



**KNOWLEDGE, ATTITUDE AND PRACTICE ON ORAL HYGIENE AMONG PATIENTS ATTENDING RWANDA MILITARY HOSPITAL, DENTAL CLINIC, KANOMBE -KIGALI.**

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**Abstract**

Good oral health is vital for overall health as well as the quality of life and depends on oral health literacy. This study's aim was to assess the level of knowledge, attitudes, and oral hygiene practices among patients attending Rwanda Military Hospital in dental services. This study was a cross-sectional study design. A tested and structured questionnaire was used for the included 390 patients attending the RMH dental clinic. The analysis of the significance of factors towards oral hygiene was set at a P-value equal to 0.05 and a certainty level of 95%. The results showed that 54.4% of females dominated 45.6% of males. The findings showed that 50.5%, 47.2%, and 61.35 were respectively with high knowledge, a positive attitude, and a good level of oral hygiene practice. It was also found that a low level of knowledge was three-fold significantly associated with poor oral knowledge, [AOR=3.80; 95%CI:1.30-7.20, p=0.01]. In addition, the negative attitude was four-fold significantly associated with poor oral hygiene with [AOR=4.76; 95CI: 2.30-9.83, p<0.001]. The study concluded that around half of the population have a low level of knowledge and a negative attitude. Moreover, the low level of knowledge and negative attitude was three-fold associated with poor oral hygiene. This study recommended implementing and strengthening the systematic oral health promotion program.

**Keywords:** *Oral, health, Knowledge, attitude, practice, dental*

**Introduction**

Good oral health is critical to both overall health and quality of life <sup>1</sup>. Poor oral hygiene practices are linked to oral diseases such as tooth decay and periodontal disease. These oral diseases are a major public health concern worldwide and are the most prevalent in the world <sup>2</sup>. Oral diseases affect people

throughout their lives, causing pain, discomfort, disability, and even death<sup>3</sup>. It was also estimated to affect 60 to 90 % of all populations<sup>4</sup>. Whereas these oral diseases and associated comorbidities could be prevented simply by improving oral hygiene practices<sup>5, 6</sup>.

Although, the Asian and Latin American countries are prominently affected, most of the adults in the entire world have experienced dental caries<sup>7</sup>. The oral diseases are astoundingly increasing and negatively impact in the population's well-being both physically and psychologically and research showed that oral diseases are associated with speech, aesthetics issues, and chewing difficulty<sup>8, 4</sup>.

Despite the efforts made in delivering universal health care for all, there is a gap in oral health promotion. A study done in India, reported the positive correlation between poor oral health statuses and low knowledge, attitude and practices<sup>9</sup>. Low knowledge of oral health is not common only among general population but also among health professional and in a study conducted in Saudi Arabia, the health professionals regardless of their positive attitude towards professional dental care, their knowledge was lower than what would be expected from them considering their higher literacy levels<sup>10</sup>. Similar findings were found in Rwanda, where little knowledge of periodontal diseases among Nurses and Midwives working in clinics was reported<sup>11</sup>.

Maintaining oral hygiene is vital to everyone's overall health and should be done regularly to prevent oral diseases from affecting the oral cavity. However, lack of knowledge, negative attitudes and poor oral hygiene practices can increase oral disease. These oral diseases are expensive to treat and 5% of total expenditure is lost and 20% of the population has had to pay out of pocket for dental services in high income countries<sup>12</sup>. In low-income countries like Rwanda, the majority of peoples do not visit dental services, which may be a good occasion for promoting oral health practices<sup>13</sup>. On the other hand, treatment and prevention of oral diseases is hardly or not provided in low and middle-income countries<sup>2</sup>. Consistent oral hygiene practice is one of the key measures to prevent most oral health conditions<sup>4</sup>. In Rwanda, a few studies have documented or published patients' knowledge, attitudes, and practices regarding oral hygiene.

Even though there is a big number of patients continued to be referred to Rwanda Military Hospital with their oral health statuses are poor, and no studies were conducted yet showing their knowledge, attitude, and practices towards oral hygiene behavior. Thus, this study aims to determine the knowledge, attitude, and practice regarding oral hygiene among patients of the Military Hospital of Rwanda and will be a backbone for the delivery of future or ongoing prevention programs and for future research in this area.

## **Methods**

### **Study design:**

A cross-sectional study design was conducted. A systematic random sampling technique was used for patients attending the RMH dental clinic. A structured questionnaire was used to collect data on sociodemographic characteristics, knowledge, attitudes, and oral health practices for 390 as a sample size of this study.

### **Data collection:**

The data collection was carried out for the patients attending the RMH dental clinic in the day hours. The patients were given numbers and the inclusion were selected basing on the age equal 18 and above, the acceptance of participating in the study and the systematic random sampling relying on the provided numbers.

### **Statistical analysis:**

Data were analyzed using SPSS version 22. The data coding was processed to categorize the level of knowledge, attitude, and oral health practice. The high level of knowledge scored was 6 and above while the low level was below 6. The high level of attitude mean score was 4.5 and above (Positive attitude) while the low-level attitude mean score was below 4.5 (Negative attitude). The practice with 2.7 mean score and above was considered good oral hygiene practice while the practice that scored

below 2.7 mean score was poor oral hygiene practice. A descriptive statistic, bivariate and multiple logistic regression were carried out to test the significant factor towards oral hygiene. The significance level was set at P-value equal to 0.05 and certainty level of 95%.

## Results

As shown in table 1, the group of 25-34 and >45 years old dominated other age groups. The gender has shown that 54.4% of female dominated male with 45.6%. Most of the marital status were married study participants with 66.4%. The education level showed that the participants with no formal education were majority with 29.2% and followed by 27.7% of primary education participants. Hence, the higher the education level, the lower the number of respondents. The half of the study participants were self-employed with 50.5% and followed by 23.3% of unemployed study participants. Kigali city was the more represented place of residence with 52.8% than other districts outside Kigali city.

Table 2 demonstrated the study findings where 90.5% knew the importance of their teeth, 53.3% knew the importance of cleaning their teeth, 64.9% knew the purpose of cleaning their teeth. Around 50% reported to know the means of gum bleeding, 51% also reported to know that the bad health of teeth and gum can affect their body, 53.3% admitted knowing the importance of doing regular dental check-up. More than 72% know the importance of brushing their teeth, 54.1% knew the negative effect of food retention in the teeth. Only 49.7% knew the meaning of dental plaque and 53.3% knew that the unpleasant breath in the month is a sign of poor oral hygiene. The overall level of high knowledge was 50.5% of the study participants while 49.5% of the respondents had low level of knowledge were 49.5% as depicted in figure 1.

The results on the attitude dimension showed that for almost all the ten item questions, study respondents scored below 50% and the overall results demonstrated that the respondents with positive attitude were 47.2% while the respondents with negative attitude were 52.8% as depicted in figure 2.

The findings of this study on objectives three regarding the oral hygiene practice as shown in table 4.4, demonstrated that 72.8% have brushed their teeth at the day of the study data collection. 20.3% brush their teeth once a day, 19.7% twice a day, 6.9% thrice a day, 32.8% once a week, 20.3% once a month. The proportion of 56.2% used toothbrush, 15.9% used wooden toothpick, 5.9% used chew stick, 22.1% used charcoal to clean their teeth. The proportion of 32.6% brush their teeth less than one minute, 17.7% used one minute, 8.7% used two minutes, 41% don't know. The proportion of 23.3% changed the toothbrush once a month, 18.7% changed the toothbrush after 3-5 months, 23.6% changed their toothbrush after one year. Around 7.2% changed their toothbrush when the bristles get discoloured. Therefore, the findings showed that the respondents with Good oral hygiene were 38.7% while the respondents with poor oral hygiene were 61.3% as depicted in figure 3.

The findings of this study showed that the relationship of 7 factors (age group, occupation, level of education, place of residence, marital status, knowledge, and attitude) toward the good oral hygiene practice, was statistically significant with  $p < 0.05$ . Living in Kigali city presented a good relationship with good oral hygiene with 60.7%,  $X^2 = 88.7$ ,  $p < 0.001$ . The higher the knowledge, the higher the good oral hygiene practice 64.5%,  $X^2 = 111.2$ ,  $p < 0.001$ . Additionally, this was applicable to the education level. The positive attitude was also associated with the good oral knowledge with 67.9%,  $X^2 = 125.3$ ,  $p < 0.001$ .

In addition, multivariate analysis results demonstrated that low knowledge level was three-fold significantly associated to the poor oral knowledge,  $AoR = 3.80(1.30-7.20)$ ,  $p < 0.01$ . In addition, the negative attitude was four-fold significantly associated to poor oral hygiene with  $AoR (CI) = 4.76(2.30-9.83)$ ,  $p < 0.001$  (table 4.6).

## Discussion

This study findings on knowledge level revealed that 50.5% of the study respondents had high level of knowledge while 49.5% had low level of knowledge towards oral hygiene practice whereas 91.9% reported to have high level of knowledge in medical practitioner's study carried out in delta state Nigeria<sup>14</sup>. The higher knowledge level was dominated by two questions responses which were

regarding the purpose 64.9% and the importance 72.3% of brushing the teeth. Other knowledge related responses were averagely responded. This knowledge results were frankly reported as low level of knowledge in comparison with the study carried out on the oral health knowledge, attitude, and behaviour and its association with sociodemographic and habitual factors. Where the level of oral hygiene knowledge was 97.9%<sup>15</sup>.

The findings on attitude level showed that the respondents with positive attitude were 47.2% while the respondents with negative attitude were 52.8% (figure 2). Whereas the south Indian study attitude level was low with 33.3% of the respondents<sup>16</sup>.

Other studies showed that the above results were very low in comparison to their findings, where 93.5% presented a positive attitude towards oral health hygiene and 63%. This study findings showed that 47.7% supported the statement of regular dentist visit while it was 81.5% in a university study<sup>17</sup>. This study results showed that 51.3% believed that smoking could cause the dental diseases which is consisting to the results of a south African study with 51%<sup>18</sup>.

The oral hygiene practices results showed that the respondents with Good oral hygiene were 38.7% while the respondents with poor oral hygiene were 61.3% (figure 3). Whereas the study done in south India had 48.2% of adequate oral hygiene practice, which are slightly higher than the above findings.

This study findings showed a high proportion of respondents with poor oral hygiene comparatively to the study done in southern Ethiopia with 39.9% of poor oral hygienic practice<sup>19</sup>. Some of the items of oral hygiene practice showed that toothbrush using was 56.2% Whereas in study done in Bengaluru city showed that 60.9% of respondents used toothbrush for oral hygiene. Around 26.6% were found to brush their teeth twice or more per day, which is slightly low result in comparison to another study which showed 36.9.7% who were using to brush their teeth twice a day<sup>20</sup>.

The findings of this study showed that living in Kigali city was associated with good oral hygiene with 60.7%,  $X^2=88.7$ ,  $p<0.001$ . Additionally, the results revealed that the higher the knowledge, the higher the good oral hygiene practice 64.5%,  $x^2=111.2$ ,  $p<0.001$ <sup>21</sup>. The adjusted odd ration of the findings this study showed that low knowledge level was three-fold significantly associated to the poor oral knowledge,  $AoR=3.80(1.30-7.20)$ ,  $p<=0.01$ (Table 6). Moreover, the same results were also found about the education level. Coherently, similar results were found in a study done in Qatar on the oral health behaviour and factors associated with poor oral status. Where the respondents with lower education level were three times more likely to have poor oral hygiene than respondents with elevated education ( $OR = 3.58$ ;  $95\%CI = 2.15-5.96$ )<sup>22</sup>.

The study done in private Dental Clinics at Hawassa City; southern Ethiopia showed also that poor knowledge was two-fold associated to poor oral hygiene practice. The bivariate analysis results showed that respondents with Kigali city residency had good oral hygiene practice than respondents from other residencies. This is also consisting to the research where the rural respondents were 3 times more likely to have poor oral hygiene than urban respondents,  $AOR: 3.79$ ,  $95\% CI: (1.724, 8.317)$ <sup>10</sup>.

This study results revealed again that in bivariate analysis, positive attitude was also associated with the good oral knowledge with 67.9%,  $X^2=125.3$ ,  $p<0.001$ (Table 5). Inversely, the negative attitude in multivariate analysis, was four-fold significantly associated to poor oral hygiene with  $AoR (CI)=4.76(2.30-9.83)$ ,  $p<0.001$ (Table 6)<sup>23</sup>.

## Conclusion

We conclude that the around the half of the study population have poor knowledge and negative attitude. Likewise, the low level of knowledge and negative attitude were more than 3-fold associated to poor oral hygiene practice.

## Recommendation

We recommend the organization of a hospital based-oral health promotion and inclusion of strengthened program in army week to close the gap of low level of knowledge and poor oral hygiene for rural residents visit the Rwanda military hospital.

**Funding: No funding sources**

**Conflict of interest: None declared**

**Ethical approval: The study obtained the University Ethical Committee.**

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## Materials

### Tables

**Table 1: Socio-Demographic characteristics of respondents**

Variables	Frequency	Percentage
<b>Age</b>		
<25	55	14.2
25-34	114	29.2
35-45	107	27.4
>45	114	29.2
<b>Gender</b>		
Male	178	45.6
Female	212	54.4
<b>Marital status</b>		
Single	88	22.6
Married	259	66.4
Windowed	30	7.7
Divorced	13	3.3
<b>Education Level</b>		
No formal education	114	29.2
Primary education	108	27.7
Secondary education	104	26.7
University/College	64	16.4

<b>Occupation</b>		
Public service	45	11.5
Self-Employed	195	50.5
Private sector	59	15.1
Unemployed	91	23.3
<b>Place of Residence</b>		
Kigali City	206	52.8
Other Districts	184	47.2

**Table 2: Level of knowledge on oral hygiene of the respondents**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Knowing that the teeth are important</b>	37	9.5
Yes	353	90.5
No		
<b>Knowing that cleaning teeth is important</b>		
Yes	208	53.3
No	182	46.7
<b>Knowing the purpose of tooth brushing</b>		
Yes	253	64.9
No	137	35.1
<b>Knowing what gum bleeding means</b>		
Yes	196	50.0
No	194	49.7
<b>Knowing that health of teeth and mouth affect health of body</b>		
Yes	199	51.0
No	191	49.0
<b>Knowing that it is important to do regular dental check-up</b>		
Yes	208	53.3
No	182	46.7
<b>Knowing the important of tooth brushing</b>		
Yes	282	72.3
No	108	27.7
<b>Knowing that retention of sweet foods on teeth has a negative effect</b>		
Yes	211	54.1
No	179	45.9
<b>Knowing the meaning of dental plaque</b>		
Yes	194	49.7
No	196	50.3
<b>Knowing that the unpleasant breath in the mouth is a sign of poor oral hygiene</b>		
Yes	208	53.3
No	182	46.7

**Table 3: Level of attitude towards oral hygiene of the respondents**

	<b>Strongly Agree n(%)</b>	<b>Agree n(%)</b>	<b>Uncertain n(%)</b>	<b>Disagree n(%)</b>	<b>Strongly disagree n(%)</b>
<b>Dentists should be visited regularly</b>	34(8.7)	152(39.0)	119(30.5)	79(20.3)	6(1.5)
<b>Well cleaning of teeth can be done without using toothpaste</b>	5(1.3)	172(44.1)	93(23.8)	86(22.1)	34(8.7)
<b>Hardness of toothbrush bristles of teeth has negative effect on teeth and gums</b>	45(11.5)	145(37.2)	119(30.5)	79(20.3)	2(0.5)
<b>The dentists play role only in treatment part and not in the prevention</b>	9(2.3)	140(34.9)	123(31.5)	80(20.5)	38(9.7)
<b>Tobacco chewing is a bad habit</b>	43(11.0)	154(39.5)	104(26.7)	86(22.1)	3(0.8)
<b>Smoking in any form is a bad habit</b>	39(10.0)	161(41.3)	100(25.6)	85(21.8)	5(1.3)
<b>Immediate replacement of missing teeth by</b>	5(1.3)	145(27.2)	151(38.7)	85(21.8)	4(1.0)

<b>artificial teeth is necessary</b>					
<b>It is important to brush teeth before bedtime</b>	40(10.3)	146(37.4)	121(31.0)	81(20.8)	2(0.6)
<b>It is necessary to brush the tongue when brush the teeth</b>	47(12.1)	146(37.4)	115(29.5)	80(20.5)	2(0.5)
<b>It is necessary to use a dental check-up</b>	45(11.5)	155(39.7)	109(27.9)	79(20.3)	2(0.5)

**Table 4: Level of oral hygiene practice of the respondents**

<b>Variables</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Did you brush your teeth today</b>		
Yes	284	72.8
No	106	27.2
<b>How often do you clean your teeth</b>		
Once a day	79	20.3
Twice a day	77	19.7
Three time a day	27	6.9
Once a week	128	32.8
Once a month	79	20.3
<b>Do you use any of the following to clear your teeth</b>		
Tooth brush	219	56.2
Wooden toothpick	62	15.9
Chew stick	23	5.9
Charcoal	86	22.1
<b>How long do you brush your teeth</b>		
Less than one minute	127	32.6
One minute	69	17.7
Two minutes	34	8.7
I don't know	160	41.0
<b>How often should you change your toothbrush</b>		
Once a month	91	23.3
After 3-4 months	73	18.7
After one year	92	23.6
When the bristles begin to bend	106	27.2
When the bristles get discolored	28	7.2

**Table 5 Bivariate analysis of factors associated to oral hygiene practice of the respondents**

	<b>Oral Hygiene practices</b>		<b>Chi-square</b>	<b>P-value</b>
	<b>Good n(%)</b>	<b>Poor n(%)</b>		
<b>Age group</b>			11.81	<b>0.008</b>
<25	21(38.2%)	34(61.8)		
25-35	54(47.4)	60(52.6)		
35-45	46(43.0)	61(57.0)		
>45	30(26.3)	84(73.7)		
<b>Gender</b>			1.125	0.289
Male	74(41.6)	104(58.4)		
Female	77(36.3)	135(63.7)		
<b>Education level</b>			73.179	<b>&lt;0.001</b>
No formal education	18(15.8)	96(84.2)		
Primary education	28(25.9)	80(74.1)		
Secondary education	63(60.6)	41(39.4)		
College or University	42(65.6)	22(34.4)		
<b>Occupation</b>			29.060	<b>&lt;0.001</b>
Public servant	28(62.2)	17(37.8)		
Self employed	52(26.7)	143(73.3)		
Private Sector	32(54.2)	27(45.8)		
Unemployed	39(42.9)	52(57.1)		
<b>Place of residence</b>			88.756	<b>&lt;0.001</b>
Kigali City	125(60.7)	81(39.3)		
Other Districts	26(14.1)	158(85.9)		
<b>Marital status</b>			8.83	<b>0.032</b>

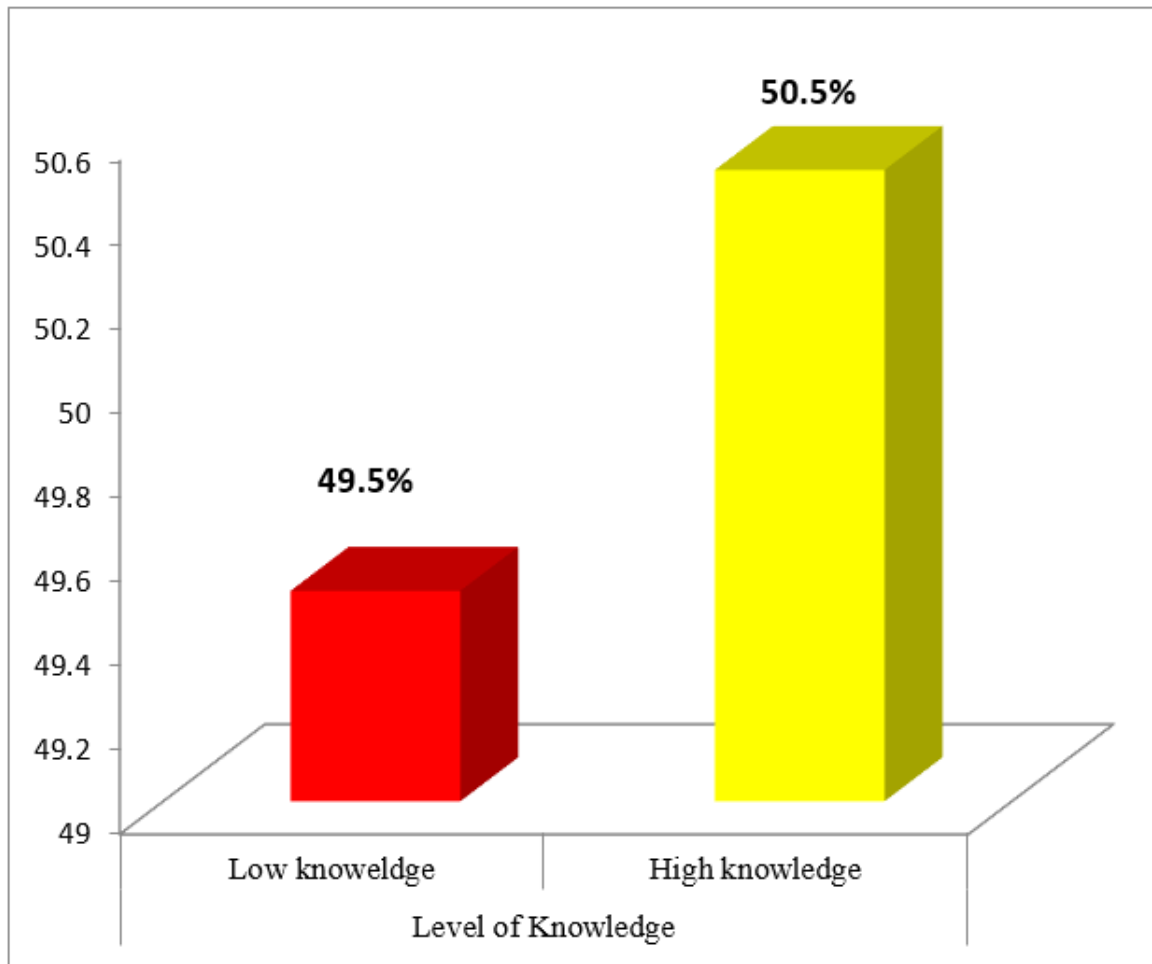


Single	38(43.2)	50(56.8)		
Married	89(34.4)	170(65.6)		
Widowed	18(60.0)	12(40.0)		
Divorced	6(46.2)	7(53.8)		
<b>Level of Knowledge</b>			111.2	<b>&lt;0.001</b>
Low knowledge	24(12.4)	169(87.6)		
High Knowledge	127(64.5)	70(35.5)		
<b>Attitude</b>			125.3	<b>&lt;0.001</b>
Negative attitude	26(12.6)	180(87.4)		
Positive attitude	125(67.9)	59(32.1)		

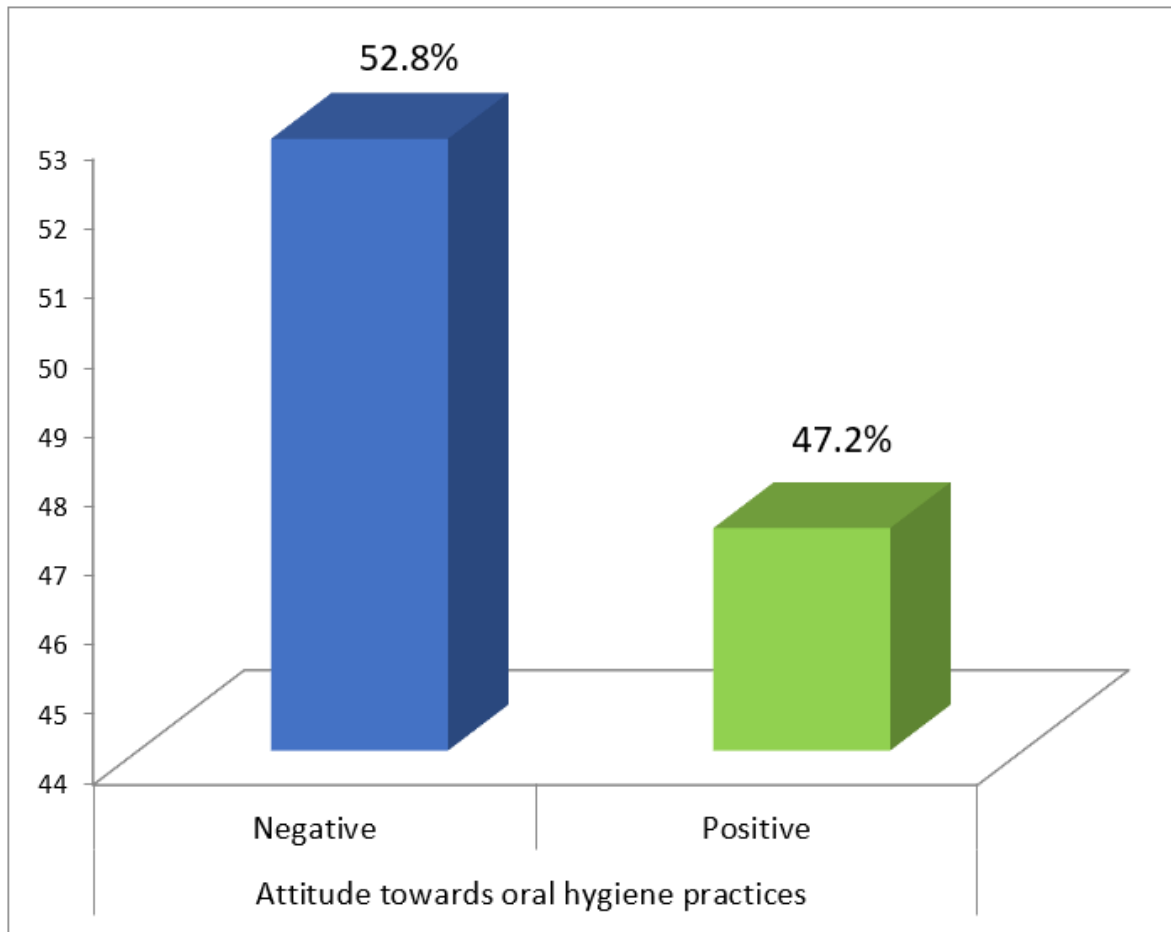
**Table 6 Multivariate analysis for factors associated with poor oral hygiene for the study participants**

	Poor oral Hygiene practices		P-value
	AoR	95%CI	
<b>Age group</b>			
<25	1.03	0.33-3.19	0.958
25-35	0.70	0.31-1.60	0.410
35-45	0.60	0.28-1.31	0.205
>45	Ref.		
<b>Education level</b>			
No formal education	1.18	0.37-3.70	0.777
Primary education	1.45	0.48-3.63	0.416
Secondary education	1.14	0.51-2.55	0.744
College or University	Ref.		
<b>Occupation</b>			
Public servant	1.23	0.43-3.45	0.693
Self employed	1.48	0.71-3.09	0.288
Private Sector	1.85	0.77-4.41	0.163
Unemployed	Ref.		
<b>Place of residence</b>			
Kigali City	0.52	0.25-1.08	0.081
Other Districts	Ref.		
<b>Marital status</b>			
Single	3.80	0.69-20.74	0.122
Married	3.31	0.70-15.52	0.129
Widowed	1.05	0.17-6.24	0.955
Divorced	Ref.		
<b>Level of Knowledge</b>			
Low knowledge	3.06	1.30-7.20	<b>0.010</b>
High Knowledge	Ref.		
<b>Attitude</b>			
Negative attitude	4.76	2.30-9.83	<b>&lt;0.001</b>
Positive attitude	Ref.		

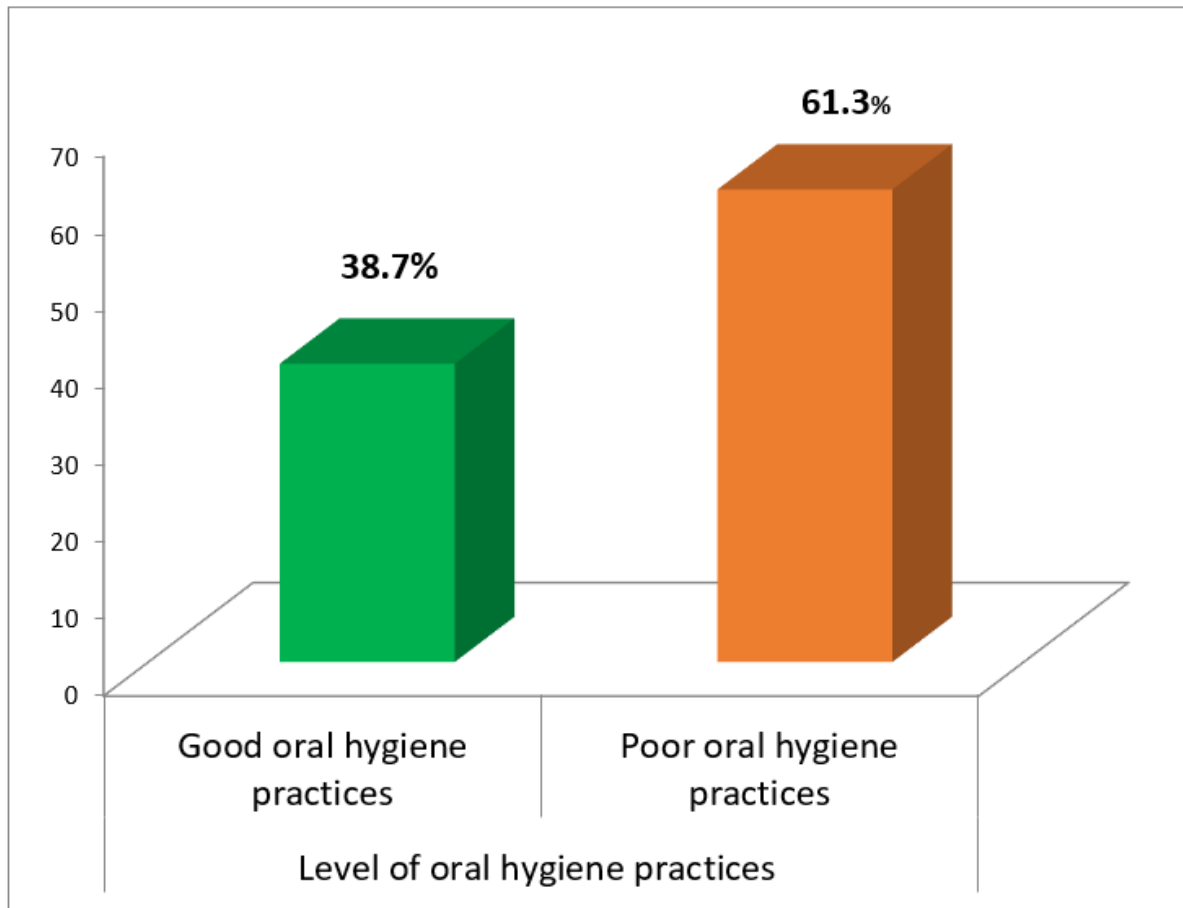
## Figures



**Figure 1** Proportion of oral knowledge level for the respondents



**Figure 2** Proportion of positive and negative attitude towards oral hygiene practices for respondents



**Figure 3 Proportion of good and poor oral hygiene practices for the respondents**

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