Research Article

Oral Health Status and Knowledge, Attitudes and Practices of Students Attending Public Secondary Schools, in Georgetown

Zoe Perreira[1], Maritza O Perez[2] and Carlos Bruzon[3]*

[1]*School of Dentistry, University of Guyana, Guyana*
[2]*Master Public Health Programme, University of Guyana, Guyana*
[3]*School of dentistry, University of Guyana, Guyana*

*Corresponding Author: Carlos Bruzon, School of dentistry, University of Guyana, Guyana.

Abstract

Background: Oral health is essential to general health and wellbeing. Fostering good oral health behaviour is fundamental to the prevention of oral diseases. Adopting healthy practices at an early age can lead to improved dental health that is more sustainable in the future. In Guyana, very little information is available on the oral health status of adolescence.

Objective: This study examined oral health knowledge, attitudes and practices of 12 and 13-year-old students attending public secondary schools in Georgetown, with their oral health status.

Method: A cross-sectional study was conducted among 353 (7th grade) students. An oral health questionnaire was given followed by an oral examination. Data collected was exported from Microsoft Office Excel to SPSS version 20 for analysis. Continuous variables were summarized using frequency distributions, mean and standard deviation for quantitative variables. Contingency tables and chi-square analysis were used, and a p-value of <0.05 was considered statistically significant.

Results: The mean DMFT and PDI was 1.51 (SD 1.70) and 1.09 (SD 0.38), respectively. Statistical significance was observed for PDI values among gender (p *value* :0.04) and schools (*p value* 0.00). 46% students had moderate DMFT status (≤ 3) and mild to moderate gingivitis (58%). Students had a fair level of knowledge (81%), and positive attitudes towards oral health (89.2%). Most student participants practiced twice-daily tooth brushing (77.9%) using toothbrush and toothpaste (98.3% and 55%)and flossing (53.3%).

Conclusion: The oral health status of the students with dental caries and periodontal diseases was moderate to poor. 84.1 % of female students and 78.1 % of male students exhibited a fair level of knowledge on the causes of oral diseases and the various preventive measures. Oral hygiene practices and attitudes among students were also found to be satisfactory. There were no overall statistically significant relationships observed among knowledge, attitudes and practices with oral health status.

Keywords: Oral Health Status; Dental Caries; Periodontal Disease; Knowledge; Attitudes; Practice

Abbreviations

DMFT: Decay, Missing, Filled Teeth Index; PDI: Periodontal Disease Index; MOH: Ministry of Health; MOE: Ministry of Education; PAHO: Pan American Health Organization; WHO: World Health Organization; IRB: Institutional Review Board; FDI: Fédération Dentaire Internationale.

Introduction

The mouth has been referred to as a mirror or window to the health of the body. It provides signs and even diagnostic clues to a person's nutritional and general health, and in some cases, it is the first indicator of a systemic condition [1,2]. Oral health is essential to general health and quality of life. It is defined as a "state of being

free from mouth and facial pain, oral and throat cancer, oral infection and sores, periodontal diseases, tooth decay, tooth loss, and other diseases and disorders that limit an individual's capacity in biting, chewing, smiling, speaking, and psychosocial wellbeing" [3]. Maintaining good oral health is of utmost importance as it enables an individual to masticate, speak and socialize without experiencing active disease, discomfort or embarrassment [4].

The most common oral diseases are dental caries and periodontal diseases [5]. Caries of Latin origin means "rottenness". According to David P. Cappelli, dental caries is a diet-dependent, transmissible, microbiologically mediated disease, similar to periodontal disease in that it follows both an infectious and chronic disease model. Dental caries remains the most prevalent chronic disease of childhood occurring five times more than asthma [6].

Periodontitis is "an inflammatory disease of the supporting tissues of the teeth caused by specific microorganisms or groups of specific microorganisms, resulting in progressive destruction of the periodontal ligament and alveolar bone with increased probing depth formation, recession or both" [7]. The most common form is plaque-induced gingivitis that affects all age groups and tends to increase with age, reaching a peak at puberty, followed by a small decline in adolescence [8,9].

Globally, dental caries and periodontal diseases are considered the most widespread oral conditions that contribute heavily to the global health burden [10,11]. Dental caries remains a significant health problem for most industrialized countries affecting approximately 60-90% of school children and nearly 100% of adults [12]. The WHO 2003, reported dental caries as the most prevalent oral disease in several Asian and Latin American countries, and to a lesser extent in most African countries [10]. Globally, most children have some signs of gingivitis (gum disease) and if left untreated may progress to periodontal diseases, which are evident in the adult population [12].

The WHO Programme, in collaboration with the FDI, formulated specific targets and goals for oral health under the Health for All by the Year 2000 Programme [13]. In 1979, one of the most critical goals formulated was that there should be no more than three decayed, missing or filled teeth at age twelve by the year 2000. Globally, approximately 70% of countries have achieved WHO's goal of no more than 3 DMFT by age 12.

The challenges posed by poor oral health worldwide is multifactorial and may be due to a lack of knowledge about basic oral hygiene, lack of acceptance to the practice of healthy oral habits, diet choices, limited or no oral health awareness or preventative programmes, as well as access to basic professional dental care [14,15]. Over the past 20 years, many industrialized countries have experienced dramatic declines in the prevalence of dental caries among children and adolescents. This decline is multifaceted but may involve better dietary choices, particularly a reduction in sugar consumption, improved oral hygiene practices, and effective use of oral health services [11]. However, recently this prevalence has shown a marked increase and may be attributed to the increased consumption of sugars particularly, non-milk extrinsic sugars (NMES) which have been documented as the principal dietary cause of dental caries [11,16-18].

In Guyana, dental caries and periodontal diseases continue to be the two most common oral diseases for which dental caries was ranked among the ten leading causes of morbidity in 1993 [19]. In 1995, PAHO, in collaboration with the MOH, carried out an Oral Health Survey on school children in all ten administrative regions of Guyana. The DMFT index was used to determine the oral health status of the students. The results of this study showed that 67% of all children were caries-free in the permanent dentition; however, only 33 % of all children examined were caries-free when total caries experience for both dentitions was taken into account. The mean DMFT observed was 2.97, for which the decayed component was the main contributor. Although this finding was below WHO's goal, the proportion of children with untreated caries and missing teeth showed an alarmingly sizable prevalence [20,21].

Guyana, with a population of approximately 782,237 people had an estimated need for 600,000 fillings. This was confounded by the fact that the population ratio of the dentist to a patient was 1 to every 40,000 patients [19]. Also, as more Guyanese move from rural to urban areas, the prevalence of sugar consumption and other cariogenic behaviours are estimated to increase with direct consequences on the prevalence of dental diseases [20,21]. Although dental work is continuously being done, along with the yearly planned activities for oral health month, data obtained are based on the number of services offered, i.e. the number of fillings or extractions. Therefore, the actual effect on the oral health status of citizens, particularly the younger generation, is unknown.

Since the school-based oral health survey by PAHO (1995) 25 years ago, no further research was done in the country about oral health status for students. This is a considerable gap in the literature that this research has essentially begun to fill by addressing

the oral health status, knowledge, attitudes and practices of students attending public secondary schools in Guyana. The knowledge gained from this research will not only benefit the students but also be invaluable to the MOH in determining and addressing the oral health needs of public secondary school students in Georgetown.

Materials and Methods

This cross-sectional study was voluntary and required the participants to fill out an oral health questionnaire followed by an oral examination. The prevalence used was 0.33%, obtained from the Guyana Oral Health Survey for School Children by PAHO, 1995 [22]. This information was inputted into the Epi tools sample size calculator at 95% confidence and 0.05 acceptable error. The sample size generated was 304 [23]. To ensure adequate power and to adjust for non-response, the sample was adjusted to 434 students [24]. The age group targeted was based on the Oral Health Surveys Basic Methods by WHO.

Selection criteria

Inclusion criteria

- Participant (male and female) must be 12 or 13 years old at last birthday.
- Participant must be a student attending a public secondary school in Georgetown.

Exclusion criteria

- Students with unsigned parental consent forms.
- Students with signed parental consent forms, but were unwilling to take part in the survey.

Sampling design

Cluster random sampling method was used to select 8 out of the 30 public secondary schools in Georgetown. Clusters were determined based on students' academic performance at the national grade 6 assessment [25]. An online random numbers generator randomly chose one school from each cluster. Proportional probability sampling to determine the number of students and the male to female ratio was also calculated.

Ethics

Ethical approval for permission to conduct the research was granted by the IRB of the MOH and the MOE.

Survey instrument

A questionnaire of twenty-seven questions was utilized. This tool was used to assess students' level of knowledge along with their attitudes and practices towards oral health. A total of two questionnaire surveys were modified and merged to create the sample tool instrument.

Dental/clinical examination

All clinical examinations were carried out by the principal researcher, accompanied by two dental assistants. One dental assistant was responsible for the proper charting of the findings using the WHO Oral Health Assessment Form for Children 2013 [26], the other assistant provided assistance to the students as needed. Dental examinations were done using sterile dental mirrors, probes, WHO community periodontal index probe, college tweezers and dental headlight.

Analysis

Data were analyzed using SPSS version 20. Descriptive statistics of the demographic variable was computed in the form of frequency distribution, mean and standard deviations. Also, the possible relationships between the independent and dependent variables were examined with the use of Contingency tables and Chi-squared test with p values of <0.05 considered statistically significant.

Results

A total of 353 students (7th grade) took part in this survey, of which 51.8% were males and 48.2% females. Most of the students were age 12 years (73.1%), and 48.2% of student participants were of mixed ethnicity. Students that participated in this research were grouped into four primary areas of residence; of which 56.1% of the sample population resided in Georgetown.

Students were also questioned on the highest known level of education completed by their parents and or guardians. Majority of the students indicated that their father or male guardian had completed secondary education (37.7%) with the second most common response as do not know (29.5%). As it relates to their mothers' or female guardian, almost half of the participants had completed secondary education (43.6%) followed secondly by the completion of college/university (25.2%). Additional, demographic and descriptive statistics are presented in table 1.

The mean level of dental caries and periodontal diseases among the students was relatively low, with mean DMFT and PDI as 1.51

Demographic Factor	n	%
Sex		
Males	183	51.8
Females	170	48.2
Ethnicity		
Indo-Guyanese	25	7.1
Afro-Guyanese	141	39.9
Amerindians	13	3.7
Mixed	170	48.2
Other	4	1.1
Age		
12 years	258	73.1
13 years	95	26.9
Area of Residence		
East Bank Demerara	74	21.0
East Coast Demerara	61	17.3
Georgetown	198	56.1
West Coast Demerara	20	5.7
Secondary School		
Carmel	7	2.0
Dolphin	64	18.1
St. George's High	27	7.6
St. Mary's	46	13.0
St. John's College	48	13.6
Richard Ishmael	65	18.4
North Georgetown	61	17.3
St. Stanislaus College	35	10.0
Education- Father		
No formal schooling	2	0.6
Less than primary school	4	1.1
Primary school completed	30	8.5
Secondary school completed	133	37.7
College/University completed	72	20.4
No male adult in household	8	2.3
Don't know	104	29.5
Education- Mother		
No formal schooling	1	0.3
Less than primary school	3	0.8
Primary school completed	30	8.5
Secondary school completed	154	43.6
College/University completed	89	25.2
No female adult in household	1	0.3
Don't know	75	21.2
Total	353	100

Table 1: Demographic and Descriptive Statistics.

dents had a moderate DMFT score (DMFT≤ 3), and 58% had mild to moderate gingivitis. The results are shown in table 2. Male respondents had a slightly lower mean DMFT of 1.41 (SD 1.70) compared to females, but a slightly higher mean PDI value of 1.14 (SD 0.39). For the individual components of the DMFT index, 45.3% of students had no tooth decay,85.8% of students have no missing teeth, and 98% of students had no fillings (Figure 1).

DMFT	PDI		
Good	Healthy gingiva	Mild to moderate gingivitis	Mild to moderately severe gingivitis
n	57	82	1
% (within DMFT)	40.7	58.6	0.7
% (within PDI)	41.3	39.8	11.1
Moderate			
n	67	93	4
% (within DMFT)	40.9	56.7	2.4
% (within PDI)	48.6	45.1	44.4
Poor			
n	14	31	4
% (within DMFT)	28.6	63.3	8.2
% (within PDI)	10.1	15.0	44.4

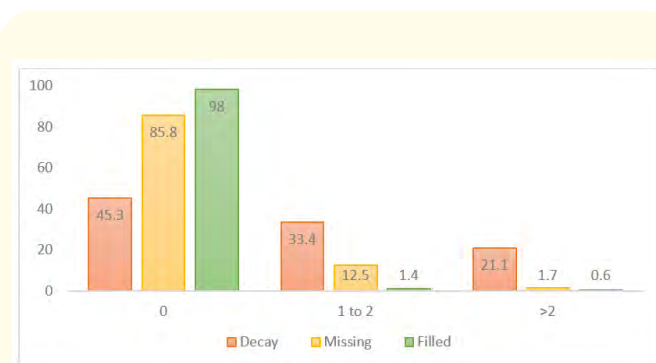**Table 2:** Oral Health Status of Students (DMFT and PDI).

Figure 1: Percentage of Decay, Missing and Filled teeth among students.

(SD 1.70) and 1.09 (SD 0.38) respectively. The results from the DMFT and PDI Indices for all students were compared, 46% of stu-

Analysis of the questionnaire about students' level of knowledge was aggregated, and their cumulative score was categorized as either excellent, fair or poor. 81% of students have a fair level of knowledge,13% having excellent knowledge and 6% poor knowledge (Table 3).

Variable	Level of knowledge among student participants		
Sex	Excellent n %	Fair n %	Poor n %
Males	26 (14.2)	143 (78.1)	14 (7.7)
Females	20 (11.8)	143 (84.1)	7 (4.1)
p value :0.267			
Age			
12 years	38 (14.7)	205 (79.5)	15 (5.8)
13 years	8 (8.4)	81 (85.3)	6 (6.3)
p value :0.295			
Secondary School			
Carmel	0 (0.0)	5 (71.4)	2 (28.6)
Dolphin	5 (7.8)	53 (82.8)	6 (9.4)
St. George's High	1 (3.7)	23 (85.2)	3 (11.1)
St. Mary's	4 (8.7)	38 (82.6)	4 (8.7)
St. John's College	6 (12.5)	38 (79.2)	4 (8.3)
Richard Ishmael	16(24.6)	49 (75.4)	0 (0.0)
North Georgetown	8 (13.1)	52 (85.2)	1 (1.6)
St. Stanislaus	6 (17.1)	28 (80.0)	1 (2.9)
p value :013			
Total	46 (13.0)	286 (81.0)	21 (6.0)
Chi square test p value < 0.05			

Table 3: Level of oral health knowledge among students.

The number and percentage of students with positive and negative attitudes toward oral health were 315 (89.2%) and 38 (10.8%), respectively. Results also showed that 66.6% (235) of all student participants had at least one previous dental visit. It was also observed that 45.5% visited a dentist only when they experienced pain,15.7 % visited for follow up treatment and 28.5% visited for routine dental checkups. During the last six months, 19.1% of students had their last dental visit, with 24.3% having visited either one year ago or more than a year ago (25.5%).

Analysis done on oral health practices showed that out of 353 students, 347 (98.3%) used a toothbrush to brush their teeth, and 275 students (77.9%) brushed twice daily. Further analysis showed only 194 students (55%) were aware that toothpaste contains fluoride. 92.4% (n:326) of students often practice up, down and sideways techniques for tooth brushing. When asked about use of dental floss to clean between their teeth, 188 (53.3%) indicated that they do, with 102 students (48.1%) indicating they floss twice daily and 77 (36.3%) once daily. Further analysis was done to determine possible relationships between knowledge, attitudes and practices with oral health status (Tables 4-6).

Variable	Knowledge			Total n %
DMFT	Excellent n %	Fair n %	Poor n %	
Good (DMFT=0)	20 (43.5)	113 (39.5)	7 (33.3)	140 (39.7)
Moderate (DMFT≤ 3)	22 (47.8)	134 (46.9)	8 (38.1)	164 (46.5)
Poor (DMFT>3)	4 (8.7)	39 (13.6)	6 (28.6)	49 (13.9)
Total	46 (100)	286 (100)	21 (100)	353 (100)
PDI				
Healthy Gingiva	21 (45.7)	108 (37.8)	9 (42.9)	138 (39.1)
Mild to moderate gingivitis	25 (54.3)	169 (59.1)	12 (57.1)	206 (58.4)
Mild to moderately severe gingivitis	0 (0.0)	9 (3.1)	0 (0.0)	9 (2.5)
Total	46 (100)	286 (100)	21 (100)	353 (100)
p value DMFT: 0.30, p value PDI:0.56				

Table 4: Relationship between level of knowledge and oral health status (DMFT and PDI).

Discussion

In Guyana, information is scarce regarding the oral health status of public secondary school students. PAHO conducted the first and only national oral health survey in 1995 [20,21]. Although this present research cannot be generalized to all public second-

Variable	Attitude	
DMFT	Positive n %	Negative n %
Good(DMFT=0)	126 (40.0)	14 (36.8)
Moderate (DMFT≤ 3)	146 (46.3)	18 (47.4)
Poor (DMFT>3)	43 (13.7)	6 (15.8)
Total	315 (100)	38 (100)
PDI		
Healthy Gingiva	127 (40.3)	11 (28.9)
Mild to moderate gingivitis	180 (57.1)	26 (68.4)
Mild to moderately severe gingivitis	8 (2.5)	1 (2.6)
Total	315 (100)	38 (100)
p value DMFT: 0.90, p value PDI: 0.39		

Table 5: Relationship between the students' attitudes and their oral health status (DMFT and PDI).

ary schools in Guyana, it does provide insights into the oral health status, and the level of oral health-related knowledge, attitudes and practices among students that attend public secondary schools in Georgetown.

The results show that the mean DMFT and PDI score among all study participants was 1.51 ± 1.70 and 1.09 ± 0.38, respectively. The mean DMFT was relatively low and well below WHO's recommendations of no more than three by the year 2000 [27]. 46.5% of students (n = 164) had a DMFT value ≤ 3, which was considered as a moderate DMFT score for this study. Further analysis showed only 45.3% of the population was caries-free, this value could be an underestimation since oral examinations did not include the use of radiographs; therefore, detection of interproximal carious lesions (caries in between teeth) could have been overlooked. This shows a significant decrease from the 67% of students that were observed to be caries-free in the Guyana Oral Health Survey for School Children by PAHO, 1995 [20].

Oral hygiene practices	Responses	DMFT		
		Good (DMFT =0) n %	Moderate (DMFT ≤ 3) n %	Poor (DMFT>3) n %
Use toothbrush to brush teeth	Yes	137 (39.5)	161 (46.4)	49 (14.1)
	No	0 (0.0)	3 (100)	0 (0.0)
	Twice daily	110 (40.0)	124 (45.1)	41 (14.9)
Tooth brushing frequency	Once daily	24 (40.7)	29 (49.2)	6 (10.2)
	Other	6 (31.6)	11 (57.9)	2 (10.5)
Use up, down and sideways tooth brushing technique	Yes	129 (39.6)	151 (46.3)	46 (14.1)
	No	5 (33.3)	8 (53.3)	2 (13.3)
	Yes	79 (40.7)	82 (42.3)	33 (17.0)
	No	28 (30.4)	55 (59.8)	9 (9.8)
Use tooth paste containing fluoride	Don't know	33 (49.3)	27 (40.3)	7 (10.4)
Use of dental floss	Yes	76 (40.3)	90 (47.9)	22 (11.7)
	No	59 (38.8)	68 (44.7)	25 (16.4)
Flossing frequency	Once daily	32 (41.6)	35 (45.5)	10 (13.0)
	Twice daily	41 (40.2)	50 (49.0)	11 (10.8)
	Sometimes	13 (39.4)	13 (39.4)	7 (21.2)
Oral hygiene practices	PDI			
	Responses	Healthy Gingiva n %	Mild to moderate gingivitis n %	Mild to moderately severe gingivitis n %
Use toothbrush to brush teeth	Yes	136 (39.2)	202 (58.2)	9 (2.6)

	No	1 (33.3)	2 (66.7)	0 (0.0)
Tooth brushing frequency	Twice daily	112 (40.7)	157 (57.1)	6 (2.2)
	Once daily	21 (35.6)	35 (59.3)	3 (5.1)
	Other	5 (26.3)	14 (73.7)	0 (0.0)
Use up, down and sideways tooth brushing technique	Yes	124 (38.0)	193 (59.2)	9 (2.8)
	No	8 (53.3)	7 (46.7)	0 (0.0)
Use tooth paste containing fluoride	Yes	73 (37.6)	114 (58.8)	7 (3.6)
	No	35 (38.0)	56 (60.9)	1 (1.1)
	Don't know	30 (44.8)	36 (53.7)	1 (1.5)
Use of dental floss	Yes	71 (37.8)	109 (58.0)	8 (4.3)
	No	66 (43.4)	85 (55.9)	1 (0.7)
Flossing frequency	Once daily	32 (41.6)	42 (54.5)	3 (3.9)
	Twice daily	34 (33.3)	64 (62.7)	4 (3.9)
	Sometimes	12 (36.4)	20 (60.6)	1 (3.0)

Table 6: Relationship between students' oral hygiene practices and oral health status (DMFT and PDI).

These aggregate statistics did not take into consideration the most significant contributor to the DMFT score observed, i.e. the decay component,33.4% of students had at least one decayed tooth present and another 21.1% had at least two or more decays. Similar observations were recorded by studies conducted in Montserrat and Sudan. The study conducted in Montserrat by Fergus showed 59% of students have untreated caries whereas 30.5% was observed by Nurelhuda., *et al*. in Sudan [28,29]. This should be significantly emphasized since only a mere 2 % of students from this research had one or more fillings present, leaving a sizable amount of untreated carious lesions, that could later lead to premature tooth loss if corrective interventions are not readily taken. The mean DMFT score recorded for females was higher than that of males (1.63 ± 1.69 to 1.41 ± 1.70). On an average females had an overall higher percentage of tooth decay. According to Zhang., *et al*. this was probably because permanent teeth usually erupt earlier in females [30].

There was also a relatively high occurrence of gingivitis among students and this is in accordance to Wilkins classification of only gingival involvement for PDI values less than 3 [31]. Only 3% of students were observed to have PDI scores above 2, 58% of students had mild to moderate gingivitis (gingival changes not extending all around the tooth). The mean PDI score recorded for males was higher than that of females (1.14 ± 0.39 to 1.03 ± 1.70), show-

ing statistical significance (p = 0.04). This observation is in agreement with findings found in similar researches by Varma., *et al.* in 2005 and Omale in 2014 [32,33].

Majority of the students (81%) exhibited an adequate level of knowledge on the causes of oral diseases and the various preventive measures, analogous to findings observed by Omale, 2014 and Kubota Y, 2017 [33,34]. A similar level of knowledge was observed among male and female students as well as among the age groups showing no statistical differences. This is probably because both the gender and age groups are equally educated. There was; however, a statistically significant difference observed among schools, a possible explanation for this finding is the academic level of the school the student attends.

Close to 90% of students (89.2%) had positive attitudes towards their oral health, acknowledging the importance of tooth brushing habits and the relationship between oral care and care of the body as a whole. Over half of the students (66.6%) have had at least one previous dental visit. This is contrary to the study conducted by Kubota., *et al.* in 2017, that observed over 95% of students had previous experiences with a dental professional and understood the importance of regular dental checkups [34]. A substantial amount of study participants (45.5%) only visited a dentist when they experienced pain, inconsistent to findings from similar research by Vishwanathaiah in 2016 for which only 22% of stu-

dents visited the dentist for reasons related to tooth decay [35]. Although many students acknowledged that regular dental check-ups are necessary and should be done at least once yearly, 33% of students have never visited a dentist, and 25.5% had their last dental visit more than one year ago.

The practice of good oral hygiene was found to be significantly sound among students since the majority practiced twice-daily tooth brushing (77.9%) with a toothbrush (98.3%) and toothpaste (55%). These findings are comparable to the study conducted by Vishwanathaiah in 2016, which found all study participants used toothbrush and toothpaste as oral hygiene aids, however, a significantly lower proportion practiced twice-daily tooth brushing (30%) [35]. Another study by Ogunrinde T., *et al.* in 2015 showed majority of the students (89.6%) practiced tooth brushing twice-daily with the aid of a toothbrush and toothpaste [36].

An alarming observation was that 45% of students were unaware that toothpaste contains fluoride, so although students frequently used toothpaste, when asked if they use a toothpaste containing fluoride most students indicated they did not or did not know. Additionally, 53.3% of students indicated they use dental floss to clean between their teeth, with 21.8% stating they floss once daily and 28.9% twice daily.

The possible relationship between the level of knowledge and oral health status measured by DMFT and PDI scores was also investigated. The results did not show a statistically significant difference. However, 81.1% of students had an appropriate level of knowledge, with 39.5% of these students having good oral health observed by a DMFT value of zero (0) and 37.8% with healthy gingiva.

The relationship between oral health-related attitudes and oral health status was also assessed, for which there were no statistically significant findings. It was found that 40% of students that displayed positive attitudes also had good oral health observed by a DMFT value of zero (0) and healthy gingiva.

Students that engaged in good oral hygiene behaviours were also observed to have good oral health. Interestingly enough among the individual variables analyzed, statistical significance was observed for the use of toothpaste containing fluoride and dental caries experience (DMFT). This finding is greatly documented; children that brush their teeth at least once daily with a toothpaste containing fluoride are more likely to have fewer cavities [37]. A statistical finding was also observed in relation to the use of dental floss and periodontal status. Research has shown that flossing, in addition to regular tooth brushing reduces the occurrence of gingivitis as opposed to brushing alone [38].

Conclusion

The oral health status of the student participants with dental caries and periodontal disease was moderate to poor. The mean DMFT score of students complied with WHO recommendation of no more than 3 DMFT by the year 2000. However, this value did not take into consideration the high proportion of untreated carious lesions, coupled with the meagre proportion of restorations observed among students. Only 45.3 % of students were observed to be caries-free. There was also a relatively high occurrence of gingivitis among students, 58% of students were noted to have mild to moderate gingivitis, with statistical significance observed among males and females with the mean PDI scores.

84.1 % of female students and 78.1 % of male students exhibited a fair level of knowledge on the causes of oral diseases and the various preventive measures. Oral hygiene practices and attitudes among students were also found to be satisfactory based on responses to the questionnaires provided. However, based on the oral examination performed students' account of their daily practices were inconsistent with the observed oral health statuses.

There were no overall statistically significant relationships observed among knowledge, attitudes and practices in relation to oral health status, however, among the various schools a significant difference in the level of knowledge and mean DMFT scores were observed. In addition, among the individual variables, statistically significant finding was observed for the use of fluoridated toothpaste and dental floss.

Conflict of Interest

The authors declare that there is no conflict of interest.

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