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## Assessment of Oral Health Care and Knowledge amongst University Students

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### Abstract

**Objectives:** Good oral health not only promotes an individual to look and feel good, it also helps in preserving oral functions. The study was carried out to assess oral health knowledge and practices, attitudes as well as their oral hygiene habits among university students in the UAE.

**Method:** A structured and revised questionnaire was distributed to 300 university students that were randomly sampled from the selected universities of the UAE. The questionnaires were answered anonymously by the students and paper consisted of questions to study and assess the prevalence of oral diseases amongst these students. The answers were then subjected to statistical analysis to determine if there is a significant correlation between oral health knowledge and attitude.

**Results:** Data showed a positive correlation with a Pearson coefficient value of 0.4 given at a positive gradient when plotted as a linear graph. The students had good knowledge on the basic oral health measures but still students had poor oral health practices they brush their teeth once daily and brushed for less than the optimal time of two minutes. Lack of time and cost were reported to be the most common causes that prevented visiting the dental clinic. While some students reported no importance to visit the dentist if there is any pain as the second most common reason.

**Conclusion:** Students had good knowledge on the basic oral health measures but efforts towards spreading proper dental education is very important to minimize and prevent the escalation of oral diseases that may develop due to lack of correct dental knowledge. Oral health education programs should be conducted with reinforcement to close the gap between knowledge and practice.

**Keywords:** Oral hygiene care between university students, Oral hygiene attitude, Dental education, Dental knowledge, Oral health, Oral health attention between students

**Abbreviations:** ADA-American Dental Association

### Introduction and Review of Literature

Oral hygiene is the process of protecting the oral cavity and keeping it healthy and clean by various modalities like brushing and flossing in order to prevent tooth decay and gum diseases. Oral health is just not limited to the teeth being healthy, but means a comprehensive protection of all the structures in the oral cavity. Oral health knowledge related to periodontal and oral diseases has a major role in the treatment and prevention of the disease amongst children, adolescents and adults including university students. University students are a good representative sample for the population since they reflect education, socioeconomic conditions, acculturation, psychological stress, and culture, which can affect their oral health behavior and status. Educating adults and university students seems among the means to improve the oral health knowledge and behavior of the nation in future. In UAE, the oral health system is currently in transition. Our information is limited regarding the knowledge and attitudes about oral diseases and their prevention. Due to a lack of studies about oral health attitudes and behavior among pre-university and university students in the UAE, systematic data are needed for public oral healthcare planning [1,2].

Oral health habits are measures people learn and practice regularly in order to maintain good oral health or prevent oral diseases. Traditionally, good oral health practice consists of continuous implementation of 2 broadly defined sets of behavior: self-care habits (dental hygiene, restriction of sugar products, and use of fluoride products) and utilization of dental services (regular dental examinations, oral health education and professionally applied preventive measures). Many methods are available for maintaining optimal oral hygiene, among which tooth brushing is the most widely accepted method for the prevention and control of periodontal diseases [3,4].

The prevalence of oral diseases varies from person to person, geographical region due to the in-accessibility to health services and as well the lack of knowledge and awareness plays a crucial role. The development of the common periodontal diseases depends mainly on human behavior, and the control of these diseases is greatly supported by the fact that the etiological factors are well documented. Many studies showed that effective plaque control for each person cannot be achieved without interactive motivation that includes

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educational and informative knowledge for the patient about periodontal diseases, their initiating factors, and the major role of dental plaque as the initiating cause for inflammatory periodontal changes [5,6].

Further more people have no behavior of visiting dental clinics for general checkup. They believe that the sign of dental diseases is painful teeth/tooth and the treatment available to dental clinic is only extraction. The main cause of periodontal disease is bacterial plaque, plaque can irritate the gums and can lead to gum diseases although many other factors such as hormonal changes, diabetes, poor nutrition, smoking, and stress may affect the initiation and progression of gingival and periodontal diseases [7,8].

Dental anxiety and fear are considered as one of the major reasons for avoidance of dental care thus resulting in deterioration of their personal oral health. It has become increasingly clear that the oral cavity can act as the site of origin for dissemination of pathogenic organisms to distant body sites. A number of epidemiological studies have suggested that oral infection, especially marginal and apical periodontitis may be a risk factor for systemic diseases. Some of the systemic diseases associated with oral infection includes; atherosclerosis, myocardial infarction, infective endocarditis, low birth weight, bacterial pneumonia and gingival inflammation caused by diabetes mellitus [9,10].

Majority of the patients associated dental fear with past painful experiences during their childhood and from negative staff behavior. Other factors that triggers dental anxiety and fear are from procedures of restorative dentistry which can be due to sight, sound and the vibration sensation of dental drills coupled with the sight and sensation of a local anesthetic injection [11,12].

Good oral health not only promotes an individual to look and feel good, it also helps in preserving oral functions. Regular dental visits are highly recommended to maintain a good oral health and prevent such problems. Also, equally important are the personal oral hygiene routines such as tooth brushing and dental flossing. The American Dental Association (ADA) and other organizations recommended that adults should get preventive dental visits at least once every six months. These visits provide professional diagnostic and prophylactic services as the early detection and treatment of dental caries and oral diseases [13,14].

Quteish Taani's study in 2004 on oral health knowledge showed that 25% of adults suffered bleeding gums on brushing and around the same percentage suffered bad breath. Nearly 40% of adults believed that they had periodontal disease. However, the knowledge of periodontal problems was found to be poor among adults. These data indicate that development and implementation of well-structured dental health education programs are needed to improve and maintain suitable oral health standards among the population. A good knowledge about oral health is necessary to pursue healthy oral practices. Prevention of Oral disease is mainly dependent on good oral hygiene. Dental problems such as dental caries, periodontal disease, tooth loss and oral cancer are major public health problems in high income countries and the burden of oral diseases is growing in much low income and middle income countries. The provision of preventive dental care for adults depends greatly on the patient's initiatives in utilizing dental care [15,16].

Many studies about oral hygiene behaviors have been conducted among University students but data is limited among university students in UAE. The purpose of this study is to assess and compare between oral health knowledge, behavior, attitudes among Universities students of the UAE.

## Methods

### Study Design

A cross sectional study was conducted for duration of six months from December to May 2020, among students of selected universities across the UAE, RAK Medical Health and Sciences University, American University of Sharjah, University of Sharjah, American University of Dubai, Zayed University, Khalifa University. A prospective study by questionnaire was done and sample size of 300 was agreed on. Our inclusion criteria consisted of students from random ages between 18-30 of both male and female were asked to anonymously fill out a structured two appendix questionnaire which addressed the following aspects: (a) knowledge, attitudes and their perception about teeth and oral hygiene, and (b) dental health habits and attitudes (regularity of dental visits, tooth brushing, flossing, usage of mouthwashes). All the students were explained regarding the nature and purpose of the study. Exclusion criteria students with systemic diseases, and ages below the inclusion criteria, uncooperative individuals and dental students were all excluded from the study.

### Data Collection

The study material and data collection procedure were both obtained from questionnaires that were based on previous studies [8]. The students were requested to fill the questionnaire they were asked to respond to each item according to the response provided in the questionnaire. Responses included multiple choice questions in which the students were instructed to choose only one appropriate response from a provided list of options. 300 students from different colleges in UAE filled questionnaires were collected giving a response rate of 100%.

The collected data were then subjected to statistical analysis; Sample T test was applied to compare the study groups from different universities, gender and age group. Results were reported only in frequencies due to lack of some types questions answers from some students in choose more than one choices (Table 1 and Table 2).

#### Appendix I

1. Have you visited the dentist before?
  - a. Yes
  - b. No
2. (If yes) How often do you visit the dentist:
  - a. Often (every year)
  - b. Not so often (only during pain)
  - c. Others
3. (If no) Choose best suitable answer to why:
  - a. Fear of the dentist
  - b. Fear of anesthesia (needles)
  - c. Instruments being used
  - d. No reason
4. Do you think it is important to visit the dentist?
  - a. Yes
  - b. No
5. What was the reason for your last visit to the dentist?
  - a. Check up
  - b. Pain
  - c. To have teeth cleaned



	d. Extraction
	e. Implants or Veneering.
6. How often do you brush your teeth?	
	a. Once daily
	b. Two times a day
	c. Three times a day
	d. Once every other day
	e. I Do not brush
7. Which of the following tools do you use to clean or brush your teeth?	
	a. Tooth brush
	b. Chewing stick (miswak)
	c. Both tools
	d. None
8. What substance do you use when cleaning your teeth / mouth: (you can choose more than one option)?	
	a. Toothpaste & Mouthwash
	b. Toothpaste only
	c. Floss
	d. Charcoal
	e. Salt
	f. None
9. How often do you floss?	
	a. After Meals
	b. Before Meals
	c. Before and After Meals
	d. Never
10. Is smoking and consuming high amounts of sugar and fatty food bad for habit:	
	a. Yes
	b. No
11. Can health of teeth and mouth affect health of body:	
	a. Yes
	b. No
	c. Don't know

**Table 1:** Study the student's behavior and attitude towards oral hygiene.

Appendix II	
1. Total number of teeth:	
	a. 24
	b. 32
	c. Don't know
2. Main purpose of tooth brushing	
	a. Prevent tooth decay and gum disease
	b. Achieve cleaner and whiter teeth

	c. To remove stains
	d. All of the above
	e. I don't know
3. Meaning of dental plaque:	
	a. Discoloration of teeth (yellow , brown teeth)
	b. Soft deposits on teeth
	c. White patches on teeth
	d. Don't know
4. Meaning of gum bleeding:	
	a. Gum disease (inflammation of gums)
	b. Infection of tooth
	c. Calcium deficiency
	d. All of the above
	e. I don't know
5. Halitosis (Bad breath) is caused by:	
	a. Improper brushing
	b. Bacteria
	c. Food
	d. Saliva
	e. All of the above
	f. I don't know
6. Tooth Ache means:	
	a. Extraction
	b. Root Canal treatment
	c. Sensitivity
	d. All of the above
	e. I don't know
7. Meaning of impacted teeth:	
	a. Retained tooth/teeth within the gum
	b. Missing teeth/tooth
	c. Discolored teeth/tooth
	d. I don't know
8. Consuming a lot of Soda and Sweet food:	
	a. Can lead to decaying of teeth
	b. Calcium deficiency
	c. Leads to bleeding gums
	d. Tooth Loss
	e. All of the above
	f. I don't know
9. Effects of fluorides on teeth:	
	a. Prevention of gum disease
	b. Prevention of tooth decay
	c. Cleaning of teeth
	d. I don't know
10. Reasons of oral cancer:	
	a. Calcium deficiency



- b. Tobacco chewing, smoking, pipe smoking.
- c. Vit. C deficiency
- d. I don't know.

**Table 2:** Understand and study the student's knowledge about dental health.

## Results

All respondents were included in the data analysis of the study. The obtained data were analyzed using the Statistical Package for the Social Sciences (SPSS) software for windows version 20.0. All statistical tests were performed using 0.05 as the level of significance at 95% confidence interval. Depending on the nature of the variables, descriptive statistics were used to tabulate and describe the data (frequency, distribution, percentages) and inferential statistics (T-test and Chi Square tests). The statistical analysis showed a positive correlation between dental health knowledge and attitude at an  $R=0.4$ . T-statistics was carried out and gave a value of 7.677 which provides evidence supporting the alternative hypothesis. Furthermore, F-stat test gave a value of 58 which was further confirmed with a P-value of  $2.431e-13$  which provides strong evidence against the null hypothesis; this data can be seen below in the data sheet provided from MAT lab in **Figure 1.1**.

```
## 'data.frame': 300 obs. of 2 variables:
## $ i..behavior: int 9 9 8 5 5 7 6 6 8 9 ...
## $ knowledge : int 6 8 7 1 2 8 5 5 7 6 ...

Correlation<-cor(DentalData$i..behavior,DentalData$knowledge)
Correlation

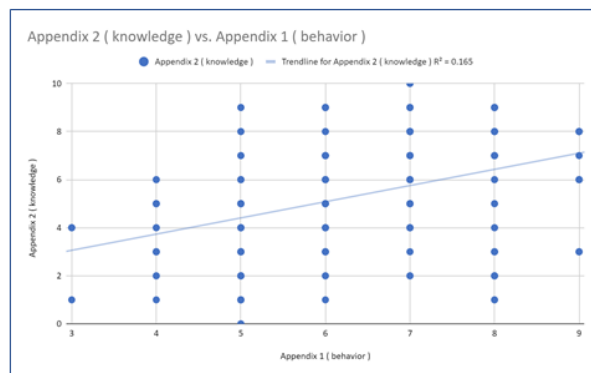
## [1] 0.4063517

LinearModel<-lm(i..behavior~knowledge, data=DentalData)
summary(LinearModel)

##
## Call:
## lm(formula = i..behavior ~ knowledge, data = DentalData)
##
## Residuals:
## Min 1Q Median 3Q Max
## -3.0188 -0.7736 -0.2448 0.7552 3.2264
##
## Coefficients:
## Estimate Std. Error t value Pr(>|t|)
## (Intercept) 5.03790 0.18593 27.096 < 2e-16 ***
## knowledge 0.24522 0.03194 7.677 2.35e-13 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.319 on 298 degrees of freedom
## Multiple R-squared: 0.1651, Adjusted R-squared: 0.1623
## F-statistic: 58.94 on 1 and 298 DF, p-value: 2.346e-13
```

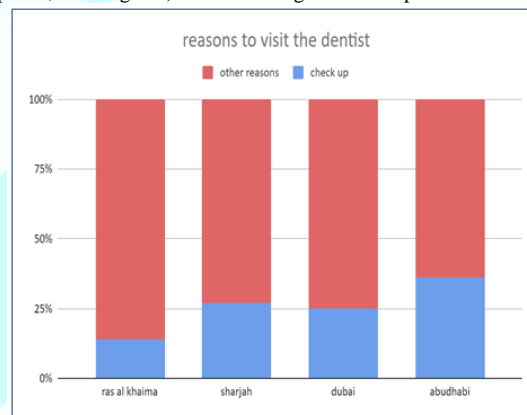
**Figure 1.1:** Data sheet provided from MAT lab.

**Figure 1.2** below shows how the data is scattered at an expected typical  $R=0.4$  value with a positive slope showing that there is a positive correlation between the two appendixes questionnaire, where appendix 2 tested oral health knowledge and appendix 1 tested oral health behavior.



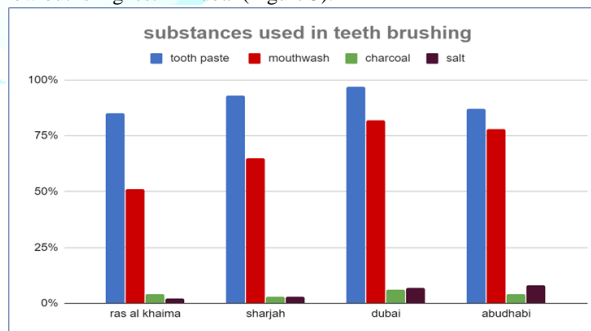
**Figure 1.2:** Positive correlation between the two appendixes questionnaire.

Moreover, **Figure 2** below showed that the study revealed that the majority of people visited the dentist only at a time of need (pain, implants, cleaning etc.) and not for regular checkups.



**Figure 2:** Reasons to visit the dentist.

Additionally in **Figure 2** and **Figure 3** showed that, the use of mouthwash across cities with lower socioeconomic status has been close to substantial in comparison with higher developing cities such as Dubai and Abu Dhabi. However, the use of newly additives alongside of toothpaste such as activated charcoal and salt remains low but is highest in Dubai (Figure 3).



**Figure 3:** Substances used in teeth brushing.

**Figure 4.1** is a result from a study done shows that 138 (98.57%) students knew that dental caries were mainly caused by bacteria. Only 49 (35%) students knew that sweetened food or drinks cause's dental caries. About 117 (83.57%) students knew that fluoride toothpaste prevents dental caries. About 137 (97.86%) students knew tobacco causes oral cancer.



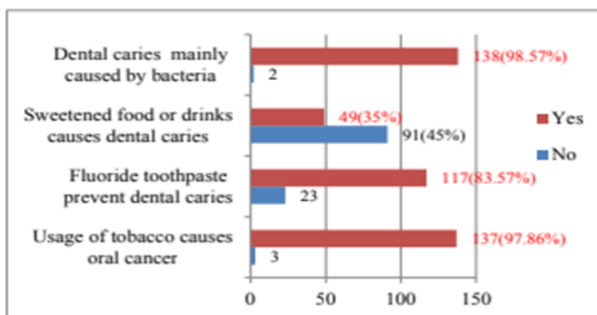


Figure 4.1: Study showing the causes for dental caries.

Figure 4.2 shows how our results align with the study mentioned above where 84% of the students believe that dental caries is caused by bacteria and 63% agrees that fluoride prevents dental decay and 91% of the students agree that tobacco causes cancer.

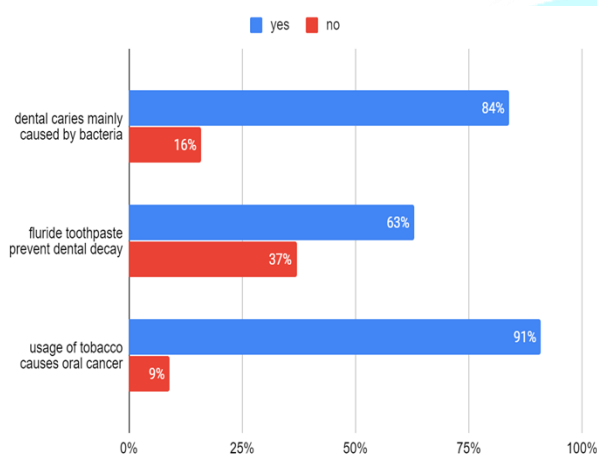


Figure 4.2: Percentage of student's opinion on dental caries, fluoride and tobacco.

Figure 5.1: 20 (14.28%) student's visit dentists once in 6-12 months, 65 (46.43%) when there is dental pain, and 55 (39.28%) have never visited dentists.

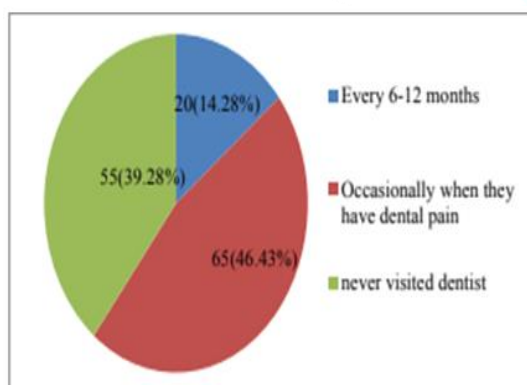


Figure 5.1: Results of student's dental visits.

Figure 5.2: Shows the result of our study which agrees with the previous study that the majority of the population visit the dentist only when in pain. However, our population had 0% of the students never visited the dentist before and 15% visited the student 1-2 per year.

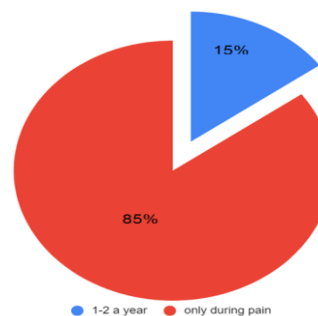


Figure 5.2: Population visit to dental clinic.

## Discussion

In the developing countries, there is a high prevalence of oral diseases in their communities. This can be due to neglect, scarcity of resources, poor knowledge and negative attitudes. This cross sectional study aimed to assess the knowledge, attitude and practices of 300 students who were randomly selected from five colleges in UAE.

In the present study, it was reported that the students had a good knowledge about oral health. It was reported that majority 63% of the students knew that the poor oral health lead to gum diseases. A good knowledge about oral health is necessary to pursue healthy oral practice. Several studies have reported that dental health attitudes become more positive and improved with an increasing level of dental education [16,17].

The attitude among the students regarding oral health was diverse. Majority of students perceived that regular visits to the dentist were necessary and this also with accordance a study done by Jasim Al-Ansari in 2019 agreed with our results which had showed that oral health knowledge seemed to be limited within the students and more than half of the students had visited a dentist during the previous 12 months but only one third of students were brushing twice a day or more often [16]. The study concluded that their tooth brushing practices are still far behind the international recommendation (twice a day). Knowledge, why it should be done so, was very limited (Shown in Figure 2 and Figure 3).

Several studies conducted in Spain, Jordan, India and Kuwait showed an association between increased knowledge and better oral health. However good oral health not only promotes an individual to look and feel good, it also helps in preserving oral functions [18-20].

As in Figure 4.1 and Figure 4.2 concluded that Almost everyone used a toothbrush regularly, but flossing and usage of mouthwashes fell short and in addition to the study, it was also observed that many of these students lack crucial education and knowledge when it came to periodontal related structures, and diseases or complications that can arise from not practicing proper oral hygiene and this results in acceptance with Retnaningsih Dwi and Arinti Rani (2018) [21,22].

This results also showed (in Figure 5.1 and Figure 5.2) that young people in the UAE are different in attitude when it comes to the importance of visiting the dentist, our results showed that the students visited the dentist only when they had a dental problem, as pain is the most important factor for visiting the dentist. This concluded same results as Muthu, et al. in 2015 [23].

Periodontal disease, including gingivitis and periodontitis, is considered to be one of the most common diseases among the population and, if left untreated, can lead to tooth loss. University students are a good representative sample for the population since



they reflect education, socioeconomic conditions, acculturation, psychological stress, and culture, which can affect their oral health behavior and status [24,25].

Many Studies showed that high percentage of adults reported gum bleeding on brushing, bad breath, and being irregular attendees to the dentist. In another study, he showed that around 80% of the subjects attended the dentist only in an emergency. Non-dental university students receive no oral health education at all during their university study, and their curriculums contain no information regarding oral health education. The above mentioned findings in the literature might explain why many participants demonstrated poor knowledge of periodontal disease signs, causes, preventive measures, and relations to general health, systemic disease and smoking [26,27].

This similar agreement with Ashley, et al. [28] found that oral health knowledge is considered to be an essential prerequisite for health related behavior even Vermaire, et al. in 2010 [29] found that a good knowledge about oral health is necessary to peruse healthy oral practice. While a weak association seems to exist between knowledge and behavior in cross sectional studies.

Furthermore, studies were done by Baseer, et al. in 2012 [30] and Timmerman, et al. in 1997 [31] disagreed with our results which reported more attributed to more favorable conditions like universities dental hospitals, free dental treatment at universities students. This could be due to the fact that students had excellent opportunities to promote oral health over health.

However students believed that these are a relationship between oral health and general health exists, brushing of teeth regularly prevents dental decay, sweets and soft drinks affect the teeth adversely. The relationship between knowledge, attitude and practice students had both good knowledge in accordance with education levels and economic status which shown in our results in Figure 3 which shown a difference between Dubai, RAK, Sharja and Abu Dhabi.

The relationship between knowledge, attitude and practices 36.2% students had both good knowledge and positive attitudes and 33.7 % students had both good knowledge and good practice. This similar to the findings of several studies that have shown oral health knowledge among the universities students positively influences their attitudes and behaviors, also in agreement with the findings of the study conducted [32-34].

In our study the prevalence of daily, brushing was reported that majority of the students brushed once daily and were using tooth brush and toothpaste, while a study conducted by Amin, et al. in 2008 [35] in Saudi Arabia (who reported that 45% of students were using miswak as a brushing tool).

Our results showed that the students visited the dentist only when they had a dental problem. This could be interpreted as pain is the most important factor for visiting the dentist. As far as reason for not visiting the dentist, there did not have any pain in the tooth. Other reasons for not visiting the dentist were busy schedule, high cost of treatment and afraid of the dental needle.

## Conclusion and Summary

The importance and aim of this study was to compare the oral health knowledge, attitudes, habits and perception about dental health among students both male and female between the ages 18-30 years old from the UAE. Overall, the study has resulted in accepting the hypothesis and rejecting the null hypothesis. This should emphasize the importance of spreading correct dental education amongst the population to help regress the spread of dental diseases. The fact that participants have shown un-abidements to ADA oral hygiene

recommendations such as not visiting the dentist twice per annum for regular checkup and maintenance signifies the importance of having proper and correct awareness of oral hygiene knowledge. We recommend holding specialized dental awareness camps and distribute dedicated advertisements that would support the benefit of this cause. Lastly, we would like to further extend this research by testing what is the percentage of the population that abides by the ADA guidelines of oral hygiene and if that number is significantly high or not.

## Recommendations

The study showed that oral health knowledge among the university students positively influences their attitude and behavior. Oral health education programs should be conducted with reinforcement, so that students can close the gap between knowledge and practice by changing their attitude from negative to positive one.

## Ethical Approval

This study was approved by The Research Ethics Committee of RAKMHSU with proposal RAKMHSU-REC-184-2020-UG-D.

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