knew about the type of tooth- brush preferably used by them to clean their teeth. Although 78.2% of the respondents reported knowing the right technique of brushing, however, only 43.5% correctly knew the right technique of brushing.

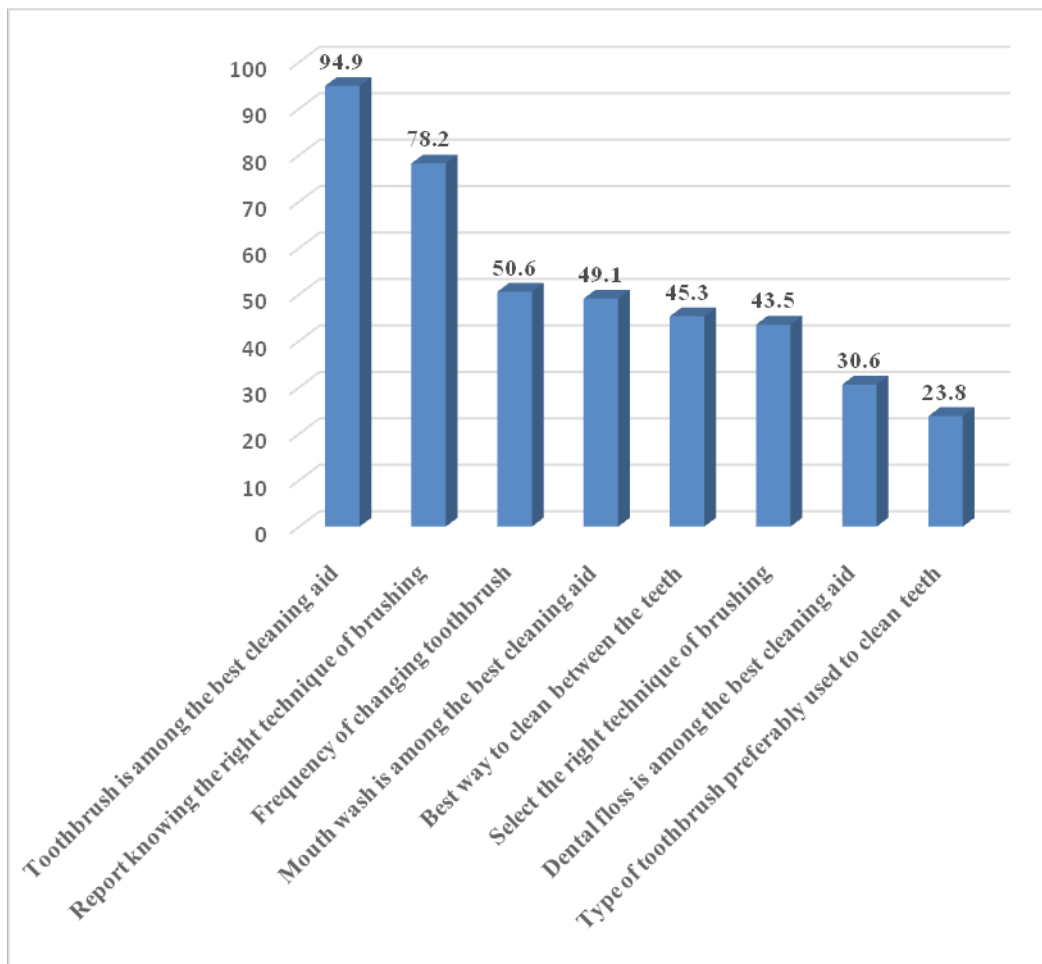


Figure 1. The percentage of correct responses in knowledge questions regarding teeth cleaning aids(n=395).

Table 2 showed the association between knowledge scores and socio-demographic characteristic of participants. Poor knowledge score was significantly association with gender, family size and dental insurance. The median crowding index in the group of

students who had poor and adequate knowledge scores were 1.0 and 1.3 respectively to assess the difference between the median crowding index in the poor Vs. adequate knowledge score groups, Mann Whitney test was used, and it was significant $P < 0.0001$.

Table 2. Association between knowledge scores and socio-demographic characteristic of participants

Variable	Groups	Poor		Adequate		Total No. (100%)	P value
		No.	%	No.	%		
Age (Years)	≤13	113	39.9	170	60.1	283	0.076
	>13	34	30.4	78	69.6	112	
Gender	Male	40	28.4	101	71.6	141	0.007
	Female	107	42.1	147	57.9	254	
Nationality	UAE	101	40.6	148	59.4	249	0.072
	Others	46	31.5	100	68.5	146	
Grades	7	23	51.1	22	48.9	45	0.218
	8	93	35.6	168	64.4	261	
	9	15	37.5	25	62.5	40	
	10	16	32.7	33	67.3	49	
Family size	Not large (≤5)	137	45.4	165	54.6	302	<0.0001
	Large (>5)	10	10.8	83	89.2	93	
Father Education Level	≤ Secondary education	72	41.9	100	58.1	172	0.093
	≥ College	75	33.6	148	66.4	223	
Mother Education Level	≤ Secondary education	73	40.6	107	59.4	180	0.209
	≥ College	74	34.4	141	65.6	215	
Dental insurance	Yes	14	40.0	21	60	35	0.721
	No	133	36.9	227	63.1	360	

Attitude: Favorable attitude score was identified in 93.7% of respondents and only 6.3% of the respondents reported unfavorable attitude. The percentage of favorable attitude responses to various attitude questions items was found as follow: the majority (95.4%) had favorable attitude when they had been asked about the importance of keeping good oral health; 84.6% toward acceptance to participate in future camps to increase the awareness about oral health, while 80% agreed that oral health is integral to general health. Furthermore, about three-fourths of the participant (72.5%) were not afraid to go to dentist, and 64.8% of them reported their readiness to encourage friend/relative to have healthy oral habits. The lowest percentage of positive attitudes (57.2%) was

reported for the perceived importance of regular dentist visit.

Table 3 Shows the association between attitude scores and socio-demographic characteristic of participants. Significant associations were found between family size and attitude scores. The median crowding index in the group of students who had positive and negative attitude scores were 1.2 and 1.0 respectively, and to assess the difference between the median crowding index for positive Vs. negative attitude score groups, Mann Whitney test was used, and it was not significant $P=0.937$.

Table 3. Association between attitude scores and socio-demographic characteristic of participants

Variable	Group	Attitude scores				Total No. (100%)	P value
		Unfavorable		Favorable			
		No.	%	No.	%		
Age (Years)	≤13	20	7.1	263	92.9	283	0.338
	>13	5	4.5	107	95.5	112	
Gender	Male	8	5.7	133	94.3	141	0.690
	Female	17	6.7	237	93.3	254	

Variable	Group	Attitude scores				Total No. (100%)	P value
		Unfavorable		Favorable			
		No.	%	No.	%		
Nationality	UAE	17	6.8	232	93.2	249	0.595
	Others	8	5.5	138	94.5	146	
Grade	7	1	2.2	44	97.8	45	0.615
	8	19	7.3	242	92.7	261	
	9	2	5.0	38	95.0	40	
	10	3	6.1	46	93.9	49	
Family size	Not large (≤ 5)	24	7.9	278	92.1	290	0.017
	Large (> 5)	1	1.1	92	98.9	93	
Father education level	\leq Secondary education	13	7.6	159	92.4	172	0.378
	\geq College	12	5.4	211	94.6	223	
Mother education level	\leq Secondary education	13	7.2	167	92.8	180	0.505
	\geq College	12	5.6	203	94.4	215	
Dental insurance	Yes	1	2.9	34	100.0	35	0.713*
	No	25	6.9	335	93.1	360	

Barriers to Dental Care from Students

Perspectives: The most common barrier for visiting the dentist regularly was explored. Parent discouragement regarding regular visit to dentist was found to be the most common barrier (37%), followed by high expenses of the dental procedure (27.6%). In less than one fourth (23.8%) of the participants, the dental phobia was the barrier, while both fear from pain associated with dental procedure and absence of advice from health care provider were reported as barriers by 22.8% and 22% of the participants respectively. The least frequent barriers were the availability of time and the availability of nearby dental service which was reported by 21.3% of the participants for both barriers.

Table 4. Shows Logistic regression analysis for identification of predictors of poor oral health knowledge. It can be seen that gender (being females compared to males), large family size, having lower education level father, and not having dental insurance are significant determinants of poor oral health knowledge.

Logistic regression analysis was done to find predictors of poor attitudes towards oral health. In Binary logistic regression, the only variables that showed significant relation with poor attitude scores were family size and knowledge level. Regarding family size, the study showed that the OR for poor attitude among students whose Family size > 5 compared to students whose family size ≤ 5 was 7.942 (95% CI: 1.060-59.528, $p=0.044$). Concerning knowledge level, the OR for poor attitude among students who had poor knowledge compared to students whose knowledge levels were adequate was 3.923 (95% CI: 1.649-9.336, $p=0.002$). On analyzing the previous two variables in multiple logistic model, the only variable that showed significant result was the knowledge level, which showed that the OR for poor attitude among students who had poor knowledge compared to students whose knowledge level were adequate was 3.022 (95% CI: 1.247-7.322; $p=0.014$) on adjusting for the effect of family size

Table 4. Logistic regression analysis: Predictors of poor oral health knowledge (Multiple logistic regression model prediction = 28.4%)

		N	COR	95% CI	P	AOR	95% CI	P
Age (Years)	≤ 13	283	1.525	0.95-2.43	0.77	-	-	-
	> 13	112	1					

		N	COR	95% CI	P	AOR	95% CI	P
Gender	Male	141	1	1.18-2.86	0.007	1	2.082-11.639	<0.0001
	Female	254	1.838			4.923		
Nationality	UAE	249	1.48	0.96-2.28	0.73	-	-	-
	Others	146	1					
Grades	7	45	1.88	0.99-3.571	0.05	0.779	0.274-2.216	0.639
	8	261	1.74	0.73-4.14	0.20	2.363	0.840-6.646	0.103
	9	40	2.15	0.93-4.97	0.71	0.986	0.372-2.618	0.978
	10	49	1			1		
Family size	Not large (≤ 5)	302	1	3.44-13.79	<0.001	1	5.481-25.522	<0.0001
	Large (>5)	93	6.89			11.828		
Father Education level	\leq Secondary	172	1.42	0.94-2.14	0.09	2.392	1.387-4.123	0.002
	\geq College	223	1			1		
Mother Education level	\leq Secondary	180	1.30	0.86-1.95	0.20	-	-	-
	\geq College	215	1					
Dental insurance	Yes	35	1	0.560-2.313	0.721			
	No	360	1.138					
Crowding Index		395	1.80	1.36-2.37	<0.001			

Discussion

During childhood and adolescence, oral health habits, beliefs and attitudes, are usually developed and correct knowledge regarding oral health is better to be provided during this period since children and adolescents are receptive to new information. Evidence showed that good oral habits could effectively be established during this period if the correct messages and approaches are used¹. This requires identification of gap in knowledge and factors that affect oral health attitudes of children and adolescents.

Knowledge: In this study the prevalence of poor knowledge was 37.2 %, this is higher than prevalence of low knowledge reported in a study from Qatar^[9] (11.2%) among students age 12-14 years and a study from Manipur, North India^[17](9%) among 810 healthy adolescents. Also, a study in China^[3] showed that in oral health knowledge among 12-15 year- old was poor and only 5.3% had correct knowledge about dental plaque

Higher prevalence of poor knowledge than our data was reported in a study from Mangalore, India^[18] with a prevalence of poor knowledge of 54.5% among 11-13 years old children and a study in Spain^[4] which showed that 97.5% of children had limited knowledge of oral health issues.

In this study only 72.2 % and 57.7% had knowledge that smoking can adversely affect the teeth and gum respectively, 24.8% had knowledge on frequency of visiting the dentist and 8.6% had the correct knowledge on frequency of cleaning teeth. Our results regarding knowledge about the frequency of cleaning teeth is lower than that in a study from India^[5], in which, 69% knew the necessity to brush teeth after every meal. Our data can be compared with a study from Tanzania^[8], with a reported knowledge about dental checkup among 72.7% of the participants. Lack of knowledge regarding the adverse effect of smoking on oral health was also studied by Sood et al. 2014, who found that among dental patients only 54% and 65% knew that smoking can cause tooth decay and gum disease respectively.^[19]

In this study 63.5% of participants have the correct knowledge on how to avoid tooth decay and this is lower than what is shown in study from Chandigarh, India⁶, in which 92.7% were aware that sweets have negative impact on dental health.

In the present study, 80.5% and 59.5% of the students knew about gum diseases signs and symptoms respectively, while in Al-Subaita et al^[20] study that included 287 students in Saudi Arabia, 56% of participants were aware that dental bleeding is a primary sign of poor oral health. Profound lack of knowledge

regarding the impact of malalignment of teeth on oral health cleaning where only 2.5% of the students had this knowledge. This is in agreement with Blaggana et al study that showed 49.8% knew that malalignment affect oral health.^[6]

In this study higher percentage of poor knowledge was found among female (42.1%) compared to male (28.4). This is in agreement with study from Malaysia^[5] which showed that males school students had significantly higher average knowledge score compared to females. Our study also agreed with data from Nigeria^[21] which revealed that male respondents, aged 11-13 years and those attending private schools, had higher average dental health knowledge than their counterparts' females. Our data disagree with another study from Saudi Arabia^[20] which showed that girls were more aware than boys about "bleeding gums, oral health effects on general health and the importance of dental check-up".

With regard to age, the present data showed no significant association between oral health knowledge scores and age, and this is consistent with Carneiro et al study from Tanzania^[22] with a reported no significant difference between knowledge score of student 14-17 years and 18+ years. The present data also did not show significant difference between junior and senior students which is consistent with Lian et al study from Malaysia.^[11]

In this study family size, parent education and crowding index were used as socioeconomic determinants of oral health oral health knowledge and attitudes. The studied students whose father education was lower had significantly higher risk of poor knowledge. This finding support Wahengbam et al^[17] study who had reported significant association between parent education and inadequate oral health knowledge among adolescents. The importance of parent education observed in this study is also supported by a study from Brazil.^[14] Our finding is also supported by earlier study which showed that parents is the most prevalent source of oral health information for children.^[9] We found that the risk of poor oral health knowledge was significantly higher among students who had larger family size and there was significant association between knowledge score and family size. This finding agrees with Al-Darwish study which showed that larger household size can act as a barrier to oral health knowledge, because of the need to focus on larger number of children. ^[9]

Worrying finding is the very high proportion of participants who were not having dental insurance (90.1%). This is important because earlier study identified dental insurance as one of the predictors for oral health utilization among school children.^[23] The CDC estimated that about one fourth of U.S. children do not have dental insurance^[24], which is less than our finding. In UAE, although all citizen is covered by health insurance (private or public), however, dental insurance is not yet a mandatory requirement for all health insurance agreement. Including dental care as part of basic health insurance is recommended. The present results have not revealed significant association between dental insurance and oral health knowledge and attitude. This could be explained by the small number of students who are covered by dental insurance. More research are suggested to explore this relationship

Attitude: In this study favorable attitude score was identified in 93.7% of respondents. This is higher than a study from Manipur, North Eastern India^[17], in which 79.8% of the studied adolescents had favorable attitude towards oral health. Reddy et al found that 52% of the students had an unfavorable attitude. ^[25] The authors in the previous study attributed the high unfavorable attitudes among the study participants to the possible fear of dental care. Regarding going to the dentist, 72.4% of our participants admitted that they were not afraid to go to dentist visit this disagree with Hans et al study^[5] which showed that 53% of the students avoid dental visit because of fear of pain.

Regular visit to the dentist was thought to be important by about half of the studied students (57.2%). Higher percentage of students was reported by de Palma et al^[26] (79.9%) and Blaggana et al⁶ (77.6%) on the belief that "regular dentist visits is necessary". Higher percentage was also reported in a study from Jodhpur, India^[5], where 88% of the children felt the need to visit a dentist. A study from Qatar⁹ found that 32.5% of the students thought wrongly that one must consult the dentist merely in case of pain.

The studied females have less favorable attitude (93.3%) compared to males (94.3%) the opposite can be seen in a study from Tanzania^[8], which showed that girls had significantly more positive attitude towards dental health compared to boys (Mean attitude scores for girls vs. boys= 19.87 vs. 19.14, P=0.025). Also, we found that the percentage of favorable attitude of older student was more among older compared to younger student (95.5%

vs. 92.9%) this is in agreement with Wahengbam et al^[17] study. Also, we observed higher percentage of favorable attitude among student with higher compared to lower father's education (94.4% vs. 92.4%) and higher compared to lower mother education (94.4% vs. 92.8%). Similar findings were also in Wahengbam et al^[17] study. The current results showed that poor oral health knowledge was the only variable significantly associated with unfavorable attitudes which suggests that improvement in attitudes can be achieved upon increasing the awareness of participants. This is in line with aforementioned study which documents significant correlation between knowledge - attitude scores. ^[17] Similar finding was also reported by Kumar et al who had documented positive linear relationship between knowledge and practice scores.^[27]

Barriers: In our study the student most perceived barrier to dental care was parent opinion (37%) followed by the cost of dental procedure (27.6%) while the lowest perceived barrier were the availability of time (21.3%) and availability of dental services near living area (21.3%). In Blasi, et al^[28] study, the most commonly barrier to dental care included was cost (83.7%) and no dental insurance (78.1%). Financial factor was also identified as a barrier to care seeking for children oral health by Kelly et al.^[29] Fear of pain associated with dental procedure and fear from dental procedure was perceived by 22.8% and 23.8% of our respondents respectively, this is lower than what was seen in Dodd et al study ^[30], where 60% of respondents offered at least one fear statement when describing why people do not go to the dentist. A qualitative study on dental care barriers of Swedish adolescents showed that fear of pain and feeling of discomfort were among the reported barriers.^[31] Interestingly, lack of advice from health provided is reported as barrier by 22% of participants this is supported by other researchers.^[15] Semi-structured interview of adolescents on perceived factors that affect utilization of oral health services reported parental perception of oral health need as one of the factors.^[30]

Limitation of this study is that we can't be generalized finding to all UAE students because the present study had included only limited number of schools only in one State (Ajman) in UAE.

We declare that this manuscript is an original study and has not been sent to other journal and we have no Conflict of Interest and have not received a fund for conducting this study. Research protocol was approved

by the Gulf Medical University (GMU) Institution Research Board (IRB). Approval from Ministry of Education was obtained before the data collection started. Informed consent was obtained from the participants parents before data collection.

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