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ORIGINAL ARTICLE

Oral health knowledge, attitude and practice among secondary school students in Kuching, Sarawak

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Keywords

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Abstract Dental caries is a major health problem affecting an estimated 90% of school children worldwide. This cross-sectional study aimed to evaluate oral health knowledge, attitude, and practices among secondary school students in Kuching, Sarawak. Data was collected using a pretested questionnaire on 209 randomly selected students from four schools. Results showed no significant differences between the gender and age groups in terms of knowledge level, but significant differences were observed between the schools. The students had positive attitude towards the dental services, but their dental visits were still low due to fear of dental needle and handpieces. Toothbrush and toothpaste were still the most commonly used oral hygiene aids. As compared to parents and friends, dentist was perceived to have more influence on oral hygiene practices among the students. Girls consumed more sweets, snacks and soft drinks than boys. However, girls spent longer time to brush their teeth and brush more frequently. Oral health education should be a life-long practice and incorporated into the school environment with the support of teachers and parents.

Introduction

About 90% of school children worldwide and most adults have experienced caries, with the disease being most prevalent in Asian and Latin American countries (Petersen *et al*., 2005). In Malaysia, the annual impact indicators, percentage of DMFT (decay, missing, filled, extraction) among 12-year-old children had improved from 47.4% with 3 or less decayed, missing, filled teeth in 1990 to 91.2% in 2000. In Sarawak, the mean DMFT score for 12-year-old had decreased over the period of ten years from 2.5 in 1997 (Oral Health Division, 1998) to 1.4 in 2007 (Sarawak Health Department, 2008). Although this decreasing trend indicate an improvement in oral health status, environmental risk factors such as diet, nutrition, oral hygiene, tobacco and alcohol (Petersen *et al*., 2005) can play an important role in prevention of dental caries.

Evidence had showed that strong knowledge of oral health demonstrates better oral care practice (Smyth *et al*., 2007). Similarly for those with more positive attitude towards oral health are influenced by better knowledge in taking care of their teeth. Studies have showed that appropriate oral health education can help to cultivate healthy oral health practice (Ab-Murat and Watt, 2006). The change to healthy attitude and practice can be occurred by given adequate information, motivation and practice of the measures to the subjects (Smyth *et al*., 2007). In order to create such health education, the assessment of knowledge, attitude and practice is essential (Al-Omiri *et al*., 2006).

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The aim of this study is to assess the level of knowledge and attitude towards oral health among the secondary students in Kuching, Sarawak, to evaluate the practice of oral hygiene among the secondary school students and to determine the relationship between oral health knowledge, attitude and practice, and socio-demographic background.

Materials and methods

This is a cross-sectional study using stratified random sampling method. The target population of this study consists of secondary school students (Form 1, 2 and 4) in Kuching district. The schools selected must have a built-up dental clinic facility and received dental check-ups and treatment annually. All the secondary schools in Kuching that met the inclusion criteria were sampled, i.e. SMK St. Joseph, SMK St. Mary, SMK St. Teresa and SMKA Sheikh Haji Othman Abdul Wahab (SHOAW). Form 3 and 5 students were excluded because of their involvement in the government public examinations (Penilaian Menengah Rendah and Sijil Pelajaran Malaysia), which exempted them from routine dental check-up. A sample size of 209 students was required for the study.

A pretested questionnaire adopted from Petersen *et al*. (2000) and Stenberg *et al*. (2000) was used for data collection. It consisted of four parts, which were:

a) Part 1, which contained 10 questions to assess the respondents' oral health knowledge included items on the effects of brushing and using fluoride on dentition, the meaning of gum bleeding and how to protect against it, the meaning of dental plaque and its effects, the effect of sweets and soft drinks on dentition, and the effects of caries on appearance. Each correct answer will be given 1 mark and wrong answer will be given 0 mark.

b) Part 2, which consisted of 13 questions to assess the respondents' attitude towards oral health included dental visits (regularity, reasons), feelings and experience during the first visit, treatments sought during the last visit, questions on fear from dental visit and perception of dentists.

c) Part 3, which was composed of 4 questions to assess the respondents' practice of oral hygiene including toothbrushing activity (frequency, time, duration) and items used for toothbrushing.

d) Part 4 contained 3 questions to assess the respondents' dietary habits (frequency of intake) on sweet foods, sweet snacks and soft drinks.

Students were gathered in one classroom with the help of the teacher and the interviewers would read aloud the questionnaire to entire class. Data collected were analysed statistically using SPSS 14.0.

Results

A total of 209 students comprising of 43.1% males and 56.9% females participated in the study. The socio-demographic background of the respondents is presented in Table 1.

Table 1: Socio-demographic background

Variable	n	%
Gender		
Male	90	43.1
Female	119	56.9
School		
SMK St. Teresa	59	28.2
SMK St. Joseph	61	29.2
SMK St. Mary	29	13.9
SMK(A) SHOAW	60	28.7
Education Level		
Form 1	69	33
Form 2	69	33
Form 4	71	34
Ethnic Group		
Malay	121	57.9
Chinese	41	19.6
India	2	1.0
Bidayuh	20	9.6
Iban	15	7.2
Melanau	6	2.9
Others	4	1.9

For knowledge of oral health, 56.5% scored below the mean score while only 43.5% scored above mean. The minimum score was 3 and maximum score was 10, with a mean value of 6.22. Details of the knowledge score is presented in Table 2.

The top three questions that were wrongly answered were questions number 2, 4 and 5. Approximately half of the respondents did not know that gum bleeding meant inflamed gum whereas for dental plaque, only 14.4% knew that it meant soft debris, and 29.7 % knew that dental plaque could lead to dental caries.

Table 2: Knowledge score of oral health (N=209)

Questions	Correct		Wrong	
	n	%	n	%
Q1. Consuming too much sweet food causes tooth decay/dental caries.	145	69.4	64	30.6
Q2. Gum bleeding means inflamed gum.	101	48.3	108	51.7
Q3. Regular brushing of teeth can protect oneself from gum bleeding.	120	57.4	89	42.6
Q4. Dental plaque means soft debris on teeth.	30	14.4	179	85.6
Q5. Dental plaque can lead to dental caries.	62	29.7	147	70.3
Q6. Carious or decayed teeth can affect teeth appearance.	185	88.5	24	11.5
Q7. Sweets affect the teeth adversely.	189	90.4	20	9.6
Q8. Fizzy drinks affect the teeth adversely.	152	72.7	57	27.3
Q9. Using fluoride strengthens the teeth.	175	83.7	34	16.3
Q10. General body health has a relationship to oral health and dental diseases.	140	67.0	69	33.0

Table 3: Relationship between knowledge score and socio-demographic background (gender, education level and school)

	Knowledge Score			
	Mean ± SD	df	Test value	*p* value
Gender*				
Male (n=90)	6.57 ± 1.54	206	$t = 3.054$	0.003
Female (n=119)	5.95 ± 1.34			
Education Level				
Form 1	6.03 ± 1.19	2	F=1.091	0.338
Form 2	6.41 ± 1.22			
Form 4	6.21 ± 1.85			
School*				
SMK St. Teresa	5.54 ± 1.33	3	F = 11.878	0.000
SMK St. Joseph	6.98 ± 1.40			
SMK St. Mary	6.34 ± 1.17			
SMK(A) SHOAW	6.03 ± 1.41			

* Significant ($p < 0.05$)
SMK St. Teresa *vs.* SMK St. Joseph $p = 0.000$
SMK St. Joseph *vs.* SMK(A) SHOAW $p = 0.001$
SMK St. Teresa *vs.* SMK St. Mary $p = 0.06$

The relationship between knowledge score and socio-demographic background, such as gender, education level and school were represented in Table 3. Between the schools, SMK St. Joseph, which is an all-boy school, scored the highest in oral health knowledge as compared to other schools. SMK St Teresa, which is an all-girl school, scored the lowest among the rest.

Table 4 presented the attitude and practice towards oral health according to gender. About 52.2% (n=109) of the respondents (32.1% female; 20.1% male) reported that they would only visit the dentist when they have dental pain. Only 4.3% (1.9% female; 2.4% male) stated that they have never visited a dentist. There was no significant difference of the frequency of dental visit by gender ($p > 0.05$). About 39.2% (n=82) of the respondents (23.9% female; 15.3% male) had their last visit to the dentist less than six months ago. There were only 3.3% (1.9% female; 1.4% male) who last visited the dentist more than five years ago. There was no significant difference of the frequency of last dental visit between genders ($p > 0.05$). About 95.7% of the respondents reported brushing their teeth at least twice per day. Female students (54.6%) brush their teeth more than twice a day as compared to male students. However, female students have a higher consumption of sweet food daily compared to male students. Similar pattern was found for the frequency of taking candy/ chocolate/ sweets and the consumption of soft drinks.

Table 4: Attitude and practice towards oral health according to gender

	Total (%)	Gender (N=209) Male [n (%)]	Female [n (%)]	*p* value
Attitude :				
Frequency of dental visits				
Regularly every 6 to 12 months	51(24.4)	22(43.1)	29(56.9)	*p*=0.401
Occasionally	40(19.1)	21(52.5)	19(47.5)	
When I have dental pain	109(52.2)	42(38.5)	67(61.5)	
Never	9(4.3)	5(55.6)	4(44.4)	
History of last dental visit				
Less than 6 months ago	82(39.2)	32(39.0)	50(61.0)	*p*=0.621
Last 6-12 months	54(25.8)	28(51.9)	26(28.1)	
Last 1-2 years	51(24.4)	20(39.2)	31(60.8)	
Last 2-5 years	15(7.2)	7(46.7)	8(53.3)	
> 5 years	7(3.4)	3(42.9)	4(57.1)	
Practice :				
Frequency of toothbrushing**				
Less than once per day	2 (1.8)	2 (2.2)	0 (0.0)	*p*=0.003
Once per day	7 (3.3)	5 (5.6)	2 (1.7)	
Twice per day	105 (50.2)	53 (58.9)	52 (43.7)	
More than twice per day	95 (45.5)	30 (33.3)	65 (54.6)	
Time spent for brushing**				
Less than 1 minute	22 (10.5)	16 (17.7)	6 (5.0)	*p*=0.001
1 minute	67 (32.1)	33 (36.7)	34 (28.6)	
2 minutes	64 (30.6)	27 (30.0)	37 (31.1)	
More than 2 minutes	56 (26.8)	14 (15.6)	42 (35.3)	
Frequency of eating sweet food per day**				
Less than 1 time	52 (24.9)	36 (40.0)	16 (13.5)	*p*=0.000
2-4 times	116 (55.5)	43 (47.8)	73 (61.3)	
4-6 times	38 (18.2)	11 (12.2)	27 (22.7)	
More than 6 times	3 (1.4)	0 (0.0)	3 (2.5)	
Frequency of taking candy/chocolate/sweets**				
Never/once in a while	40 (19.1)	29 (32.2)	11 (9.3)	
1 time/ week	19 (9.1)	11 (12.2)	8 (6.7)	*p*=0.000
2 times / week	40 (19.1)	17 (18.9)	23 (19.3)	
3-5 times / week	47 (22.5)	15 (16.7)	32 (26.9)	
Everyday	40 (19.1)	8 (8.9)	32 (26.9)	
Several times per day	23 (11.0)	10 (11.1)	13 (10.9)	
Frequency of taking soft drinks*				
Never/once in a while	48 (23)	27 (30.0)	21 (17.7)	
1 time/week	22 (10.5)	6 (6.7)	16 (13.4)	*p*=0.023
2 times/week	36 (17.22)	15 (16.7)	21 (17.6)	
3-5 times/week	48 (23)	24 (26.7)	24 (20.2)	
Everyday	35 (16.7)	8 (8.9)	27 (22.7)	
Several times per day	20 (9.6)	10 (11.0)	10 (8.4)	

* significant (p <0.05)
**significant (p<0.01)

Table 5 presented the oral behaviour and practice according to gender. It is worth noting that almost all of the respondents (97.6%) brushed their teeth with brush and toothpaste (with or without fluoride). Meanwhile, about half of the respondents used mouthwash to maintain their oral health. However, the use of dental floss was still not very popular among the secondary school students as evident in this study. Most of the respondents practised toothbrushing in the morning (80.4%) and before bedtime (80.4%). Only about one third of the respondents reported brushing their teeth at noon time.

Discussion

Only 3 questions on teeth appearance, sweets and fluoride (Table 2; Questions 6, 7 and 9) were scored above 80%. However, the knowledge of oral disease on various areas was still poor (Questions 2, 4 and 5). These findings agreed with a study done in Jordan among the school children (Al-Omiri *et al.*, 2006). The lack of knowledge in the periodontal health could reflect the dental health education, which is most likely was limited to certain level of understanding and contact with relevant dental personnel was confined only to the treatment hour.

Table 5 : Oral health behaviour and practice according gender

	Total (% of N)	Gender (N=209)	
		Male [n(%)]	Female [n(%)]
Treatment :			
Check my teeth.	196 (93.8)	87 (44.4)	109 (55.6)
Have tooth extraction.	35 (16.7)	20(57.1)	15(42.9)
Have my gums treated.	34 (16.3)	15 (44.1)	19 (55.9)
Have filling.	34 (16.3)	20(58.8)	14(41.2)
Have scaling.	27 (12.9)	14(51.9)	13(48.1)
Have fluoride on my teeth.	21 (10.0)	13(61.9)	8(38.1)
Have orthodontic treatment.	14 (6.7)	4(28.6)	10 (71.4)
Take X-rays.	8 (3.8)	3 (37.5)	5 (62.5)
Have crown/bridge.	6 (2.9)	3 (50.0)	3 (50.0)
Others.	5 (2.4)	1 (20.0)	4 (80.0)
Reasons for the last dental visit:			
It's time for a check-up	73 (34.9)	26(35.6)	47 (64.4)
Dental pain	56 (26.8)	24 (42.9)	32 (57.1)
Advice by dentist/dental staff	36 (17.2)	14 (38.9)	22 (61.1)
Advice by family/friends	28 (7.7)	9 (56.3)	7 (43.8)
Others	16 (13.4)	17 (60.7)	11 (39.3)
Feeling during the First dental visit:			
Scared and reluctant	42 (20.1)	9 (21.4)	33 (78.6)
Slightly afraid	75 (35.9)	36 (48.0)	39 (52.0)
Very slightly afraid	21 (10.0)	11 (52.4)	10 (47.6)
Never afraid	71 (34.0)	34 (47.9)	37 (52.1)
Experience during the First dental visit:			
No dental pain	32 (15.3)	18 (56.3)	14 (43.8)
Little dental pain	64 (30.6)	25 (39.1)	39 (60.9)
Severe dental pain	18 (8.6)	10 (55.6)	8 (44.4)
Felt nothing	51 (24.4)	20 (39.2)	31 (60.8)
Not comforTable	37 (17.7)	14 (37.8)	23 (62.2)
Enough time for treatment	6 (2.9)	2 (33.3)	4 (66.7)
Not enough time for treatment	1 (0.5)	1 (100)	0
Reasons for not visiting the dentist:			
Afraid of the hand piece.	35 (16.7)	12(34.3)	23(65.7)
Afraid of the dental needle.	101 (48.3)	40(39.6)	61(60.4)
Treatment cost is high.	34 (16.3)	22(64.7	12(35.3)
No dental clinics nearby.	17 (8.1)	13(76.5)	4(23.5)
No time.	51 (24.4)	22(43.1)	29(56.9)
No pain to go to dentist.	48 (23.0)	20(41.7)	28(58.3)
Afraid of sitting in the waiting room.	18 (8.6)	4(22.2)	14(77.8)
Afraid even from thinking of tomorrow's appointment.	23 (11.0)	8(34.8)	15(65.2)
Opinions on dental visit (Answer = Yes)			
Do you think you can decide the treatment you need?	94 (45.0)	38(40.4)	56(59.6)
Is it necessary for patients to decide their dental treatment?	127 (60.8)	51(40.2)	76(59.8)
Regular visit to the dentists are necessary.	167 (79.9)	71(42.5)	96(57.5)
Dentists always explain the dental problem and solve it.	181 (86.6)	79(43.6)	102(56.4)
The dentists always examine and take care of his or her patients.	190 (90.9)	83(43.7)	107(56.3)
What the dentists care about is treatment not prevention.	62 (29.7)	22(35.5)	40(64.5)
Items used for toothbrushing:			
Brush + toothpaste (with or without fluoride)	204 (97.6)	88(43.1)	116(56.9)
Mouthwash	100 (47.8)	44(44.0)	56(56.0)
Toothpicks	29 (13.9)	10 (34.5)	19(65.5)
Dental floss	24 (11.5)	6(25.0)	18(75.0)
Others	3 (1.4)	3 (100.0)	0
Time of Toothbrushing:			
Morning	195 (93.3)	83(42.6)	112(57.4)
Before going to bed	168 (80.4)	64(38.1)	104(61.9)
Noon	79 (37.8)	27(34.2)	52(65.8)
Other	30 (14.4)	14(46.7)	16(53.3)

Note: the respondents can choose more than one option

There was no significant difference of the knowledge score between genders (p=0.003). This may be because both genders are equally educated. However, Joshi *et al*. (2005) reported that boys had better knowledge than girls. The significance difference in oral health knowledge among the schools could be attributed to the difference in terms of implementation of oral health education in the school setting.

In agreement with the report by WHO (2008), majority (52.2%) of the students only visited their dentist when they had dental pain. Approximately a quarter of the students (24.4%) had regular dental visit every 6 to 12 months. This could be due to school oral health programme which required all the students to visit their dentist as part of the annual routine check-up. However, the frequency of dental visit remains relatively low as compared to half of the 1351 second-year secondary school students in Canada used dental services once in every six months (Scott *et al*., 2002). This may be due to the lack of oral health knowledge among these students that caused the frequency of visit low. Low dental visits may probably due to low awareness of importance of oral health, thus affects the students health seeking behavior. However, this study also showed that 89.5% of the students did visit their dentists in the last 2 years, which is slightly lower than 95-96% reported in Finland (Honkala *et al*., 2002).

The most common treatment sought by the students during their last dental visit was dental check-ups, which explained why the students' dental visit was low. This indicates their realization that routine dental visit is a good way to prevent periodontal disease and tooth decay (Biesbrock *et al*., 2006). Family and friends seems to play a minor role in advising a dental visit. Barker and Horton (2008) in their study among the pre-school children in California showed that parents played a major role in influencing their children's oral health and access to care. These findings could be explained by the fact that the respondents in this study were teenagers who try to achieve independence and establish their own identity without family and friends interference.

In agreement with Joshi *et al.* (2005), most students (66%) experienced fear during the first dental visit and the main reason that hampered a dental visit was fear of the dental needle. Early oral education in children had a positive influence on dental anxiety, improving the long term dental follow-up (Nicolas *et al.,* 2007). Although local dental health authorities have taken enormous efforts to start dental check-up as early as in pre-school level, the experience of first dental visit play an important role in encouraging young children to follow up. Many times, young children are frightened off after one visit due to unpleasant experience.

More than half (60.8%) of the students felt that it was necessary to make decisions about the dental treatments they need. However, 55.0% of them were not able to do so. This may be due to the lack of oral health knowledge among these students. Most of them believed that the dentists will always take care of their patients (90.9%), and explain the dental problem and solve it for them (86.6%). Only 29.7% of them agreed that dentists emphasized on treatment but not prevention. This shows that the role of dentists in promoting and disseminating the knowledge of oral disease prevention is essential. However, with the limited number of dentists serving the patients, the amount of time dentists can spend with each of the patient is compromised. Therefore, the role of educating oral health should not totally on dentists alone.

Although most of the students stated that regular dental visit was necessary, the data showed that only 24.4% of them had practised it. This shows that the awareness of oral health does not necessarily influence good dental practice. Barker and Horton (2008) showed that delay in seeking dental care could be attributed to other factors like parental beliefs and practices, lack of economic resources and accessibility of dental services.

The study showed that 95.7% of the students brushed their teeth at least twice a day, which was more than twice the figure (44.4%) reported by WHO (2008). There were 95.7% of the students who brushed their teeth at least twice or more per day, which was higher than Finnish adolescents (Kuusela *et al*., 1997). Girls were found to brush their teeth more frequently, and spent longer time during toothbrushing as compared to boys, supported by other studies (Rise *et al*., 1991; Kuusela *et al*., 1997; Honkala *et al*., 2002; Al-Sadhan, 2003; Al-Ansari *et al*., 2006, Gordon and Roberts, 2005).

Toothbrush and toothpaste were the most commonly used oral hygiene aids, as that reported elsewhere (Russel *et al*., 1989; Lin *et al*. 2001; Al-Sadhan, 2003; Al-Ansari *et al*., 2006). However, the use of dental floss was still not very popular among the secondary school students as evident in this study (11.5%). This was in contrast with the finding in San Francisco where 75% of the 12-14 years old students there used dental floss at least once per day (Walsh, 1985); and in Iraq where over half of the students used dental floss once or more a week (Russel *et al*., 1989). Most of the students practised toothbrushing in the morning and before bedtime.

Female students had more sugar intake than the male students from the consumption of sweet food, sweet snacks and soft drinks. Studies had shown that girls usually have greater preference for sweet foods while boys will opt for higher fat and salt content fast-foods and snacks (Oogarah-Pratap, 2007).

In terms of frequency of sweet snacking, there was no significant difference between the age groups, similar to Al-Sadhan's findings (2003). As the age difference among the groups was small, it is not surprising to note that the respondents shared the same interest in sweet snacks, like most of the teenagers do. Despite of this, there was still a minority (19.1%) of the respondents claimed they have never eaten any candy/chocolate/sweet – a figure that is higher as compared to 12-year-old students in Spain (6%) (Smyth *et al*., 2007). Other than sweet snack, carbonated drinks was reported to be the most favorable among the respondents where majority (77%) claimed they drink carbonated drinks and 26.3% have at least once per day. The availability of the sweet food, snacks and carbonated drinks within and outside the compound of the school had facilitated the purchasing of the items among the students. Students seem to be more attracted by the taste and appearance of the food than its nutritional value.

Since permission was not granted to access dental records of the secondary school students due to data confidentiality, this study was not able to compare the students' knowledge, attitude and practice of oral knowledge with their oral health status. Furthermore, the exclusion of Form 3 and 5 students has limited the generalisation of this study.

In conclusion, the oral health knowledge, attitude and practice among the secondary school students in Kuching is still below the satisfactory level. The findings of this study suggest that awareness on the importance of oral health needs to be enhanced among the secondary school students in Kuching, Sarawak. There is a need to decrease dependency on oral health personnel, and encourage students to take responsibility for their own oral health. The schools may serve as the best platform for promotion of oral health care among teenagers. The oral health education programmes should be intensified to promote oral healthcare a lifelong practice. The incorporation of oral health education activities into the school's curriculum has already taken place, but more efforts in the form of educational materials, health promotion activities need to be carried out. Undoubtedly, the support from the parents and teachers in various ways – organization and participation is essential. The school health policies are already in place with the introduction of healthy eating behaviour that bans sugar foods and drinks in the school premises. However, the implementation still needs to be strengthened. Healthy foods must be made available in the school canteens, while the canteens should be prohibited from selling food and drinks that contain high sugar levels. Although parents play a role of influence the eating behaviour of their children, a more effective idea would be empowering the children to make healthy food choices. At this age, these students are more likely to purchase food on their own as compared to primary school children.

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