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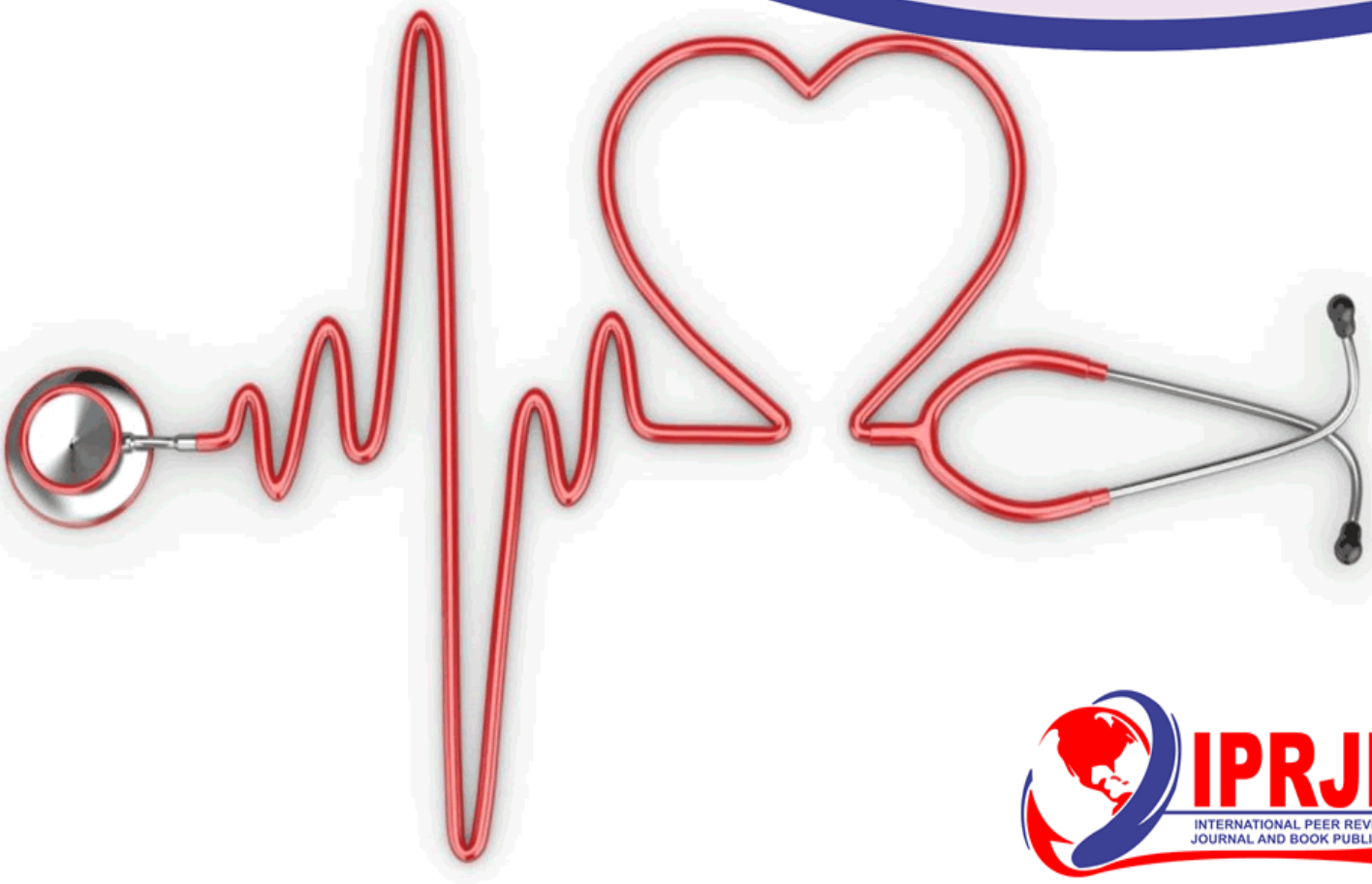

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ORAL HEALTH STATUS AND ITS ASSOCIATED FACTORS AMONG THE YOUTH IN IGEMBE SUB-COUNTY, MERU COUNTY

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Abstract

Purpose: To determine the oral health status and its associated factors among the youth in Igembe sub-county, Meru County.

Methodology: Data was collected through a questionnaire which was adopted from the WHO Oral Survey Handbook. Oral diagnosis was done by two dental examiners. The World Oral Health assessment form was also used. Data was analyzed using SPSS window version 25 and Epi Info. Descriptive statistics such as frequencies and percentages were used to analyze categorical data. Inferential statistics by use of Chi-square test were used to determine the interactions between the independent variables and the dependent variable. Control of confounders was done using logistic regression models. Data was presented inform of tables, charts, frequencies and percentages.

Findings: After calculation of the Simplified Oral Hygiene Index (OHI-S), it was revealed that majority, 80% of the respondents have a poor oral health status. The prevalence of dental caries among the study respondents was very high with the majority (85%) of the respondents having lost their teeth due to a dental problem. The prevalence of periodontal disease among the respondents was high with most of them diagnosed with plaque, dental calculus and gum bleeding on dental probing. This current health situation is of major public health significance and needs urgent attention.

Unique contribution to theory, practice and policy: The recommendations of this study were therefore useful in promoting oral health among the youth in Meru County and also useful in identifying oral health risk factors. The study would also assist the Meru County government in identifying measures to deal with the high dental caries in the region. The study will also contribute to the achievement of the two of the big four agenda, that is Universal health coverage and Employment opportunities. Finally it is anticipated that this study will help fill gaps in this area and may prompt other researchers to undertake similar studies in other regions.

Key words: *Oral health, Dental caries, Periodontal disease, Simplified Oral Hygiene Index*

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1.0 INTRODUCTION

Oral health is demarcated as the absence of diseases and optimal functioning of the mouth and its tissues, in a way that preserves the highest level of self-esteem. Oral health defines a standard which empowers an individual to eat, speak and socialize without disease. Dental caries and periodontal diseases are the major oral diseases in the world. The prevalence of dental caries in the world ranges between 60 and70 percent (WHO, 2014). Other diseases and conditions that affect the oral cavity include dental fluorosis, oral cancer, Edentulism, cranial facial birth defects and malocclusion of teeth. Dental caries is the most common dental disease of mankind (WHO, 2014).

Utilization of oral health services encompasses visiting a dental specialist frequently. The National Institute for Clinical Excellence (NICE-United Kingdom) states that the commended intermission between dental examinations should be determined precisely for every patient, and tailored to meet his or her needs, on the basis of an assessment of disease levels and risk of or from dental diseases. It commends that for adults, the intermission ought to be between 3 and 24 months. This is due to the fact that problems are managed more easily at a primary stage. People at high risk of dental diseases need more regular check-ups. These may comprise smokers, diabetics, and people with existing gum disease, people with a feeble immune response to bacterial disease and people who tend to get widespread caries or build up plaque (NICE Guideline, 2013).

In Kenya, Meru, in addition to tobacco usage, the Ameru people extensively use alcohol and Miraa, which is popular because of its socio-cultural values in this community. This ethnic group is ranked high among communities most affected by both oral and nasopharyngeal carcinomas (Journal of African Cultural Studies, 2014). The success of oral health in this region will depend on the enhanced understanding of the prevalence and identification of potential risk factors involved. This study therefore sought to determine the oral health status and its associated factors among the youth in Igembe constituency, Meru County.

1.1 Problem Statement

Oral diseases such as dental caries, gum diseases, fluorosis, oral mucosal lesions and tooth wear are a major proportion of Kenya´s oral problems. A report produced by the Kenya National Oral Health Survey, (2015) showed that the prevalence of dental caries among the adult population and children was 34.5% and 32.5% respectively hence leading to an overall prevalence of 67%. On average, every adult had one decayed tooth with a DMFT of 0.72. This meant that the adult population had unmet dental caries related treatment needs. The prevalence of fluorosis among the adult was 23.7% and 41.4% among the children, the prevalence of oral mucosal lesions was 3.2% among the children while among the adults was 20.8% and the prevalence of tooth wear was 14.6% among the adult population. Over 99% of children said they had at least one dental problem. All the adults indicated that they had at least one current dental problem which required attention. The high prevalence of gum related diseases and dental caries among both adult and children populations was an indication of poor oral hygiene practices. Hence, these could be further accredited to the point that the government has allocated very little funds towards provision of oral health services. Oral health accounts for only 0.0016% of the Ministry of Health budget (KNOHS, 2015). In Meru County, specifically the Igembe constituencies are ranked high among areas most affected by oral diseases in Kenya, with the youth being the most affected (Journal of African

Cultural Studies, 2014). This finding was supported by the fact that most of the youths who turned up for the Kenya Defence Forces recruitment in Igembe North, Meru County was turned away due to decayed and missing teeth. Only eight young men were recruited and the majority were rejected due to oral health problems. However, the main cause of the poor oral health in the region could not be established (KDF recruitment report, 21st Feb 2018). This study therefore sought to determine the oral health status and its associated factors among the youth in Igembe sub-county, Meru County.

1.2 Specific Objectives

1. To determine the oral health status among the youth in Igembe sub-county, Meru County
2. To determine the prevalence of dental caries and periodontal diseases among the youth in Igembe sub-county, Meru County

2.0 LITERATURE REVIEW

2.1 Dental Caries

Dental caries refers to a transmissible microbiologic disease of the teeth that result in confined termination and annihilation of the calcified tissues. The pathogenesis of caries comprises from the commencement of the formation of plaque. The superficial of the tooth that is covered by the plaque, when there is a decline in the pH of the localized area, causes the dissolution and demineralization of tooth (WHO, 2012). The prevalence of dental caries has been described to contrast from one country to another owing to the dissimilarities in socio-economic status (SES) patterns and demographic factors. A nationwide oral health survey done in Portugal by Aalmeida *et al*, revealed the prevalence proportion rates of dental caries was 46.9% in 6 years old and 52.9% in 12 year old in 2003 (WHO, 2009). Whereas in Australia prevalence of caries was revealed to be 34% in 3-6 year old by Hallet, *et al.,* 2002, with DMFT at 2.28. In a nationwide study in 2003 in the United Kingdom, 34% of 12 year olds and 49% of 15 year olds had clear decay. WHO data displays developing countries to have a lesser caries experience than developed countries (Pitts NB, 2006). Risk factors for dental caries comprise diet of refined carbohydrates, poor oral hygiene, use of non-fluoridated tooth paste, poor oral health seeking behaviour and tooth morphology among others (Caries Research, 2007).

2.1 Periodontal disease

Periodontal disease is an inflammatory disease that affects the soft and hard structures that support the teeth and is a foremost source of connective tissue attachment and tooth loss in population (WHO, 2012). They are the most common prolonged diseases affecting people of all ages worldwide. Though, the severe forms of the disease are more distinct in older individuals predominantly due to lengthy exposure to risk factors. Numerous methods have been established to study the distribution of periodontal disease and can be categorized as mild, moderate or severe on the basis of multiple measurements of periodontal pocket depth, attachment loss and gingival inflammation around teeth (Armitage GC, 2002). Moreover, statistics from large epidemiological studies specify in some populations periodontal disease is more predominant in males than in females and it worsens with increasing age. One of the main risk factors of periodontal diseases is deliberated to be poor oral hygiene (Petersen PE, 2009). According to WHO report (2014) periodontal diseases in mankind, 80% of the young

children in the world have gingivitis, over 90% of the world adult population have experienced gingivitis, periodontitis or both (WHO, 2014).

3.0 MATERIALS AND METHODS

3.1 Study Site

Igembe Constituency is in Meru County, one of the 47 counties in Kenya, located in the former Eastern Province. The area lies within one degree on both sides of the equator and 37º- 38º east, longitude. It is the home of the Ameru (Meru) tribe which is sometimes described as being related to the tribes living around the Mt. Kenya region: the Kikuyu and Embu people. Meru County has become increasingly cosmopolitan to the lucrative trade in khat (Miraa), a minor narcotic, particularly popular with Somali community both in Kenya, Somalia and people of Somali descent in the diaspora. Several factors led to the choice of this location. First, the area is ranked high among areas most affected by oral diseases in Kenya, with the youth being the most affected (Carrier N, Journal of African Cultural Studies, 2014). Secondly, the area is the largest Miraa growing region in the county. Finally, Miraa has been in the headlines after being related to causing oral harm.

3.2 Study Design

Stratified random sampling was used to select the respondents, where the area was divided into four locations (stratum) as shown in the table 1 below. Listing of persons in the target population was first done in the stratum. Hence, from each stratum simple random sampling was done to come up with the desired sample size of 340 respondents.

Table 1: Stratified random sampling of study participants

Location(stratum)	Population
Maua	107
Maili tatu	62
Kangeta	77
Laare	94
Total	**340**

3.3 Oral Health Indices

3.3.1 Dental Caries Indices

Using the DMFT (Damaged Missing and Filled Teeth), a tooth was considered decayed when there was an open carious cavitation on any surface of the tooth. A tooth was classified as missing in the index if it was extracted due to caries. A tooth was classified as filled if it had a restoration for a carious lesion. Exfoliated teeth in the primary and mixed dentition, unerupted and those extracted for other reasons apart from caries were not included in the indices.

3.3.2 Periodontal Disease Indices

The number and percentage of individuals with absence of periodontal disease (score 0).The number and percentage of individuals with pockets 4-5 mm (score 1).The number and percentage of individuals with pockets 6mm (score 2).

3.4 Data Collection Tools

A questionnaire adopted from the WHO Oral Survey Handbook was used to collect data from the selected sample. The questionnaire entailed all aspects taking into account the socio-

demographic and socio-economic factors and all other variables in the study were incorporated in the questionnaire. Oral examination instruments included; mouth mirror, explorer and probe.

3.5 Data Management and Analysis

The questionnaire was checked manually for completeness and consistencies, and then coded, entered, and analyzed using SPSS window version 25. Descriptive statistics such as frequencies and percentages were used to analyze categorical data. Inferential statistics by use of Chi-square test was used to determine the associations between the independent variables and the dependent variable (P= <0.001).

4.0 FINDINGS

4.1 Response rate

This chapter presents findings organized in form of tables, bar graphs, pie charts and narratives. The sample size was 340. The response rate was 100%.

4.2 Socio-demographic Information

4.2.1 Distribution of study respondents by age

The mean age of study respondents was 27(±3) years. Majority, 52% of the study respondents were aged 23-27 years, (Table 2)

Table 2: Distribution of study respondents by age

Age	Frequency	Percentage
18-22 years	34	10%
23-27 years	177	52%
28-32 years	102	30%
33-35 years	27	8%
Total	**340**	**100%**

4.2.2 Distribution of study respondents by gender

Majority, 54% of the study respondents were male,

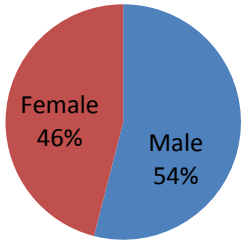

Figure 1 Distribution of study respondents by gender

4.2.3 Religious affiliations

Most, 52% of the respondents were Christians, 27% were Muslims, and 17% did not have any religious belief while 4% were Hindu,

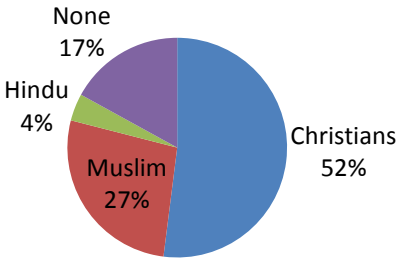

Figure 2: Religious affiliations

4.2.4 Distribution of study respondents by marital status

Majority, 52% of the respondents were single, 28% were married, 12% were separated, 6% were widowed while 2% were divorced,

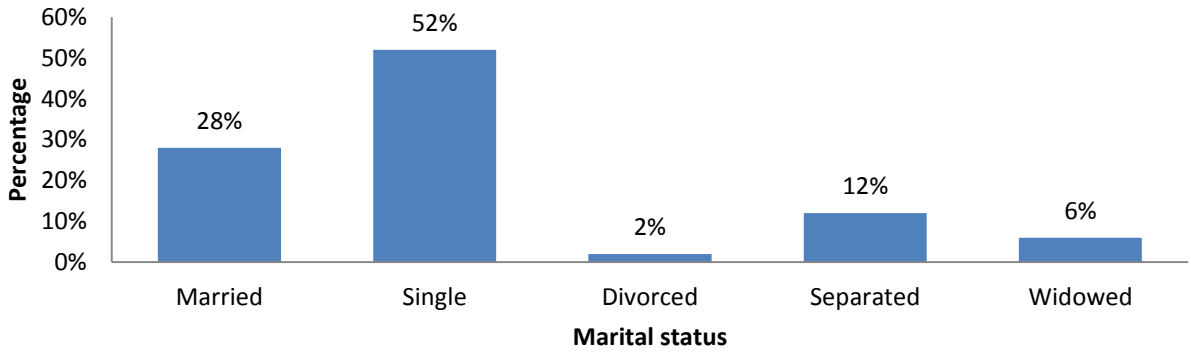

Figure 3: Distribution of respondents by marital status

4.2.5 Distribution of respondents by place of residence

Sixty eight percent of the study respondents resided in a rural setting while thirty two percent in an urban area,

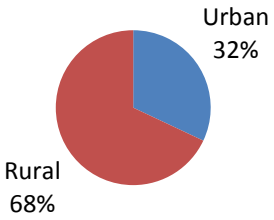

Figure 4.4 Distribution of respondents by place of residence

4.3 Socio-Economic Information

4.3.1 Distribution of respondents by highest level of education

In this study, 75% of the respondents had attained the primary school level of education, 14% secondary school, while 4% had no formal education,

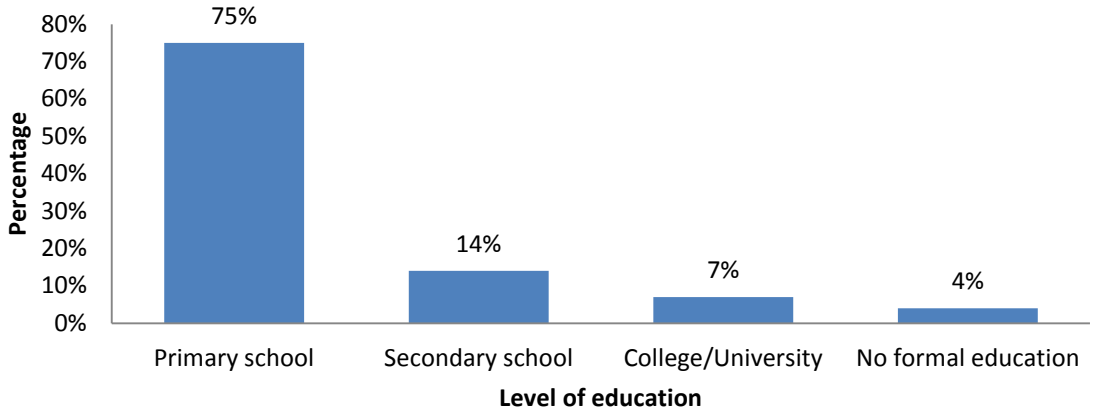

Figure 5: Distribution of respondents by highest level of education

4.3.2 Distribution of study respondents by occupation

Forty six percent of the study respondents were business people, eighteen percent were unemployed while five percent were casual laborers,

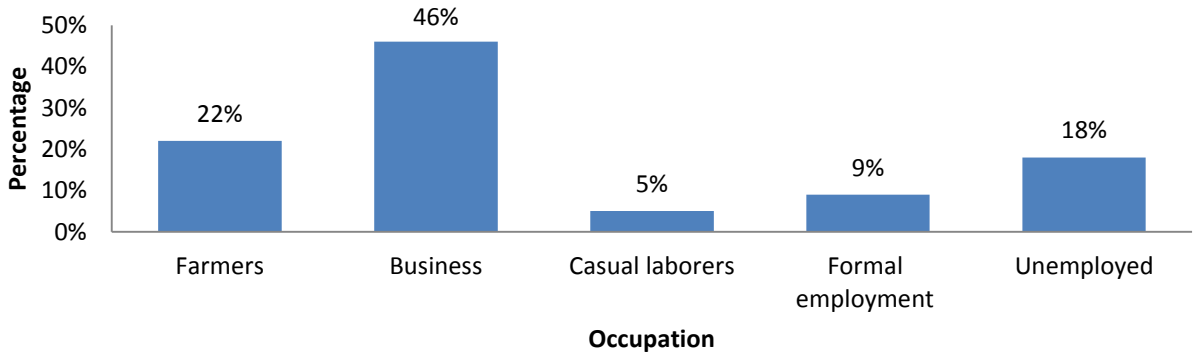

Figure 6: Distribution of study respondents by occupation

4.3.3 Distribution of respondents by level of income

In this study, 23% of the respondents had a monthly income of sh 6000-sh 10,000 while 20% had below sh 1000 and 4% had above sh 20,000.

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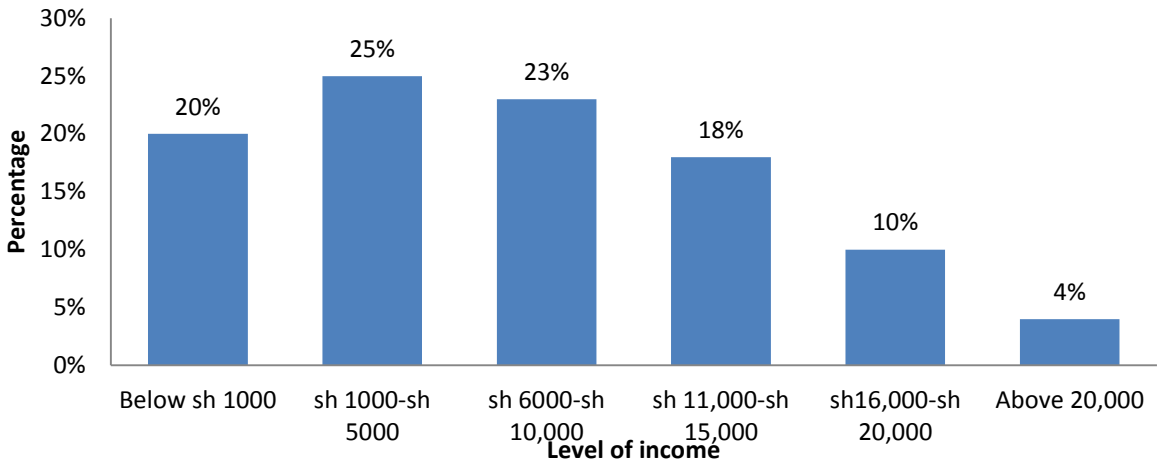

Figure 7: Distribution of respondents by level of income

4.3.4 Distribution of respondents by Health care Insurance (NHIF)

Majority, 85% of the study respondents did not have any health care insurance,

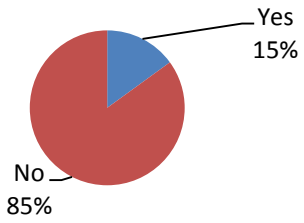

Figure 8: Distribution of respondents by health care insurance

4.4 Prevalence of Dental caries and periodontal disease (gum disease)

4.4.1 Prevalence of dental caries among the study respondents

In this study finding it was revealed that the prevalence of dental caries was 62%,

Table 3: Prevalence of dental caries among the study respondents

Gender	Caries tooth	Cariesfree subject	Total subject examined
Male	40%	14%	54%
Female	22%	24%	46%
Total	**62%**	**38%**	**100%**

4.4.2 Prevalence of periodontal disease (gum disease) among the study respondents

In this study finding it was revealed that the prevalence of periodontal disease was 47%,

Table 4: Prevalence of gum disease among the study respondents

Score	Variable	Frequency	Percentage
0	Absence of periodontal disease	180	53%
1	Shallow pocket (4-5mm)	92	27%
2	Deep pocket (6mm)	68	20%

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4.5 Oral Health Status

In this study findings, after calculation of the Simplified Oral Hygiene Index (OHI-S), it was revealed that majority, 80% of the respondents have a poor oral health status,

Table 5: Oral Health Status

OHI-S score	Rating scale	Frequency	Percentage
0-0.9	Good	10	3%
1.0-1.9	Fair	58	17%
2.0-6.0	Poor	272	80%

4.6 Measures of association

4.6.1 Factors associating with Dental caries

From the table 6 below, it can be seen that the factors which had a significant association (P<0.001) with the prevalence of dental caries include; age, gender, level of education, income and Health care insurance.

Factor	With Dental caries	Caries free	P-value
Age			0.004
18-22 years	21(6.1%)	13(3.9%)	
23-27 years	149(43.9%)	27(8.1%)	
28-32 years	32(9.4%)	70(20.6%)	
33-35 years	9(2.8%)	17(5%)	
Gender			0.002
Male	136(40%)	48(14%)	
Female	75(22%)	82(24%)	
Religious affiliations			0.412
Christian	121(35.5%)	57(16.7%)	
Muslim	58(17.2%)	34(10%)	
Hindu	7(2.2%)	6(1.7%)	
None	24(7.2%)	32(9.4%)	
Marital status			0.073
Married	53(15.6%)	41(12.2%)	
Single	123(36.1%)	55(16.1%)	
Divorced	6(1.7%)	2(0.6%)	
Separated	17(5%)	24(7.2%)	
Widowed	13(3.9%)	6(1.7%)	
Place of residence			0.004
Urban	89(26.1%)	21(6.1%)	
Rural	123(36.1%)	108(31.7%)	
Level of education			<0.001
Primary school	151(44.4%)	104(30.6%)	
Secondary school	40(11.7%)	7(2.2%)	
College/University	9(2.8%)	15(4.4%)	
No formal education	11(3.3%)	2(0.6%)	
Income			<0.001
Below sh 1000	49(14.4%)	19(5.6%)	
Sh 1000-sh 5000	64(18.9%)	21(6.1%)	
Sh 6000-sh 10,000	58(17.2%)	19(5.6%)	
Sh 11,000-sh 15,000	19(5.6%)	41(12.2%)	
Sh 16,000-sh 20,000	13(3.9%)	21(6.1%)	
Above sh 20,000	7(2.2%)	7(2.2%)	
Health Care Insurance			<0.001
Yes	15(4.4%)	36(10.6%)	
No	196(57.8%)	92(27.2%)	

Note: (P=<0.001)

4.6.2 Factors associating with Periodontal disease

From the table 7 below, it can be seen that the factors which significant association (P<0.001) with the prevalence of periodontal disease (gum disease) include the following; age, gender, level of education and income

Factor	With Periodontal Disease	No Periodontal disease	P-value
Age			0.004
18-22 years	17(5%)	17(5%)	
23-27 years	96(28.3%)	81(23.9%)	
28-32 years	34(10%)	68(20%)	
33-35 years	13(3.9%)	13(3.9%)	
Gender			0.002
Male	117(34.4%)	66(19.4%)	
Female	43(12.8%)	113(33.3%)	
Religious affiliations			0.174
Christian	51(15%)	126(37.2%)	
Muslim	66(19.4%)	26(7.8%)	
Hindu	7(2.2%)	6(1.7%)	
None	36(10.6%)	21(6.1%)	
Marital status			0.156
Married	55(16.1%)	40(11.7%)	
Single	72(21.1%)	106(31.1%)	
Divorced	2(0.6%)	6(1.7%)	
Separated	26(7.8%)	15(4.4%)	
Widowed	6(1.7%)	13(3.9%)	
Place of residence			0.164
Urban	75(22.2%)	34(10%)	
Rural	85(25%)	146(42.8%)	
Level of education			<0.001
Primary school	119(35%)	136(40%)	
Secondary school	26(7.8%)	21(6.1)	
College/University	6(1.7%)	19(5.6%)	
No formal education	9(2.8%)	4(1.1%)	
Income			<0.001
Below sh 1000	40(11.7%)	28(8.3%)	
Sh 1000-sh 5000	34(10%)	51(15%)	
Sh 6000-sh 10,000	28(8.3%)	49(14.4%)	
Sh 11,000-sh 15,000	26(7.8%)	34(10%)	
Sh 16,000-sh 20,000	19(5.6%)	15(4.4%)	
Above sh 20,000	13(3.9%)	2(0.6%)	
Health care insurance			<0.001
Yes	21(6.1%)	30(8.9%)	
No	140(41.1%)	149(43.9%)	

5.0 DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion

5.1.1 Socio-demographic characteristics of the study respondents

The mean age of study respondents was 27(±3) years. Majority, 52% of the study respondents were aged 23-27 years, while 30% were aged 28-32 years and the least were aged 33-35 years at 8%. The study findings revealed that tooth loss tended to increase significantly with age among the study respondents while vulnerability to dental caries and periodontal diseases tended to increase significantly among the younger youths as compared to the older youths. The findings were in agreement with a study conducted by Amarasema *et*

al., 2011, in order to explore the socio-demographic factors associated with tooth loss in rural inhabitants of Sri Lanka. The study findings revealed that tooth loss increased significantly with age. In these study findings it was revealed that majority, 54% of the study respondents were male, while 46% were female. There was a strong significant association (P=<0.001) between gender and the risk to dental caries and periodontal diseases. This is because the male had a higher prevalence of dental caries (40%) and periodontal disease (34.4%) as compared to the females at dental caries (22%) and periodontal diseases (12.8%) respectively. Majority, 52% of the study respondents were single while 28% were married. There was no significant association between the marital status of the respondents and the risk to dental caries and periodontal diseases. According to these study findings, majority, 68% of the respondents were rural inhabitants while 32% resided in the urban areas. Furthermore, the study findings revealed that mean number of decayed teeth (DT) in rural areas was higher than that in the urban areas, while the mean number of filled teeth (FT) in rural areas was lower than that in the urban areas. It was revealed that young adults living in rural areas were more likely to report having unmet dental care needs and were less likely to have had a dental visit in the past year compared with young adults living in the urban areas. These finding was in concordant with a study conducted by (African Journal of oral health sciences, 2009) which revealed that Caries experience was more probable to be greater among young adults residing in rural areas. Hence, they established that oral health differences existed among young adults living in rural and urban areas.

5.1.2 Prevalence of dental caries

In these study findings it was revealed that the prevalence of dental caries was 62%. This finding was in line with a studies done by (Medicinal Oral, 2010) which revealed that countries such as Spain having a prevalence of 61% and mean DMFT 1.52. Additionally similar studies done Asia, Saudi Arabia found the prevalence of dental caries among 12 year olds to be 68.9% (Amin and Al-Abad, 2017) while in Thailand the prevalence was 70% with a DMFT of 2.4 (WHO, 2014). Factors which had a significant association (P<0.001) with the prevalence of dental caries included; age, gender, level of education, income, Health care insurance, smoking, alcoholism and Miraa chewing.

5.1.3 Prevalence of Periodontal disease

In these study findings it was revealed that the prevalence of periodontal disease was 47%. Deep pockets of more than 6mm were found in 20% of the respondents. Bleeding on gentle probing was found on 27% of the respondents examined. These findings were in concordant with studies conducted by (WHO 2014) in Morocco and West Africa which had a periodontal diseases prevalence of 84.2% respectively. Other studies for instance in Gambia showed a high proportion (80%) who are in need of complex periodontal treatment. Factors which had significant association (P<0.001) with the prevalence of periodontal disease (gum disease) included the following; age, gender, level of education, income, smoking, alcoholism and Miraa chewing.

5.2 Conclusion

After calculation of the Simplified Oral Hygiene Index (OHI-S), it was revealed that majority, 80% of the respondents have a poor oral health status. The prevalence of dental caries among the study respondents was very high with the majority (85%) of the respondents having lost their teeth due to a dental problem. The prevalence of periodontal disease among the respondents was high with most of them diagnosed with plaque, dental calculus and gum

bleeding on dental probing. This current health situation is of major public health significance and needs urgent attention.

5.3 Recommendations

The youths should be encouraged on brushing teeth at least twice a day, avoiding risk factors such as tobacco, alcoholism and chewing Miraa with cariogenic foods. Brushing of teeth should highly be recommended among the Miraa chewers especially at night to avoid keeping of khat bolus. The County Government in collaboration with the Public Health department should create awareness among the youths on the importance of regular dental check-ups as part of preventive measures and teaching good habit on oral hygiene. The County Government should carry also out oral health promotion in the rural areas. Further studies should also be done to determine the association between drug use and the oral health effects among the youth.

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