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Oral Health Awareness, Behaviour and Status among Malaysian 16-Year-Old School Students in Penang

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ABSTRACT

Aim. The aim of this study was to assess theawareness and behaviour among Malaysian 16 year old school students towards oral health and as well as to evaluate their oral health status.

Methods. Secondary School children (n=1407) of age 16 years attending public schools in Penang islandwere recruited into this study. The subjects completed a questionnaire that aimedto evaluate theirawareness and behaviour towards oral health and dental treatment. A clinical oral examination was also carried out to determine their oral health status.

Result. Participants cleaned their teeth by brushing using tooth paste and 87% brush at least twice a day. 59% changed their tooth brush every 3 months. 62%do not know what dental floss is. 69% agreed that oralhealth effects and is as important as general health,however 46% believed that they should only visit a dentist when and if they have dental problems. 51% respondents believed that dental caries has an effect on physical appearance.More than 65%believed that sweets and carbonated drinks have an effect on oral health. 54%reported that parents played a role in advising and enforcing oral hygiene.More than 50% of respondents did not know what gum disease was or how it can be prevented and that it is related to systemic disease.80.8 had DMFX ≤2.85% had plaque score > than 20% and only 6.3 % were free from periodontal disease.

Conclusion. The results of this study indicate that oral health awareness and behaviour with an emphasis on periodontal health in school children need to be improved. Comprehensive oral health educational programs for school children are required to achieve this goal.

Key Words: Not available

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INTRODUCTION

Periodontal disease and dental caries affects the majority of population , their prevalence and severity varying according to age, sex, race , socioeconomic factors local oral as well as systemic factors and methods of oral hygiene.[1] In the past fifty years a reduction in the severity and prevalence of oral disease among the population of the developed countries has been reported.[1-4]

The reasons for the improved oral health have been attributed to improved oral hygiene practices, fluorides in tooth paste, topical fluoride application, effective use of oral health services and establishment of school-based preventive programmes.[5-9] Significant improvements in oral health awareness, dental knowledge and attitudes in children and parents have also been reported.[10-12]

In Malaysia under the Ministry of Health, a comprehensive and systematic Incremental Dental Care Programme is carried out for the school children in the country. The programme aims to render the students orally fit when they leave school through a gradual but cumulative improvement in their oral health status.

The National Oral Health Survey of SchoolChildren 2007(NOHSS2007) reported thatwhile 40% of the 16- year-olds were caries free, prevalence of periodontal disease was as high as 89.4%.13.

The causes of oral diseases are known and are preventable through relatively simple and affordable health measures. Tooth brushing and flossing are the most commonly performed oral self-care behaviour. It is recommended that individuals should brush and floss their teeth at least once a day and visit a dentist regularly to avoid oral diseases.

There are limited studies on oral health attitudes and behaviour of children from developing countries such as Malaysia in comparison with those from developed countries13, although such knowledge is an indication of the efficacy of applied dental health education programs. The World Health Organisation (WHO) recommends age 15 for oral health surveys.[14] In Malaysia 15 year old childre undergo important national examination therefore children aged 16 are used as proxy for this age group in surveys on school children.Therefore the purpose of this study was to investigate oral health awareness,behaviour and status among Malaysian 16-year-old school students in Penang.

METHODOLOGY

The research was approved by the National Institute of Health and Medical Research Ethics CommitteeMinistry of Health Malaysia(NMRR-10-454-5869).Permission to conduct the research was also obtained from the Penang State Education Department.

Setting - The study was conducted in secondary schools located in Penang Island which were under the Ministry Of Heath Malaysia Dental Health Programme. The schools chosen were based on logistics. Schools located close to the work place of the researchers were used for the study. Seven public schools on Penang island were chosen for the study.

Study design - A cross sectional study was chosen as the study design to meet the objective of the study. Data was collected from May to November 2010.

Sample - All form four students (16 years old) in the chosen schools were eligible to participate. The participants were briefed on the purpose and procedure of the study and only those who consented were enrolled in the study. At the time of the study there were 1589 form four students enrolled in these schools.

Tools - Data was collected by trained post basic (Periodontics) dental nurses. A self-response questionnaire was used to collect the data. The questionnaire was given to the students after the briefing and recollected as students completed them. The potential limitation of self-reported questionnaire is the varying levels of language ability, which may have influenced the selection of responses, due to misinterpretation and misunderstanding of questionnaire by the subjects. To overcome this problem the questions were worded simply for easy comprehension and theinvestigators were always available for anyclarification during the completion of the questionnaire.The questionnaire had two sections; demographic and oral health practices and awareness. Besides the baseline demographic data, information on the awareness and practices of oral health was collected using a questionnaire which is a modified version adapted from studies by Peterson et al.,[15] Stenberg et al.[16] and Al-Omiri et al.[17] A clinical oral examination was also undertaken using portable dental chair, Waldmann operating light, disposable mouth mirrors,probes and CPI periodontal probes.Each of the standing teeth in the four quadrants was studied.Dental indices recorded were DMFX score,presence or absence of plaque on tooth surfaces (Plaque Index; Silness&Loe 1964, 0 = absence of plaque 1 = presence of plaque on stroking the tooth surface with a probe tip, 2 = plaque present on visual examination) and Community Periodontal Index Scores (0-4).

Analysis - Data was be tabulated, cross tabulated and analysed using PASW version 18. Inferential analysis was done using chi square test. A probability value of $P<0.05$ was considered to be statistically significant.

Ethics - All respondents were asked to give an informed consent before enrolling in the study. The anonymity of the respondents is assured.

RESULTS

A total of 1407 students responded. Those that did not participate were because either they refused or were absent when the data was collected. As shown in table 1, most were male, Chinese, from urban schools with the parents' highest level of education upto secondary school.

Table 1. Demographic profile of respondants

Variable	n (%)
Gender	
Male	980 (69.7)
Female	427 (30.3)
Race	
Chinese	895 (63.6)
Malay	490 (34.8)
Indian	22 (1.6)
Location of school	
Urban	1206 (85.7)
Rural	201 (14.3)
Parents education level	
Primary school	52 (3.7)
Secondary school	1043 (74.1)
Uni/college	312 (22.2)

Table 2. Oral health practices and awareness

Variable	n (%)
Were you taught about oral hygiene	
Yes	1092 (77.6)
No	315 (22.4
How do you clean your teeth (multiple choice)	
Brushing using tooth paste	1407 (100)
Using dental floss	137 (9.7)
Mouth wash	379 (26.0)
Tooth pick	140 (10.0)
How often do you brush your teeth in a day	
Once	179 (12.7)
Twice	847 (60.2)
More than two times	381 (27.1)
How often do you change your tooth brush	
Every 3 months	828 (58.8)
Every 6 months	362 (25.7)
Every year	178 (12.7)
Every 2 years or more	39 (2.8)
Reason for brushing teeth (multiple response)	
To clean teeth	1349 (95.9)
Avoid caries	638 (45.3)
Avoid gum diseases	679 (48.3)
Avoid bad breath	1098 (78.0)
Concerning dental floss	
I floss every day	63 (4.5)
I floss once a while	470 (33.4)
I don’t know what is dental floss	874 (62.1)
Oral health can effect general health	
Yes	795 (56.5)
No	245 (17.4)
Don’t know	367 (26.1)
Oral health is as important as general health	
Yes	971 (69.0)
No	125 (8.9)
Don’t know	311 (22.1)
Regular dental check-up is important	
Yes	1022 (72.6)

No	112 (8.0)
Don't know	273 (19.4)
How often should you go for a dental check up	
Every 6 months	421 (29.9)
Every year	339 (24.1)
Only when one has dental problems	647 (46.0)
Parents role in oral health	
Advice and enforce	766 (54.4)
Advice only	374 (26.6)
No role	267 (19.0)
Do dental caries have an effect on physical appearance	
Yes	718 (51.0)
No	108 (7.7)
Don't know	581 (51.3)
Sweets have an effect on oral health	
Yes	1219 (86.6)
No	97 (6.9)
Don't know	91 (6.5)
Carbonated drink have an effect on oral health	
Yes	981 (69.7)
No	129 (9.2)
Don't know	297 (21.1)
Plaque is	
A soft deposit stuck on teeth	372 (26.4)
A hard deposit stuck on teeth	278 (19.8)
When the colour of the teeth fade	46 (3.3)
Don't know	711 (50.5)
Reason for not having a dental checkup (multiple response)	
Afraid	326 (99.7)
Expensive	317 (22.5)
Location of clinic	142 (10.1)
No time	523 (37.2)
No dental problem	614 (43.6)
What would happen if oral health is not maintained (multiple response)	446 (31.7)
Gum swelling	962 (68.4)
Tooth ache	294 (20.9)
Pus in gums	913 (64.3)
Bad breath	
What was done on your last dental check up (multiple response)	
Dental examination	1208 (85.9)
Dental filling	331 (23.5)
Scaling	359 (25.5)
Extraction	194 (13.8)
Orthodontic treatment	78 (5.5)
Others	155 (11.0)

As shown in table 2, majority of the respondents claimed they were taught about oral hygiene. Most cleaned their teeth by brushing using tooth paste twice a day. They changed their tooth brush every 3 months and the main reason they brushed their teeth was to avoid bad breath. Most responded that they did not know what dental floss and plaque was. Majority agreed that oral health effects and is as important as general health however they believed that they should only visit a dentist when and if they have dental problems hence the main reason given for not having a dental check-up was because they had no dental problems. Those that did go for a dental check-up most only had routine dental examination on their last visit. Most respondents believed that dental caries have

an effect on physical appearance and that sweets and carbonated drinks have an effect on oral health. Majority participants reported that their parents gave advice and enforced their oral hygiene routine.

Table 3. Awareness of gum diseases

Variable	n (%)
What will you do if your gums bleed when you brush	
Brush harder	136 (9.7)
Brush softer	750 (53.3)
Stop brushing	175 (12.4)
See a dental health practitioner	346 (24.6)
Do you know what is gum disease	
Yes	685 (48.7)
No	722 (51.3)
Gum disease is related to systemic disease	
Yes	307 (21.8)
No	1100 (78.2)
Do you know what are the signs of gum disease (multiple response)	
Bleeding gum	626 (44.5)
Loose teeth	160 (11.4)
Bad breadth	248 (17.6)
Teeth becomes long	48 (3.4)
gum swelling	405 (28.8)
gum pain	451 (32.1)
What are the causes of gum disease (multiple response)	
Infection	652 (46.3)
Lack of Calcium	398 (28.3)
Not visiting dentist	238 (16.9)
Smoking	378 (26.9)
Not brushing	664 (47.2)
Gum disease can be prevented by	
Brushing and flossing	308 (21.9)
Eating soft food	30 (2.1)
Don't know	1069 (76.0)
On your last visit to the dentist were you told you have gum problem	
Yes	430 (30.6)
No	977 (69.4)
On your last visit what was the treatment given to you for gum problem (multiple response)	179 (12.7)
Scaling	217 (15.4)
Dental advice	133 (9.5)
Extraction	14 (1.0)
Surgery	13 (0.9)
Others	

Table 3 shows the responses of the participants concerning gum diseases. Although majority did not know what gum disease was or how it can be prevented and that it is related to systemic disease, most responded that gum swelling and gum pain were the signs and not brushing was among the cause. Majority responded that they would brush softly if gums bled during brushing. Majoritywere not told if they had have gum disease on the last dental check-up.

Table 4 shows the results for the cross tabulation between gender and school location with the awareness of gum diseases. Female students were more likely to be told they had gum disease (OR 1.46 95%CI 1.15;1.86) when last visited a dentist hence they were more likely to know what gum disease is (OR 2.03 95%CI 1.61;2.56).

Table 4. Cross tabulation between gender and school location and awareness of gum diseases

	Gender				School Location			
Variables	Female n (%)	Male n (%)	Chi Square / p	OR (95% CI)	Urban n (%)	Rural n (%)	Chi Square / p	OR (95% CI)
What will you do if your gums bleed when you brush								
Brush harder	41 (30.1)	95 (69.9)	2.69 / 0.44		10 (73.5)	36 (26.5)	31.34 / <0.001*	
Brush softer	241 (32.1)	509 (67.9)			66 (89.2)	81 (10.8)		
Stop brushing	49 (28.0)	126 (72.0)			15 (89.1)	19 (10.9)		
See a dental health practitioner	96 (27.7)	250 (72.3)			28 (81.2)	65 (18.8)		
Do you know what is gum disease								
Yes	260 (30.3)	425 (62.0)	35.56 / <0.001	2.03 (1.61;2.56)*	568 (82.9)	117 (17.1)	8.51 / 0.004	0.64 (0.47;0.87)*
No	167 (23.1)	555 (76.9)			638 (88.4)	84 (11.6)		
Gum disease is related to systemic disease								
Yes	93 (30.3)	214 (69.7)	0.001 / 0.98		266 (86.6)	41 (13.4)	0.28 / 0.59	
No	334 (30.4)	766 (69.6)			940 (85.5)	160 (14.5)		
On your last visit to the dentist were you told you have gum problem								
Yes	155 (36.0)	275 (64.0)	9.76 / 0.002	1.46 (1.15;1.86)	348 (80.9)	82 (19.1)	11.26 / 0.001	0.59 (0.44;0.81)*
No	270 (27.8)	701 (72.2)			852 (87.7)	119 (1.3)		

Students from urban schools were least likely to know what gum disease is (OR 0.64 95%CI 0.47;0.87) probably because they were least likely diagnosed with gum problems on their last dental

visit (OR 0.59 95% CI 0.44;0.81). The differences in the responses to what they will do if gum bleeds when they brush was also statistically significant (p<0.001).

Table 5. DMFX, Plaque and CPI score

Variable	n (%)
DMFX	
≤ 2	1137 (80.8)
> 3	270 (19.2)
Plaque score	
≤ 20%	211 (15.0)
21-50%	664 (47.2)
≥ 51%	532 (37.8)
CPI score	
0	6.3
1	18.1
2	57.1
3	17.5
4	1.0

Table 5 show the DMFX,plaque score and CPI score of the students. Bar charts 1, 2 and 3 show the DMFX, plaque score % and CPI scores respectively. 80.8 % of the students have DMFX score of ≤ 2.85% of the studentshad more than 20% plaque score.More than 93.7% have periodontal disease.The majority were CPI scores 1,2 and 3 which can be managed by nonspecialist dental settings. 1 % had CPI score 4 which would require complex treatment.

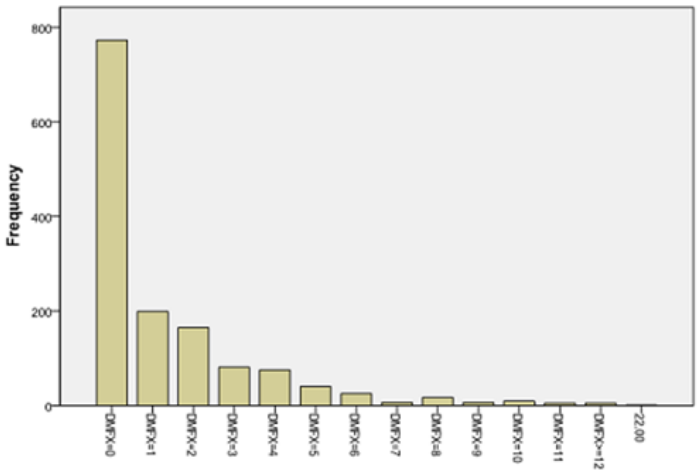

Figure 1. DMFX status.

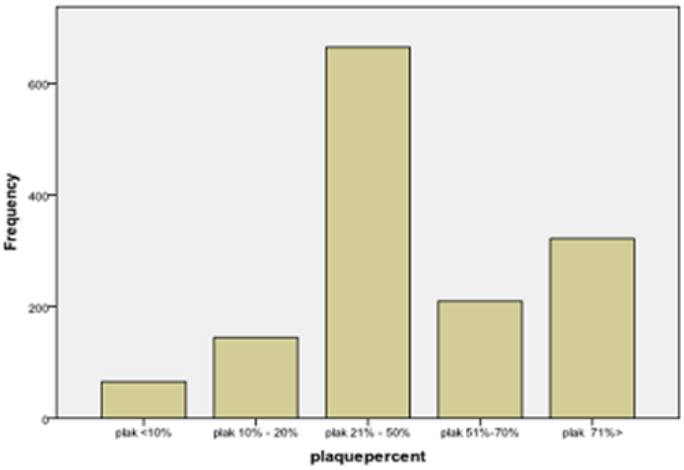

Figure 2. Plaque score percentage.

DISCUSSION

The school based approach to collect data for this study has resulted in a high response rate,89% of the total enrolment of 16 year old students in the selected schools.

The results of this study show that although tooth brushing is practiced regularly by all respondents,60 % twice daily most of them did not know what dental floss was and therefore rarely used it. Similar findings were reported in other European studies where 73–83% students in Sweden, Denmark, Germany, Austria and Norway brushed their teeth twice a day, use of the dental floss was rare.[18] Similar to the findings in the previous studies female students seem to have better awareness and behaviour towards oral health care. The American Dental Association has reported that floss removes up to 80% of plaque from inter-dental areas and recommends incorporating floss as part of a daily oral care routine.[19] Therefore education on the use of dental floss is needed.

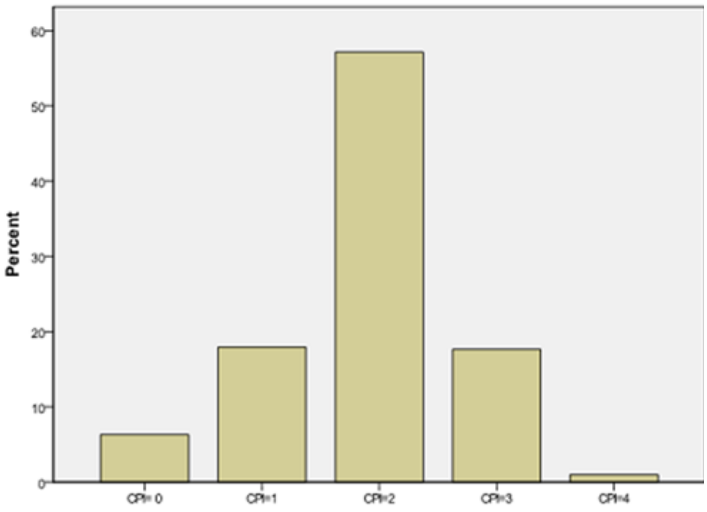

Figure 3. CPI score.

There is also higher awareness of dental caries includingits impact on the dentition, cause, and prevention incomparison to periodontal health. This could be attributedto the fact that signs and symptoms of dental caries areeasier noticed and felt compared to periodontal disease. Thus students are more likely to attend dental clinics seeking treatmentforcaries;therefore, they may receive more professional advice on it. A study by Brady et al.[20] on dental school patients reported that 73% of patients did not realize that they had periodontal disease and 79% had not been informed by their previous dentist about the existence of the disease. Another similar study in Switzerland21 also showed that around 59% patients were not informed Therefore oral health care providers must inform patients of their periodontal status and educate them on treatment and prevention of disease.

The results of this study also show that while DMFX scores are low in majority of students, more than 90% have periodontal disease and 1% out of this (CPI score 4) require more complex care. The findings of this study is comparable to the The National Oral Health Survey of SchoolChildren 2007which report a high prevalence of periodontal disease (89.4%) and a mean DMFX score of 2.1.14The high prevalence of periodontal disease can be attributed to poor oral hygiene reflected by the high levels of plaque among these students. Both epidemiological and clinical studies have shown that oral hygiene procedures, as performed by most subjects, are insufficient to control supragingival plaque formation and prevent gingivitisand more severe forms of periodontal disease, despite the fact that most individuals claim to brush their teeth at least twice a day.[22] Improper brushing technique and inadequate duration spent on oral hygiene practices must be corrected . Regular, repeated and also individualised oral hygiene instuction should be incorporated into the school health care preventive programmes.

CONCLUSION

The results of this study indicate that oral health awareness and behaviour with an emphasis on periodontal health in school children need to be improved. School children must also be taught of the importance of self- awareness and self-care to maintain a healthy mouth. Regular, reinforced and individualised demonstrations of oral hygiene measures must be given to students under the incremental dental care programme Comprehensive oral health educational programs for their parents are also required to achieve this goal.

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