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RESEARCH ARTICLE

KNOWLEDGE ON ORAL HYGIENE AMONG SCHOOL CHILDREN IN AJMAN, UAE

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ABSTRACT

Background: Good oral hygiene is believed to be the result of level of knowledge of the individuals about the oral health and its great importance. Low level of knowledge results in poor oral hygiene practices.

Objectives: The objective of this study was to assess the level of knowledge of secondary school students in Ajman, UAE, and its association with age, grade of study and nationality.

Materials and Methods: A cross sectional study was conducted, among 175 children of grades 6-9 in the emirate of Ajman located in the United Arab Emirates. The students were selected conveniently from one school after obtaining permission from parents. The data was collected using a self-administered questionnaire which consisted of different sections that focused on the knowledge of the participants with regard to oral hygiene. The frequencies and percentages were obtained from the data and inferential statistics was applied to find the association between dependent and independent variables using SPSS 21 version.

Results: All the participants reported that they're aware of the importance of brushing. Among all participants, 148 (84.6%) reported that teeth should be brushed twice daily, and 82 (46.9%) reported soft brush to be used for brushing the teeth. Regarding the frequency of change of brush, 118 (67.4%) mentioned that the brush should be changed every 3 months and 62 (35.4%) mentioned 2 minutes brushing. Regarding the appropriate way of brushing 25 (14.3%) reported that brushing is to be done in vertical motion. The perception of participants on oral hygiene showed that 157 (90%) perceived that brushing teeth is very important (good score >=7). According to the overall rate on oral hygiene, 156 (89.1%) of the participants rated their oral hygiene as good (good score >=7). It was observed that age, grade and nationality did not show any statistically significant influence on participant's knowledge on brushing and on their knowledge on importance of oral hygiene.

Conclusion: In conclusion, good knowledge was observed regarding importance of brushing, frequency of brushing, and frequency of changing the brush whereas regarding type of brush to be used, duration of brushing, and appropriate way to brush the teeth the participants' were lacking knowledge. Association between level of knowledge regarding oral hygiene and socio-demographic factors showed that the knowledge was more or less similar with regard to age and gender.

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INTRODUCTION

Oral hygiene is one of the major factors in the wellbeing of people. It is a state of being liberated from several issues: long-lasting mouth and facial pain, birth defects, periodontal diseases, throat cancer, oral sores, tooth decay and loss, amongst other disorders that distress oral cavity (World Oral health report, 2003). Oral hygiene is achieved through constant maintenance of the health of the mouth and teeth by several methods such as flossing and tooth brushing to avoid decay of food residue in the mouth and the eventual diseases of the gum. The sole purpose of maintenance is to limit the build-up of bacteria and food residue in the teeth, which prevents the generation of acids that dissolve the enamel (outermost layer) of the tooth and cause cavities (http://www.oxforddictionaries.com/definition/english/oral). Poor dental hygiene among the school children has several effects on the children, some more major than others. One of these effects is physical pain which leads to sleeping problems, eating problems and behavioral

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problems (Low *et al*., 2000), all of which at such a young age should be avoided as much as possible. The fact is that the little attention paid to the issue of oral hygiene of school aged children especially in the developing countries could be fatally dangerous in advance cases such as in patients with oral cancer, which is the eighth most common worldwide cancer (Singh and Purohit, 2012).

The root of this problem is the poor level of education of the parents in the dental field. Once the awareness of the parents increase regarding oral hygiene they will pass on the knowledge to their younger ones. Nonetheless, based on the research done by Peterson (Petersen, 2009), 90% of the school children have experienced dental cavities and in the less severe cases such as this, the issue is still of great importance because it could lead to tooth loss at a very young age. Out of this 90%, the female children showed a higher percentage of taking care of their oral hygiene, more specifically just brushing their teeth. The methods of oral hygiene range from flossing to brushing and gum rubbing to maintain good dental health. One's lifestyle, according to Nabil Al-Beiruti, is influential to formation of dental caries and periodontal diseases (Beiruti, 2004). It's ideal to brush ones teeth, at least two times daily: once early in the morning and the next before going to bed at night. Flossing is just as essential as brushing if not even more indispensable; it helps prevent tooth decay by eliminating food residues present between the teeth, which are not reachable by bristles of the toothbrush. Food residue is the drive force of cavity formation; teeth are vulnerable to plaque, which attract bacteria and cause them to attack the enamel (Leena *et al*., 2006).

The factors that can affect knowledge range from age, gender, level of education (of the children and the parents), religion, tradition, culture, disabilities, etc. Firstly, age difference between children and adolescents plays a role in the maintenance of good oral hygiene. Adults tend to have more knowledge about the oral health than children and thus having a better practice. Secondly, gender plays a vital role in oral hygiene maintenance. A lot of studies reported that girls showed more interest in oral health than boys, leading to higher degree of oral hygiene practice. Larger number of girls showed knowledge and application of tooth brushing and oral hygiene practice at least once a day as compared to boys, theyreported using fingers instead of tooth brushing (Emmanuel and Chang'endo, 2010). Thirdly, education in general and parent's level of education in specific is one of the important factors linked with children oral hygiene. Because children are influenced by their parents' life style, Parents' oral health behavior could impact their children's gingival wellbeing and dental caries directly or indirectly. This influence on children's health could be through the effect of parents' attitudes on children's oral health behavior. Highly educated parents, with awareness of dangers of the lack of oral hygiene, means better oral health practice between girls and boys (Kwan and Petersen, 2003). Children of parents who monitor their hygiene such as tooth brushing and sugar intake have favorable oral health habits, demonstrating that parental attitudes have a positive impact on their children's oral health status (Bartoshuk*et al*., 1994 and AlineRogériaFreire de Castilho *et al*., 2008). According to Finlayson *et al*., during the process of learning to brush, children only play with the toothbrush in their mouth, and do not actually clean their teeth. Therefore, mothers play a key role in helping their children by teaching them favorable oral health habits (Gisela, 2014). Likewise, parents with poor level of education will largely influence their children's oral health behavior. Eventually parents catalyze the development of tooth decay and gingival diseases. Hence, if children do not obtain the basic adequate knowledge about oral hygiene at early age, they are likely to develop oral issues as they grow up, according to Albandar Brown (Albandar *et al*., 1997).

Economic, cultural and social status affects the level of oral hygiene amongst people. In North America, Uneven distribution of oral health remains a substantial problem across some sub-populations like non-Hispanic blacks, Hispanics, and American Indians and Alaska natives. Those subpopulations have the poorest oral health of any of the racial and ethnic groups in the US population because they are considered being the poorest according to other population groups as well (Beck and Hunter, 1985). Unmet health needs is an indicator of lack of dental visits. Especially that oral disease is common and does not resolve in the absence of intervention. The lack of dental care creates a barrier in obtaining proper oral health. Several factors could result in such scenario: unmet needs in populations could be due to low income, lack of accessibility to oral care needs and limitation in knowledge (AlineRogériaFreire de Castilho *et al*., 2008). Considering the fact that very few studies have been done regarding the knowledge of dental hygiene in Ajman, UAE. Yet another factor is the rise in the number of dental problems in students of this age. Hence, this study was conducted to assess the knowledge of secondary school students about oral hygiene.

MATERIALS AND METHODS

A cross sectional study was conducted, among 175 children of grades 6-9 in the emirate of Ajman located in the United Arab Emirates. The students were selected conveniently from one school in Ajman Emirate. University Ethics committee approval was sought before start of the study. Consent was obtained from the parents of the participants and then the data was collected by having the students fill a self-administered questionnaire, which consisted of different sections that focused on the knowledge of the participants with regard to oral hygiene such as importance of brushing, type of brush to be used, frequency and method of brushing, and frequency of changing tooth brush. The data was fed into Excel spread sheet and analysed using SPSS version 21. The frequencies and percentages were obtained from the data and inferential statistics was applied to find the association between dependent and independent variables.

RESULTS

This research was conducted to assess the knowledge of secondary school children regarding oral hygiene. A total of 175 students from grade six to nine participated in this research.

Table 1.Distribution of Socio-demographic characteristics (N=175)

Socio-demographic Characteristics	Groups	No.	%
Age in years	<13 years	86	49.1
	≥13 years	89	50.9
Grade	6th	61	34.9
	7th	33	18.9
	8th	41	23.4
	9th	40	22.9
Nationality	Arabs	175	100.0

Table 1 shows the distribution of socio-demographic details of study participants, 89 (50.9%) were in the age group 13 years and 86 (49.1%) were less than 13 years of age group. The participant's age ranges between 11 and 15 years. With regard to the level of study of the participants, 61 (34.9%) were of 6th grade, 41 (23.4%) were of 8th grade, 22.9% and 18.9% were 9th and 7th grade respectively. All participants were Arab nationals.

Table 2. Distribution of participants according to knowledge on Dental hygiene (N=175)

Knowledge on Dental Hygiene	Groups	No.	%
Importance of Brushing	Yes	175	100.0
	No	--	--
Frequency of brushing	Once daily	26	14.8
	Twice daily	148	84.6
	Weekly once	1	0.6
Type of brush to be used	Soft	82	46.9
	Medium	70	40.0
	Hard	23	13.1
Frequency of brushing	Every 3 months	118	67.4
	Every 6 months	49	28.0
	Annually	7	4.0
	Never	1	.6
Time one should take to brush their teeth	30 seconds	25	14.3
	About 1 minute	48	27.4
	About 2 minute	62	35.4
	I do not know	40	22.9
Appropriate way to brush the teeth	In vertical motion	25	14.3
	In horizontal motion	22	12.6
	In rotary motion	73	41.7
	In all different directions	55	31.4

Table 2 describes the distribution of participants according to knowledge on dental hygiene. All the participants reported that they're aware of the importance of brushing. Among all participants, 148 (84.6%) reported that teeth should be brushed twice daily followed by 26 (14.9%) once daily, and 1 (0.6%) reported once weekly. Among the participants, 82 (46.9%) reported soft brush to be used for brushing the teeth. Whereas 70 (40.0%) reported medium and, 23 (13.1%) reported hard. Regarding the frequency of change of brush, 118 (67.4%) mentioned that the brush should be changed every 3 months whereas 49 (28%) mentioned that the brush should be changed every 6 months, 7 (4.0%) mentioned that the brush should be changed once every year, and 1 (0.6%) mentioned that the brush should never be changed. It was also observed that 62 (35.4%) mentioned 2 minutes brushing. Regarding the appropriate way of brushing 25 (14.3%) reported that brushing is to be done in vertical motion, whereas 22 (12.6%) reported brushing should be done in horizontal motion. 73 (41.7%) reported brushing to be done in rotary motion and 55 (31.4%) brushing should be in different directions.

Table 3. Distribution of Participants' perception on oral hygiene (N=175)

Perception on oral hygiene	Groups	No.	%
How important do you think brushing your teeth is	Poor (Score<=3)	2	1.1
	Moderate (Score 4-6)	16	9.1
	Good (Score >=7)	157	89.7
Overall rate on Oral Hygiene	Poor (Score <=3)	3	1.7
	Moderate (Score 4-6)	16	9.1
	Good (Score >=7)	156	89.1

Table 3 describes the perception of participants on oral hygiene. It was observed that 157 (90%) of the participants perceived that brushing teeth is very important (good score >=7) whereas 16 (9.1%) perceived that brushing is moderately important (moderate score 4-6), and 2 (1.1%) feels that brushing the teeth is unimportant (poor score <=3). According to the overall rate on oral hygiene, 156 (89.1%) of the participants rated their oral hygiene as good (good score >=7), whereas 16 (9.1%) of the participants rated their oral hygiene as moderate (moderate score 4-6), and 3 (1.7%) of the participants rated their oral hygiene as poor (poor score <=3).The knowledge on importance of oral hygiene among participants showed that, 99 (56.6%) mentioned that not cleaning the teeth would result in bad breath. Among the participants 101 (57.7%) mentioned tooth decay would be the result. whereas 143 (81.7%) of the participants reported that gum disease is not related to cleaning the teeth. 163 (93.1%) of the participants didn't know the effect of not cleaning the teeth on oral health, whereas 174 (99.4%) reported nothing will happen. Regarding visiting the dentist, 142 (81.1%) of the participants reported that cavity is not a result of not visiting the dentist, whereas 119 (68%) of the participants reported that toothache is a result of not visiting the dentist. 142 (81.1%) mentioned that bad breath is a result of not visiting the dentist, whereas 140 (80%) of the participants reported nothing will happen.

Table 4. Association between Socio-demographic characteristics and knowledge on Brushing (N=175)

Socio-demographic Characteristics	Groups	Knowledge on Brushing				P value
		Good (Score >3)		Poor (Score ≤ 3)		
		No.	%	No.	%	
Age	<13 years	50	58.1	36	41.9	NS
	≥ 13 years	43	48.3	46	51.7	
Grade	6th	37	60.7	24	39.3	NS
	7th	14	42.4	19	57.6	
	8th	21	51.2	20	48.8	
	9th	21	52.5	19	47.5	
Nationality	Arabs	93	53.1	82	46.9	--

Table 4 describes the influence of socio-demographic characteristics on participants' knowledge on brushing. Regarding age category, 50 (58.1%) participants were of age less than 13 years good knowledge (score > 3) compared to the participants with age 13 years and above 43 (48.3%). With respect to the grade good knowledge was found among the children from 6th grade 37 (60.7%). Coming to the nationality, all were Arab nationalities and among them, 93 (53.1%) of the Arab participants showed to have a good knowledge (score > 3). It was also found that age, grade and nationality has no statistically significant influence on participant's knowledge on brushing.

Table 5. Association between Socio-demographic characteristics and knowledge on Importance of Oral hygiene (N=175)

Socio-demographic Characteristics	Groups	Knowledge on Importance of Oral Hygiene				P value
		Good Score >5		Poor Score ≤ 5		
		No.	%	No.	%	
Age	<13 years	22	25.6	64	74.4	NS
	≥ 13 years	24	27.0	65	73.0	
Grade	6th	18	29.5	43	70.5	NS
	7th	5	15.2	28	84.8	
	8th	9	22.0	32	78.0	
	9th	14	35.0	26	65.0	
Nationality	Arabs	46	26.3	129	73.7	--
	Non-Arabs	--	--	--	--	

Table 5 describes the influence of socio-demographic characteristics on participants' knowledge on Importance of Oral hygiene. Regarding age category, 22 (25.6%) participants with age less than 13 years had good knowledge (score > 5) compared to the participants with age 13 years and above 24 (27.0%). With respect to the grade good knowledge was found among the individuals from 9th grade 14 (35.0%). Among all Arabs 46 (26.3%) showed good knowledge (score > 5) Importance of Oral Hygiene. It was observed that age, grade and nationality have no statistically significant influence on participant's knowledge on importance of Oral Hygiene.

DISCUSSION

Awareness of oral hygiene is essential, and majority of people who do not have the knowledge of the subject do not know the factors that are associated with oral hygiene. In the present study the 100% of the students were aware of the importance of tooth brushing as oppose to the study conducted in Sweden that investigated the Oral Health of 17,280 students, which showed 95% knowledge about the importance of tooth brushing (Anna-Lena Östberg *et al*., 1999). This could be due to the fact that the sample size is noticeably larger in the KAP study conducted in Sweden that the one conducted in UAE. However, this may not be the sole reason behind the small difference in the outcome. Other reasons could be such as the difference in nationality. UAE as a fast-growing and more recent country has well adapted to the modern standards regarding the health of the citizens, and more specifically for the permanent residents of the country. This being said, the percentage is rather a small difference. According to the results, 148 students, which makes up approximately 85% of the total number, are aware that brushing twice daily is best followed by 15% who think brushing only once a day is enough. This varies to 75% of the adolescents who are aware of brushing twice daily in the study held in Kerala, India (Jayakumary Muttappallymyalil *et al*., 2009). However, another study shows a more radical difference to these two studies, which shows only a small group of candidates are aware of brushing twice daily, and a large percentage, 86%, of the individuals think brushing only once daily is enough (Khan *et al*., 2010). The reason causing this radical change could be that the groups of individuals taking part in the study are patients who have visited the dentist rather than a group of individuals, some of whom may or may not have dental issues to visit the doctor for seeking help. Therefore, it is sensible that those who think brushing once daily would face more dental issues than those who believe brushing should be done twice daily. According to the data obtained, 47% of candidates are aware that soft brush should be used as oppose to a medium or hard brush. This can be supported by the official Oral-B website, which states that despite the more traditional knowledge of people, and the preconception of the harder the toothbrush bristles the more it will clean teeth, the majority of the toothbrushes used by people are the soft or super-soft bristled toothbrushes (http://www.oralb.com/topics/types-of-tooth brush-bristles.aspx). This is majorly because of the dentists' recommendations, in cases that the individuals visit the dentists. Yet another cause of this outcome may be because of the change in the supply. In other words, every store selling toothbrushes, have a higher supply of soft bristled tooth brushes, therefore the use of that type of brush increases due to its availability. Based on the study held, 67% of the secondary school students in one of the schools of Ajman believe that a toothbrush must be changed every three months. A similar research held in Pakistan reported that an average of 26% of males and females believe that the toothbrushes should be changed every six months rather than 3 months (Attaullah *et al*., 2010). This change in the observations could be the result of the economical level of the average individual in Pakistan versus the economical level of the average person in the Ajman, UAE. The study held in Pakistan goes on to further explain that the overall oral hygiene of the wealthier happens to be higher, statistically speaking, than the oral hygiene level of the less wealthy individuals who took part in the survey.

With regard to the method of brushing, 42% of candidates selected the rotary motion out of the options such as vertical direction, horizontal direction and all different direction. Conversely, a study carried out in Kanchipuram District in Tamil Nadu, India, in 2011, that shows only 11% of individuals between the ages of 5-10 believe that the correct way is the rotary motion (Punitha and Sivaprakasam, 2011). What could be concluded is that over the years the individuals learn to differ what they believe the appropriate way of brushing is. At a younger age, the concept of tooth-brushing remains minimal, and the majority of individuals brush in all different directions, but over the years, the individuals learn from different sources, for example seeing their parents brushing, that the more appropriate way is to clean in a rotary motion, which is a combination of the vertical and the horizontal motion. Here we observe that the concept of tooth brushing develops over the years. Yet another aspect that was investigated is the knowledge of the individuals when it comes to the consequences that follow not cleaning the teeth regularly. In a KAP study done on children attending a government-aided missionary school in Bangalore city, age group 11-12 years old, 75% of the participants find tooth decay and gum diseases as the consequences of bad tooth-brushing habits (Harikiran *et al*., 2008). In the current study the results suggest that 58% of participants know of tooth decay, closely followed by 57% for bad breath, and only an 18% of gum diseases. In the current research the participants were given the option of choosing multiple options. Perhaps, the results for bad breath are less due to the knowledge of the major and more concerning consequences of not brushing, and more a result of personal experience in the short term, which is more easily observed than the long term effects. In both studies, the knowledge on leading consequence of bad oral

health does remain to be tooth decay. In the present study nationality did not play a role, as all the participants were Arabs. However, the age and the grade that the participants belonged to varied. Regarding the knowledge on brushing neither age nor grade made a significant difference. This is similar to the study done in Jordan, which also did not have a significant difference with regard to age and grade (Al-Omiri *et al*., 2006).The knowledge on the importance of oral hygiene of the participants in the present study represents that there is no significant difference in the age or in the grade of the participants. A study carried out in India shows a difference in the gender of the participants, where the females had a better knowledge of oral health (Mehta and Kaur, 2012). The present study was conducted only in one school and the results cannot be generalizable to the entire school children.

Conclusion

The present study conducted among school children conclude that good knowledge was observed regarding importance of brushing, frequency of brushing, and frequency of changing the brush. Poor knowledge was observed regarding type of brush to be used, duration of brushing, and appropriate way to brush the teeth. Association between level of knowledge regarding oral hygiene and socio-demographic factors showed that the knowledge was more or less similar with regard to age and gender.

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