

Knowledge and Behavior towards Oral Health among Undergraduate Students of the Catholic University of Eastern Africa, Kenya

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Abstract

Background: Oral health has been defined as the state of being free from facial and mouth pain, sores and oral infections and oral or any other diseases that may limit a person's capacity in speaking, biting, smiling chewing and/or from psychological or psychosocial well-being. Oral ill health is associated with stroke, diabetes, heart diseases, pneumonia among other respiratory diseases and is as well associated with low birth weight in newborns and preterm deliveries. Oral ill health can cause discomfort, functional limitations, and impairment, physical, social and psychological disability that can result from pain caused by oral diseases. This research has established the prevalence of knowledge and behaviors towards oral health among the Catholic University of Eastern Africa undergraduate students, Lang'ata Campus.

Materials and Methods: A school-based, cross-sectional study design was conducted among 98 Catholic University of Eastern Africa students. Stratified random sampling was applied to select participants for the study. A pre-tested questionnaire was given out to determine oral health knowledge and behaviors with a semi-structured self-administered questionnaire with open-ended and closed-ended questions was used in data collection.

Results: A total of 98 (n = 98) undergraduate students from the Catholic university of Eastern Africa responded to the study. Female students had significantly better knowledge and behavior on oral health as compared to the male students (p < 0.05). Majority of the respondents (69.4%) aged < 25 years had high level of knowledge (76.5%) on dental check-up. Additionally, most of the students (72.4%) had knowledge that the type of food they ate had an effect on oral health. More than half of the respondents (62.2%) had knowledge that drugs and substance abuse had harmful effects on their oral health. Furthermore, large number of the respondents (53.1%) had ever visited the dentist with more than half (54.1%) visited while in pain. Most of the respondents who brushed their teeth in the morning were female (p value = 0.029) while male were knowledgeable on the length of time before changing their toothbrush. Most of the respondents significantly (p = 0.001) changed their toothbrush after 1 - 3 months as demonstrated in this study which is major requirement for oral health.

Conclusion: The study reveals that there is a disparity in knowledge and oral health practices among the study population. Therefore, an essential need to increase oral health knowledge and behaviors among university students, including awareness of various oral cavity problems and how to avoid dental disorders is indispensable. Improvements can be implemented by regular campus training, such as oral health seminars, materials and other similar ways. Further research in a more diverse student population is recommended to expand on the findings of this study.

Keywords: Oral Health; Xerostomia; Halitosis; CUEA; Gingivitis; Noma

Background Information

Oral health is a state of having the ability to speak, smile, smell, taste, chew, swallow and convey a range of emotions through facial expressions with confidence and without pain, discomfort and disease of the craniofacial complex (FDI, 2021). Periodontal diseases, dental caries, oral manifestations of HIV, oral cancers, cleft lip and palate or-dental trauma and noma [1] are the major oral health illnesses. Oral health illnesses are a burden to almost all countries affecting individuals throughout their lifetime and causing pain, disfigurement, discomfort and may even cause death [2].

The Global Burden of Diseases estimates that oral health diseases affect more than 3.5 billion people throughout the globe with caries of the permanent teeth being the most prevalent oral health disease affecting nearly 2.3 billion people of the world's population ([3], pp 1789-8583). Irrespective of the severity, every human being encounters some degree of tooth decay in their lifetime. Untreated dental caries of permanent teeth are the leading cause of tooth loss [4]. Dental caries is most prevalent in Latin-American countries and Asia and less prevalent in African countries [4]. Periodontal disease affects almost 10 percent of the world population and it is mainly associated with tobacco use and poor oral hygiene. At some point in life, 20% of the population suffer from oro-dental trauma while cleft lip or palate affects more than one newborn in every 1000 births worldwide. Noma is a gangrenous disease of the face and mouth affecting children between 2 - 6 years of age and is mainly found in sub-Saharan Africa. It is estimated that around 140 000 new cases of noma occur annually and are fatal in 90% of the cases (WHO, 2020). Oral cancers are ranked in the top three cancers in Asian- pacific countries and are estimated at 20 cases in every 100000 people. In Europe and North America, the HPV virus is the leading cause of oral cancer mostly among young adults [5]. In the United States, there were 45000 new diagnosed cases of oral cancer in 2016 with more than 10,000 deaths [6].

Despite oral health illnesses not being considered life-threatening by the general population, ill oral health has been previously associated with mortality [7]. Indirectly, the loss has been linked with mortality as it leads to poor eating behavior and thus poor nutrition [8]. Periodontitis and dental caries have been associated with the acceleration of the atherosclerotic process and causing coronary heart disease [9]. Certain researches propose that mortality is related to oral health problems because they share some risk factors like smoking, low socioeconomic status, and age with cardiovascular diseases [10]. Poor oral health has also been linked to low birth weight and premature births [11].

According to WHO, 2021 in Africa, oral health problems have been associated with the rising cases of non-communicable diseases. In 2017, approximately 400 million people were affected by some form of oral disease (WHO, 2021). Gingivitis prevalence is high in all age groups mostly in African countries while dental caries prevalence is much lower than in developed countries. The most common birth defect in Africa is oral-facial clefts and the estimated oral cancer cases stand at 25 cases per 100000 people in Africa. The Middle East and North Africa have the most cases of noma [12].

According to research conducted in Kenya by the ministry of health in 2015, involving 1462 adults from Nairobi (capital city), Mombasa and Kisumu (main urban centers), rural areas, and small towns, nearly 99.9% of the sample population reported having a case of a dental related condition in the previous one year [13]. The recommended dentist: population ratio by WHO (2017) is 1:7000 as compared to Kenya which has 1000 registered dentists thus serving a population ratio of 1:42000 with only approximately 20% of the dentists in rural areas. Dental materials are quite expensive and contribute to the escalation of lacking dental services thus preventing a majority of people from accessing the services [13,14]. In Kenya dental caries affected 34.3% of the adults, 98.1% of adults suffered from gum diseases in 2014 and 0.4% of children suffered from noma [13].

A research carried out by the School of Dentistry, Eldoret University involving 401 students consisting of 221 males and 180 females showed that females brush more frequently than males [15]. After meals, 86.5% of the students brushed their teeth. Use of commercial toothpaste was reported by 39.9% of the students while 87% of the students did not visit the dentist unless they have a dental problem. Only 16.5% of the total students could clearly explain the importance of teeth [15]. The research aimed at finding out the oral health

knowledge and behaviors among undergraduate CUEA students. The results obtained from the research on oral health knowledge, and behaviors may provide beneficial information on how the students perceive oral health. It can also pave way for any interventions required to promote oral health.

Materials and Methods

Study setting and sampling

This was a school-based descriptive cross-sectional study, undertaken among 98 students. A pretested semi-structured questionnaire was used to collect data on knowledge and behaviors towards oral behaviors among CUEA undergraduate students. This study was carried out in the Catholic University of Eastern Africa, Langata, Nairobi County. The institution was founded in 1984. It is certified by ISO 9001:2015. It accommodates local and international students. It has different faculties including faculty of science, commerce, education, faculty of arts and social sciences, center for social justice and ethics, school of nursing, law and business.

A Stratified random sampling method was applied to select study participants. A compiled list of every undergraduate gender and year of study was obtained. Using the list, stratification on two characteristics was done; gender with two strata (male and female) and year of study with four strata (year 1, 2, 3 and 4). Since the target population was 98 students, they were divided by the 8 strata groups to obtain 12 study participants in each strata. Simple random sampling was used to select study participants within the 8 strata groups.

Data collection

Data was collected using pretested, semi-structured questionnaires from the students in CUEA. The collected data was on social-demographic factors, dental check-ups, diet and nutrition, drug and substance abuse and oral hygiene.

Data analysis

Quantitative data was analyzed using SPSS version 22.0. Descriptive analysis was done using means and percentages to determine the relationship between independent and dependent variables. The results obtained was presented as graphs, bar charts and tables.

Ethical approval

This study was approved by UoN-KNH Ethics and Research Committee number UP877/11/2021 and National commission for science, technology and innovation (NACOSTI) license number NACOSTI/P/22/15011.

Results

The analysis and interpretation of the study findings have been highlighted in this chapter. The results are presented in tables, bar graphs and pie charts. The sample size of this study was 98. 98 questionnaires were fully responded to giving a response rate of 100%. Any response rate above 50% is considered adequate for statistical data analysis (Bobbie, 2002). The statistical data analysis is in accordance with the specific objectives of this study. The overall objective of this study was to assess the knowledge and behaviors towards oral health among the Catholic University of Eastern Africa undergraduate students.

Socio-demographic characteristics of the respondents

A majority of the respondents 69.4% (N = 68) were aged less than 25 years. Most of them were female 61.2% (n = 60) and in their 3rd year of study 28.6% (n = 28) as shown in table 1 below.

Variable	Frequency	(Percent %)
Age		
< 25 years	68	69.4
25 - 35 years	24	24.5
> 35 years	6	6.1
Gender		
Male	38	38.8
Female	60	61.2
Year of study		
1	20	20.4
2	24	24.5
3	28	28.6
4	26	26.5

Table 1: Socio-demographic characteristics of the respondents.

Key: < Less than > More than.

Level of knowledge on oral health

Level of knowledge on the importance of regular dental check-up

There was a high level of knowledge (76.5%) on the importance of regular dental check-up as shown in figure 1 below.

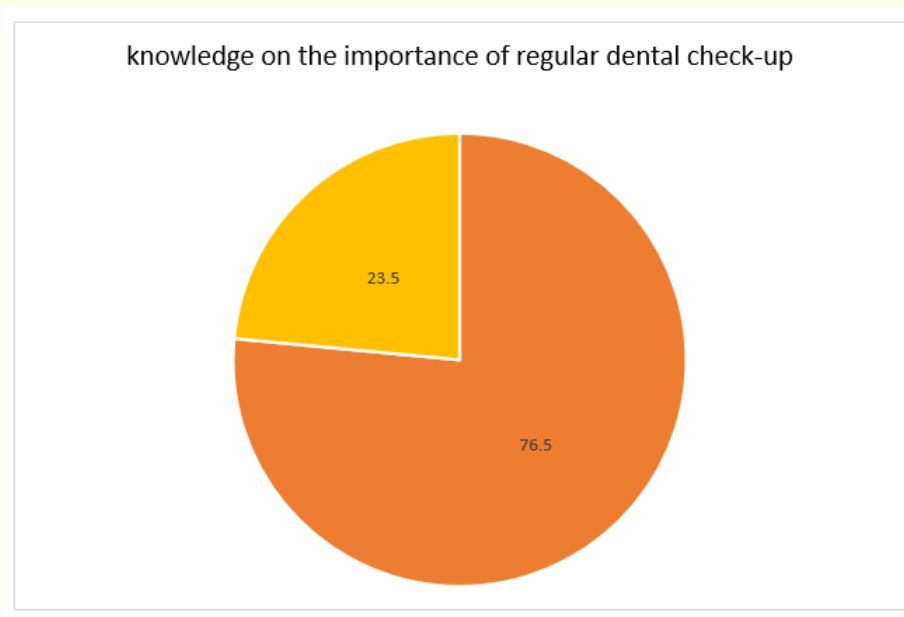


Figure 1: Knowledge on importance of regular medical check-up.

Key: ■ Yes ■ no

Gender in relation to knowledge on importance of regular dental check-up

More females had a good knowledge on importance of regular dental check-up as highlighted in figure 2 below.

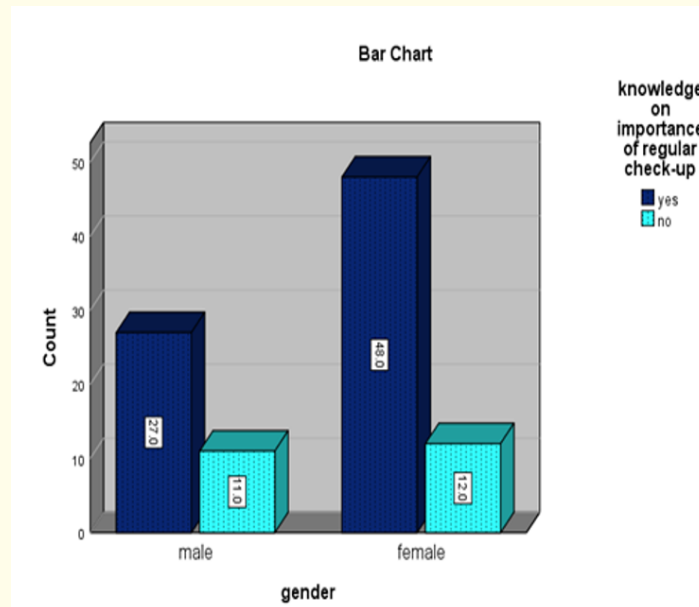


Figure 2: Gender in relation to knowledge on importance of regular dental checkup.

Knowledge that the frequency of the type of food eaten has an effect on oral health

A majority of the respondents, (72.4%) had a good knowledge that the type of food one eats has have an effect on their oral health.

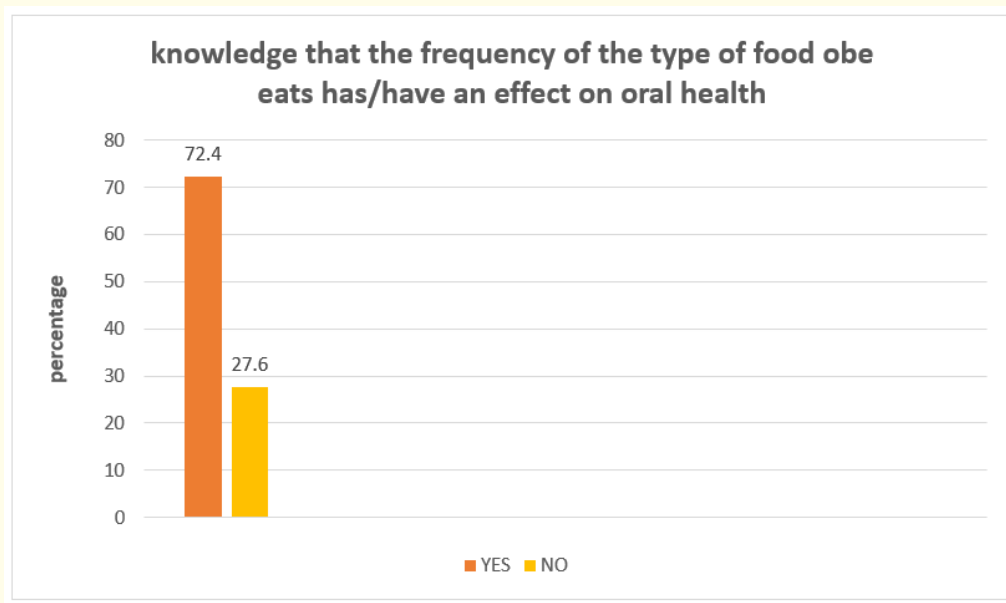


Figure 3: Knowledge that the frequency of the type of food eaten has an effect on oral health.

Knowledge on harmful effects of drug abuse on oral health

More than half of the respondents (62.2%) had a good knowledge that drug abuse had a harmful effect on oral health.

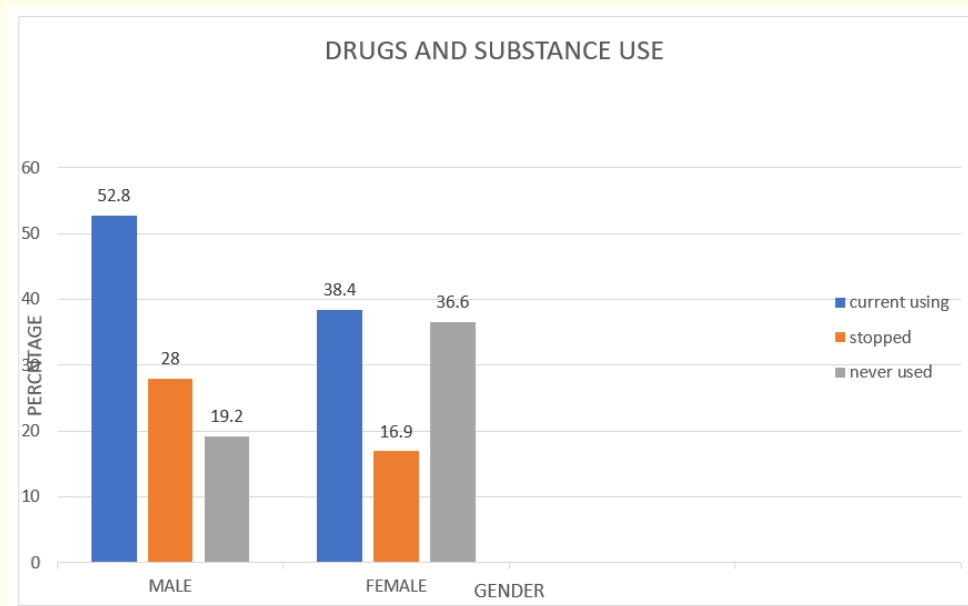


Figure 4: Use of drugs and substance abuse.

Gender in relation to knowledge on harmful effects of drug abuse on oral health

More females had a good knowledge on effects of drug abuse on oral health than males as shown in the figure below.

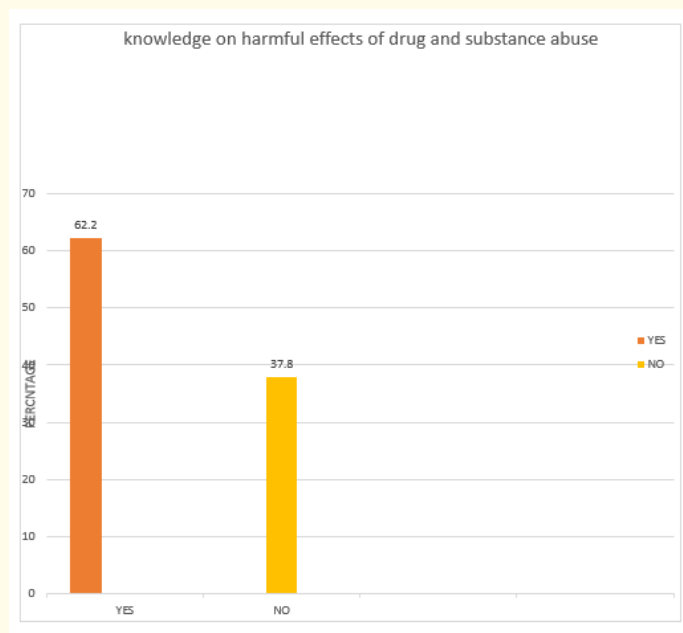


Figure 5: Knowledge on harmful effects of drug abuse on oral health.

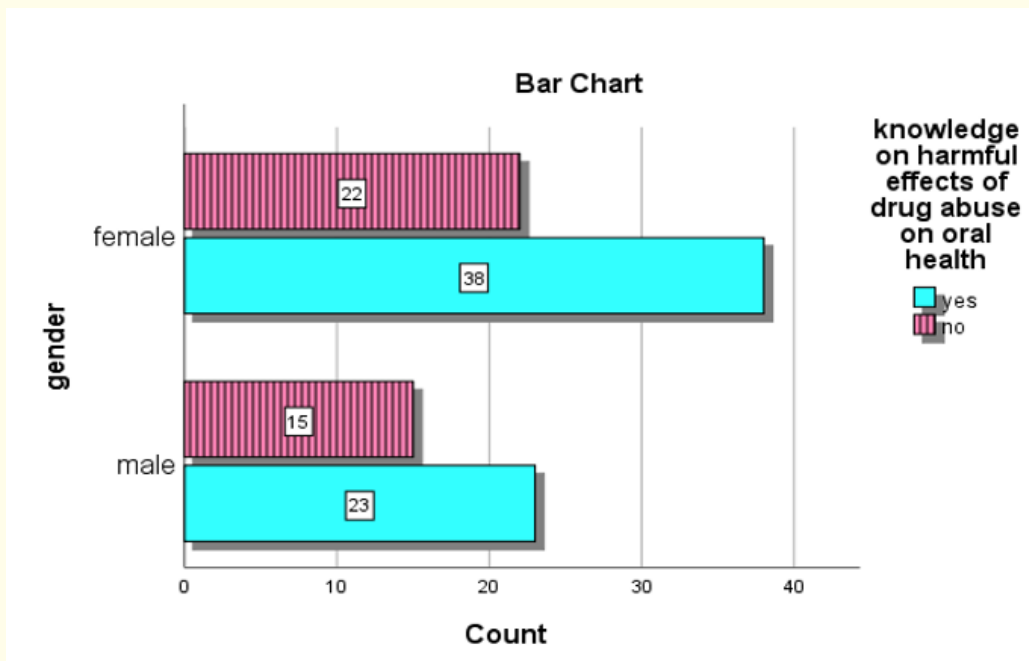


Figure 6: Gender in relation to knowledge on harmful effects of drug abuse on oral health.

Oral hygiene practice among undergraduate students at the catholic university of eastern Africa

A majority of the respondents had ever visited a dentist for check-up (53.1%). However, more than half of them visited the dentist when in pain (54.1%). Most of them went to the dentist for tooth extraction (20.4%). Most of them brushed their teeth once a day (40.8%), and used a tooth paste and a brush (79.6%). A majority of them recommended a medium hard brush (40.8%).

Practice	Frequency (n)	(Percent %)
Have you ever visited the dentist for dental check-up?		
Yes	52	53.1
No	46	46.9
How often do you visit the dentist?		
Regularly	24	24.5
Occasionally	21	21.4
When in dental pain	53	54.1
What type of treatment did you seek during your last visit?		
Dental X-rays	10	10.2
Check-up/consultation	18	18.4
Gum treatment	16	16.3
Scaling	8	8.2
Crowning/bridging	18	18.4
Tooth extraction	20	20.4
Filling	8	8.2

Frequency of brushing teeth		
Less than once a day	26	26.5
Once a day	40	40.8
Twice a day	26	26.8
More than twice per day	6	6.1
Items used to clean teeth		
Toothpaste+ brush	78	79.6
Mouthwash	10	10.2
Dental floss	6	6.1
Toothpicks	4	4.1
What type of toothbrush do you recommend when brushing teeth?		
Soft	38	38.8
Hard	10	10.2
Medium hardness	40	40.8
I don't know	10	10.2

Table 2: Oral health behaviors.
Key: n- Sample size; %- Percentage.

Association between socio-demographic variables and oral health behaviors students at the catholic university of eastern Africa

A significant relationship was established between socio-demographic variables and oral health behaviors. A majority of the respondents who had ever visited the dentist were aged less < 25 years and the two variables were significant (p = 0.003). Most respondents who brushed their teeth in the morning were female (p = 0.029), most of them preferred using toothbrush with medium hardness and were aged less than 25 years (p = 0.032, p = 0.004) respectively. Most of the respondents significantly changed their toothbrush after 1 - 3 months (p = 0.000) as shown in table 3 below.

Variable	Yes	no	Total	Chi-square	Df	P value
Age	Have you ever visited the dentist for dental check-up					
< 25 years	30 (57.7)	38 (82.6)	68 (69.4)	11.612	2	0.003
25-35	16 (30.8)	8 (17.4)	24 (24.5)			
>35 years	6 (11.5)	0 (0)	6 (6.1)			
Total	52 (100)	46 (100)	98 (100)			
Gender	At what time of the day do you brush your teeth					
	Morning	Noon	Before bed	Total		
Male	21 (30)	11 (73.3)	6 (46.2)	38 (38.8)	9.051	3
Female	49 (70)	4 (26.7)	7 (53.8)	60 (61.2)		
Total	70 (100)	15 (100)	13 (100)	98 (100)		
	What type of brush do you recommend when brushing your teeth					
	Soft	Hard	Medium hardness	Total		
Male	15 (39.5)	8 (47.1)	15 (34.9)	38 (38.8)	8.788	3
Female	23 (60.5)	9 (52.9)	28 (65.1)	60 (61.2)		
Total	38 (100)	17 (100)	43 (100)	98 (100)		

Age	What type of brush do you recommend						
	Soft	Hard	Medium	Total			
< 25 years	32 (78.0)	18 (66.7)	28 (70)	68 (69.4)	18.900	6	0.004
25 - 35 years	9 (22.0)	7 (25.9)	8 (20)	24 (24.5)			
> 35 years	0 (0.0)	2 (7.4)	4 (10)	6 (6.1)			
Total	41 (100)	27 (100)	40 (100)	98 (100)			
	How long before changing toothbrush						
	1 - 2 weeks	3 - 4 weeks	1 - 3 months				
< 25 years	22 (91.7)	18 (69.2)	28 (63.6)	68 (69.4)	24.19	6	0.000
25-35 years	0 (0.00)	8 (30.8)	16 (36.4)	24 (24.5)			
>35 years	2 (8.3)	0 (0.00)	4 (9.0)	6 (6.1)			
Total	24 (100)	26 (100)	44 (100)	98 (100)			

Table 3: Association between socio-demographic variables and oral health behaviors.
 Key: < -Less than; >- Greater than; Df-Degrees of freedom; P-Value- < 0.05.

Association between knowledge on oral health and socio-demographic variables

There was no significant relationship between oral health and socio-demographic factors, i.e. p value was greater than 0.05. More females had a good knowledge on importance of regular checkup than men (Chi = 1.037, df = 1, p value = 0.309). On the other hand, more males had a good knowledge on length of time before one changes their tooth brush than females (Chi = 4.063, df = 3, p value = 0.255). More females had a good knowledge on harmful effects of drug abuse on oral health than men (Chi = 0.078, df = 1, p value = 0.780).

Discussion

Oral health is an integral part of general health and a valuable asset for any individual. Oral health has always been remained a neglected entity. People have underestimated consequences of bad oral health, which have led to bigger problems which later on become difficult to treat. The main objective of the study was to assess the knowledge and behaviors towards oral health among the Catholic University of Eastern Africa undergraduate students. In this study some expected findings were reported as well as other fascinating relationships and trends.

The level of knowledge on oral health

There was a high level of knowledge (76.5%) on the importance of regular dental check-up. These findings were much higher than findings from a study done in India where a 32% of the participants had a good knowledge on oral health [16]. This could have been due to differences in area of study as students with a university level of education are more likely to be more knowledgeable. More females had a good knowledge on importance of regular dental checkup than men in this study. A majority of the respondents, (72.4%) had a good knowledge that the type of food one eats has/Have an effect on their oral health. A study done in Zambia on school children identified similar findings as awareness on oral hygiene among participants in the study was generally adequate [12]. More than half of the respondents (62.2%) had a good knowledge that drug abuse had a harmful effect on oral health. Furthermore, this study established that more females had a good knowledge on effects of drug abuse on oral health than males.

The oral health behaviors

A majority of the respondents had ever visited a dentist for check-up (53.1%) and most of whom went to see the dentist when in pain (54.1%). A study done in Northern India had similar findings with 52% of the respondents having visited the dentist for check-up and

extraction and pain as the reason for the first visit [16]. Furthermore, most of the residents in this study went to the dentist for tooth extraction (20.4%). This study established that most of the respondents brushed their teeth in the morning and a majority brushed their teeth once a day (40.8%). This was less than the findings from study done on students by Johnson., *et al.* (2020) which found that 51.8% brushed once day. In this study, most of the respondents used a tooth paste and a brush (79.6%). A majority of them recommended a medium hard brush (40.8%).

Association between socio-demographic variables and oral health behaviors

A significant relationship was established between socio-demographic variables and oral health behaviors in this study. A majority of the respondents who had ever visited the dentist were female aged less < 25 years and the two variables were significant ($p = 0.003$). More females brushed their teeth in the morning as compared to males and the two variables were significant ($p = 0.029$). This was similar to a study done in Qatar on students where it established that females visited the dentist and brushed their teeth in the morning [17]. Most of them preferred using toothbrush with medium hardness and were aged less than 25 years ($p = 0.032$, $p = 0.004$) respectively. Most of the respondents changed their toothbrush after 1 - 3 months ($p = 0.000$).

The association between social demographic data and knowledge on oral health

There was no significant relationship between oral health and socio-demographic factors, i.e. p value was greater than 0.05. More females had a good knowledge on importance of regular checkup than men ($p = 0.309$). Similar findings were established on a study done in Tanzania by Luting D., *et al.* (2018) where he found that more females than males had a good knowledge on dental hygiene. On the other hand, more males had a good knowledge on length of time before one change their tooth brush than females in this study ($p = 0.255$). However, more females had a good knowledge on harmful effects of drug abuse on oral health than men ($p = 0.780$) [18].

Conclusion

The study has been conducted with an objective to assess the level of knowledge and awareness of dental care, dental health, problems and solutions among the college students. The study reveals that there is a disparity in knowledge and oral health practices among the study population, as several of them reacted as having good oral health practices, but we cannot wrap up the actual picture because we have not checked oral cavity parameters. There is an essential need to increase oral health knowledge and behaviors among university students, including awareness of various oral cavity problems and how to avoid dental disorders. Improvements can be implemented by regular campus training, such as oral health seminars, materials, and other similar ways. The study data shows a need for health services and resources directed at supporting oral health promotion programmers in school settings.

Recommendations

This study came to the following recommendations:

1. There is need to inculcate and emphasize on oral health-related education in university curricula with a greater focus on male student who are majorly ignorant about issues of dental health.
2. The ministry of Health and Ministry of Education in Kenya should regularly support School-based Oral Health Programs by recruiting an oral hygienist and initiate appropriate oral hygiene and dental educational activities.
3. The dental profession in Kenya has an important role to play in shaping the future of oral health. The profession's intervention is needed for development of healthy lifestyles, such as healthy diets low in sugars, effective use of fluoride, and development an oral health system that is oriented toward oral disease prevention and health promotion.
4. It is highly recommended that all policymakers and public health authorities strengthen their work policy for raising awareness and translation of sound knowledge about risk factors of poor oral health.

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