



Assessment of Oral Health Knowledge and Behavior Related to Oral Hygiene Status among Selected Secondary School Students in Kasese District, Western Uganda

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Authors' contributions

This work was carried out in collaboration among all authors. Authors IW, IN and AAA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors IN, IW, AAA, AB, TP and CA managed the analyses of the study and the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Aims: Good oral health is essential for the well-being of Human being. However lack of knowledge, guidance and poor oral hygiene practices may lead to poor oral hygiene and predispose one to oral health diseases. This study assessed oral health knowledge and behavior

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related to oral hygiene status among selected secondary school students in Kasese District, Western Uganda.

Study Design: A descriptive cross sectional study was carried out among students from selected secondary schools of Kasese District, Western Uganda. Stratified sampling technique was used to recruit 278 participants among students of the selected secondary schools.

Methodology: Data was collected using closed and open ended questionnaires. The dependent variable was based on the participant's responses if he/she had any decayed, missing or filled teeth (DMFT). Bivariate analysis was used to compute crude odds ratios for predisposing factors. The significant variables were then included in the multivariate model to obtain adjusted odds ratios for risks factors associated with occurrence of DMFT.

Results: Out of 278 participants interviewed, 108 (38.8%), 95% CI= (0.3325-0.4468) students had DMFT. There was a statistical significant relationship between the level of the knowledge and behavior of the students and their oral health status. For the Students who had never visited a dentist (95% CI; 1.177-3.315, aOR = 1.975, p=0.010) and those who brushed their teeth once a week (95% CI; 1.226-31.161, aOR = 6.180, p=0.027) were found to be more at risk of developing DMFT.

Conclusion: Poor oral health hygiene among secondary school students was significantly associated with frequency of brushing teeth and failure to visit a dentist. There is need to increase oral health education in secondary schools in order to encourage students to visit dentists regularly as well as improving the frequency of brushing teeth as this will positively impact on oral health behaviors and status.

Keywords: Oral health knowledge; Secondary students; oral hygiene.

1. INTRODUCTION

Increase in burden of oral diseases in low income countries remains a global concern [1-2]. Prevalence of oral diseases was reported to be higher among poor and underprivileged people [1,3]. In African countries, the problem was reported to be higher due to the persistent poverty on this continent as this disease was fuelled by unhealthy diet, tobacco use, harmful alcohol use, poor oral hygiene practices, and social determinants [3-6]. Globally, the burden of oral disease among the school children was reported to be 60–90% [7]. As reviewed by Abid et al. [4], there is no actual profile of oral diseases in Africa, but available literature showed that, the prevalence and severity of oral diseases differed from one country to another. However, available literature from some East African countries showed that periodontal oral disease are on rising due to the higher consumption of sugar, lack of knowledge on oral health and inadequate dental health care [4-5]. In a study conducted in Laikipia Sub county, Tanzania showed that 50% (n= 127) of the participants had dental problems (DMFT) with more than half having gingival inflammation [8]. These infections if untreated were reported to have a negative impact on the quality of life like eating and chewing well, communication, facial appearance and can also deny them the right of schooling [9]. A similar study conducted in Maragua, Kenya by Mwangi [10] showed

that only 8.3% had adequate knowledge about oral health while 36.4% scored below average. In Uganda the story was not different, in a study conducted from Mbarara district showed that oral hygiene of school children was poor where 75% (n=437) of the students had dental plaques showing clearly poor oral hygiene practices [11]. In another Baseline survey of oral health of primary and secondary school pupils in Uganda conducted by Margaret and Twa-Twa [12], reported 33.4% (n= 685) as prevalence of dental caries. Furthermore, Annet et al. [1] in their study of prevalence and factors associated with dental caries among children and adults in selected districts (Kabale, Masaka, Hoima, Kabarole, Gulu, Soroti and Jinja) in Uganda reported the low prevalence of dental caries among school children 0.73% (n=1,230). Poor oral hygiene predisposes to oral diseases as it leads to a high germ load in the mouth and has a direct relationship to oral behaviors [10]. Despite this, there is no adequate information about oral hygiene and oral diseases among secondary school students in Kasese district, Western Uganda. Therefore, this study was aimed at finding out how the students' knowledge and performance of oral hygiene affects their oral hygiene status. This may lay a platform on how to improve education and awareness of good oral health hygiene among secondary school students which may act as a data base for further research in oral hygiene.

2. MATERIALS AND METHODS

2.1 Study Area, Study Population and Study Design

A descriptive cross-sectional study was done to obtain quantitative data using semi structured questionnaire from secondary school students about their oral health status, practices/behavior and knowledge. The study was conducted in selected secondary schools in Kasese District, Western Uganda located on latitude and longitude (0.1699°N, 30.0781°E). Kasese district has a population of 738,300 [13-14] and the schools had more than 400 students each. This is a rural area having a few urbanized trading centers. A big percentage of the residents are peasant farmers with fairly low social economic status. Students present on the day of data collection and whose teachers had assented were allowed to participate in the study. Students who were doing or preparing for National Exams and those who were assented for and later withdrew from the study were excluded. Random sampling method was used to select the school included in this study. Stratified sampling technique was used to select 278 participants among students from the selected secondary schools. The study involved both male and female students aged between 14 and 22 years.

2.2 Data Collection

Stratified sampling technique was used to select 278 participants among students from the selected secondary schools. The data was collected according to the method described by Lorna [15]. A self-administered semi structured questionnaire was used. In the presence and with the help of their class teachers, students were guided through the questions before filling the questionnaire. The respondents were requested to give information to determine oral health behavior which included; whether the student brushed his or her teeth, and why the student brushed or did not brush the teeth, any change after brushing your teeth and the changes seen after brushing, what they use to brush the teeth, what they use to clean their teeth, the frequency of cleaning the teeth, whether the tongue is brushed as well, frequency of changing the tooth brush, whether the student had any dental problems (DMFT) (Sign of poor oral hygiene) and the student's experience in case he or she had DMFT. The presence of decayed, missing or filled teeth (DMFT) was

assessed based on if the participants had any of DMFT.

The oral health knowledge was determined by requesting for information which included; the source of oral health hygiene knowledge, whether the school organizes oral health education or not, whether he or she was aware of the possible health problems/diseases due to poor oral health hygiene, whether he or she has ever visited a dentist and why.

The respondents answered by checking boxes with pre-written options, while additional information were given in provided spaces. The filled questionnaires were later collected at the end of the session and cross-checked in order to ascertain full return of questionnaires by the selected students. This was followed by an oral health education to the participants.

2.3 Data Analysis and Presentation

Data was entered in Microsoft Excel[®] and then exported to Statistical package for social science (SPSS) version 16 for analysis. Descriptive statistics was used to summarize the socio-demographic characteristics of study participants where the frequencies/proportions were obtained. Cross tabulation was used to generate the distribution frequencies/proportions of each independent variable within the dependent variable (DMFT). Binomial logistic regression was used in the bivariate analysis to obtain crude odds ratio of likely factors that influenced poor oral hygiene among students. The factors that were statistically significant ($p \leq 0.05$) at bivariate analysis were included in to the multivariate model to ascertain the strength of association (adjusted odds ratio) of significant risk factors after adjusting for confounding factors. The full model was checked for best fit of data using the Hosmer and Lemashow test ($p > 0.05$). Statistical significance was considered when $p \leq 0.05$ at 95% level of confidence.

3. RESULTS

3.1 Social Demographic Characteristics

A total of 278 secondary school students participated in the study. Of these 127 (45.7%) were males while 151 (54.3%) were females. The medium and standard deviation age of the respondents was 16 ± 2.1 years. The age range was 14- 22 years. Majority (60.1%) of the

respondents were aged between 14-16 years. Most of the students 171 (61.5%) were Christians and 107 (38.5%) were Muslims and also the majority of the participants 185 (66.5%) were from rural area compared to 98 (33.5%) from urban centers of the study area as shown in (Table 1).

3.2 Oral Hygiene Status among Students

Oral hygiene status was determined depending on whether the students had dental problems (such as toothache, holes in teeth and missing teeth due to teeth decay) for poor oral hygiene status while no dental problems (DMFT) for good oral hygiene status. Majority of the students 170 (61.2%) had no dental problems (DMFT) and 108 (38.8%) had dental problems (dental caries) with 95% confidence interval (CI) of (0.3325-0.4468) as shown in (Fig. 1).

Table 2 showed the prevalence of decayed, missing or filled teeth (DMFT) among student's participants according to gender, age groups, religions and residences. The results of this study showed that females had a higher prevalence of 68/151 (45.0%) of DMFT than their males counterpart 40/127 (31.5%). It was also observed that participants within age group 14-16 years had the highest prevalence 71/ 167 (42.5%) of DMFT (95% CI=0.379-2.311) while those within age group 17-19 years had the lowest prevalence 28/89(31.5%) of DMFT. The results of prevalence of DMFT among the students according religions showed that Muslims had a higher prevalence 42/107 (39.3%)

compared to Christians who had a lower prevalence of 66/171 (38.6%). Prevalence of DMFT among the students according their residences indicated that, those from rural areas had a higher prevalence of 78/185 (38.8%) compared to their counterpart from Urban center 30/98 (32.3%).

However, the bivariate analysis of the factors (age, sex, religious and residence) associated with DMFT (Table 2) showed that females were 1.782 times more likely to have DMFT compared to the males and it was statistically significance (95% CI = 1.088-2.917, cOR = 1.1782, p = 0.022). The bivariate analysis of age groups showed that age group 17-19 years were 37.9% less likely to have DMFT compared to the 14-16 years age groups but it was not statistically significant (95% CI = 0.361-1.068, cOR = 0.621, p = 0.085). Furthermore, participants within age group 20-22 years were 6.4% less likely to have DMFT compared to those aged between 14-16 years, this was not statistically significant when other factors were held constant (95% CI = 0.379-2.311, cOR = 0.936, p = 0.886). According to participant's religion, the Muslims were 1.028 times more likely to have DMFT compared to the Christians but it was not statistically significant (95% CI = 0.626-1.687, cOR = 1.028, p = 0.913). Participants who were resident of rural areas were 1.531 times more likely to have DMFT compared to those who were resident of urban areas, but it was not statistically significance (95% CI = 0.907-2.584, cOR = 1.531, p = 0.111).

Table 1. Socio-demographic characteristics of the study participants

Characteristic	Frequency	Percentage (%)
Sex		
Male	127	45.7
Female	151	54.3
Total	278	100
Age		
14-16	167	60.1
17-19	89	32.0
20-22	22	7.9
Total	278	100
Religion		
Christian	171	61.5
Muslim	107	38.5
Total	278	100
Residence		
Urban center	98	33.5
Rural area	185	66.5
Total	278	100

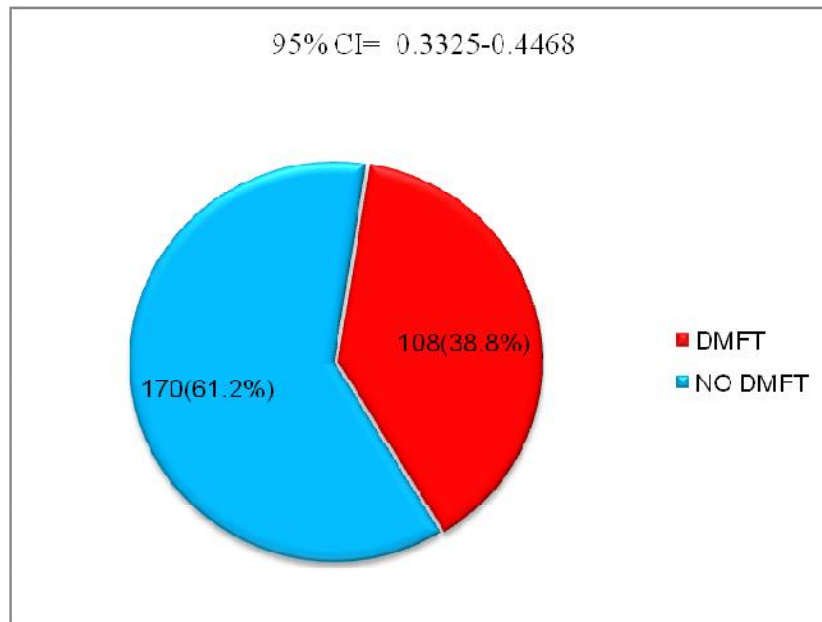


Fig. 1. Oral hygiene status among secondary school students in Kasese District, Uganda
 DMFT: decayed, missing or filled teeth

Table 2. Prevalence of DMFT among secondary school students of Kasese Districts, Uganda

Demographic characteristics of participants	Number of students with DMFT, n (%)	Crude OR	95% CI	P-value
Sex				
Male	40(31.5)	1.000		
Female	68(45.0)	1.782	1.088-2.917	0.022*
Age				
14-16	71(42.5)	1.000		
17-19	28(31.5)	0.621	0.361-1.068	0.085
20-22	9(40.9)	0.936	0.379-2.311	0.886
Religion				
Christian	66(38.6)	1.000		
Muslim	42(39.3)	1.028	0.626-1.687	0.913
Residence				
Urban center	30(32.3)	1.000		
Rural area	78(38.8)	1.531	0.907-2.584	0.111

Key: *Statistically significant at $p \leq 0.05$; DMFT: decayed, missing or filled teeth

3.3 Oral Health Behavior/Practices among Student

Majority of the students brushed once a day and that was 180 (64.7%). A higher percentage of the participants 256 (92.1%) responded that they used tooth brush to brush their teeth. Most of the students 212 (76.3%) used toothpaste, followed by 52 (18.7%) who used water only and the least 14 (5.0%) used salty water as cleaning aid. Two hundred seventy (270, 97.1%) participants reported to have seen changes after brushing

their teeth. A total of 175 (62.9%) participants responded that they brushed their tongue during brushing while 103(37.1%) didn't brush their tongue when brushing their teeth. Majority of the students 237 (85.3%) changed their tooth brush after it got broken, the rest of the details are shown in Table 3.

The bivariate analysis of oral health behaviors showed that students who brushed twice daily were 52.7% less likely to get dental problems (DMFT) compared to the ones who brushed once

daily (95% CI; 0.270-0.828, cOR= 0.473, p=0.009). Those students who brushed once weekly were 5.351 times more likely to get dental problems (DMFT) compared to the ones who brush once daily (95% CI; 1.105-25.909, cOR= 5.351, p=0.037). The rest of the information is shown in Table 4.

Table 5 showed oral health knowledge among the participants. Out of the 278 participants, majority 136 (48.9%) responded to have got their oral health knowledge information from teachers. One hundred and seventy four 174 (62.6%) participants indicated that their schools organized oral health education for the students, 124 (44.6%) had never visited a dentist and 58 (46.8%) of these respondents who didn't visit dentist said dentist services were expensive.

However, the results of bivariate analysis on oral health knowledge affecting oral health hygiene status among the studied secondary school

students showed that students who got their oral health information over radios were 79.6% less likely to get dental problems (DMFT) than those who watched on TV, this was statistically significant (95% CI; 0.051-0.818, cOR = 0.204 p=0.025). Students who had never visited a dentist were 2.070 times more likely to develop dental problems (DMFT) compared to those who had once visited a dentist, this was statistically significant (95% CI=1.268-3.380, cOR=2.700, p=0.004) as shown in Table 6.

Furthermore, multivariate analysis was done to compute adjusted odds ratios (aOR) for risk factors associated with poor oral health hygiene among secondary school students. The factors that were statistically significant at ($p \leq 0.05$) with the bivariate analysis were included into the full model after adjusting for confounders and these included; gender, frequency of brushing teeth, source of oral health knowledge and if participants ever visited a dentist (Table 7).

Table 3. Oral health behavior/practices among secondary school students of Kasese District, Uganda

Variables	Number of students (n)	Percentage (%)
Frequency of brushing teeth		
Once daily	180	64.7
Twice daily	88	31.7
Once weekly	10	3.6
Total	278	100
Tool used to brush teeth		
Tooth brush	256	92.1
Stick	19	6.8
Charcoal	3	1.1
Total	278	100
Aid used to brush teeth		
Salt water	14	5.0
Only water	52	18.7
Tooth paste	212	76.3
Total	278	100
See any change after brushing		
No	8	2.9
Yes	270	97.1
Total	278	100
Brush the tongue when brushing		
No	103	37.1
Yes	175	62.9
Total	278	100
Frequency of changing your tooth brush		
After it breaks	237	85.3
After a year	35	12.6
After a month	6	2.1
Total	278	100

Table 4. Bivariate analysis of oral health behaviors affecting oral health hygiene status of secondary school students of Kasese District, Uganda

Variables	Number of students with DMFT, n (%)	Crude OR	95% CI	P-value
See change after brushing teeth				
Yes	106(39.3)	1.000		
No	2(25)	0.516	0.102-2.603	0.423
Aid used when brushing teeth				
Salt water	3(21.4)	1.000		
Only water	23(44.2)	2.908	0.725-11.663	0.132
Tooth paste	82(38.7)	2.313	0.626-8.539	0.208
Frequency of brushing teeth				
Once daily	77(42.8)	1.000		
Twice daily	23(26.1)	0.473	0.270-0.828	0.009*
Once weekly	8(80.0)	5.351	1.105-25.909	0.037*
Brush tongue when brushing teeth				
Yes	74(42.3)	1.000		
No	34(33.0)	0.673	0.404-1.118	0.126
Frequency of changing tooth brush				
After it breaks	95(40.1)	1.000		
After a year	11(31.4)	0.685	0.321-1.464	0.329
After a month	2(33.3)	0.747	0.134-4.162	0.740

Key: *Statistically significant at $p \leq 0.05$; DMFT: decayed, missing or filled teeth
Oral health knowledge among students

Table 5. Oral health knowledge among secondary school students of Kasese District, Uganda

Variables	Number of students (n)	Percentage (%)
Source of oral health knowledge		
Parents	92	33.1
Teachers	136	48.9
Radio	31	11.2
Television	19	6.8
Total	278	100
School organizes oral health education		
No	104	37.4
Yes	174	62.6
Total	278	100
Aware of possible oral health problems		
No	143	51.4
Yes	135	48.6
Total	278	100
Ever visited a dentist		
No	124	44.6
Yes	154	55.4
Total	278	100
Why don't you visit the dentist		
Service expensive	58	46.8
No need	48	38.7
Absence of service	18	14.5
Total	159	100

Table 6. Bivariate analysis of oral health knowledge affecting oral health hygiene status of secondary school students of Kasese District, Uganda

Variables	Number of students DMFT, n (%)	Crude OR	95% CI	P-value
Source of oral health knowledge				
T.V	8(42.1)	1.000		
Parents	40(43.5)	1.058	0.389-2.874	0.912
Teachers	56(41.2)	0.963	0.364-2.546	0.939
Radio	4(12.9)	0.204	0.051-0.818	0.025*
School organizing O.H.K education				
Yes	68(39.1)	1.000		
No	40(38.5)	0.974	0.592-1.604	0.918
Know health problems due to poor oral health hygiene				
Yes	46(34.1)	1.000		
No	62(43.1)	1.481	0.911-2.407	0.113
Ever visited a dentist				
Yes	48(31.2)	1.000		
No	60(48.4)	2.070	1.268-3.380	0.004*
Why don't you visit the dentist				
No need	21(43.8)	1.000		
Absence of dental services	7(38.9)	0.818	0.271-2.473	0.722
Dental service expensive	32(55.2)	1.582	0.733-3.418	0.243

*Statistically significant at $p \leq 0.05$, O.H.K: Oral Health Knowledge, DMFT: decayed, missing or filled teeth

Table 7. Multivariate analysis of factors affecting students' oral health hygiene status of secondary school students from Kasese District, Uganda

Predictor variables	Adjusted OR	95% CI	P-value
Sex			
Male	1.000		
Female	1.555	0.921-2.627	0.099
Frequency of brushing teeth			
Once daily	1.000		
Twice daily	0.480	0.269-0.860	0.014*
Once weekly	6.180	1.226-31.161	0.027*
Source of oral health knowledge			
T.V	1.000		
Parents	1.188	0.411-3.429	0.750
Teachers	1.098	0.392-3.078	0.859
Radio	0.240	0.055-1.046	0.057
Ever visited a dentist			
Yes	1.000		
No	1.975	1.177-3.315	0.010*

*Statistically significant at $p \leq 0.05$

The full model used at multivariate level explained 16.6% (Nagelkerke R^2) variance in the oral hygiene status of students of which 64.0% of the participants were correctly classified to have poor oral health hygiene (DMFT). The model used showed best fit for the data (Hosmer and Lemeshow test; $p=0.447$) and its fitness for the data was statistically significant, Chi-square, $\chi^2 = 36.265$, $p < 0.001$. Only frequency of brushing teeth and visits to a dentist were significant factors. The students who had

never visited a dentist were 1.975 times more likely to get dental caries compared to those who had visited a dentist, this was statistically significant (95% CI; 1.177-3.315, aOR = 1.975, $p=0.01$). Students who brushed their teeth twice daily were 52% less likely to get dental caries compared to those who brushed their teeth once daily when other factors were held constant (95% CI; 0.269-0.860, aOR = 0.480, $p=0.014$). However, students who brushed their teeth once weekly were 6.180 times more likely to get DMFT

compared to those who brushed their teeth once daily ($p=0.027$) (Table 7).

4. DISCUSSION

According to several authors [1,11,16] there is need for frequent study on oral health in Uganda, this will help in planning and revising of oral health services within the country. In Uganda, dental study was given less attention and this leads to the poor understanding of actual magnitude of the oral health diseases in the country [11]. Therefore, this study determined oral health knowledge and behavior related to the oral hygiene status among selected secondary schools students in Kasese district, western Uganda. This was to lay a platform on how to improve education and awareness of good oral health hygiene and practices among secondary school students and this would act as a data base for further research in oral hygiene. The results of this study showed that 38.8% students had dental problems (DMF) while majority (61.2%) of the students had no DMFT which are a sign of good oral hygiene practice. This was in line with findings of Kutesa et al. [1] who reported similar prevalence of dental caries among secondary school children from two districts out of the seven he studied (Soroti = 36.9% and Jinja = 30.1%). However, this was contrary to the findings of Margaret and Twa-Twa [12] in a baseline survey of oral health among primary and secondary school pupils in Mbarara District, Uganda who reported lower prevalence of 26.35% ($n=683$). Similarly, Annet et al. [1] reported lower prevalence of dental caries among school children from three districts out of the seven districts he studied (Kabale =25.3% Kabarole = 21.3%, Gulu = 27.1%) in Uganda. This was contrary to the findings of Kutesa et al. [1] who reported higher prevalence of dental caries among the secondary school children from two districts out of the seven he studied (Masaka = 45.0% and Hoima = 41.8%). It was observed that the earlier study by Margaret and Twa-Twa [12] found a lower prevalence while the latter [11] reported higher prevalence from the same district although different study populations. This showed the needs for frequent research on the oral health diseases as suggested by Batwala et al. [11] due to the changes that occur within community especially on financial status (poverty) which is one of the factors that fuel increase of oral diseases within the communities since its expensive to afford dental services [4,7]. Outside the country, the prevalence of oral health status among secondary school reported by this

study was very low compared to prevalence reported by Serah and Iii [8] from Laikipia county, Kenya, who reported 50% ($n=288$) prevalence of oral health caries among secondary school students. Similarly, Emmanuel and Chang'endo [17] also reported higher prevalence of 58.6% ($n=384$) oral health caries among secondary school students from Iringa Municipality Tanzania. The prevalence obtained in our study may be explained by the fact that dental caries is a slow disease and its development may start long before persons decides to either improve his/her oral health behaviors and/ practices or seek dental attention. Furthermore, most of the studied participants had knowledge about the oral hygiene practice (Table 5).

The gender of the participants was a statistically significant factor for DMFT at bivariate analysis however; it was not a significant predictor at multivariate level. The higher prevalence of DMFT among the female students was in line with findings of Batwala et al. [11] who reported higher prevalence of DMFT ($1.6\pm 0.8SD$) in females than males ($1.3\pm 0.8SD$) among school children in Mbarara District, Uganda and a study by, Mafuvadze et al. [18] which reported higher prevalence of dental caries in girls 26/57 (46.6%) than the boys 12/36 (33.3%) among 12 year old school children in Zimbabwe. However, the finding was contrary to the study by Bahannan et al. [19] who reported higher prevalence of dental caries in males 351/395 (88.9%) than the females 234/339 (69.0%) among adolescents with limited access to dental care services in Jeddah. The greater burden of dental caries in females than males could probably be attributed to hormonal and/or physiological variations, differences in dietary behaviors, earlier tooth eruption in girls (increased time of exposure to cariogenic processes), utilization of oral health care, and characteristics of the dentition, tooth enamel, or saliva [20]. Furthermore, the discrepancy effects of genes influencing dental caries between the different sex was not fully understood but may partly explain by dietary and oral hygiene behaviors, utilization of oral health care, hormones/physiology, and characteristics of saliva [21].

Basing on age group, the highest prevalence of DMFT in this study was among students with age group 14-16 years than those of age groups 17-19 years which showed that the prevalence lowered with age increase. The findings of this study was in line with findings of [22] who reported higher prevalence of dentals caries

among 14 years aged students 273/326 (83.7%) than students with 18–19 age groups 118/169 (69.8%). However, this was not in agreement with the findings by Bahannan et al. [19] in their study conducted in Arkhangelsk, Russia who reported that DMFT index increased significantly with age, as dental caries is an irreversible and accumulative disease.

The prevalence of DMFT in this study according to residence of the studied participants showed that students from rural areas had a higher prevalence of DMFT than those from urban centers although it was not statistically significant at $p \leq 0.05$. This could be attributed to lack of dental services within the rural areas and yet it's known that residents of rural areas can hardly afford the costs of dental services if at all available in urban centers as reported in the present study findings. This confirmed the statement by Shaffer et al. [22] who reported that, higher prevalence of DMFT in Africa could be due to lack of awareness about oral health and dental services among the majority of the population as found in other African countries. However, this finding was contrary to those of [12] who reported higher prevalence of dental caries among urban area students 105/257 (40.85) than the rural area 124/428 (28.97%) of primary and secondary school pupils from Mbarara District of Uganda. Similarly, Mafuvadze et al. [18] also reported higher prevalence of dental caries among urban area students 38/93 (40.86%) than those who were residents in the rural areas 47/79 (59.49%) among 12 year old school children from low socio-economic status background in Zimbabwe.

According to this study, the level of knowledge on oral health was adequate considering Kasese District to be a village although it was not statistically significant. The teachers and parents played a big role in educating and monitoring their children/students on good oral health practices and behaviors. Majority of the students (62.4%) reported to have oral health education program at school and less than average said they don't usually have the education program. The level of knowledge on oral health reported in this study was in line with study done by Mwangi [10] who reported average level of knowledge 55.2% (n=384) among secondary school students in Maragua District from Kenya and a study by Emmanuel and Chang'endo [17] from Tanzania also reported the level of Knowledge on oral health of 65.2% (n=384) among secondary school students in Iringa Municipality, Tanzania.

The present study showed that failure to visit the dentist was a significant risk factor associated with occurrence of DMFT among the study participants. Most of the students who had never visited a dentist were 1.693 times more at risk of developing dental problems (DMFT) than the students who had visited a dentist before. This was in line with findings of Ahmad et al. [23]; Vashisth and Devi [24] who reported 95% and 72% of participants who had never visited dentists respectively. However it differed from a study by Serah and Iii [8]; John et al. [25] which showed 64.6% and 54.7% had visited a dentist respectively. This could be because those who visited a dentist got the advice and perhaps arrested a threatening oral health condition before it worsened compared those who never went there at all.

According to the study findings, teachers and parents were the highest source of information. This was in agreement with a study by Mwangi [10] who reported that teachers were the highest source of information. Nevertheless, it was found out that obtaining information from radios was a significant factor associated with good oral health hygiene at bivariate analysis in which students who obtained knowledge from radios were significantly less likely to develop DMFT than those who got the information from TV. This could be because radios are cheaper to buy and portable to move with compared to TVs and as such students easily get reliable health information at any time from radios than TVs. Moreover, the present study has also showed that most participants were residents from rural areas of Kasese district which are hard to extend electricity used to power their TVs. Furthermore, the frequency of brushing teeth was also a significant predisposing risk factor to develop DMFT. According to this study, the higher risk of students who brushed teeth once weekly to develop DMFT could be attributed to decaying food which accumulates on teeth thus increasing bacteria colonization in the mouth causing teeth decay.

According to this study, students who changed tooth brush after a year were more likely to get DMFT than those who changed monthly though this was not significant ($p \geq 0.05$). This was in agreement with studies done by Serah and Iii [8] and Petersen et al. [9] who reported that prolonged duration while using the same tooth brush accelerated occurrence of DMFT. This could be because the longer you use a tooth brush the lesser efficient it becomes in cleaning teeth than when you change it more often.

Furthermore, the present study revealed that students who did not brush their tongue were more at risk of getting dental problems (DMFT) compared to those who brushed their tongue. This was in agreement with a study done by Mwangi [10] where majority of the students brushed their tongue while those who didn't brush were at risk of getting DMFT. This could be explained by the fact that the tongue harbours microorganisms as well as the gum and not brushing it puts one at risk of getting dental problems.

5. CONCLUSION

Out of 278 participants interviewed, 108(38.8%) students had dental problems (DMFT) which reflected poor oral practices among the students. Students who had never visited a dentist were significantly more likely to develop dental problems (DMFT) compared to those who had once visited a dentist. Poor oral health hygiene (occurrence of DMFT) among secondary students was significantly associated with frequency of brushing teeth in which those who brushed once in a week were more at risk of developing DMFT than those who brushed daily. There is need to increase oral health education in secondary schools in order to encourage students to visit dentists regularly as well as improving the frequency of brushing teeth. This will positively impact on oral health behaviors and oral health status of secondary school students.

CONSENT

As per international standard or university standard, students' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

Ethical approval was sought from the Kampala International University Research and Ethics committee. Permission to carry out the study was sought from the School of Allied Health Sciences, KIU-western campus as well as from the school administration. Participation in the study was on voluntary basis and assent was sought from the class teachers. All information was treated with utmost confidentiality. Participants were free to decline or withdraw from participating in the study at any time during the study period.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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