THE UNIVERSITY OF THE WEST INDIES
AT ST. AUGUSTINE, TRINIDAD AND TOBAGO

A Research Paper

Submitted in partial requirements

for HUEC 3012

of

The University of the West Indies

Title: Dental Health Knowledge, Attitude and Practice among Students in two Faculties at the University of the West Indies St. Augustine Campus

Student Name: Shivani Sinanan

Project Supervisor: Ms. Anisa Ramchaitar Bourne

Year Submitted: 2014

Department of Agricultural Economics & Extension
Faulty of Food and Agricultural

DENTAL HEALTH KNOWLEDGE, ATTITUDE AND PRACTICE AMONG STUDENTS IN TWO FACULTIES AT THE UNIVERSITY OF THE WEST INDIES ST. AUGUSTINE CAMPUS.

A Research Paper

Submitted in Partial Requirements of HUEC 3012

Of

The University of the West Indies,

St. Augustine Campus, Trinidad, West Indies.

Department of Agriculture Economic and Extension.

Faculty of Food and Agriculture.

Submitted by: Shivani Sinanan- 810001322

Supervised by Ms. Anisa Ramcharitar Bourne

January 2014-May2014

ACKNOWLEDGEMENT

First and foremost, I would like to thank Ms Anisa Ramcharita Bourne for making the concerted effort to advice and guide me along the way throughout the semester. I would also like to thank Dr. Cowie for his assistance with respect to statistical analysis. I would like to express great appreciation to all the students at the University of the West Indies who were approachable, accommodating and willing to participate in the questionnaire. I would also like to thank my colleagues who assisted me in distributing the questionnaires.

Abstract

Objective: To investigate dental health, knowledge, attitude and practice among students at the University of the West Indies St Augustine Trinidad and Tobago.

Method: A structured questionnaire was distributed to a total 178 out of 3, 560 students enrolled in 2 faculties of the University of the West Indies St Augustine from February to March 2014. The questionnaire was randomly distributed and students anonymously filled them out. The purpose of the cross- sectional design was to look at oral health knowledge, attitude and practices. Descriptive statistics was used to analyse results.

Results: The response rate for the study was a 100%. A total of 88.8% of the study population were categorized as highly knowledgeable whereas only 11.2% were categorized as belonging to a low knowledge group. The mean knowledge score for students enrolled in the faculty of food and agriculture was significantly higher than that obtained for the faculty of Social Sciences. The p value (0.011) indicates there is a significant association. A total of 68% of students believed their overall oral health was good. A p value (0.013) and (0.021) were obtained for frequency of flossing teeth and how often respondents changed tooth brush. Higher amount of females were concerned with oral self-care habits indicating there is an association between gender and oral health practices. Analysis showed statistical significance between dental visits and level of knowledge.

Conclusion: Findings indicate students were highly knowledgeable with respect to oral health issues. Even though they were aware they did not necessarily practice it. Generally females were more engaged in dental health behaviour as oppose to males

Table of Contents

Chapter One:

Introduction

According to Health Report Card for Trinidad and Tobago, 2011, Oral health can be defined as "an integral element of general health and well- being as it impacts on our daily functioning and our overall quality of life." Attention has to be paid to the prevention of oral disease and the promotion of oral health.

Oral hygiene can be defined as the practice of keeping the mouth clean by brushing and flossing to prevent tooth decay and gum disease (Medical Dictionary 2014). The purpose of maintaining proper oral hygiene is to prevent the build - up of plaque. Plaque is a sticky film of bacteria and food that forms on the surfaces of teeth in crevices and fissures. If left untreated, the enamel surfaces are eroded, cavities form and periodontal diseases can occur. Oral daily care such as brushing teeth, flossing, use of antiseptic mouthwash and the use of fluoride toothpaste assist in removing plaque build-up. Most common oral diseases include dental caries and periodontal diseases. This is because they are considered to be behavioural diseases and adoption of healthy oral habits is crucial in controlling them. (Al –Hussaini, 2002).

The KAP (Knowledge-Attitude- Practice) model of oral health education is usually the foundation for most health education programmes (Suprabha 2013). There are several factors that may influence an individual or community health behaviour. These factors include knowledge, attitude, beliefs, finance, skills, time and influence from people such as family members or co- workers. Knowledge is a set of understandings that give an insight into how one perceives something to be, whilst attitude looks at one's way of being. It is the belief one has to an object, subject or concept. Based on studies that were carried out using the KAP model,

there's little or no connection between attitude and practices. Practices are behavioural actions of an individual in response to stimuli. According to this model, adequate oral health practices occur due to healthy attitudes which in turn develop due to proper knowledge (WHO 2005).

Dietary intake should also be considered when maintaining oral hygiene. Dental caries usually occur when acid producing bacteria *Streptococci* and *Lactobacilli* dominate the plaque build - up on the surface of teeth. These bacteria break down carbohydrates such as glucose, fructose, sucrose and starches in to lactic acid. This in turn makes the plaque acidic and as a result demineralization of dental enamel and dentin occurs.

The aim of this study was to determine the extent of dental health knowledge among students at the University of the West Indies, as well as their attitudes towards dental health and oral hygiene habits. The use of fluoridated products, dietary habits, and tooth-brushing are all behaviours that are related to oral health. However, values and beliefs may vary from culture to culture. Sugar consumption for example, is usually associated with the desire to maintain a healthy body image or being overweight. Very few individuals take into consideration that it also leads to plaque build-up. The purpose for carrying out the study is to obtain vital information and also to determine the severity of oral health practices among students in two faculties at the University of the West Indies, St. Augustine Campus.

.

Background

Oral health as stated previously is an important element of general health and well-being. An important aspect of oral health is hygiene or practice of keeping the mouth cavity in a healthy condition. This is achieved by a combination of flossing the teeth together with regular dental visits. Oral diseases has an impact on both individuals and communities globally, and usually results in pain and impairment of function. Dental caries and periodontal diseases have historically been considered the most important global oral health issues (Peterson et al. 2005). Based on both clinical and public health research, a number of individual, professional and community preventative measures were effective in preventing these two diseases (Cohen and Gift, 1995).

The determinants of oral health also affect maintaining and practicing oral hygiene. Factors such as an individual socio- economic status adversely affects components such as diet, education, access to health care facilities and as a result these persons are less resistant to oral diseases. Additionally socio- environmental determinants, such as tobacco use, high intake of sugars and alcohol consumptions is highly related to oral disease. It is also a risk factor for developing other chronic diseases such as obesity and diabetes mellitus.

According to the World Health Organisation website (www.who.int/oral_health/en/), Oral Health Programme is working on building oral health policies to control risk factors associated with oral health. Globally, the programme focuses on developing and implementing community oriented demonstration projects. Oral health promotion and prevention of oral diseases focuses mainly on developing countries particularly rural areas. The Programme also

supports other countries and regions in their efforts to ensure a healthy environment. National Health Authorities in developing countries also implement programmes pertaining to fluoride use and the prevention of dental caries. The WHO also provides assistance towards school oral health programmes.

According to the National Oral Health Plan for Trinidad and Tobago 2010, there are 55 units located in the 110 health care services in Trinidad and Tobago. The main goals of these health facilities:

- Improving the oral health status by reducing the burden of oral disease and disability across Trinidad and Tobago.
- To promote healthy lifestyles and reduce the risk factors associated with oral health that may arise from environmental, social, economic and behavioural causes.

Informing individuals about oral health has an impact on behaviour as well as practices. Methods of educating the population have to be thoroughly evaluated. Factors such as age group, literacy level and socio- economic status need to be taking into consideration. There are several challenges arising with respect to people with special needs. Oral health promotion and prevention programmes seek to educate the caregiver or person that may be involved in the person's life.

Rationale/ Scope

This project will focus on Oral dental health and the relationship between knowledge, attitude and practices. The aim of the study is to asses knowledge, attitude and practices among students in the faculty of Social Sciences and the faculty if Food and Agriculture at the University of West Indies St Augustine. It focuses mainly on a certain percentage of students in both faculties. A total of 178 students would be randomly selected and asked to complete a questionnaire pertaining to the topic at hand. The study is not only limited to the three aspects knowledge, attitude and practice but also dietary habits and its association with oral hygiene. Both faculties were specifically targeted because conducting a study involving all faculties would have been time consuming and difficult to complete in the given time. Faculties were also chosen based on the number of students enrolled for the academic year 2013/ 2014.

General Objective:

- To investigate dental health, knowledge, attitude and practice among students at the University of the West Indies St Augustine Trinidad and Tobago.

Chapter Two:

Literature Review

Oral Health means more than healthy teeth. According to The World Health Organization, Oral health means "being free of chronic mouth and facial pain, or and throat cancer, oral sores, birth defects such as cleft lip and palate, periodontal (gum) disease, tooth decay, tooth loss and other diseases and disorders that affects the mouth and oral cavity." (WHO, 2009). Oral health is an important aspect of maintaining a healthy lifestyle. Though risk factors are common, they can be prevented by changes in lifestyle, dietary habits, and oral hygiene practices.

Knowledge and Attitude/ Perceptions concerning Dental Health

When compared to normal individuals, persons with Diabetes Mellitus are at an increased risk for developing periodontal diseases. A study was conducted among persons with both Type 1 and Type 2 diabetes to assess knowledge, attitude and practices. According to Allen and Ziada et al. (2007) only 33% of participants were aware that they were at risk for periodontal diseases. 16% of the group received information from their dentist, 32% from the diabetic team, 7 % from a dental hygienist and 10% of from other sources. Contrary to this, according to results obtained at Kuwait University in 2002, majority of respondents received advice related to oral health from family and friends.

It has been globally accepted that the combination of brushing and flossing are the best methods for controlling dental plaque. This is because, brushing alone is not sufficient for cleaning the proximal surfaces of the teeth and as such, flossing is also recommended. Al-Hussaini (2002) highlighted that tooth brushing plays a limited role in the prevention of dental

caries. According to a study carried out at Kuwait University in 2002, 64.5% of the students believed that the main cause of tooth decay was “not brushing teeth”. Only 2.4% believed that gingival bleeding could be prevented by flossing regularly. In another study conducted by Prasad et al. (2010) 57.7% of students agreed that regular tooth brushing prevents all tooth problems and 24.2% disagreed.

The main function of fluoride is to protect and strengthen teeth. As time goes by the fluoride dissolves and its concentration gradually decreases. Regular use of fluoridated toothpaste can help in replenishing fluoride concentration as well as help enamel resist bacteria, acid and tooth decay. According to Suprabha (2013), children between the ages 11 to 13 years lacked awareness with regards to using fluoridated and non- fluoridated toothpaste and dental floss. The study also showed that 17% were not aware about the relationship between tooth brushing and oral health.

There are several factors which lead to the discoloration of teeth. These include foods/ drinks, tobacco use, age, environmental factors, medications, trauma and poor dental hygiene. In addition to causing tooth discolouration, tobacco is also associated with causing oral and pharyngeal cancer. Based on a study carried out by Bolt J. William et al (2014), cessation of smoking was associated with reducing the risks of these cancers. Page et al.(2002) indicated that tobacco consumption plays an important role particularly in the development of periodontitis

Findings from a comparative study carried out by Shetty and Sharda (2008) indicated 86.3% of first year dental students agreed that visits to a dentist were necessary. A total of 97.5% of final year students also agreed to this statement. Based on a study carried out by Suprabha et al. (2013), children between the ages 11 – 13 years old were given questions to test their

knowledge level. From the findings it was seen that 15. 5% think that cariogenic foods are the main precursor for tooth decay whereas 70.4% disagreed with this and 14.1% did not know.

Prasad et al. (2010) highlighted that students have a positive attitude towards dental visits. However, 36.7% of the study population refused to visit the dentist due to fear of pain. Only 26.1% of the study population visit the dentist for regular check- up. Shetty and Sharda (2008) indicated that 28.6% and 15.3% of first and final year students respectively never visited a dentist. A total of 53.8% of the study population cancelled dentist appointments unless they experienced pain. A study conducted by Prasad et al (2010) indicated that fear of pain is not the only reason for not visiting the dentist but high cost. The cost of dental treatment also limits the accessibility of dental care.

Dental Health Habits

Oral hygiene education consists of not only knowing the knowledge behind it, but also practices and personal skills must be considered. Tooth brushing is essential in preventing dental caries and periodontal diseases. As a result of this, dentist recommends brushing teeth twice a day to prevent plaque build. Plaque is considered the main precursor for both dental caries and periodontal diseases. According to Ashley (2001), data from 5 to 15 year olds indicated that there was little improvement in plaque removal when brushing occurs for more than 60 seconds. T. Attin and E. Hornecker (2005), highlighted that tooth brushing is also recommended to be performed after meals to eliminate both bacterial plaque build-up and food impaction. Thirty seconds of tooth brushing is sufficed to eliminate any food remnants that may be present. Lifestyle and behavioural factors have an impact on tooth brushing frequency.

While tooth brushing plays a major role in maintaining oral hygiene, the brushing force can have a negative outcome. Over vigorous habits are thought to damage soft tissues and may cause dental hard tissue loss. Addy M and Shellis RP (2006) indicated that it can also lead to dental erosion which is considered a significant co factor for tooth surface loss.

Both mechanical and chemical means are essential in preventing plaque build-up. Dr. Shukla (2013) highlighted that antiseptic and anti- plaque mouth rinse claims to kill bacterial plaque that causes caries, gingivitis and bad breath. However, mouth wash has to be used together with tooth-brushing and flossing for optimal results. Mouth wash can also be used to remove food particles and mucus deep within the throat. Dr. Shukla (2013) suggests that in cases where a person cannot brush their teeth after meals the use of mouthwash would be helpful. It is advised to use mouthwash at least half an hour after brushing teeth.

According to T. Attin and E. Hornecker (2005), it is important to consider using fluoridated components when brushing teeth. Brushing teeth with fluoridated toothpaste is responsible for preventing dental caries. It is also important to change toothbrush after fraying of bristled occur. Based on findings from a comparative study conducted by Sharda and Shetty (2008), 73.6% of first year students change their tooth brush every 1- 3 months. However, with respect to final year students, 96.2% changed their tooth brush when fraying of bristles occurred.

According to a study carried out by Khami MR, Virtanen JL et al (2007) indicated that there is a difference in males and females with respect to oral self- care habits. The study highlighted that there is a significant association between gender and factors such as tooth brushing frequency, use of fluoridated tooth paste and regular flossing. In contrast, a study conducted by Sharda and Shetty (2008) indicated that there was no significant association

between gender and oral self- care habits. Findings indicate that there was no significant difference with males and females with respect to tooth brushing frequency.

Dietary Habits

A common risk factor for obesity and diabetes mellitus is the high consumption of sugar containing foods. According to the World Health Organization (WHO), approximately 3.4 million people died from high fasting blood sugar in 2004. Based on a study carried out in Thiruchengode, India (2010), 33.7% and 27.9% respectively consumed snacks and soft drinks on a daily basis. Oral health is strongly influenced by daily intake of food and plays a significant role in nutritional intake and general health status (Willer shausen et al. 2004).

The link between oral health and dental caries has been a subject of dispute for several years. Contrary to this, Cãlin and Frâncu highlighted that there is a dynamic relationship between sugar consumption and oral health. Individuals who consumed high amounts of sugar, be it soft drinks, snacks or juices, when measured in quantity have a large number of cariogenic bacteria in comparison to those who have a reduced consumption. Based on findings by Cãlin and Frâncu, approximately 18.5% of subjects consumed sweetened foods at least once a day 20.7 % two times a day and 33.3% three times a day. Approximately 27% of women and 31.1% of men drank sweetened drinks once a day.

In recent years there has been evidence linking obesity to increased periodontal disease. According to the Indian Dental Association (2012), several cross- sectional studies were carried out among different age groups. One of these studies showed a direct association between dental caries and obesity. Increase caloric intake can lead to obesity and also tooth decay because of the

amount of times food has come into contact with the teeth. Snacking between meals in particular, is not only the major cause of obesity but also leading cause of tooth decay.

In 2014, a dental hygienist highlighted that there over 3 million people diagnosed with diabetes in the United Kingdom. Diabetes affects the general health status of many people in several ways. According to Macphearson (2014), the main effects of diabetes on oral health include gingivitis and periodontal diseases. When compared to a healthy individual, periodontal disease tends to be more severe because of the fact that their ability to resist infection is generally lower. Lamster et al (2008) states that "diabetes is believed to promote periodontitis through an exaggerated inflammatory response to the periodontal micro - flora." Inflammation may cause both destruction and/ or reduced repair of damaged tissues which may be a factor in the destruction of periodontal tissues. Periodontitis may be associated with the increase in blood sugar levels making diabetes a little more difficult to control. High, uncontrolled consumption of cariogenic foods is a risk factor for developing Diabetes Mellitus.

Sharda and Shetty (2008) indicated that 38.5% of first year dental students don't consume sweet whereas 16.6% of final year student don't consume sweets. Prasad (2010) highlighted that 33.7% and 27.9% consumes sweets and soft drinks once a day respectively. Additionally another study conducted by Harikiren et al. 65.9% and 32.1% of sweet and soft drinks once per day respectively.

Nutritional Supplements are used for a variety of purposes. It is included in the diet to improve energy, health status and immune system and promotes rapid healing during illness and disease. Nutritional Supplements can be in the form of herbs, vitamins, minerals, meal supplements, sports nutrition products. Nutrition not only affects the development of teeth but also the development and maintenance of soft oral tissues. According to Boerum (2012), Vitamin

A deficiency during pre - eruptive stages of tooth development leads to enamel hypoplasia and defective dentin formation. Vitamin A is also associated with normal teeth spacing and promotes the osteoblast function. Boerum also highlighted that the importance of vitamin D and C. According to Boerum (2012) the functions of vitamin D is mineralization of bone and teeth and maintain calcium and phosphorous levels in the blood. Vitamin C plays an important role in the formation of connective tissues.

It is important to note that knowledge only plays an important role in prevention of oral health diseases. It is also crucial to practice oral self-care habits frequently and be aware of one's diet as cariogenic foods is the main precursor for developing dental caries. Private oral health care services in Trinidad and Tobago are provided by 338 dentists nationwide. A total of 0.7% of the health budget is allocated to public oral health care services.

Chapter Three:

Methodology

This particular study was undertaken to assess the level of knowledge, attitude and practices (KAP) among students in two faculties at the University of the West Indies St Augustine, Trinidad and Tobago.

Study Population

The study population comprised of both males and females from both the faculty of Social Sciences and the faculty of Food and Agriculture. Both undergraduate and postgraduate students were included in the study.

Design and Procedure

A cross- sectional study was conducted from February to March 2013. The students were randomly approached in classrooms, food courts and shuttle areas where they were asked to complete a questionnaire. The survey instrument used was a pre - tested, self - administered questionnaire. The questionnaire consists of 34 closed ended questions which addressed the following aspects:

a) Demographics (age, gender, religion and study year.)
b) Knowledge, attitude and perceptions (KAP) pertaining to oral hygiene
c) Dental Habits (use of mouth wash, flossing, dental visits and consumption of sugar containing food)

Sample Size

A total of 3, 560 students were currently enrolled in the two faculties for the academic year 2013/2014.The sample size for the study was calculated by using 5% of the number of students enrolled in each faculty. Out of the 3,560 students, a total of 178 were approached for participation in the study. The study included 42 out of 842 students from the faculty of Food and Agriculture and 136 students out of the 2718 in the Faculty of Social Sciences.

Statistical Analyses

Data was entered using the statistical package for social sciences (SPSS) version 12.0. Descriptive statistics were used to analyse results. Several chi-square tests were done to determine if there was any significant association between variables. These variables include knowledge level, oral practices, attitudes and dietary habits. A p value of <0.05 was used as the cut of level for statistical significance. A Student t-test was to compare mean knowledge score for both faculties. A p value of < 0.05 was used as the cut off level for statistical significance. Several diagrams were used to depict median score and frequency distribution.

Chapter Four:

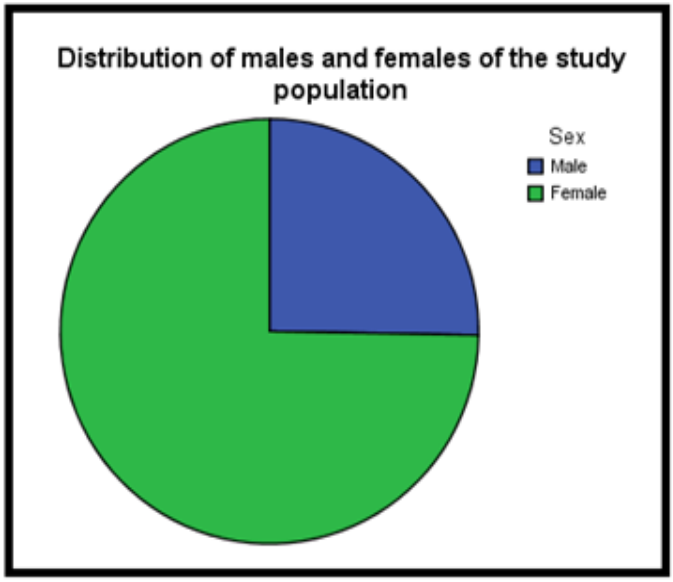
Results

Based on the data that was collected a total of 167 students belonged to the age bracket 18-24 years of age as seen in Table 1. Figure 1 gives a visual appearance of gender distribution in both faculties at UWI. Table 1 however, gives the exact percent and number of males and females that made up the study population. Regarding student status, 96.7% were undergraduates whereas only 3.4% were postgraduate students. The majority of students, 76.4% belonged to the faculty of Social Sciences since Food and Agriculture had relatively fewer students enrolled. The response rate for this study was 100%

Table 1 shows the characteristics of the Study Population.

Variable	Categorization	N	Frequency %
Age	18-24 25-34 35-44 45 and older	167 9 0.0 2	93.8 5.1 0.0 1.1
Age	Male Female	45 133	25.3 74.7
Ethnicity	African Decent Indian Decent Caucasian Decent Chinese Decent Mixed Decent	46 83 2 3 44	25.8 46.6 1.1 1.7 24.7
Religion	Christian Muslim Hindu Other	99 12 51 16	55.6 6.7 28.7 9.0
Faculty	Food and Agriculture Social Sciences	42 136	23.6 76.4
Student Status	Undergraduate Postgraduate	172 6	96.6 3.4

Figure 1 represents data from Table 1



Results were obtained by dividing participants into a high and low knowledge group. A total of 8 questions were given pertaining to oral health. Students who got 4 and over were categorized as belonging to the high knowledge group and students who got 3 and less were categorized as belonging to the low knowledge group. As seen in Table 2, overall, 88.8% of the study population had a high knowledge score whereas only 11.2% had a low knowledge score. Table 3 shows advice received on issues related to oral health. From the information seen in Table 3 majority of students did receive advice on issues pertaining to oral health. A relatively high amount of students 42.7% did not receive advice on caring for gums. Majority of students received advice from their dentist or dental nurse (73.6%) and 61.8% received advice from family and friends.

Table 2 shows the study population's current knowledge level about oral health.

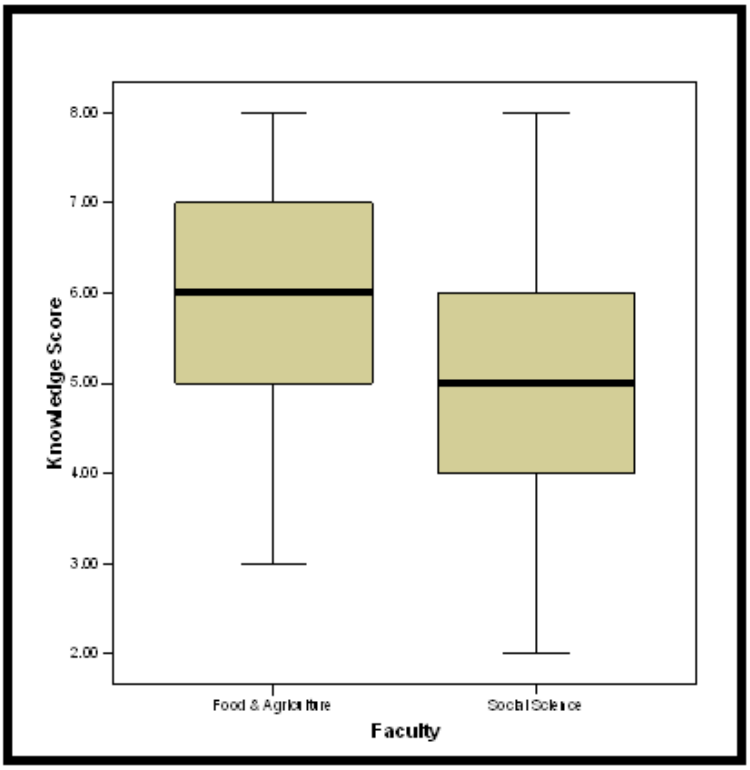
Variable	N	%
High Knowledge	158	88.8
Low Knowledge	20	11.2

Table 3 shows advice received by the study population on issues related to dental health.

Variable	Yes (%)	No (%)
Have you ever received advice on		
Brushing teeth	83.3	16.3
Times you should visit the dentist	68.5	31.5
Use of toothpaste	65.2	34.8
Use of mouthwash	60.1	39.9
Caring for gums	57.3	42.7
Diet for good dental health	59.0	41.0
Use of dental floss	77.0	23.0
Where did you get this advice		
Dentist/ dental nurse	73.6	26.4
Magazine/Newspaper	19.7	80.3
TV/Radio	34.3	65.7
Family/ Friends	61.8	38.2
Teacher	19.1	80.9
School Nurse	8.4	91.6
Pharmacist	8.4	91.6

Figure 1.1 shows the knowledge scores obtained for both faculties. The minimum point represents the lowest score obtained. From the diagram it appears that the lowest score obtained in the faculty of Social Science was 2 and the lowest score obtained in Food and Agriculture was 3. The maximum point represents the highest score obtained. From the diagram it appears that both faculties had a maximum score of 8. The middle region between the upper and lower quartile represents the median score. Figure 1.1 shows that the median score obtained for Food and Agriculture was 6 and for Social Sciences it was 5.

Figure 1.1 shows the knowledge scores obtained in the 2 faculties.



An Independent Student t - test was done to determine the mean percentage for knowledge scores in both faculties. Based on Table 4 the mean percentage for the faculty of Food and Agriculture is slightly higher than the mean percentage for the faculty of Social Sciences. The p value tabulated was 0.011 which is less than 0.05 indicating it is statistically significant.

Table 4 showing Independent student's t-test results.

Faculty	N	Mean	SD	SE	t-value	p value
Knowledge Score					2.557	0.011*
Food and Agriculture	42	5.7143	1.23537	0.19062		
Social Sciences	136	5.0809	1.45070	0.12440		

Figure 1.2 shows are representation of students' opinion about their overall oral hygiene. A total of 68% of the study population perceived their oral hygiene to be good, 30.9% thinks it has to be improved and only 1.1% believed it was very poor.

Figure 1.2

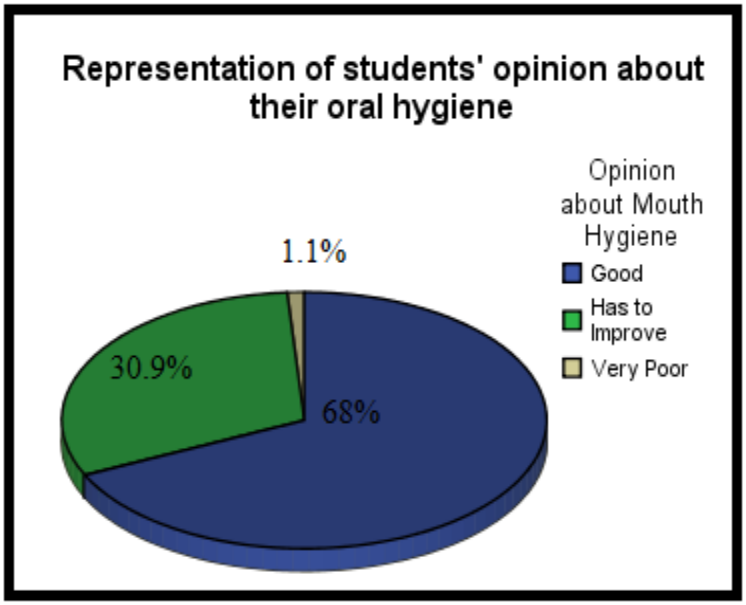


Table 5 highlights an association between knowledge level and various oral hygiene practices. The N (%) column gives the total number of responses and the percentage value. A total of 80.9% responded to brushing their teeth twice or more times as day. 32% of respondents said they never flossed while 19.2% flossed twice or more times for the day. According to Table 5, 30.9% of the study population used mouth wash at least once a day and 65.7% changed their tooth brush every 1-3 months. The majority of the study population were aware that they used fluoridated tooth paste to brush their teeth, only 5.9% of the study sample was not aware of what they used to brush their teeth. Values in brackets found in high and low knowledge columns represents the percentage value within the score for knowledge. Table 5 shows Chi Square

results when showing an association between knowledge level and various oral health practices. Based on the values tabulated, the p values were higher than 0.05 which indicated it is not statistically significant.

Table 6 shows Chi- Square results used to test for significant difference between gender and various oral hygiene practices. Based on values obtained, the p obtained for frequency for flossing teeth and gender was 0.013 indicating that it is statistically significant. Table 6 also highlighted that 65.7% of the study population changes their tooth brush every 1-3 months. A total of 94 female respondents changed their tooth brush every 1-3 months whereas a total of 23 male respondents changed their tooth brush every 1-3 months. Based on the p value tabulated (0.021), it shows that is statistically significant.

Table 5 shows Chi- Square results obtained at a 5% confidence interval for various oral hygiene practices according to the level of knowledge.

Variable	High Knowledge (%)	Low Knowledge (%)	N (%)	χ^2	p
Tooth Brushing frequency per day				.968	0.809
Once a day	27(17.1)	5(25)	32(18)		
Twice or more times a day	129(81.6)	15(75.0)	144(80.9)		
Every other day	1(.6)	0(0)	1(0.6)		
Once every two days	1(.6)	0(0)	1(0.6)		
Frequency for flossing teeth				8.89	0.064
Once a day	50(31.6)	3(15.0)	53(29.8)		
Twice or more times a day	33(20.9)	2(10.0)	35(19.7)		
Every other day	18(11.4)	4(20.0)	22(12.4)		
Once every two days	11(7.0)	0(0)	11(6.2)		
Never	46(29.1)	11(55.0)	57(32)		
Frequency for using mouthwash				6.242	0.182
Once a day	49(31.0)	6(30.0)	55(30.9)		
Twice or more times a day	43(27.2)	2(10.0)	45(25.3)		
Every other day	16(10.1)	3(15.0)	19(10.7)		
Once every two days	18(11.4)	1(5.0)	19(10.7)		
Never	32(20.3)	8(40.0)	40(22.5)		
Material used for tooth brushing				3.967	0.265
Fluoridated toothpaste	144(91.1)	16(80.0)	160(89.9)		
Non-Fluoridated toothpaste	6(3.8)	1(5.0)	7(3.9)		
Charcoal/Other	1(.6)	0(0)	1(.6)		
Don't Know	7(4.4)	3(15.0)	10(5.6)		
Method of brushing				6.323	0.176
Horizontal strokes	14(8.9)	0(0)	14(7.9)		
Upward and downward strokes	46(29.1)	3(15)	49(27.5)		
Circular Motion	73(46.2)	12(60.0)	85(47.8)		
No systematic way	20(12.7)	5(25.0)	25(14.0)		
I do not know	5(3.2)	0(0)	5(2.8)		
Brushing teeth after each meal				3.060	0.80
Yes	72 (45.6)	5(25)	77(43.3)		
No	86 (54.4)	15(75.0)	101(56.7)		

Table 6 shows Chi- Square results obtained at a 5% confidence interval for various oral hygiene practices according to gender.

Variable	Male (%)	Female (%)	N (%)	χ^2	p
Tooth Brushing frequency per day				4.110	0.250
Once a day	10(22.2)	22(16.5)	32(18.0)		
Twice or more times a day	34(75.6)	110(82.7)	144(80.9)		
Every other day	0(0)	1(.8)	1(0.6)		
Once every two days	1(2.2)	0(0)	1(0.6)		
Frequency for flossing teeth				12.743	0.013*
Once a day	12(26.7)	41(30.8)	53(29.0)		
Twice or more times a day	3(6.7)	32(24.1)	35(19.7)		
Every other day	7(15.6)	15(11.3)	22(12.4)		
Once every two days	1(2.2)	10(7.5)	11(6.2)		
Never	22(48.9)	35(26.3)	57(32.0)		
Frequency for using mouthwash				3.970	0.410
Once a day	16(35.6)	39(29.3)	55(30.9)		
Twice or more times a day	7(15.6)	38(28.6)	45(25.3)		
Every other day	5(11.1)	14(10.5)	19(10.7)		
Once every two days	4(8.9)	15(11.3)	19(10.7)		
Never	13(28.9)	27(20.3)	40(22.5)		
Material used for tooth brushing				.503	0.918
Fluoridated toothpaste	40(88.9)	120(90.2)	160(89.9)		
Non-Fluoridated toothpaste	2(4.4)	5(3.8)	7(3.9)		
Charcoal/Other	0(0)	1(0.8)	1(0.6)		
Don't Know	3(6.7)	7(5.3)	10(5.6)		
Frequency for changing tooth brush				9.714	0.021*
Every 1-3 months	23(51.1)	94(70.7)	117(65.7)		
Every 3-6 months	20(44.4)	33(24.8)	53(29.8)		
After 1 year	1(2.2)	6(4.5)	7(3.9)		
Never changed it	1(2.2)	0(0)	1(.6)		
Brushing teeth after each meal				1.456	0.228
Yes	16(35.6)	61(45.9)	77(43.3)		
No	29(64.4)	72(54.1)	101(56.7)		

Table 7 shows and association between knowledge level and consumption of cariogenic foods. As seen in column N (%), 28.7% of the study population consumed cariogenic foods such as cake, candy and chocolate 2-4 days per week. Majority of the students consumed biscuits or cookies once a day. With regards to soft drink and juices, most of the study population consumed it 2-4 times per week. A large proportion of the study population have a habit of snacking between meals (77.5%) and 42.7% snack 2-3 times per day. Based on Table 7 there was no statistical significance with regards to level of knowledge and consumption of cariogenic foods. However, with regards to juice drinks and the level of knowledge the p value obtained was 0.051 which suggest it is pending to be significant.

Table 7 Chi- Square results obtained at a 5% confidence interval for cariogenic foods according to knowledge level.

Variable	Frequency	High Knowledge (%)	Low Knowledge (%)	N (%)	χ^2	p
Sweet include cakes, chocolate, candy etc.	Never 1 day per week 2-4 days per week 5-6 days per week Once a day Every day, more than once a day	6(3.8) 34(21.5) 49(31.0) 13(8.2) 26(16.5) 30(19.0)	1(5) 9(45) 2(10.0) 2(10.0) 3(15.0) 3(15.0)	7(3.9) 43(24.2) 5(28.7) 15(8.4) 29(16.3) 33.(18.5)	7.094	.214
Cookies/Biscuits	Never 1 day per week 2-4 days per week 5-6 days per week Once a day Every day, more than once a day	14(8.9) 54(34.2) 48(30.4) 9(5.7) 15(9.5) 18(11.4)	1(5.0) 5(25.0) 5(25.0) 1(5) 5(25) 3(15.0)	15(8.4) 59(33.1) 53(29.8) 10(5.6) 20(11.2) 21(11.8)	4.948	0.421
Soft drinks	Never 1 day per week 2-4 days per week 5-6 days per week Once a day Every day, more than once a day	18(11.4) 46(29.1) 54(34.2) 10(6.3) 10(6.3) 20(12.7)	1(5.0) 5(25.0) 7(35.0) 0(0) 5(25.0) 2(10.0)	19(10.7) 51(28.7) 61(34.3) 10(5.6) 15(8.4) 22(1.4)	9.499	0.091
Juice Drinks	Never 1 day per week 2-4 days per week 5-6 days per week Once a day Every day, more than once a day	8(5.1) 39(24.7) 53(33.5) 15(9.5) 19(12.0) 24(15.2)	3(15.0) 6(30.0) 2(10.0) 1(5.0) 6(30.0) 2(10.0)	11(6.2) 45(25.3) 55(25.3) 16(9.0) 25(14.0) 26(14.6)	11.030	0.051*

Based on the percentage frequency, 43.3% of the study population visited the dentist once a year and more than half the study population do not follow up dental visits. With regards to experience at last dental visits, 74.2% of the study population said that it was pleasant whereas 16.9% said that it was unpleasant. Based on the statistical analysis, the p value obtained for frequency of dental visits and level of knowledge was 0.016 which indicated that it is statistically significant. The values obtained for the other two variables were higher suggesting there is no statistical significance.

Table 9 shows a chi-square done to determine the statistical difference between faculties and attitude towards dental visits. Based on the results obtained, there was no statistical significance between faculties and attitude towards dental visits. All p values obtained were higher than 0.05 which is an indication that there is no statistical significance.

Table 8 shows Chi- Square results obtained at a 5% confidence interval for attitude towards dental visits according to knowledge level.

Variable	High Knowledge (%)	Low Knowledge (%)	N (%)	χ^2	p
Frequency of dental visits				10.354	0.016*
Every 3 months	28(17.7)	3(15.0)	31(17.4)		
Every 6 months	39(24.7)	1(5.0)	40(22.5)		
Once a year	69(43.7)	8(40.0)	77(43.3)		
Never	22(15.9)	8(40.0)	30(16.9)		
Follow up dental visits				.401	0.527
Yes	67(42.4)	7(35.0)	74(41.6)		
No	91(57.6)	13(65.0)	104(56.4)		
Experience at the dental visits				3.720	0.156
Pleasant	118(74.7)	14(70.0)	132(74.2)		
Unpleasant	28(17.7)	2(10.0)	30(16.9)		
Never visited the dentist					

Table 9 shows Chi- Square results obtained at a 5% confidence interval for attitude towards dental visits according to faculty.

Variable	Food and Agriculture (%)	Social Sciences (%)	N (%)	χ^2	p
Frequency of dental visits				.501	0.919
Every 3 months	7(16.7)	24(17.6)	31(17.4)		
Every 6 months	9(21.4)	31(22.8)	40(22.5)		
Once a year	20(47.6)	57(41.9)	77(43.3)		
Never	6(14.3)	24(17.6)	30(16.9)		
Follow up dental visits				0.037	0.847
Yes	18(42.9)	56(41.2)	74(41.2)		
No	24(57.1)	80(58.8)	104(58.8)		
Experience at the dental visits				1.280	0.527
Pleasant	32(76.2)	100(73.5)	132(74.2)		
Unpleasant	8(19.0)	22(16.2)	30(16.9)		
Never visited the dentist	2(4.8)	14(10.3)	16(9.0)		

Chapter Five:

Analysis of Results

The aim of the study is to investigate the level of knowledge pertaining to oral health and the practice of oral habits among students in two faculties at the University of the West Indies St Augustine campus. Most students belonged to the faculty of Social Sciences because of the fact that Food and Agriculture have relatively fewer students enrolled for the academic year 2013/2014. Additionally, majority of the study population were undergraduates because the survey was conducted during the day. Most post graduates are usually on campus in the later evening. Approximately 75% of the study population were females however, it doesn't necessarily mean that there is a higher percentage of females enrolled for the academic year 2013/2014.

As mentioned in Chapter 4, a high and low knowledge group were developed by computing the overall score obtained for 8 knowledge questions. Students who obtained a score over 4 were categorized in the high knowledge group and students who obtained a score lower than 4 were categorized in the low knowledge group. All students who participated in the study have been advised on issues pertaining to oral health either by a dentist / dental nurse, family/ friends or by other persons. This could be a possible reason for a total of 88.8% of the study population scoring 4 and over, suggesting that the students in both faculties were familiar with issues pertaining to oral health. A box-and-whisker plot was used to depict the scores obtained in both faculties. Based on the diagram it appears as though the lowest score obtained in Social Sciences was 2 and the highest score were 8. The lowest score obtained in the faculty of Food and Agriculture was 3 and the highest was also 8. The median score appeared to be higher for the faculty of Food and Agriculture as oppose to Social Sciences it was lower.

A student t-test was used to compare the mean scores between the two faculties. The faculty of Food and Agriculture had a mean of 5.7143 whereas Social Sciences had a mean score of 5.0809. The p value obtained was 0.011 which is less than 0.05 suggesting there was statistical significance. These results were similar to a previous study carried out by Sharda and Shetty (2008) where there was a difference in knowledge scores between first year and final year students. The results obtained from the student's t-test reflect variation in the student's education level. It is important to note that students enrolled in both Human Ecology and Food Production programmes may have been exposed to oral health as it part of the course curriculum.

As seen in Table 2 in chapter four, the most common advice given concerning oral health was the importance of tooth brushing. This can be a possible reason for the majority of students brushing their teeth twice or more times a day. More than half the students used mouth wash at least once a day. Contrary to this, 77.0% of the total study population did receive advice on the importance flossing, and 32.0% never flossed their teeth. Majority of students were aware that they used fluoridated tooth paste to brush their teeth and changed their tooth brush every 1-3 months. In a previous study conducted by Suprabha et al. (2013) children between the ages 11-13 years lacked awareness with respect to the use of fluoride and use of dental floss. In this present studies, students were aware of the importance of both tooth paste and use of dental floss however, majority of the student population do not practice flossing. This may be due to the fact that most students brush their teeth regularly and use mouth wash once a day so they do not think it is necessary to floss their teeth every day.

A Chi- square test was conducted to test for significant difference between the level of knowledge and various oral health practices. All p values tabulated were higher than the confidence interval of 5% (0.05) suggesting that there was no significant difference.

Female population at the University of the West Indies, St. Augustine Campus, generally followed the recommended advice with regards to oral hygiene practices as oppose to the male population. A total of 32 female respondents flossed their teeth twice or more times as oppose to only 3 males who flossed twice or more times a day. These results are consistent with previous studies conducted by Khami MR, Virtanem Jl et al. (2007) which indicated that several self - care habits have been associated with gender. In the current study, the p value (0.013) obtained for frequency of flossing and gender indicates that there is some association between both variables. There is also a significant association between gender and frequency of changing tooth brush. A total of 94 female respondents changed their tooth brush ever 1 - 3 months as oppose to total of 23 males changing their tooth brush every 1 - 3 months.

Another aspect that was looked at is health- related behaviour. Unhealthy behaviours such as consuming diets high in cariogenic foods can have an impact on oral health. With respect to behaviour related to sugar consumption, 28% of the study population consumed sweets such as cake, candy and chocolate 2 - 4 days per week. Additionally 77.5% of the study population snack between meals and 56.7% do not brush their teeth after each meal. One possible reason for not brushing their teeth after a meal is that majority of students spend their entire day on campus and may not want to brush their teeth in the facilities located on campus. Also class schedule may also affect students eating habits. Unfortunately snacking between meals increases the risk of developing dental caries. Based on the results obtained from the cross tabulation between level of knowledge and consumption of cariogenic foods, the p values were higher than 0.05 indicating there was no significant differences. A p value of 0.051 was obtained when showing an association between consumption of juice type drinks and level of knowledge. This indicates

that it is pending significance. If the sample size was a slightly larger, the value would have varied. This can be considered a limitation for the study.

The final aspect that was looked at was attitude towards dental visits and its association with level of knowledge. Most of the respondents for the study were aware of the importance of dental visits and the role it played in maintaining proper oral health. From the results obtained it can be seen that there was some level of association between knowledge level and frequency of dental visits. An association between faculties and attitudes towards dental health was also looked at based on the findings there was no significance found between faculties and attitudes towards dental visits.

Most of the respondents do not follow up dental visits. One possible reason for this is that they may only visit the dentist when pain occurs. Based on findings most students perceive their overall oral health to be good this may partly explain why most of them only visited the dentist when they believe it is necessary. Similar findings were found to be the same when compared to a study with nursing students conducted by Kaira LS et al (2012).A similar study conducted by Suprabha (2013) among children ages 11 - 13 years indicated that children believed that tooth decay makes them look bad and as a result may visit the dentist frequently. Children with low knowledge were afraid of visiting the dentist and perceive it to be unpleasant. In the current study 74.2% indicated that the last dental visit was a pleasant experience. Prasad et al (2010) highlighted that a possible frequency of dental visits may also be due to high cost of dental treatment. According to the Ministry of Health, Trinidad and Tobago have approximately 55 dental units to provide dental services for citizens nationwide and as a result high cost may not be an issue the study population.

The survey instrument used in this study was a self - administered questionnaire. This method has its limitations. The KAP method assumes that both knowledge and behaviour are absolute and under conditions of uncertainty respondents maybe bias. Also the survey instrument was structured in such a way that only descriptive statistics could have been used to analyse the data. This survey was conducted during mid-terms and as a consequence of this is respondents may have just ticked an answer. Given the short period of time for this study to be conducted and completed only two out of eight faculties were targeted.

Chapter Six:

Recommendations

Results indicated that students in the faculty over Social Sciences had a lower score with respect to level of knowledge. It can be recommended that course dealing with oral self-care practices can be included as part of various degree programmes. It can be offered as an elective or even as a core course for student belonging to the faculty of Social Sciences. In additions to learning about their degree they can be thought or enlighten about the oral health and its association to dietary habits and other factors. Degree programmes should add a variety of knowledge from different aspect of life.

The Ministry of Health should introduce programmes not only at the University of the West Indies, St. Augustine Campus, but at other educational institutions to educate students about the importance of maintaining oral health. Programmes should be introduced whereby dental service can be offered monthly for persons who cannot afford to pay for health care services.

Conclusion:

Based on findings, both students at belonging to the faculty of Food and Agriculture and Social Sciences were highly knowledgeable with respect with oral health. The mean for the knowledge score was significantly higher with students in the faculty of Food and Agriculture. Most students perceived there overall oral health to be good and frequently practiced oral self-care habits. There was an association between gender and frequency of flossing and changing toothbrush. Females were more concerned with oral self-care habits. Majority of student visited the dentist once a year and do not follow up dental visits even though they responded to the last dental visit being pleasant.

Reference

- Amanda Van Boeram. 2012. "Supplement Usage and its Effect on Oral Health" Last accessed 16th April 2014.
- Archana J Sharda, Srinath Shetty. 20th February 2008." A comparative study of oral health knowledge, attitude and behaviour of first and final year dental students of Udaipur city, Rajasthan, India". Last Accessed 16th April 2014.
- Arun Kumar Prasad P, Shankar S,Sowmya J, CV Priyaa. 2010. "Oral health Knowledge Attitude Practice of School students of KSR Matriculation School, Thiruchengode". JIADS Volume 1. Issue1
- A. Watts, M Addy. 2000. "Tooth discolouration and staining: A review of Literature". Bristish Dental Journal 2001 Volume 190 No 6 pages 309-316.
- Baranya Shrikrisha Suprabha, Arathi Rao, Ramya Shenoy, Sanskriti Khanal. 30th April 2013. " Utility of Knowledge, attitude and practice survery and prevelance of dental caries among 11 to 13 year old children in an urban community in India". Last accessed 16th April 2014.
- C. Grans, N Schlueter, S.Preiss, J.Klimek. 14th October 2008. "Tooth brushing habits in uninstructed adults-frequency technique, duration and force". DOI10.1007/s00784-008-0230-8.
- Dorelia Lucia, L.L Francu. 2010. "Sucrose Intake and Carious Experience". Volume X-Nr.2. 2011.
- Dr. Varun Dahiya, Dr. Pradeep Shukla, Dr. Shreya Hasija. 2013. "Mouthwash: Role in Prevention of Oral Diseases". Last Accessed 16th April 2014.

- E. M. Allen, H. M. Ziada, D. O Halloran, V. Clerehugh et al. 1st April 2007."Attitudes, awareness and oral health –related quality of life in patients with diabetes". Journal of Rehabiliation 2008, 35,218-223.
- Khami MR, Virtanem JI, Jafarian M, et al. 2007. "Oral health behaviour and it's determinants amongst Iranian dental student". Volume 11 pages 42-47.
- Laxman Singh Kaira, Virag Srivastava, Parul Giri, Devendra Chopra. "Oral Health-Related Knowledge, Attitude and Practice among Nursing Students of Rohilkhan Medical College and Hospital:A Questionnaire Study". J Orofac Res 2012;2(1):20-23.
- Ministry of Health. "Health Report Card for Trinidad and Tobago, 2011". The Directorate of Health Policy, Research and Planning.
- Ministry of Health. July 2010." National Oral Health Plan for Trinidad and Tobago".
- "Online Medical Dictionary" Last Modified January 23rd 2012. http://dictionary.reference.com/medical/
- Patricia Macpherson. 2014. " The effect of diabetes on oral and systematic health". Volume 4 No. 10.
- Peterson PE.2003. " World Oral Health Report 2003: continuous improvement of oral health in the 21st century – the approach of the WHO Global Oral Health". Programme Community.Dent Oral Epidemiol 2003: 31 3-24
- Petti S, Tarsitani G, Panfili P, Simonetti D'Arca. 1996. "Oral hygiene, sucrose consumption and dental caries prevelance in adolescent systematic fluoride non – users". Last accessed 16th April 2014.

- R. Al- Hussaini, M. Al-Kandari, T. Hamadai, A. Al-Mutawa et al. 2002. “Dental Health Knowledge, Attitudes and Behaviour among students at the Kuwait University Health Sciences Centre”. DOI 10.1159/000072295
- Sybille Gumucio. January 2011. “ The KAP Survey Model (Knowledge, Attitude and Pratice)”
- T. Attin, E. Hornecker. 2005. “Tooth Brushing and Oral Health: How frequently and when should Tooth Brushing be Performed?” Volume 3. Number 3,2005.
- William J. Blot, Joseph K. McLaughlin, Deborah M. Winn, et al. 25th March 2014. “Smoking and Drinking in Relation to Oral and Pharyngeal Cancer”. Last accessed 16th April 2014.
- “World Health Organization (WHO)”, Last Modified 2014.

  http://www.who.int/about/en/

Appendix

Section 1 Survey Instrument (Questionnaire)

Section 2 Data Coding

Section 1

Good day, I'm currently doing my research project on Oral Dental health, knowledge, attitudes and practices among UWI students. The following questionnaire consists of 34 questions pertaining to the topic. Kindly answer the questions below to the best of your ability.

1. Age:

a) 18- 24 ( ) 1
b) 25- 34 ( ) 2
c) 35 – 44 ( ) 3
d) 45 and older ( ) 4

2. Sex:

Male ( ) 0
Female ( ) 1

3. Ethnicity:

a) African Descent ( ) 1
b) Indian Descent ( )2
c) Caucasian Descent ( ) 3
d) Chinese Descent ( )4
e) Mixed Descent ( )*5
* (A combination of two or more ethnicities)
f) Other _____ 6

4. **Religion:**
   a) Christian ( ) 1
   b) Muslim ( ) 2
   c) Hindu ( ) 3
   d) Other_____ 4

5. **Which Faculty do you belong to?**
   a) Faculty of Food and Agriculture( ) 1
   b) Faculty of Social Sciences ( ) 2

6. **Student Status.**
   a) Undergraduate ( ) 1
   b) Postgraduate ( ) 2

7. **Have you ever received advice on any of the following:**
   (Please tick all that applies to you).
   a) Brushing teeth ( )
   b) Times you should visit the dentist ( )
   c) Use of toothpaste ( )
   d) Use of mouthwash ( )
   e) Caring for your gums ( )
   f) Diet for good dental health ( )
   g) Use of dental floss ( )
   h) None of the above ( )
   1 if Ticked, 0 not ticked

8. **Where did you get this advice? (Please tick all that applies)**
   a) Dentist/dental nurse ( )
   b) Magazine/newspaper ( )
   c) TV/radio ( )
   d) Family/friends ( )
   e) Teacher ( )
   f) School nurse ( )
   g) Pharmacist ( )

9. **What is your opinion about your mouth hygiene?**

a) Good ( )1
b) Has to improve ( )2
c) Very poor ( )3

10. Do you think you need to visit the dentist?

a) Yes ( )1
b) No( )0

11. **How do others feel about your mouth health**?

a) Good ( )1
b) Has to Improve ( )2
c) Very Poor ( )3

12. Dentist advice. (Please tick all that apply.)

a) To brush teeth better ( )
b) Plaque has to be removed ( )
c) Filling ( )
d) Extraction ( )

13. Are you satisfied with the appearance of your teeth?

a) Very Satisfied ( ) 1
b) Acceptable( )2
c) Has to improve ( )3
d) Poor and not satisfied ( ) 4

14. Please tick whether you agree, disagree or don't know.

Questions	**Agree**	**Disagree**	**Don't Know**
It is necessary to maintain oral hygiene.	1	0	2
Regular dental visits are necessary to maintain mouth hygiene.			
Dental visits are due to fear of pain.			
Regular brushing prevents all tooth problems.			

Appearance and colour of teeth are permanent and cannot be altered.			
Smoking causes mouth cancer.			
Eating and drinking sweet foods **will not** cause tooth decay?			
Flossing teeth regularly **will not cause** tooth decay.			
The use of fluoride can prevent tooth decay.			

15. Which of the following do you think is the correct method for brushing your teeth?

a) Horizontal Strokes ( )1
b) Upward and Downward Strokes ( )2
c) No systematic method ( )3
d) I don't know ( )4
e) Circular Motion ( )5

16. How often do you brush your teeth?

a) Once a day ( )4
b) Twice or more times a day ( )3
c) Every other day ( )2
d) Once every 2 days ( )1
e) Never ( )0

17. How often do you floss your teeth?

a) Once a day ( )
b) Twice or more times a day ( )
c) Every other day ( )
d) Once every 2 days ( )
e) Never ( )

18. How often do you use mouthwash?

a) Once a day ( )
b) Twice or more times a day ( )
c) Every other day ( )
d) Once every 2 days ( )
e) Never ( )

19. What do you use to brush your teeth?

a) Tooth brush ( )1
b) Fingers ( )2
c) Neem Sticks ( )3
d) Other ( )4

20. Do you brush your teeth after you eat any meal? (Any meal would include breakfast, lunch or dinner)

a) Yes ( )1
b) No ( )0

21. What material do you use to brush your teeth?

a) Fluoridated toothpaste ( )1
b) Non-Fluoridated toothpaste ( )2
c) Tooth powder ( ) 3
d) Charcoal / other ( ) 4
e) Don't know ( )5

22. How often do you change your tooth brush?

a) Every 1- 3 months ( )3
b) Every 3-6 months ( )2
c) After 1 year ( )1
d) Never changed it ( )0

23. How often do you consume sweets? (Sweets would include any jams, jellies, chewing gum, candy, cakes, chocolates etc. between meals)

a) Never ( ) 0
b) 1 day per week ( ) 1
c) 2-4 days per week ( ) 2
d) 5- 6 days per week ( )3
e) Once a day ( )4

f) Everyday, more than once a day ( )5

24. How often do you consume cookies/biscuits? (Chocolate chip, Oatmeal and raisin, White chocolate chip, bourbon etc.)

a) Never ( )
b) 1 day per week ( )
c) 2-4days per week ( )
d) 5-6 days per week ( )
e) Once a day ( )
f) Everyday, more than once a day ( )

25. How often do you consume soft drink/sweet drink, sodas or any carbonated/ fizzy drinks, for example chubby?

a) Never ( )
b) 1 day per week ( )
c) 2 -4 days per week ( )
d) 5-6 days per week ( )
e) Once a day ( )
f) Everyday, more than once a day ( )

26. How often do you consume juice-type drinks such as kool aid, mauby drinks, Fruta, Snapple, Orchard or any juice drinks with added sugar?

a) Never ( )
b) 1 day per week ( )
c) 2 -4 days per week ( )
d) 5-6 days per week ( )
e) Once a day ( )
f) Everyday more than once a day ( )

27. Do you have a habit of consuming snacks between meals? If yes, please refer to question 28.

a) Yes ( )1
b) No ( )0

28. On average how many times a day do you snack? (Snacking would include munching on any food item, vegetables, fruits etc.)

a) 1 snack time per day ( )1
b) 2-3 times per day ( )2
c) 4-5 times per day ( )3
d) More than 5 times per day ( )4

29. Whom do you consult for a tooth problem? (Please Tick all that apply)

a) Dentist ( )
b) Pharmacist ( )
c) Doctor for example,a General Practitioner ( )
d) Other_____( )

30. How often do you visit a dentist?

a) Every 3 months ( )3
b) Every 6 months ( )2
c) Once a year ( )1
d) Never ( )0

31. Do you follow up with your dental visits even after relieving pain?

a) Yes ( )1
b) No ( )0

32. How was your experience during your last dental visit?

a) Pleasant ( )2
b) Unpleasant ( )1
c) Never visited the dentist ( )0

33. What was the reason for your last dental visit? (please tick all that apply)

a) Tooth ache ( )
b) Filling ( )
c) Extraction ( )
d) Abscess ( )
e) Gum Disease ( )
f) Regular Check-up ( )
g) Other ( )

34. When was your last visit to the dentist?

a) 1-3 months ago ( )4
b) 3- 6 months ago ( )3
c) 1 year ago ( )2
d) More than one year ago ( )1
e) Never visited ( )0

Section 2 : Data Coding

Variable Name: age

Variable Label: Age

Variable Measure: - Scale

Variable Type: Numeric

Value	Value Label
1	18-24
2	25-34
3	35-44
4	45 and older

Variable Name: Sex

Variable Label: Sex

Variable Measure: nominal

Variable Type: string

Value	Value Label
1	Female
0	Male

Variable Name: Ethnicity

Variable Label: Ethnicity

Variable Measure: nominal

Variable Type: string

Value	Value Label
1	African Descent
2	Indian Descent
3	Caucasian Descent
4	Chinese Descent
5	Mixed Descent

Variable Name: Religion

Variable Label: Religion

Variable Measure: Nominal

Variable Type: String

Value	Value Label
1	Food and Agriculture
2	Social Sciences

Variable Name: Student

Variable Label: Student Status

Variable Measure: Nominal

Variable Type: String

Value	Value Label
1	Undergraduate
2	Postgraduate

Variable Name: Teeth

Variable Label: Advice on brushing teeth

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Visit

Variable Label: Advice on dental visits

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Toothpaste

Variable Label: Advice on use of toothpaste

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: Mouthwash

Variable Label: Advice on use of mouthwash

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not ticked

Variable Name: Gum

Variable Label: Caring for Gum

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Dietdh

Variable Label: Diet for good health

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: DentalF

Variable Label: Use of dental floss

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Dentist

Variable Label: Dentist/Dental Nurse

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name:Newspaper

Variable Label: Magazine/Newspaper

Variable Measure:Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: Tv

Variable Label: TV/ Radio

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: FamilyF

Variable Label: Family/ Friend

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Teacher

Variable Label: Teacher

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: SchoolN

Variable Label: School Nurse

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Pharmacist

Variable Label: Pharmacist

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: OpinionMH

Variable Label: Opinion about mouth hygiene

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Good
2	Has to improve
3	Very Poor

Variable Name: needdv

Variable Label: Need to visit the dentist

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Yes
0	No

Variable Name: MouthH

Variable Label: How do others feel about your mouth hygiene

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Good
2	Has to improve
3	Very poor

Variable Name: Brushteeth

Variable Label: Dentist advice to brusth teeth better

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: plaque

Variable Label: Dentist adviced to remove plaue

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Filling

Variable Label: Dentist adviced filling

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Extraction

Variable Label: Dentist adviced extraction

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: Appearance

Variable Label: Satisfied with teeth appearance

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
1	Very Satisfied
2	Acceptable
3	Has to Improve
4	Poor and not Satisfied

Variable Name: q14a

Variable Label: Necessary to maintain oral hygiene

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14b

Variable Label: dental visits necessary to maintain oral hygiene

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14c

Variable Label: dental visits are due to fear of pain

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14d

Variable Label: regular brushing prevents tooth problems

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14e

Variable Label: Appearance and colour are permanent and cannot be changed.

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14f

Variable Label: Smoking causes mouth cancer.

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14g

Variable Label: Sweet Foods will not cause tooth decay.

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14h

Variable Label: Flossing teeth will not cause tooth decay.

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: q14i

Variable Label: The use of fluoride will prevent tooth decay.

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Disagree
1	Agree
2	Don’t Know

Variable Name: Bteeth

Variable Label: Correct method for brushing your teeth.

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Horizontal Strokes
2	Upward and Downward Strokes
3	No systematic method
4	I don’t know
5	Circular Motion

Variable Name: Frequency

Variable Label: How often do you brush your teeth.

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
4	Once a day
3	Twice or more times a day
2	Every other day
1	Once every 2 days
0	Never

Variable Name: Floss

Variable Label: How often do you floss.

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
4	Once a day
3	Twice or more times a day
2	Every other day
1	Once every 2 days
0	Never

Variable Name: q18M

Variable Label: How often do you use mouthwash

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
4	Once a day
3	Twice or more times a day
2	Every other day
1	Once every 2 days
0	Never

Variable Name: Use

Variable Label: What do you use to brush your teeth

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
1	Tooth Brush
2	Fingers
3	Neem Sticks
4	Other

Variable Name: Use

Variable Label: What do you use to brush your teeth

Variable Measure: Nominal

Variable Type: Numeri

Value	Value Label
1	Tooth Brush
2	Fingers
3	Neem Sticks
4	Other

Variable Name: Meals

Variable Label: Brushing after each meal

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	No
1	Yes

Variable Name: Material

Variable Label: What material do you use to brush your teeth

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Fluoridated Toothpaste
2	Non-Fluoridated toothpaste
3	Tooth powder
4	Charcoal/ other
5	Don’t Know

Variable Name: Change

Variable Label: How often do you change your tooth brush

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
3	Every 1-3 months
2	Every 3-6 months
1	After 1 year
0	Never changed it

Variable Name: Sweets

Variable Label: Frequency of consuming sweets

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
0	Never
1	1 day per week
2	2-4 days per week
3	5-6days per week
4	Once a day
5	Everyday, more than once a day

Variable Name: Cookies

Variable Label: Frequency of consuming Cookies/ Biscuits

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
0	Never
1	1 day per week
2	2-4 days per week
3	5-6days per week
4	Once a day
5	Everyday, more than once a day

Variable Name: Drinks

Variable Label: Frequency of consuming Soft drinks etc.

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
0	Never
1	1 day per week
2	2-4 days per week
3	5-6days per week
4	Once a day
5	Everyday, more than once a day

Variable Name: Juice

Variable Label: Frequency of consuming Juice

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
0	Never
1	1 day per week
2	2-4 days per week
3	5-6days per week
4	Once a day
5	Everyday, more than once a day

Variable Name: Snacks

Variable Label: Habit for consuming snacks

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
0	No
1	Yes

Variable Name: Snacking

Variable Label: How many times a day do you snack

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
1	1 snack time per day
2	2 -3 snack time per day
3	4-5 times per day
4	More than 5 times per day

Variable Name: Consult

Variable Label: Consult dentist for tooth problem

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Consult1

Variable Label: Consult pharmacist

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Consult2

Variable Label: Consult doctor

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: Consult3

Variable Label: Consult other

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Often

Variable Label: How often do you visit the dentist

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label
3	Every 3 months
2	Every 6 months
1	Once a year
0	Never

Variable Name: Follow

Variable Label: Follow up dental visits

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
0	Yes
1	No

Variable Name: experience

Variable Label: How was last dental visit experience

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
2	Pleasant
1	Unpleasant
0	Never visited the dentist

Variable Name: Reason1

Variable Label: Toothache

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Reason2

Variable Label: Filling

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: Reason3

Variable Label: Extraction

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Reason4

Variable Label: Abscess

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Reason5

Variable Label: Gum Disease

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label

1	Ticked
0	Not Ticked

Variable Name: Reason6

Variable Label: Regular check up

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: Reason7

Variable Label: Other

Variable Measure: Nominal

Variable Type: Numeric

Value	Value Label
1	Ticked
0	Not Ticked

Variable Name: LastVisit

Variable Label: Last dental visit

Variable Measure: Ordinal

Variable Type: Numeric

Value	Value Label

4	1-3 months ago
3	3-6 months ago
2	1 year ago
1	More than one year ago
0	Never Visited