PRACTICES, ATTITUDES AND AWARENESS OF SUBURBAN ADOLESCENCE SCHOOL CHILDREN TOWARDS ORAL HYGIENE: SCHOOL- BASED SURVEY

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Abstract

Background: Oral hygiene is importance in maintaining a good oral health as it may affect the general health of the body. Adolescence features a stage of significant caries activity for countless individuals. Thus, the purpose of this study was to assess the knowledge, attitude and practice among adolescence suburban school children towards oral hygiene.

Methods: A cross-sectional study in which self-administered questionnaire was distributed to 300 students at selected suburban public schools in Selangor based on stratified sampling. The questionnaire comprised of socio-demographic characteristics, knowledge about oral hygiene, attitude towards oral hygiene and practice for prevention of oral disease. Students who had previously resided in urban areas for a minimum period of 1 year in the past 5 years were excluded. Data were analyzed by using descriptive analysis and Chi-squared test in SPSS version 21.

Results: A total of 252 answered questionnaires were returned. The results of the study indicated low level of awareness for oral hygiene; 75.4 % showed lack of knowledge on dental plaque, 81.3% did not use floss, only 46.0 % brush their teeth twice per day and 27.8% visited a dentist last 6 months ago. A good attitude towards oral hygiene is still lacking, nevertheless a majority of the respondents have slight negative view toward dental visit which is mostly influenced by their anxiety.

Conclusion: This study revealed deficient of oral hygiene awareness among adolescence suburban school children in certain aspects of dental hygiene. It therefore highlights that urbanization does not always correlate with high level of oral hygiene awareness.

Keywords: *Adolescent, Attitude, Awareness, Oral Hygiene, Practice, Suburban, School Children*

Introduction

Oral diseases are preventable, but they remain as a major challenge in oral health due to many etiological factors (1,2). Oral diseases are the most common noncommunicable diseases and affect people throughout their lifetime, causing pain, discomfort, disfigurement and even death (3). The risk to get oral disease will increase when maintenance of good oral hygiene practices and awareness are ignored. Pattern of practice, awareness and attitude toward oral hygiene depends on several factors such as socioeconomic status, geographical status, gender and age (4-6). Positive relationship between urbanization with the oral hygiene practices have been reported in higher socioeconomic class (6-9).

In Malaysia there was a significant difference between level of understanding of oral hygiene and oral hygiene practice in rural and urban adolescence (10). Urban adolescence have better exposure through school programmes, better transportation, more clinics which are close to them and with better technology, good role of parents and society, and better awareness towards dental care. Adolescence is defined as a phase of life between 10-19 years old (11). In Malaysia, 26% of 15 to 19-year-old have been reported to have healthy periodontal tissues (12). The increased sex hormones during adolescence is suspected to be a cause of the increased prevalence of periodontal disease thus affecting the composition of the subgingival microflora (13). Studies had demonstrated that having

profound knowledge of oral health shows better oral hygiene practice (14). Currently, there are limited studies on oral hygiene practice, attitudes, and awareness of school children in suburban areas from developing countries such as Malaysia in comparison with those from developed countries specifically among the adolescents (15-16). There are limited studies on oral hygiene practice, attitudes, and awareness of school children in suburban areas from developing countries such as Malaysia in comparison with those from developed countries specifically among the adolescents until now. Cheah et al. (15) looked only on oral health knowledge, attitude and practice among secondary school students in Kuching, Sarawak while Raman et al. (16) studied oral health awareness, behaviour and status among 16-year-old students in Penang. Both studies had been done in urban areas. Therefore, our study is done as school-based survey in schools in Puncak Alam, one of the suburban areas in Selangor. Adequate oral health education should be given to the subjects with the purpose of producing healthy attitude and practice. To generate such health education, the evaluation of knowledge, attitude and practice is of fundamental importance (17). Thus, the purpose of this study was to assess the knowledge, attitude and practice among adolescence suburban school children towards oral hygiene.

Materials and Methods

This study was adopted from a previous study done by Al-Omiri et al. (17). A cross-sectional study of suburban school children was conducted at selected public schools. The sample selection was based on stratified random sampling. Uncontrolled quota sampling was used from Sekolah Kebangsaan Puncak Alam 2 and Sekolah Menengah Kebangsaan Puncak Alam which consists of Year 4-6 of the primary school, until Form 5-6 of the secondary school. In uncontrolled quota sampling, subjects chosen for these categories are a convenience sample, selected in any way that the interviewer chooses. These schools were chosen to represent schools in suburban areas. Ethics approval was attained from UiTM research ethics committee with ethics number REC/243/19. Consent from parents were obtained for each student before the survey was conducted.

Sample size was calculated using Epi Info with $\alpha = 0.05$, expected frequency was 79.8%, non-response rate was 20%; yielding a final value of 298 participants. The population was divided into 3 groups based on stage of adolescent development age 10-19. Inclusion criteria for participants in this study are: 1) aged between 10-19 years old, 2) received education in suburban school, 3) healthy in general (in terms of physical, mental, and social well-being). The students who had previously resided in the urban areas for a minimum period of 1 year in the previous 5 years are excluded. A total of 300 students participated in this study and 252 returned completed questionnaires.

Data collection

All respondents were requested to answer a comprehensive questionnaire adopted from Al-Omiri et al. (17). Participants were screened for parameters such as sociodemographic characteristic (age, gender, race, and family financial background), knowledge, attitude and practice on oral hygiene. The questionnaire consisted of 4 sections: sociodemographic characteristics (4 questions), items designed to assess the attitudes (10 questions), knowledge (10 questions) and behaviour (5 questions) of the adolescent in suburban school regarding their oral hygiene and dental treatment. The sociodemographic characteristics are the independent variables, whilst the knowledge, attitude and practice on oral hygiene are the outcomes or dependent variables. According to Kellet & Ding (18), children can and do provide reliable responses if questioned in a manner that they can understand. To make the school children reliable respondents, we modified the survey into a relevant and appropriate form of questions so that our target sample were able to understand. After obtaining the ethical approval by The Faculty Research and Ethics Committee, a letter was sent to the selected schools explaining the purpose of the study and the procedures that would be followed during its conduct. The headmaster/principal of each school informed the students and their parents about the study, and a day was set for each school to collect the data. Parents' approval and the subject's informed consent were obtained before recruiting the school students into this study. Items that evaluated the participants' dental attitudes included question on anxiety or fear from dental treatment, feelings concerning the treatment, thoughts about receiving dental treatment, attitudes towards oral and body health generally, and attitudes towards regular dental attendance (17).

Exclusion criteria are:

1. Participant who is not a school student
2. Participant who formerly lived in an urban area

Data analysis

All data were analysed using the Statistical Package for the Social Sciences (SPSS) version 21.0 for Windows. Descriptive analysis was used for analysing the socio demographic profiles of the participants, and knowledge of, practice of and attitude towards oral hygiene with appropriate descriptive table. Chi-squared test was used to compare between 3 adolescence age group. The levels of knowledge, attitude and practice were analyzed by using method adopted from Rad et al. (19) as shown in Table 1.

Results

Socio demographic characteristics

The mean age of the respondents was (± 13-year-old), which is in early adolescent with the majority being 10 to 14 years old (52.8%), followed by middle adolescent with 15-16 years old (39.7%), and late adolescent being17-19 years old (7.5%). The respondents were females (54.8%) and males (45.2%). Majority of them were Malays (98.8%), followed by Indian (0.8%) and Chinese (0.4%). Most of the respondents (90.5%) had family income between RM 3000 to RM 5000 and 7.1% had income less than RM 3000. Only

Table 1: Method of calculating KAP scores

Variables	Number of Questions	Score to Answers	Level of Variables (%)
Knowledge	10	1= Correct 0= Wrong/ Don't know	Poor = 0-1.7 (0-33) Moderate = 1.8-3.4 (34-67) Good = 3.5-5.0 (68-100)
Attitude	10	1= Correct 0= Wrong/ Don't know	Poor = 0-2.3 (0-33) Moderate = 2.4-4.8 (34-67) Good = 4.9-7.0 (68-100)
Practice	5	1= Good practice 0= Poor practice	Poor = 0-1.3 (0-33) Moderate = 1.4-2.7 (34-67) Good = 2.8-4.0 (68-100)

2.4% of the respondents had a family income of RM5000 and above.

Table 2: Socio-demographic characteristics of the respondents (n=252)

Characteristic	N	%
Question 1: Age		
Early (10-14 years old)	133	52.8
Middle (15-16 years old)	100	39.7
Late (17-19 years old)	19	7.5
Question 2: Gender		
Male	114	45.2
Female	138	54.8
Question 3: Race		
Malay	249	98.8
Chinese	1	0.4
Indian	2	0.8
Question 4: Family Income		
<3000	18	7.1
3000- 5000	228	90.5
>5000	6	2.4

Knowledge

A total of 72.1% respondents reported to know the meaning of gum bleeding, which is 'inflamed gum', with 34.5% early, 31.3% middle and 6.3% late adolescent who answered, 'inflamed gum'. Less than half of the respondents (33.7%) agreed that using toothbrush, toothpaste and floss can prevent gum bleeding. However, only 24.6% knew that plaque is also known as soft debris on the tooth surface which was answered by a majority of middle adolescent. More than half of the 16 respondents (54%) were confused that dental plaque can cause staining and some of them do not know the effect of plaque on oral health. Meanwhile most of the respondents know that caries can affect teeth appearance (87.3%), sweet food cause dental disease (90.8%), and same goes with fizzy drink (74.5%), brushing can prevent dental disease (81.3%) and fluoride will enhance strength of teeth (70.2%). Half of respondents understand that they need to change toothbrush every 3 months (54%).

Table 3: Knowledge of oral hygiene among respondents (n=252)

	Correct answer, n			Total (%)
	Early Adolescent	Middle Adolescent	Late Adolescent	
Question 1: Meaning of gum bleeding				
Inflamed gum	87(34.5%)	79(31.3%)	16(6.3%)	182 (72.1)
Question 2: How do you protect yourself from gum bleeding?				
Use toothbrush, tooth paste and floss	53 (21.0%)	28 (11.1%)	4 (1.6%)	85 (33.7)
Question 3: What does plaque mean?				
Soft debris on the teeth	20 (7.9%)	34 (13.5%)	8 (3.2%)	62 (24.6)
Question 4: Dental plaque lead to these stated below EXCEPT?				
Staining of teeth	41(16.3%)	17 (6.7%)	4 (1.6%)	62 (24.6)
I do not know	41(16.3%)	29 (11.5%)	4 (1.6%)	74 (29.4)
Question 5: Carious teeth can affect teeth appearance				
Yes	105 (41.7%)	97 (38.5%)	18 (7.1%)	220 (87.3)
Question 6: Sweets affect the teeth adversely				
Yes	116 (46.0%)	95 (37.7%)	18 (7.1%)	229 (90.8)
Question 7: Fizzy drinks affect the teeth adversely				
Yes	89 (35.3%)	81(32.1%)	18(7.1%)	188 (74.5)
Question 8: Brushing teeth prevents dental decay				
Yes	95 (37.7%)	92 (36.5%)	18 (7.1%)	205 (81.3)
Question 9: Using fluoride strengthen the teeth				
Yes	83 (32.9%)	79 (31.3%)	15 (6.0%)	177 (70.2)
Question 10: How often should you change your toothbrush?				
Once per 3 months	72 (28.6%)	60 (23.8%)	4 (1.6%)	136 (54.0)

Attitude

A total of 62.2% of respondents agreed that it is necessary to have regular dental visit. During their first visit, they felt slightly afraid (51.6%), scared and reluctant (37.2%), slightly afraid (29.1%) but some are never afraid (22.6%). Half responded that the reasons that they are afraid is because of being afraid of the dental needle (51.1%) and hand piece (36.9%), and that they are not ill (38.6%). However, they agreed that general body health has relationship to oral disease (62.7%) and they are taking care of their teeth as much as other parts of their body (70.3%).

Table 4: Attitude among respondents towards oral hygiene (n=252)

Classification	Frequency, n			Total (%)
	Early Adolescent	Middle Adolescent	Late Adolescent	
Question 1: Regular dental visit is necessary				
Yes	68 (26.9%)	75 (29.8%)	13 (5.2%)	62.2
Question 2: When I first visited the dentist				
I was scared and reluctant	38 (28.8%)	11 (4.4%)	10 (4.0%)	37.2
slightly afraid	30 (22.7%)	10 (4.0%)	6 (2.4%)	29.1
very slightly afraid	44 (33.3%)	44 (17.5%)	2 (0.8%)	51.6
I was never afraid	21 (8.3%)	35 (13.9%)	1 (0.4%)	22.6
Question 3: 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	51 (20.2%)	27 (10.7%)	15 (6.0%)	36.9
I am afraid of the dental needle	79 (31.3%)	33 (13.1%)	17 (6.7%)	51.1
There is no time	24 (9.5%)	32 (12.7%)	3 (1.2%)	23.4
There is no pain to go to the dentist	44 (17.5%)	44 (17.5%)	9 (3.6%)	38.6
Treatment cost is high	28 (11.1%)	27 (10.7%)	15 (6.0%)	27.8
There are no dental clinics nearby	15 (6.0%)	29 (11.5%)	3 (1.2%)	18.7
I am afraid sitting in the waiting room	12 (4.8%)	8 (3.2%)	4 (1.6%)	9.6
I am afraid even from thinking of tomorrow's appointment	21 (8.3%)	13 (5.2%)	8 (3.2%)	16.7
Question 4: General body health has relationship to oral and dental disease				
Yes	62 (24.6)	82 (32.5%)	14 (5.6%)	62.7
Question 5: You care your teeth as much as other any part other body				
Yes	76 (30.2%)	97 (38.5%)	4 (1.6%)	70.3

Practice

Some respondents brush their teeth twice per day (46%) while others do it more than twice per day (39.3%). Meanwhile others brushed her teeth once per day (13.1%) and sme do not brush their teeth at all (1.6%). Regarding oral hygiene aids, most of the respondents used toothbrush and toothpaste (95.2%), mouthwash (49.9%), dental floss (14.7%), toothpick (15.5%) and others (2%). Less than half of the respondents considered 1 min as an ideal time of tooth brushing (39.6%), while others said 2 min (33%), >2 min(18.6%) and less than 1 min (11.5%). Most of the respondents were aware that they need to clean their tongue, cannot share toothbrush and used fluoridated toothpaste and the percentages are 58.8%,94.4% and 69.5% respectively. There are various reasons for why the respondents visit the dentist. Only 46.8% visit the dentist when they have dental pain, 33.45% visit occasionally and 8.3% have dental visits every 6-12 months. There are respondents who had never visited a dentist before (11.6%) Less than a quarter of the respondents who answered that their last dental visit was more than 6 months ago (27.8%). Regarding the treatment done in their last dental visit, 34.1% of all respondents did check-ups and 23.5% had extraction. Meanwhile, 13.4% of the respondents considered had scaling, 18.7% filling, while other treatment were 0.4% and those with no history of treatment 10%.

Table 5: Oral hygiene practice among adolescents (n=252)

Characteristics	Frequency, n			Total (%)
	Early Adolescent	Middle Adolescent	Late Adolescent	
Question 1: How often do you brush your teeth?				
Do not brush	2 (0.8%)	2 (0.8%)	0 (0.0%)	4 (1.6)
Once per day	24 (9.5%)	6 (2.4%)	3 (1.2%)	33 (13.1)
Twice per day	58 (23.0%)	52 (20.6%)	6 (2.4%)	116 (46.0)
More than twice per day	49 (19.4%)	40 (15.9%)	10 (4.0%)	99 (39.3)
Question 2: What do you use to clean teeth?				
Toothbrush and toothpaste	124 (49.2%)	98 (38.9%)	18 (7.1%)	240 (95.2)
Dental floss	24 (9.5%)	14 (5.6%)	9 (3.6%)	47 (18.7)
Mouthwash	56 (22.2%)	52 (20.6%)	18 (7.1%)	126 (49.9)
Toothpick	19 (7.5%)	12 (4.8%)	8 (3.2%)	39 (15.5)
Others	4 (1.6%)	1 (0.4%)	0 (0.0%)	5 (2.0)
Question 3: When do you brush your teeth? (answers may be more than one)				
In the morning	109(43.3%)	90(35.7%)	19(7.5%)	218 (86.5)
After lunch	29(11.5%)	13(5.2%)	11(4.4%)	53 (21.1)
Before bedtime	79 (31.3%)	65 (25.8%)	15 (6.0%)	159 (63.1)
After every meal	27 (10.7%)	21 (8.3%)	5 (2.0%)	53 (21.0)
Question 4: For how long do you brush your teeth?				
<1min	18 (7.1%)	8 (3.2%)	3 (1.2%)	29 (11.5)
1 min	51 (20.2%)	40 (15.9%)	2 (0.8%)	93 (36.9)
2 min	43 (17.1%)	28 (11.1%)	12 (4.8%)	83 (33.0)
>2 min	21 (8.3%)	24 (9.5%)	2 (0.8%)	47 (18.6)
Question 5: Do you clean your tongue after brushing teeth?				

Table 5: Oral hygiene practice among adolescents (n=252) (continued)

Characteristics	Frequency, n			Total (%)
	Early Adolescent	Middle Adolescent	Late Adolescent	
Yes	72 (28.6%)	69 (27.4%)	7 (2.8%)	148 (58.8)
No	61 (24.2%)	31 (12.3%)	12 (4.8%)	104 (41.3)
Question 6: Do you share your toothbrush with others?				
Yes	9 (3.6%)	3 (1.2%)	2 (0.8%)	14 (5.6)
No	124 (49.2%)	97 (38.5%)	17 (6.7%)	238 (94.4)
Question 7: Does your toothpaste contain fluoride?				
Yes	88 (34.9%)	72 (28.6%)	15 (6.0%)	175 (69.5)
No	14 (5.6%)	6 (2.4%)	0 (0.0%)	20 (8.0)
Do not know	31 (12.3%)	22 (8.7%)	4 (1.6%)	57 (22.6)
Question 8: How often do you visit the dentist?				
Regularly every 6-12 months	17 (6.7%)	3 (1.2%)	1 (0.4%)	21 (8.3)
Occasionally	43 (17.1%)	35 (13.9%)	6 (2.4%)	84 (33.4)
When I have dental pain	58 (23.0%)	49 (19.4%)	11 (4.4%)	118 (46.8)
I never visited a dentist	15 (6.0%)	13 (5.2%)	1 (0.4%)	29 (11.6)
Question 9: Last time I visited a dentist was				
Last 6 months ago	39 (15.5%)	30 (11.9%)	1 (0.4%)	70 (27.8)
6-12 month ago	19 (7.5%)	20 (7.9%)	5 (2.0%)	44 (17.4)
Last 1-2 years	27 (10.7%)	23 (9.1%)	6 (2.4%)	56 (22.2)
Last 2-5 years	14 (5.6%)	12 (4.8%)	5 (2.0%)	31 (12.4)
>5 years	21 (8.3%)	4 (1.6%)	1 (0.4%)	26 (10.3)
No history of dental visit	13 (5.2%)	11 (4.4%)	1 (0.4%)	25 (10.0)
Question 10: The treatment(s) I sought during my last visit to the dentist was (were)				
Check up	28 (11.1%)	58 (23.0%)	0 (0.0%)	86 (34.1)
Scaling	20 (7.9%)	11 (4.4%)	3 (1.2%)	34 (13.5)
Filling	27 (10.7%)	14 (5.6%)	6 (2.4%)	47 (18.7)
Extraction	45 (17.9%)	5 (2.0%)	9 (3.6%)	59 (23.5)
Others	0 (0.0%)	1 (0.4%)	0 (0.0%)	1 (0.4)
No history of dental visit	13 (5.2%)	11 (4.4%)	1 (0.4%)	25 (10.0)

Discussion

Adolescence is a time of great change for young people when physical changes are happening at an accelerated rate. They also experience cognitive, social/emotional and interpersonal changes as well (20). Early adolescent experience struggle with sense of identity, likely to express feelings by action than by words, less attention shown to parents and peer group influences their interests (20). Meanwhile middle adolescent has self-involvement for their self-extremely concerned with appearance and with their bodies, lowered opinion of parents and withdrawal from them (21). Late adolescent is a stage which is nearly reaching adulthood, they will have firmer identity, ability to think ideas through and express in words, ability to make independent decisions and self-reliance (21). By considering all of these changes that are experienced by adolescent, we are interested to find out relationship between these changes with their oral hygiene practice, awareness and knowledge.

In this study, the questions that were asked are about teeth appearance and tooth decay prevention by tooth brushing (Questions 5 and 8) scored above 80% in the knowledge section. However, the knowledge about dental plaque or biofilm was still poor (Questions 3 and 4). These findings are in agreement with studies done in Jordan and Sarawak (Malaysia) amongst the school children (15,17). Cheah et al. (15) suggested that the lack of knowledge concerning periodontal health could reflect the dental health education.

It showed low significant difference in the knowledge score between genders. Questions that were asked about the meaning of bleeding gum, the effects of fizzy drinks and fluoride to the teeth (Questions 1, 7 and 9) showed a significant difference ($p < 0.05$) between genders. It was reported that male school children had better knowledge than their counterpart (22). However, this study showed there was only slight difference in terms of knowledge, with percentages difference more or less being the same. This may be due to the exposure of the similar dental health education in the schools.

American Dental Association recommended the change of toothbrush every 3-4 months (21). It has been documented that toothbrush with frayed bristles is ineffective for proper cleaning (23). In this study, 54.0% changed their toothbrush every 3 months, with middle adolescent group at the highest percentage (60%). Meanwhile, 68.4% of the late adolescent group changed their toothbrush every 6 months. Students should be educated about the significance of changing toothbrush every 3 months at the most. The fraying toothbrushes will not clean the teeth properly, thus predisposes the teeth to many harmful microorganisms.

It was found that 46.0% of the respondents in this study brushed their teeth at least twice and 39.3% of brush more than twice daily. There was no significant difference in the frequency of toothbrushing by age and gender ($p > 0.05$). Majority of the population clean their teeth by using toothbrush and toothpaste (95.2%), however, only 69.5% used toothpaste that contain fluoride. American Academy of Paediatric Dentistry recommended the use of fluoridated toothpaste in reducing dental caries in children (24). Apart from that 81.3% claimed they do not use floss. It was reported that floss eliminates up to 80% of dental plaque from interproximal areas and recommends to practise flossing on a daily basis. Thus, the public need to be educated on the use of dental floss.

A total of 50% of the population answered that they used mouthwash, with the highest percentage in the late

adolescent age group (94.7%) compared to only 42.1% in early adolescent. The findings of usage of floss and mouthwash agreed with a study done by Cheah et al. (15). This result of the use of mouthwash contradicts with the study by Al-Omiri et al. (17) that reported only 5.9% of the population use mouthwash. The reasons may be due to the influence from commercial marketing which claimed mouthwash can kill dental plaque or their needs to be socially accepted by their peers without having any mouth problems.

Most of the respondents brushed their teeth in the morning (86.5%) and before going to bed (63.1%). Approximately 51.6% brush their teeth for a period of equal to or more than 2 minutes while 11.5% take shorter time than 1 minute. Majority (73.7%) of age 17-19 population and 54.8% female students significantly brushed their teeth equal to or more than 2 minutes ($p < 0.05$). It has been proposed that the major cause of inadequate oral hygiene in the general population is that the brushing duration is too short (25). The frequently suggested tooth brushing times vary between 120 seconds (USA) and 180 seconds (Europe) (25).

About 58.7% answered that they did tongue cleaning after tooth brushing. Surprisingly, 63.2% of the late adolescent claimed they did not clean their tongue. A study revealed that build-up of bacterial plaque on the tongue is an important cause for oral malodour or bad breath in the adolescents. Oral malodour levels were significantly reduced after cleaning the surface of the tongue (25). Therefore, the adolescent should be educated on the practice of tongue cleaning.

Approximately half of the subjects (46.8%) did dental visit only when they had pain which is in agreement by a study from Cheah (15). A total of 27.8% of the students had regular dental attendance every 6 months and 17.5% every 6-12 months. Majority of the subjects (34.1%) stated that the last dental treatment sought was dental check-up. This could be due to school oral health programme which require all the students to visit their dentist as part of the annual routine check-up (15). Majority of the students answered 'very slightly afraid' during their first dental visit if we compare by age and gender category. In this study, more female (19.4%) felt very anxiety during their first dental visit compared to male (16.3%). The students who did not visit the dentist or were afraid to seek dental treatment are different in terms of the reasons between genders. Most girls claimed that they were afraid of the dental needle, hand piece or because of no pain. Meanwhile most boys did not have dental visit frequently because of costly treatment, no nearby dental clinic and having no time for a dental visit. Psychological factors also play role in this condition as male less likely to express their fear and anxiety compared to female. They will use other reason to hide their true feelings (26).

This result are in agreement with previous research (27) which reported that approximately 18% avoided going to the dentist due to fear or anxiety. Many people did not consider going to the dentist to be worth making time for, with just over 30% of those people who avoided or delayed going to the dentist citing lack of time as well as not getting around to it as reasons. By far the biggest reason was due to the cost of dental treatment, representing 67.6% of those who avoided going to the dentist or 45.4% of all people.

Nonetheless, early adolescent have more fear in seeking dental treatment compared to middle and late adolescent. They are afraid of even thinking of the next day's appointment (8.3%). It could happen due to traumatic past dental experience. It was found that children with dental fear had encountered their first traumatic experience earlier in life than non-fearful children (28). Participants mostly understand the relationship between oral health and general body health and its importance. Many systemic diseases have oral manifestations which proved significant relationship of oral health and general health status. These oral manifestations may be the initial sign of clinical disease. The oral cavity is also known as portal of entry and site where the microbial infections occurred and later affect general health status. Female students showed more concern about these relationship (37.7%) and took better care of oral hygiene (39.7%) as compared to male. By comparing age categories, middle adolescent shows better attitude in oral hygiene care (38.5%).

Since permission was not granted to access dental records of the 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, there is exclusion of Form 5 students who have limited available time as they have examination during our period of doing survey. Our respondents are mostly of the Malay ethnic group due to a higher population of Malay adolescent in schools of Puncak Alam compared to Chinese and Indian thus we cannot analyze this result based on race categories.

This project is dependent on self-reported data that what were derived from adolescent with varying levels of familiarity with completion of questionnaires and varying levels of language ability, which may influence the selection of responses. It is also not known if the particular sample from one place in one rural area is representative of another samplewith similar age in another rural area.

The findings of this study suggest that awareness on the importance of oral hygiene needs to be enhanced among school students regardless of location or area. A study showed that repeated oral hygiene instruction makes a major improvement on the amount of awareness, attitude and practice of patients in relation to plaque control. In addition, there is a need to decrease dependency on oral health personnel, as to encourage the population to take responsibility of their own oral health such as by strengthening the implementation of oral health education in schools. The results of this study might be of assistance to weigh up the implementation of oral health education programs by using school as a platform in Malaysia in the future.

Conclusion

To conclude, oral hygiene knowledge, attitude and practice among adolescents in Puncak Alam are still below the satisfactory level. This study revealed a deficiency of oral hygiene awareness among suburban school children in certain aspects of dental hygiene. The oral hygiene knowledge, attitude and practice among adolescents in some suburban areas are still below the satisfactory level. Thus, it can be concluded that urbanization does not always correlate with high level of oral hygiene awareness.

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Competing interests

The authors declare that they have no competing interests.

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