Oral hygiene practices and periodontal conditions among chronic kidney diseases patients attending Muhimbili National Hospital

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ORAL HYGIENE PRACTICES AND PERIODONTAL CONDITIONS AMONG CHRONIC KIDNEY DISEASES PATIENTS ATTENDING MUHIMBILI NATIONAL HOSPITAL

By

Medard Thadeus Mrema, (DDS)

A Dissertation Submitted in (partial) Fulfilment of the Requirements for the Degree of Master of Dentistry (Restorative Dentistry) of

Muhimbili University of Health and Allied Sciences
November, 2018

CERTIFICATION

The undersigned certifies that he has read and hereby recommend for examination by Muhimbili University of Health and Allied Sciences a dissertation entitled; *"**Oral hygiene practices and periodontal conditions among chronic kidney diseases patients attending Muhimbili National Hospital"*** in (Partial) fulfillment of the requirements for the degree of Master of Dentistry (Restorative Dentistry) of Muhimbili University of Health and Allied Sciences.

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Dr. E. G. S. Mumghamba

(Supervisor)

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Date

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Dr. Peter Shempemba

(Co-Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Medard Thadeus Mrema**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature……... Date……..……

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DEDICATION

This dissertation work is affectionately dedicated to my parents (Thadeus Mrema and Fransisca Mtuy) and my lovely wife Alice Lukensa.

ABSTRACT

Background: Periodontal diseases are among the most common infectious diseases seen in humans characterized by gingival inflammation, as well as loss of connective tissue and alveolar bone from around the roots of the teeth, if untreated may eventually lead to tooth loss. Chronic Kidney Disease is a condition which is characterized by either kidney damage or a decrease in kidney function lasting three months or longer. Studies have established a relationship of CKD with periodontal diseases but the relationship yet established is an association and not causation. Poor oral hygiene is linked with periodontal disease, and lack of proper tooth brushing and other measures of oral hygiene can encourage bacterial deposition and build-up of dental plaque on teeth and gums which can set a stage for inflammatory changes in periodontal tissues. There is pronounced relationship between poor oral hygiene and increased accumulation of dental plaque, Calculus, high prevalence and increased severity of periodontal disease.

Objective: The aim of this study is to assess oral hygiene practices and periodontal conditions among Chronic Kidney Diseases patients attending the Muhimbili National Hospital.

Material and methods: This was hospital based descriptive cross-sectional study conducted at nephrology clinic at Muhimbili National Hospital. A total of 154 CKD patients, 84 (54.4%) male and 70 (45.5%) female aged 22 to 77 years were recruited. Full-mouth examination was performed and all six surfaces of teeth were examined. The subject's socio-demographic and Oral hygiene practices were gathered through self-administered structured questionnaires followed by full mouth clinical examination carried out by a single examiner for assessing the presence of plaque, calculus, gingival bleeding on gentle probing, periodontal pocket depth, gingival recession and periodontal attachment loss. The gathered information were coded, entered in a computer and analyzed using IBM Statistical Package for Social Sciences (SPSS) version 20. Frequencies and percentages were generated to show the distribution of specific parameters in periodontal patients. Mean scores were calculated for each periodontal parameter scored and the independent sample 't' test was used for comparing the mean

number of sites with plaque, bleeding, calculus, pockets, gingival recession and connective tissue attachment loss according to the age groups, education and sex respectively and the level of statistical significance was set at $p < 0.05$. ANCOVA was used to analyze the effect of confounder .Chi square test were used for comparing proportion.

Results: The study population is composed of 154 CKD patients of whom 84 (54.4%) were males and 70 (45.5%) were females providing a male to female ratio of 1:1. Their age ranged from 22 to 77 years (Mean 49.93±13.06). Very few participants (1.3%) had no formal education and (45.5%) had primary education, and majority (53.2%) had secondary or higher level of education. Concerning brushing habits (51.9%) brushed once per day, (48.5%) brushed more than once per day, Regarding the use of brushing device (mswaki) for tooth cleaning (97.4%) reported to be using plastic tooth brush only for brushing and (2.6%) reported to be using both plastic and chewing stick for cleaning their teeth. All studied participants (100%) reported using fluoridated tooth paste for brushing. The mean number of sites with gingival bleeding was 7.27 ± 9.24. The prevalence of dental plaque was (74.7%). The mean number of surfaces with dental plaque was 46.73 ± 36.91. The prevalence of dental calculus was (70.8%). The mean number of surfaces with calculus was 34.31±29.61. The prevalence of periodontal pockets as (36.4%) The mean number of sites with gingival recession was 7.98 ± 10.24. The prevalence of attachment loss was (39%). The mean number of surfaces periodontal pocket was 4.12 ± 6.74. The prevalence of gingival recession was (54.5%). The mean number of surfaces with attachment loss was 7.81±11.79.

Conclusion; In conclusion, most of the study population brushes their teeth once per day and visited a dentist less than once annually, oral hygiene status in this study population was poor, majority of the patients presented with plaque, calculus and gingival bleeding on gentle probing in most of the teeth surfaces examined. Periodontal pocket depth and attachment loss were associated with males sex.

Recommendations; Based on the findings of the study the following recommendations are made:

1. Oral Health measures should be in conjunction with objective clinical parameters in disease assessment, planning, treatment, and subsequent evaluation of care.
2. Further studies on Oral hygiene practices and periodontal conditions among chronic kidney diseases should be done in population based study.

TABLE OF CONTENTS

CERTIFICATION ii
DECLARATION AND COPYRIGHT iii
ACKNOWLEDGEMENT iv
DEDICATION v
ABSTRACT vi
LIST OF TABLES xi
LIST OF FIGURES xi
ABREVIATIONS xii
DEFINITION OF TERMS xiii
1.0 INTRODUCTION 1
1.1 Background 1
2.0 PROBLEM STATEMENT 4
3.0 RATIONALE OF THE STUDY 4
3.1. Conceptual framework 5
4.0 LITERATURE REVIEW 6
5.0 OBJECTIVES 10
5.1 Research questions 10
5.2 Broad objective 10
5.3 Specific objectives 10
6.0 METHODOLOGY 11
6.1 Study Area 11
6.2 Study Design 11
6.3 Study Population 11
6.4 Sample Size 11
6.5 Sampling method 12
6.6 Exclusion Criteria 12
6.7 Ethical Issues 12

6.8 Calibration of the examiner and reliability of the clinical data 13
6.9 Data collection and tools.....13
7.0 DATA ANALYSIS.....15
8.0 RESULTS.....16
9.0. DISCUSSION.....25
10.0. CONCLUSION 28
11.0. RECOMMENDATIONS.....28
REFFERENCE 29
APPENDICES.....34
Appendix I (a): Informed Consent Form (English version) 34
Appendix I (b): Informed Consent Form (Kiswahili version).....37
Appendix II (a): Questionnaire (English version) 40
Appendix II (b): Questionnaire (Swahili version) 44
Appendix I11: Clinical Examination Form 48

LIST OF TABLES

Table 1: Distribution of the study population by social-demographic factors……17
Table 2: Showing Oral hygiene practices by sex, age and level of education…….18
Table 3: Showing periodontal conditions by sex, age and level of education…….....…20
Table 4: Adjusted and unadjusted t test and P value for attachment loss…….…….24

LIST OF FIGURES

Figure 1**:** The conceptual framework……..……5
Figure 2: Distribution of the periodontal conditions in the study population……..…23

ABREVIATIONS

ANUG	-	Acute Necrotizing Ulcerative Gingivitis
BoP	-	Bleeding on Probing
CAL	-	Clinical Attachment
CEJ	-	Cemento Enamel Junction
CKD	-	Chronic Kidney Diseases
CPITN	-	Community Periodontal Index of Treatment Need
CRP	-	C-reactive protein
CVD	-	Cardiovascular Diseases
DM	-	Diabetes mellitus
GI	-	Gingival index
MNH	-	Muhimbili National Hospital
NUG	-	Necrotizing Ulcerative Gingivitis
PAL	-	Periodontal Attachment Loss
PPD	-	Periodontal Pocket Depth
PTLBW	-	Preterm Low Birth Weight
USA	-	United State of America
WHO	-	World Health Organization
PD	-	Periodontal Disease
CVD	-	Cardiovascular Diseases
CPI	-	Community Periodontal Index

DEFINITION OF TERMS

Periodontal disease is a type of diseases that affects one or more of the periodontal tissues or are infections of the tissues that surround and support the teeth namely the gingiva, periodontal ligaments, alveolar bone and cementum (Ranney, 1993).

Periodontal pocket probing depth (PPD) is the distance from the gingival margin to the bottom of the periodontal pocket (Lindhe, 2008).

Plaque is a biofilm usually a pale yellow which develops naturally on the teeth, formed by colonizing bacteria trying to attach themselves to the tooth's smooth surface (Carranza, 2011).

Gingival recession is defined as an apical displacement of gingival margins to the cemento-enamel junction (CEJ), which results in root expo-sure (Lindhe, 2008).

Calculus or tartar is a mineralized bacteria plaque that forms on the surface of natural teeth and dental prostheses (Carranza, 2011).

Tooth mobility refers to the movement of loose teeth within their sockets physiological or pathological, whereas pathological when exceeds normal mobility value primarily caused by periodontal disease and trauma (Carranza, 2011).

Periodontal attachment loss refers to the pathological detachment of collagen fibers from cemental surface with the concomitant apical migration of the junctional or pocket epithelium on the root surface (Armitage, 2000).

Chronic Kidney Disease also known as renal failure or renal insufficiency, is a medical condition of impaired kidney function in which the kidneys fail to adequately filter metabolic wastes from the blood (Sandsmark *et al.,* 2015).

1.0 INTRODUCTION

1.1 Background

Periodontal diseases (PD) are group of diseases which affects supporting tissues of the teeth (Carranza, 2011). These diseases are some of the most common infectious diseases that are seen in humans, they are characterized by inflammation of the gingiva as well as loss of connective tissue and bone that surrounds the roots of the teeth, which if left untreated they may eventually lead to tooth loss (Brown & Löe, 1993). The signs of PD include parameters observed clinically, such as loss of periodontal tissue support which is assessed by measurements of pocket depth and attachment level. Probing pocket depth (PPD) which is the distance from the gingival margin to the location of the tip of a periodontal probe inserted in the pocket with moderate probing force. Likewise, probing attachment level (PAL) or clinical attachment level (CAL) is the distance from the cemento-enamel junction (CEJ) to the location of the inserted probe tip (White and Pharoah, 2014). The main cause of the diseases shown to be bacterial plaque (also called biofilm) which are the normal commensal in the subgingival area, Gram-positive organisms predominate in the periodontally healthy population (Moore and Moore, 2000). However, individuals who are affected by PD have an increased prevalence of Gram-negative organism, these Gram-negative organisms are capable invoking inflammatory and immune responses by their endotoxins (Milne *et al.*, 2015). The bacterial plaque (periodontal pathogens) includes primary colonizers which are the yellow complex (*Streptococcus spp*) or purple complex (A. *odontolyticus*). Secondary colonizers are green complex (E. *corrodens,* A. *Actinomycetemcomitans* and *Capnocytophaga spp*.), orange complex (*Fusobacterium, Prevotela* and *Campylobacter spp*) and red complex (B. *forsythus*, P. *gingivalis* and T. *denticola*). The red complexes are associated with bleeding on probing (Carranza, 2011 ,Haffajee and Socransky, 2005).

Also periodontitis as a manifestation of systemic diseases as one of the periodontal disease have revealed close associations between PD and systemic disease(Weidlich *et al.*, 2008), such as Chronic Kidney Disease (CKD) (Ariyamuthu *et al.*,2013: Salimi. 2010),

CKD is a major problem worldwide. It is a condition which is characterized by either kidney damage or a decrease in kidney function lasting three months or longer (Levey *et al*., 2003). This condition mostly can progress to kidney failure, where 90% of the kidney's function is lost (Levey *et al.,* 2003). There are numerous conditions which can lead to the development of kidney disease, these conditions are;- hypertension and diabetes mellitus, particularly type 2, these constitute the main causes, followed by glomerulonephritis (Shaheen *et al.,* 2005; Craig & Kotanko, 2009).

Recently research work has been carried out regarding effects of CKD on oral tissues and the effect of oral diseases on worsening the prognosis of patients with CKD (Proctor et al. 2005). Studies revealed that CKD affects teeth, oral mucosa, periodontium, salivary glands, and tongue resulting in a negative effect on the oral health status of the patients (Summers *et al.*, 2007). A proposed mechanism for the effect of periodontitis on the development of kidney disease is systemic inflammation. Periodontal pathogens have been shown to have the ability to adhere to, invade, and proliferate in endothelial cells leading to atheroma formation and impaired vasculature relaxation (Thorman, Neovius and Hylander, 2009).

Both periodontitis and kidney diseases are associated with inflammatory markers such as C-reactive protein and chronic low level inflammation associated with periodontitis may lead to endothelial dysfunction which plays a role in the pathogenesis of kidney disease (M.A. *et al.*, 2002).

The harmful effects of systemic inflammation on kidney function could occur during the period of active periodontal infection and accumulate during the life time of the individual (Proctor *et al.,* 2005). Regarding the serum markers of inflammation in CKD patients, serum markers related to periodontitis that have been studied include albumin and CRP (Menon *et al.*, 2003). Researchers have reported that CKD patients have elevated levels of C-reactive protein (CRP) as compared to normal conditions and PD is associated with an elevation of serum levels of CRP (Stephen, 2009; Pepys and Hirschfield, 2003).

Those studies revealed that periodontal infection represents a significant risk factor for various systemic diseases.

There are some studies that show no conclusive association between PD and CKD (de Oliveira, Watt and Hamer, 2010) yet recent evidence strengthens support of the biologically plausible role for PD in the occurrence and progression of CKD (Fisher and Taylor, 2009).

Poor oral hygiene is linked with periodontal disease, and lack of proper tooth brushing and other measures of oral hygiene can encourage bacterial deposition and build-up of dental plaque on teeth and gums which can set a stage for inflammatory changes in periodontal tissues.(de Oliveira, Watt and Hamer, 2010) There is pronounced relationship between poor oral hygiene and increased accumulation of dental plaque, Calculus, high prevalence and increased severity of periodontal disease (Albandar, 2002).

In practice, we can't control PD without focusing on oral hygiene practices as PD are closely related to poor oral hygiene. Therefore there is a strong reason to study on these patients' oral hygiene practices and periodontal conditions.

In order to intervene this association, researches has to be done and in Tanzania there is no any study done on oral hygiene practices and periodontal conditions among CKD population.

2.0 PROBLEM STATEMENT

PD are among chronic diseases which affect most of the population in Tanzania and other parts of the world, mostly these diseases are caused by poor oral hygiene. CKD patients are part of general population therefore they are affected as well.CKD patients suffer the burden of the disease and with the additional of periodontal problems the condition worsens, since it has been suggested that there is a bidirectional relationship between CKD and PD where PD increases the disease burden. Prevalence of periodontal disease as well as CKD in Tanzania has been documented, however the extent to which CKD patients experience a burden of periodontal disease is not known. Also with the burden of CKD patients suffering from such conditions seem to ignore oral hygiene practices leading to poor oral hygiene which will eventually cause periodontal diseases. Therefore the aim of the study is to assess oral hygiene practices and periodontal conditions among CKD patients attending Muhimbili National Hospital.

3.0 RATIONALE OF THE STUDY

The chronic kidney disease as well as periodontal diseases are both none communicable diseases that affects the Tanzanian population. This study therefore will contribute to the understanding of oral hygiene practices and periodontal conditions of chronic kidney disease patients in Tanzania. Also data from this study will provide baseline information on burden of diseases among CKD patient. Furthermore the information gained from this study shall be submitted to Ministry of Health, Community Development, Gender, Elderly and Children for use in planning community-based preventive programs and provision of treatment for patients suffering from such conditions.

3.1. Conceptual framework

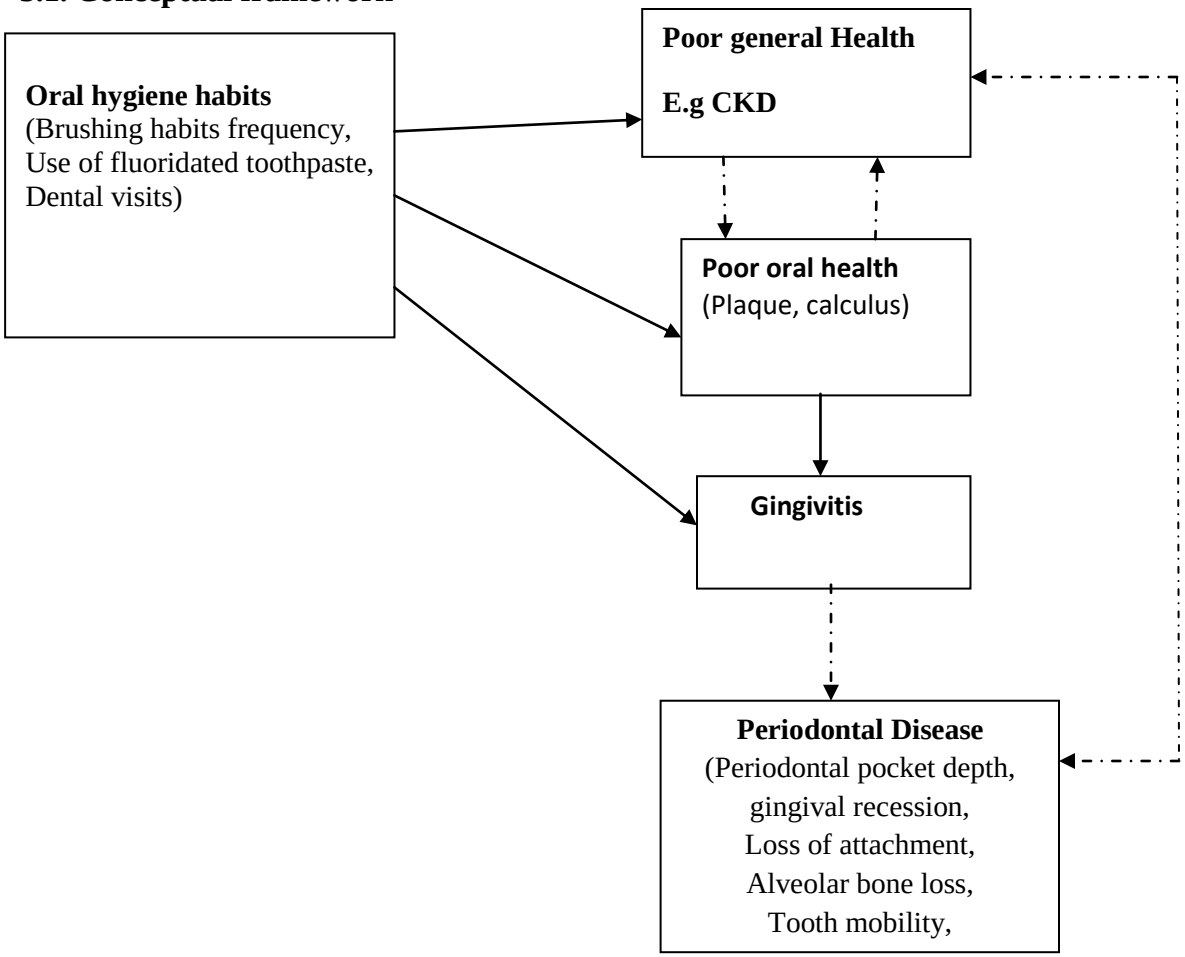


Fig 1: The conceptual framework showing interaction between oral hygiene practices, PD and CKD (Sheiham and Watt, 2000).

4.0 LITERATURE REVIEW

Recently UN declaration recognizes that renal and oral diseases pose a major health burden for many countries and that these diseases share common risk factors and can benefit from common responses to non-communicable diseases. The renal and oral diseases had recently been declared as a constituent on non-communicable diseases (J Can Dent Assoc 2011; 77:b138).

Also recently special interests have emerged to study the association between periodontal disease and chronic kidney disease.

Studies have established a relationship of systemic conditions like CKD with oral diseases but the relationship yet established is an association and not a causation(Khan, 2009; Kshirsagar *et al.*, 2007). In some situations a bidirectional model has also been observed. Presence of one condition increases the chances of others. On the other hand controlling one condition may benefit the patient regarding the other condition (Kshirsagar *et al.*, 2007).

Recent studies have shown an association between PD and CKD, with periodontal disease being associated with twice the risk of CKD (Kshirsagar et *al.*, 2007, Fisher and Taylor, 2009).

4.1 Oral hygiene practices among CKD patients.

Primary preventive measures for patients with CKD by promoting good oral health reduces the risk of oral diseases that may predispose the patient to oral diseases. Ensuring healthy dentition becomes increasingly important especially when a patient is suffering from CKD. Poor oral health as a result of poor oral hygiene may further predispose to oral and possibly disseminated infection.

A study on dental health status among 226 dialysis patients was in Canada found that only 79% of the participants brushes 1-2 times a day, 15% visited dentist more than once annually(Klassen and Krasko, 2002).

Also there was a study done Germany on Oral behavior, dental, periodontal status among 70 patients undergoing dialysis and found that 88% brushes their tooth twice, 54% visited dentist more than once annually (Schmalz *et al.,* 2016).

In Vietnam a study was done on periodontal status in CKD patients, 120 patients were enrolled, it was found that 71.1%/ brushes twice a day and 10% visited dentist more than once annually(Du *et al.,* 2016).

Also in Iran, a study was done on oral health status among 72 CKD patients and it was found that 27% brushes twice a day, 16.7% visits dentist twice a year (Malekmakan *et al.,* 2011).

The African and Tanzania literature on Oral hygiene practices among chronic kidney diseases patients could not be retrieved; therefore the present study will fill the knowledge gap and form a valuable source of information on oral hygiene practices among CKD patients.

4.2 Plaque, gingival bleeding and calculus among CKD patients

The basic fundamental factor for oral health is good Oral hygiene. Poor oral hygiene leads to microbial plaque accumulation on natural teeth surfaces in the oral cavity and the causative factor of gingivitis that in time may lead to periodontal diseases. Gingival status is one of the important clinical parameter for oral health and is assessed by scoring gingival bleeding on gentle probing, plaque accumulation, and calculus.

Mostly the deposition of dental plaque and calculus is the main causes of gingivitis (Marya, 2011). Several studies have documented that patients with CKD has an increased plaque and calculus deposition(Gavaldá *et al.,* 1999) (Bayraktar *et al.,* 2007; Bots *et al.,* 2006; Gavaldá *et al.,* 1999; Klassen & Krasko, 2002;) .The increased plaque and calculus deposition in these CKD patients was accredited by poor oral hygiene (Klassen & Krasko, 2002; Al-Wahadni & Al-Omari, 2003; Bayraktar *et al.,* 2007). Furthermore, the altered serum calcium-phosphorous balance, which causes changes in the salivary composition, has been recognized as another cause of this increase(Al-Wahadni and Al-Omari, 2003) (Epstein *et al.,* 1980; Gavaldá *et al.,* 1999).

A study done in Poland, (Borawski *et al.*, 2007) enrolled 135 CKD patients and reported that the median plaque index was 2.5. In Holland, (Bots *et al.*, 2006) found that of the mean total number of examined surfaces of teeth was (5.4±1.0), almost half of the surfaces were covered with dental plaque (2.4 ± 1.6) in the 42 dentate dialysis patients examined.

In Brazil there was a study done on Oral health in patients with chronic renal disease and found that majority of the patients (79.6%) presented with calculus (Souza *et al.*, 2008).

Another study done in turkey on Oral Health Status and Oral Hygiene Habits of Adult Population on Dialysis found that plaque score and gingival bleeding was 93% and 67.5% respectively (Gurkan, Kose and Atilla, 2008).

The African and Tanzania literature on Plaque, gingival bleeding and calculus among CKD patients could not be retrieved; therefore the present study will fill the knowledge gap and form a valuable source of information on Plaque, gingival bleeding and calculus among CKD patients.

4.3 Periodontal pocket depth and clinical attachment loss among CKD patients

In periodontitis there is migration of junctional epithelium apically which results into so called periodontal pocket. (Marya, 2011) Thus, in many researchers reported that the pocket depth can determine the presence or absence of periodontal disease in many populations including those with CKD (Leroy, Eaton and Savage, 2010).

A study done in Jordan Al-Wahadni & Omri, (2003) found a mean PPD for 47 CKD patients of 2.86mm±0.58 and in another study on 126 CKD patients reported a mean of (4.62mm ±1.25)(Algdar, 2016) Also another study done in turkey involving 68 CKD reported a mean PPD score of 2.3mm± 0.6, CAL of 1.75mm± 0.13,(Cengiz *et al.*, 2009). Also (Haghpanah *et al.*, 2011) reported a PPD of 2.2mm± 1.03 among 55 Iranian CKD patients.

Also there was a study done in Vietnam on periodontal status among 120 CKD patients reported that periodontal status among chronic kidney disease patients ranged from PPD (4.78-2.06), CAL (4.25-1.59(Du *et al.*, 2016).

The African and Tanzania literature on Periodontal pocket depth and clinical attachment loss among CKD patients could not be retrieved; therefore the present study will fill the knowledge gap and form a valuable source of information on periodontal pocket depth and clinical attachment loss among CKD patients.

5.0 OBJECTIVES

5.1 Research questions

1. What are oral hygiene practices among CKD patients attending MNH?
2. What are the periodontal conditions among CKD patients attending MNH?

5.2 Broad objective

This study aimed at determining oral hygiene practices and periodontal conditions among chronic kidney disease patients attending Muhimbili national hospital by age group, sex and level of education.

5.3 Specific objectives

1. To determine the oral hygiene practices among CKD patients attending Muhimbili National Hospital for treatment by age group, sex and level of education.
2. To determine clinically presence of plaque, calculus and gingival bleeding on probing among Chronic Kidney Disease patients attending Muhimbili National Hospital for treatment by age group, sex, and level of education.
3. To assess the probing periodontal pocket depth, calculated clinical attachment loss and gingival recession among Chronic Kidney Disease patients attending Muhimbili National Hospital by age group, sex, level of education**.**

6.0 METHODOLOGY

6.1 Study Area

This study was conducted at the nephrology clinics in Muhimbili National Hospital. Muhimbili National Hospital is a government hospital/institutions located in the City of Dar es Salaam, serving populations of different background, education and different levels of economics. Also Muhimbili National Hospital is a referral hospital where by a large numbers of patients with CKD are referred for management.

6.2 Study Design

It was a descriptive cross-sectional hospital-based study

6.3 Study Population

This study included all diagnosed CKD patients ranging from 18years old and above attending Muhimbili National Hospital in Dar-es-Salaam during the study period.

6.4 Sample Size

In determining the study sample size, the following formula was used.

$$\mathbf{n} = \frac{\mathbf{Z^2 P\,(1-P)}}{\mathbf{e^2}}$$

Where;

n = Sample size.

Z = Standard normal deviation, set at 95% (1.96)

P=Proportion in the study population estimated to have periodontal diseases (0.5)

e =Level of accuracy/precision, set at 5% (0.05).

Sample size, n = $\frac{1.96 \times 1.96 \times \mathbf{0.5(1-0.5)}}{0.05 \times 0.05}$

n = **384.16**

n = Approximate (384)

6.5 Sampling method

CKD patients attending MNH and met inclusion criteria were recruited until the sample size was attained.

Inclusion criteria

It will be adult patient aged 18 years and above with CKD attending MNH (both inpatient and outpatient) at a time where the study will be taking place after the explanation of study objections to the target population, the ones giving consent will consecutively being recruited for the study until the set sample size is attained.

6.6 Exclusion Criteria

Exclusion criteria are those characteristics that disqualify prospective subjects from inclusion in the study this will include-

1. Mentally incapable patients.
2. Patients with oral tumors/cancers.
3. Those who did not give consent
4. Completely edentulous patients.
5. Severely ill patients whereby cannot open the mouth voluntarily for periodontal examination.

6.7 Ethical Issues

Ethical clearance was obtained from the Ethical Clearance Committee (Appendix 1a&b) of the Muhimbili University of Health and Allied Sciences. Participants were filled informed consent form before participation. After the assessment of oral condition, findings and advices were given to the participants accordingly. Thereafter treatment was arranged for those who were in need. Refusal to participate in the study did not involve penalties. Participants were free to discontinue their participation in the study at any time without with no penalty, whatsoever.

6.8 Calibration of the examiner and reliability of the clinical data

The calibration exercises and reproducibility testing of the clinical examiner was carried out by a single examiner and the intra-observer kappa indices were recorded. Each periodontal site was assessed and recorded accordingly and 10% of the 100 participants were re-examined for reliability in this research findings were compared for reliability and validity. Intra-examiner reproducibility Kappa statistics were 0.726 for full mouth mean score for gingival recession and 0.821 for full mouth mean score for periodontal pocket depth indicating good to very good agreement. Intra-examiner reproducibility for plaque, calculus and bleeding were not measured because it was difficult to measure these entire variables on the same day due to limited time.

6.9 Data collection and tools

The study commenced after being granted ethical clearance and administrative permission to access the Muhimbili Nephrology clinic.

Both questionnaires and clinical examination (Appendix 11a&b, 111) was carried out by the investigator with the support of research assistants in recording the findings.

Questionnaires (containing a total of 23 questions on social demographic characteristics, oral hygiene practices and other medical conditions) were administered to each patient before the clinical examination in the Muhimbili Nephrology clinic. Clinical examination was performed by one calibrated examiner (Qualified and experienced Dentist) following the procedures recommended by the World Health Organization (2012). Examination was carried out using plane non-magnifying mouth mirror, CPI probe, William probe. Clinical examination involved full mouth examination and six surfaces/sites per tooth to determine presence of plaque (P), calculus (C), gingival bleeding (GB) on gentle probing, gingival recession (GR) in mm, periodontal pocket depth (PPD) in mm. The surfaces/sites examined per tooth were the three buccal surfaces/sites (mesial-buccal, buccal, buccal-distal) and the three lingual/palatal surfaces/sites (mesial-lingual/palatal, lingual/palatal, distal-lingual/palatal). Also tooth mobility (TM), missing teeth (MT) were scored and recorded, accordingly. In addition, at the

end of examination, connective tissue attachment loss was calculated from gingival recession and periodontal pocket depth.

6.9.1 Periodontal status

In assessing periodontal status different indices were used for estimating severity of periodontal disease namely; periodontal pocket, gingival recession and loss of attachment.

6.9.2 Gingival recession

In order to estimate the apical-coronal width of recession, linear measurements of gingival recession were obtained from the cemento-enamel junction up to the edge of free gingival margin by using William's periodontal probe. Gingival recession were reported when the apical coronal width of recession is measured from one or above millimeters while less than one millimeter were considered as normal or absence of gingival recession. In the clinical record data form, gingival recession was scored as measured in millimeters while absence of recession was scored as zero (0).

6.9.3 Calculated attachment loss

The connective tissue attachment loss as measured in millimeters from cement-enamel junction to the base of the periodontal pocket was calculated by summing up the periodontal pocket depth and the gingival recession measurements. The findings were recorded in the clinical record form by using numerical code in mm whereby measurement less than 1mm implied absence of loss of attachment thus coded (0), and in case of measurement ≥1mm implied presence of attachment loss and therefore the actual millimeters scored were recorded accordingly, for example 1, 2, 3, etc.

6.9.4 Periodontal pocket

The apical coronal width of the periodontal pocket is done using William's periodontal probe. With gentle probing force (estimated to be 20 grams) the probe was inserted into the pocket on each tooth surface/site and the measurements were recorded in the clinical record form accordingly. When PPD depth measured was less than 4 mm, it was considered as normal sulcus (no periodontal pocket) while measurements greater than or equal to 4 mm was

considered as a true periodontal pocket and thus was scored in the actual millimeters that were found on each surface/site, accordingly.

6.9.5 Gingival bleeding

Gingival bleeding was assessed on six-sites per tooth using the CPI periodontal probe with an approximated 20gm force. Bleeding at gingival margin for at least within 10 seconds after gentle probing was recorded in the clinical form. The coding was as follows: absence of bleeding = 0, presence of bleeding = 1. Bleeding elicited by gentle probing indicate gingivitis.

6.9.6 Dental Plaque and Calculus

Plaque and calculus were assessed by using CPI probe through walking strokes while probing on the surface of the tooth from supra to sub-gingival area on both buccal and palatal/lingual surfaces of the tooth. By using tactile sensation, catchment or resistance during probing indicate presence of calculus whereas physical appearances of soft deposits on the surfaces of the tooth while probing indicate presence of plaque.

The findings were recorded in the clinical record form by using numerical code whereby absence of calculus or plaque was coded as zero (0) while presence of supra and/or subgingival calculus or plaque was coded as one (1).

7.0 DATA ANALYSIS

Quality checks were done at the end of the working day during data collection to ensure that the information obtained was properly recorded. All the gathered data were entered in a computer using Statistical Package for Social Sciences (SPSS, version 20.0, Chicago, IL) Before data analysis in line with each specific objective, some information was transformed by the use of “counts” and “re-coding” to suit data handling. The characteristics of variables were described using frequency distribution for categorical variables and in the case of continuous variables; the mean and standard deviation were applied.

8.0 RESULTS

The study population is composed of 154CKD patients of whom 84 (54.4%) were males and 70 (45.5%) were females providing a male to female ratio of 1.2:1. Their age ranged from 22 to 77 years (Mean 49.93±13.06). Male age ranged from 22 to 76 years, while female age ranged from 22 to 77 years. Very few participants (1.3%) had no formal education and (45.5%) had primary education, and majority (53.2%) had secondary or higher level of education. The distribution of the study population by socio-demographic factors that includes sex, age-group and level of education is Also majority of the participants 139(90.2%) have complex medical conditions including hypertension and diabetes. More than half of the participants (51.9%) had hypertension, less than half had diabetes (37.6%) and few had cardiovascular diseases (4.5%). Many of the participants were also under medication (Shawn in table 1)

Table 1: Distribution of the study population by socio-demographic factors (N=154)

Characteristic	n (%)
Number of patients	154
Mean ages(years)	49.93±13.06
Sex	
Male	84(54.5)
Female	70(45.5)
Age	
20-24	7(4.5)
25-29	8(5.1)
30-34	6(3.9)
35-39	9(5.8)
40-44	18(11.6)
45-49	19(12.3)
50-54	29(18.8)
55-59	21(13.6)
60-64	19(12.3)
65+	18(11.4)
Education	
None	2(1.3)
Primary	70(45.5)
Secondary	41(26.6)
University	47(27.6)
Other medical conditions	
	139(90.2)
Diabetes	54(37.6)
Hypertension	78(51.9)
Cardiovascular	7(4.5)
Medications	
Ant diabetes	54(37.6)
Antihypertensive	78(51.9)
Cardiovascular drugs	7(4.5)

Table 2 showing Oral hygiene practices by sex, age and level of education (N=154).

Oral hygiene status	Socio-Demo	Frequency n (%)		*P value*
	Sex	Once per day	Twice or more per day	
Brushing	Male	53(66.2)	31(41.8)	0.002*
	female	27(33.7)	43(58.2	
	Age			
	22-44	29(36.2)	19(25.6)	0.004*
	45+	51(63.7)	55(74.3)	
	Education			
	None/Primary	35(43.8)	36(48.6)	0.542
	Secondary/University	45(56.2)	35(51.4)	
Use of fluoridated toothpaste	**Sex**	**Yes**	**No**	
	Male	84(100)	0(0)	0.83
	female	70(100)	0(0)	
	Age			
	22-44	48(100)	0(0)	0.83
	45+	106(100)	0(0)	
	Education			
	None/Primary	71(100)	0(0)	0.73
	Secondary/University	83(100)	0(0)	
Use of brushing devise(mswaki)	**Sex**	**Plastic tooth brush**	**Both plastic and chewing stick**	
	Male	82(97.6)	2(2.4)	0.85
	female	68(97.1)	2(2.9)	
	Age			
	22-44	48(100)	0(0)	0.17
	45+	102(96.2)	4(3.8)	
	Education			
	None/Primary	67(94.4)	4(5.6)	0.028*
	Secondary/University	83(100)	0(0)	
Dental visits	**Sex**	**More than once annually**	**Less than once annually**	
	Male	5(55.6)	47(53.3)	0.988
	female	4(44.4)	38(44.7)	
	Age			
	22-44	2(22.2)	52(52.9)	0.080
	45+	7(77.8)	40(47.1)	
	Education			
	None/Primary	5(55.6)	34(40.0)	0.368
	Secondary/University	4(44.4)	51(60.0)	

Among the study population 80(51.9%) brushed once per day, 74(48.5%) brushed more than once per day, among males (66.2%) reported to brush once per day and (41.8%) reported to brush twice or more per day. Among females (33.7%) reported to brush once per day and (58.1%) reported to brush twice or more per day respectively. This was statistically significant (*P=0.002).*

Brushing habits among age groups, 22-44age group 29(36.2%) reported to brush once per day and 19(25.6%) reported to brush twice or more per day. Among 45+ age group 51(63.7%) reported to brush once per day and 55(74.3%) reported to brush twice or more per day respectively. This was statistically significant *P=0.002*.

The brushing device(mswaki) for tooth cleaning among level of education, none/primary group 67(94.4%) reported to be using plastic tooth brush only for brushing and 4(5.6%) reported to be using both plastic and chewing stick for brushing. Among the secondary/university group 83(100%) reported to be using only plastic toothbrush for brushing. This was statistically significant *P=0.028*. Other oral hygiene practices were not statistically significant (Table 2).

Table 3. Showing periodontal conditions by sex, age and level of education (N=154)

Periodontal Condition	Socio-Demo	Mean±SD	*P value*
	Sex		
Plaque present(Yes)	Male	45.79±37.31	0.636
	female	47.87±36.66	
	Age		
	22-44	48.46±36.11	0.715
	45+	45.95±37.41	
	Education		
	None/Primary	42.56±37.93	0.135
	Secondary/University	50.30±35.86	
Gingival bleeding present(Yes)	**Sex**		
	Male	8.61±9.42	0.011*
	female	5.69±8.83	
	Age		
	22-44	8.25±10.28	0.031*
	45+	6.84±8.75	
	Education		
	None/Primary	6.34±8.45	0.279
	Secondary/University	8.08±9.85	
Calculus present(Yes)	**Sex**		
	Male	36.68±20.06	0.048
	female	31.47±31.33	
	Age		
	22-44	36.25±31.11	0.535
	45+	33.43±29.01	
	Education		
	None/Primary	25.94±26.88	0.030*
	Secondary/University	41.47±30.10	
Gingival recession present(Yes)	**Sex**		
	Male	9.57±10.53	0.003*
	female	6.07±9.62	
	Age		
	22-44	8.88±11.28	0.007*
	45+	7.58±9.77	
	Education		
	None/Primary	7.00±9.37	0.226
	Secondary/University	8.82±10.92	

Periodontal Pocket depth present(Yes)	**Sex**		
	Male	5.10±6.98	0.001*
	female	2.96±6.38	
	Age		
	22-44	4.23±7.49	0.160
	45+	4.08±6.47	
	Education		
	None/Primary	3.30±5.58	0.783
	Secondary/University	4.83±7.63	
Calculated attachment loss present(Yes)	**Sex**		
	Male	8.65±12.40	0.451
	female	5.40±10.83	
	Age		
	22-44	8.75±12.83	0.269
	45+	6.46±11.28	
	Education		
	None/Primary	5.66±9.69	
	Secondary/University	8.47±13.25	

Gingival bleeding was present in 52.4% of all subjects examined. Among all the examined subjects there were more male with gingival bleeding 61.9% than females subjects 41.4% and this difference was statistically significant.(X^2=6.421, *P=0.011*). (Table 3)

Out of 154 examined subjects 70.8% had calculus. There were more male subjects with calculus (77.4%) than females subjects 62.9%) and this difference was statistically significant. (X^2=3.894, *P=0.048*).

Recession was present in 54.5% of all subjects. There were male subjects with gingival recession (65.5%) than female subjects (41.4%) and this difference was statistically significant. (X^2=8.906, *P=0.003*)

Periodontal pocket depth was present in 36% of all subjects examined. There were more male subjects with pocket depth (46.6%) than female subjects (22.9%) and this difference was statistically significant. (X^2=8.906, *P=0.003*). (Table 3)

Gingival bleeding was present in 62.0% of all subjects examined. There were more of the subjects in age of 52-77 yrs with gingival bleeding (62.0%) compared to 22-51yrs category that has (44.6%) and this was statistically significant. (X^2=4.643, *P= 0.031*). (Table 3)
Gingival recession was present in 54.5% of all subjects examined. There were more of the subjects in age of 52-77 yrs with gingival recession (66.2%) compared to 22-51yrs category that has (44.6%) and this was statistically significant. (X^2=7.213, *P= 0.007*). (Table 3)

Calculus was present in 70.8% of all subjects. There were more of the subjects in the secondary/university (80.7%) than those who had primary or less education (59.2%) that had calculus and this difference was statistically significant.(X^2=8.607, *P value=0.003*). (Table 3)

There were no statistic significant differences in distribution of all other factor in relation to sex, age and level of education. (Table 3)

Plaque

Majority of the patients presented with dental plaque in one or more of the teeth surfaces. The occurrence of dental plaque was 74.7% among all CKD patients studied. The mean number of surfaces in all sextants that had dental plaque was 46.73±36.91.

Calculus

Each patient presented with dental calculus in one or more of the teeth surfaces. The occurrence of dental calculus among all CKD patients studied was 70.8%. The mean number of surfaces sextants 1 to 6 that had dental calculus was 34.31±29.61.

Gingival Bleeding

Regarding bleeding on probing, every patient presented with bleeding in one or more of the teeth surfaces on gentle probing. The occurrence of gingival bleeding on gentle probing among the examined patients was 52.6% among all CKD patients studied. The mean number of sites all combined sextants (1-6) that had gingival bleeding was 7.27± 9.24.

Periodontal pocket depth

Regarding Periodontal pocket some patient presented with pockets in one or more of the teeth. The occurrence of periodontal pocket depth among the examined patients was 36.4% among all CKD patients studied. The mean number of sites all combined sextants (1-6) that had periodontal pocket depth was 4.12± 6.74.

Gingival recession

With regard to gingival recession, some patient presented with recession in one or more teeth. The occurrence of gingival recession among the examined patients was 54.5% among all CKD patients studied. The mean number of sites all combined sextants (1-6) that had gingival recession was 7.98± 10.24.

Calculated attachment loss

The occurrence of CAL among all CKD patients examined was 39%. The mean number of sites all combined sextants (1-6) that had attachment loss was 7.81± 11.79.

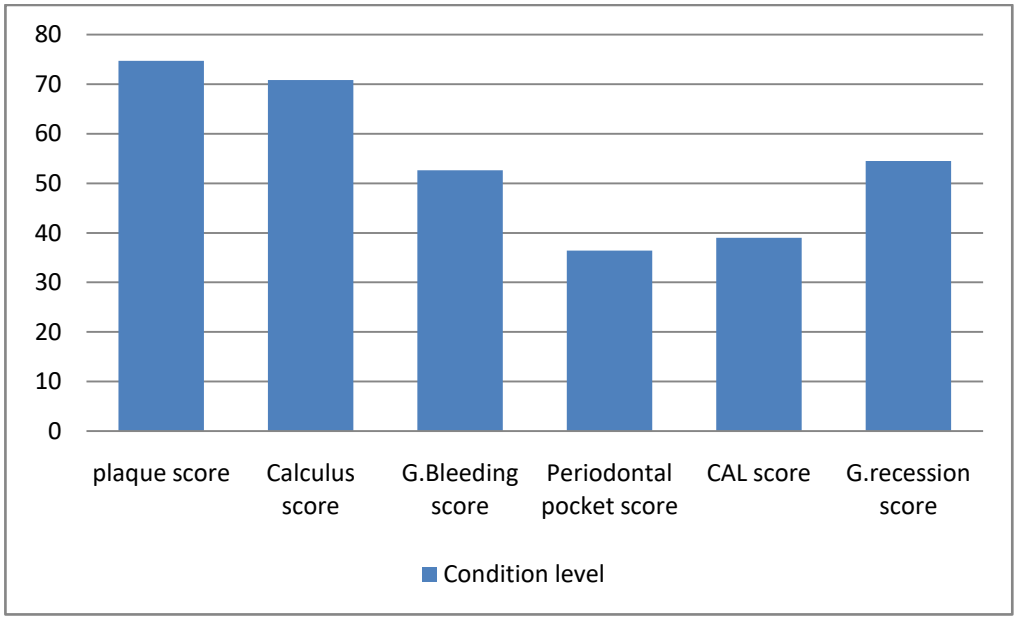


Fig. 2: Distribution of the periodontal conditions (%) in the study population (N=154)

Table 4.The t test and P value for attachment loss before and after adjustment for age, sex and education level with possible cofounders (Diabetes, Hypertension and CVS)

Attachment loss (CAL)		**Unadjusted (for Diabetes, Hypertension and CVS)**		**Adjusted (for Diabetes, Hypertension and CVS)**	
		t test	**P *value***	***F*[b]**	P ***value***
Sex	Male Female	1.716	0.088	2.741	0.031
Age	22-44 45+	1.116	0.266	2.942	0.022
Education	Non/Primary Secondary/University	-1.47	0.141	2.741	0.031

There was no statistical significant for attachment loss by sex, age, and education level before adjustment with possible confounder (Diabetes, Hypertension and CVS). After adjustment of possible confounder (Diabetes, CVS, Hypertension) using ANCOVA there was statistical significant difference between sex, age and level of education (Table 4).

9.0. DISCUSSION

This study was conducted among the Chronic Kidney Disease patients attending Muhimbili National Hospital which is a referral hospital harboring several patients coming all over the country. The reason to choose this study population is to have baseline data on oral hygiene practices and periodontal conditions among CKD patients. These will improve the provision of services countrywide through both the training and service sectors of oral health delivery mechanism. Patients excluded were those found with mental incapability, oral tumors/cancers, completely edentulous patients and severely ill patients who cannot open the mouth voluntarily for periodontal examination. Measurement of intra examiner reproducibility were carried out for gingival recession and periodontal pockets examined demonstrating good reproducibility in the diagnosis of all conditions thus give good quality to the data collected. Connective tissue attachment loss were calculated from gingival recession so were not reexamined for its reproducibility.

This study includes participants of diverse population in terms of age, sex and education. A total of 154 participants were recruited which is 40% of the calculated sample size. Failure to reach calculated sample size was due to time constrained and also most of the patients were not willing to be clinically examined (on average refusals/unwilling patients were 45%) but they were clinically and demographically not different from those examined.

Most of the studied people have complex medical conditions which include hypertension and diabetes of which these constitute the main cause of CKD.

Looking at oral hygiene practices, more than half of the study population brushes their tooth once per day and less than half brushes their teeth more than once per day, These findings were contrary to the findings obtained from the study done in Canada (Klassen and Krasko, 2002) on dental health status among dialysis patients, Also These findings are contrary to the findings obtained from the study done in Germany (Schmalz et al., 2016) on Oral behavior, dental, periodontal status of patients on dialysis. These differences might be due to the fact that the studied population included in the analysis was executed in different countries with

different hygienic standards, which might explain the large differences. Also all of the study population reported to be using fluoridated tooth paste while brushing; the majority of the patients used plastic tooth brush for brushing their tooth while very few of the participants used both chewing stick and plastic tooth brush for cleaning their teeth.

Concerning dental visits More than half of the study population have never being to a dentist, very few visited dentist more than once annually, while more than half visited a dentist less than once annually. These findings are contrary to the findings obtained from the study done in Germany on Oral behavior, dental, periodontal status of patients on dialysis (Schmalz et al., 2016) Also the findings were contrary to a study done in Iran (Haghpanah *et al.*, 2011) on Oral health status in hemodialysis patients. These differences might be due to the fact that the studies included in the analysis were executed in different countries with different access to dental facilities and motivations lack of awareness of the need for care, cost and fear of dental procedures among the studied population. Most of the studied people had plaque on about three quarter of the entire surfaces examined. Important methods for plaque control is tooth brushing so inadequate tooth brushing and other measures of oral hygiene can encourage bacterial deposition and build-up of dental plaque on teeth and gums which can set a stage for inflammatory changes in periodontal tissues. (De Oliveira, Watt and Hamer, 2010) Calculus was significantly high in the study population, where more than two third of the entire surfaces examined were covered with calculus. Also most of the studied people had gingival bleeding on about more than half of the sites examined. These findings are contrary to the findings obtained from the study done in Turkey by (Gurkan, Kose and Atilla, 2008) to evaluate the oral health status and oral hygiene habits of dialysis patients and reveled that patients had high plaque and gingival bleeding scores. Also the results were contrary to the findings obtained from the study done in Brazil by (Souza *et al.*, 2008) to evaluate Oral health in patients with chronic renal disease and reveled that patients had low calculus score. The high plaque, calculus and bleeding score could probably be due to lack of effective oral hygiene practices. High plaque, calculus and bleeding score can significantly be reduced through oral health promotion to the studied population as it reinforces people to be responsible for their oral

health. This can be speculated that patients tend to pay little attention to oral health or concerned about their renal disease and tend to neglect measures related to oral health aspects. The occurrence of periodontal pocket depth among the studied people were more than one third of the teeth examined, these was close to the study done in Vietnam on periodontal status among CKD patients (Du *et al.,* 2016), and another study done in Libya on Oral Health Status of Patients on Hemodialysis (Algdar, 2016). Also Calculated Attachment Loss was present in less than a half of the examined teeth among the studied people. These findings are contrary to the findings obtained from the study done in Turkey on Periodontal disease in chronic kidney disease and end-stage renal disease patients (Cengiz *et al.*, 2009). Also was contrary to a study done in Iran (Haghpanah *et al.*, 2011) on Oral health status in hemodialysis patients which revealed low mean sites scores with calculated attachment loss. The reasons for the disagreement could be the difference in methodology and biased sample as this was hospital based.

In this study there were some limitations worth mentioning. Due to constraints of resources, radiological assessment using Orthopantomographs (OPG) was not done while this could have given details on the periodontal status of the study population. This being a hospital based study, though it gives baseline information on the few studied individuals, and hence the findings may have limited generalizability to include the whole Tanzanian population.

10.0. CONCLUSION

In conclusion, most of the study population brushes their teeth once per day and visited a dentist less than once annually, they need to be motivated on oral hygiene practices and the importance of regular dental checkups. Also oral hygiene status in this study population was poor, majority of the patients presented with plaque, calculus and gingival bleeding on gentle probing in most of the teeth surfaces examined. Periodontal pocket depth and attachment loss were associated with males sex.

11.0. RECOMMENDATIONS

Based on the findings of the study the following recommendations are made:

1. Oral Health measures should be in conjunction with objective clinical parameters in disease assessment, planning, treatment, and subsequent evaluation of care.
2. Further studies on Oral hygiene practices and periodontal conditions among chronic kidney diseases should be done in population based study.

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APPENDICES

Appendix I (a): Informed Consent Form (English version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES



DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

INFORMED CONSENT FORM

ID-NO. ☐☐☐

Consent to Participate in a Study

Greetings! My name is Dr. Medard Thadeus Mrema; I am working on this research with the objective of assessing oral hygiene practices and periodontal conditions among Chronic Kidney Disease patients attending Nephrology clinic at Muhimbili National Hospital.

Purpose of the study

The study is conducted in partial fulfillment of the requirements for the degree of Master of Dentistry in Restorative Dentistry of MUHAS. This study is aiming at assessing oral hygiene practices and periodontal conditions among Chronic Kidney Disease patients attending Nephrology clinic at Muhimbili National Hospital.

You are being asked to participate in this study because you have particular knowledge and experiences, information as well as clinical problems that may be important to the study. Kindly please be honest and true for betterment of the results that could lead to better intervention and recommendations for future.

What Participation Involves.

If you agree to participate in the study, you will first be administered with a questionnaire in order to answer a series of questions in the questionnaire prepared for the study.

Secondly, you will be examined by a dentist who will perform a brief examination of your mouth. The examiner will provide you with a summary of the findings, offer advice and refer for suitable treatment.

Confidentiality

I assure you that all the information collected from you will be kept confidential. Your name will not be written on any questionnaire or in any report/documents that might let someone identify you. Your name will not be linked with the research information in any way. All information collected on forms will be entered into computers with only the study identification number. Confidentiality will be observed and unauthorized persons will have no access to the data collected.

Risks

We do not expect that any harm will happen to you because of participating in this study.

Right to Withdraw and Alternatives

Taking part in this study is voluntary. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty.

Benefits

The information you provide as well as the findings obtained from oral and dental examinations will help to assess the periodontal status and oral health related quality of life among Chronic Kidney Diseases patients.

Whom to Contact

If you ever have questions about this study, you should contact the Principal Investigator, Dr.Medard Thadeus Mrema (Tel 0655926392 or 0755023089) of Muhimbili University of Health and Allied Sciences, P. O. Box 65001, Dar es Salaam.

If you ever have questions about your rights as a participant, you may call the Chairperson of the Senate Research and Publications Committee, **Dr. Joyce Masalu,** P. O. Box 65001, Telephone: 255-22-2152489 Dar es Salaam and Dr. E.G.S Mumghamba who is the Supervisor (Tel 0716176478). Do you agree?

Participant agrees ……... Participant does NOT agree …….

I ……. have read the contents in this form. My questions have been answered. I agree to participate in this study.

Signature of participant ……

Signature of Research Assistant …… Date ……..……

Appendix I (b): Informed Consent Form (Kiswahili version)

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI, MUHIMBILI

KURUGENZI YA TAFITI NA UCHAPISHAJI

FOMU YA RIDHAA

Namba ya utambulisho ☐☐☐

Ridhaa ya kushiriki kwenye utafiti

Hujambo! Ninaitwa Dr Medard Mrema nashughulika kwenye utafiti huu wenye lengo la kuchunguza matendo ya usafi wa kinywa pamoja na magonjwa ya fizi kwa wagonjwa wanaofika katika Kliniki ya figokatika hospitali ya Taifa Muhimbili.

Utafiti huu unafanyika katika kutimiza sehemu ya matakwa ya shahada ya uzamili ya matibabu ya kurekebisha na kuziba meno ya Chuo Kikuu cha Afya na Sayansi Shirikishi, Muhimbili. Utafiti unalenga kuchunguza kuchunguza magonjwa ya fizi na ubora wa maisha unaohusiana na afya ya kinywa na meno kwa wagojwa wa fizi wanaofika katika Kliniki ya Kinywa na Meno katika Chuo Kikuu cha Afya na Sayansi Shirikishi, Muhimbili. Unaombwa kushiriki katika utafiti huu kutokana na upeo na ufahamu ulionao au pengine kuwa na magonjwa hayo ambavyo ni muhimu kwa utafiti huu. Tafadhali kuwa mkweli na muwazi kwa vile matokeo ya utafiti huu yanaweza yakatoa maamuzi na mapendekezo ya baadaye kuhusu matibabu.

Jinsi ya kushiriki

Ukikubali kushiriki katika utafiti huu, kwanza utapewa dodoso ili kuweza kujibu maswali toka kwenye dodoso lililoandaliwa kwa ajili ya utafiti huu.

Pili, mganga wa meno atafanya uchunguzi mfupi wa kinywa chako kwa kuangalia afya ya fizi na maeneo yanayozunguka meno, kisha atakufahamisha kuhusu afya yako ya kinywa, kukupatia ushauri wa kitaalam na kukuelekeza mahali sahihi pa kupatiwa matibabu.

Usiri

Taarifa zote zitakazokusanywa kupitia dodoso zitaingizwa kwenye ngamizi kwa kutumia namba za utambulisho.Kutakuwa na usiri na hakuna mtu yeyote asiyehusika atakayepata taarifa zilizokusanywa.

Hatari

Hatutegemei madhara yoyote kukutokea kwa kushiriki kwako kwenye utafiti huu.

Faida

Kama utakubali kushiriki kwenye utafiti huu taarifa utakazotoa zitatuwezesha kutupa mwanga zaidi juu ya matatizo ya fizi na ubora wa maisha unaohusiana na afya ya kinywa na meno kwa wagojwa wa fizi.

Athari na kukitokea madhara

Hutegemewi kupata madhara yoyote kutokana na ushiriki wako katika utafiti huu.

Uhuru wa kushiriki na haki ya kujitoa

Kushiriki kwenye utafiti huu ni hiari. Unaweza kujitoa kwenye utafiti huu wakati wowote hata kama umeshajaza fomu ya ridhaa ya kushiriki utafiti huu. Kukataa kushiriki au kujitoa kwenye utafiti huu hakutaambatana na masharti yoyote.

Nani wa kuwasiliana naye

Kama una maswali kuhusiana na utafiti huu, wasiliana na Mtafiti: Dr.Medard Mrema, simu: (0655926392 au 0784926392) wa Chuo Kikuu cha Afya na Sayansi Shirikishi, Muhimbili, S. L. P. 65001, Dar es Salaam.

Kama una swali kuhusu stahili zako kama mshiriki unaweza kumpigia simu Mwenyekiti wa kamati ya Utafiti na Uchapishaji, **Dr. Joyce Masalu,** S.L.P 65001, Simu :(255 22 2152489) Dar es Salaam au msimamizi wa utafiti huu Dr.E.G.S Mumghamba (Simu: 0716176478)

Je umekubali?

Mshiriki amekubali ……..... Mshiriki hajakubali …….....

Mimi ..... nimesoma maelezo ya fomu hii.

Maswali yangu yamejibiwa.Nakubali kushiriki katika utafiti huu.

Sahihi ya mshiriki…….....

Sahihi ya mtafiti msaidizi……Tarehe ya idhini ya kushiriki….....…

Appendix II (a): Questionnaire (English version)

Periodontal status among CKD patients attending Muhimbili National Hospital

a) Patient ID Number [__][__][__]

b) Date of Birth (Year) [_____]

c) Gender: Male [__] Female [__]

d) Occupation.....

e) Education (tick one): No formal education [__] Primary education [__]
Secondary education [__] College/University [__]

INFORMATION FROM PATIENTS MEDICAL FILE

A. Diagnosis....., .

B.BP- Systolic.....,

C. BP-Diastolic.....

1. Have you ever visited a dentist? No [__] Yes [__]
2. If yes, when was the last time?
   a. One day ago No [__] Yes [__]
   b. One week ago No [__] Yes [__]
   c. One month ago No [__] Yes [__]
   d. One year ago No [__] Yes [__]
   e. More than one year ago No [__] Yes [__]
3. What was the problem that made you to visit a Dentist?
   a. Periodontal problem. No [__] Yes [__]
   b. Prothodontic problem. No [__] Yes [__]
   c. Orthodontic problem No [__] Yes [__]
   d. Restoration No [__] Yes [__]
   e. Extraction. No [__] Yes [__]
   f. Checkup. No [__] Yes [__]

4. Have you ever suffered from any chronic diseases?
    a. Diabetes Mellitus No [__] Yes [__]
    b. Cardiovascular Diseases. No [__] Yes [__]
    c. Respiratory Tract Infections. No [__] Yes [__]
    d. Hypertension. No [__] Yes [__
    e. Mention if any…….
5. Are you under any medication? No [__] Yes [__]

6. If yes, which type of medication?
    a. Ant diabetic No [__] Yes [__]
    b. Antihypertensive No [__] Yes [__]
    c. AntiRTI No [__] Yes [__]
    d. Immunosuppressant No [__] Yes [__]
    e. Mention if any……
7. Do you take care of your teeth? No [__] Yes [__]
8. If yes, be sincere how many times do you brush your teeth in/per day?
    a. Once per day No [__] Yes [__]
    b. Twice per day No [__] Yes [__]
    c. Three times a day No [__] Yes [__]
    d. More than three times per day No [__] Yes [__]
9. At what time do you brush your teeth?
    a. Before breakfast No [__] Yes [__]
    b. After breakfast No [__] Yes [__]
    c. After meals No [__] Yes [__]
    d. Before supper No [__] Yes [__]
    e. Before going to bed No [__] Yes [__]

10. What type of tooth cleaning device you use?
    a. Both Plastic and chewing stick No [__] Yes [__]
    b. Plastic tooth brush only No [__] Yes [__]
    c. Chewing stick only No [__] Yes [__]
    d. Other, mention_____

11. Do you use fluoridated tooth paste when brushing? No [__] Yes [__]

12. What tooth paste do you prefer to use?
    a. Colgate No [__] Yes [__]
    b. Whitedent No [__] Yes [__]
    c. Sensodyne No [__] Yes [__]
    d. Aquafresh No [__] Yes [__]
    e. Other (mention)……

14. Do you drink alcohol? No [__] Yes [__]

15. How many bottles do you drink per day?
    a. One No [__] Yes [__]
    b. Two No [__] Yes [__]
    c. Three No [__] Yes [__]
    d. Four No [__] Yes [__]
    e. More than five No [__] Yes [__]

6. Have you ever experienced gum problem(s)?
    a. Bleeding gums No [__] Yes [__]
    b. Painful gums No [__] Yes [__]
    c. Swollen gums No [__] Yes [__]
    d. Tooth mobility No [__] Yes [__]
    e. Other, mention……

17. Have you ever experienced a problem of bad mouth smell? No [__] Yes [__]

18. How did you know that you have such problem?

a. Self experienced, Self-perceived No [__] Yes [__]

b. A spouse/close friend have shared with me that I have such a problem No [__] Yes [__]

c. I just feel that the people close to me at work feel uncomfortable with me when I'm talking No [__] Yes [__]

19. How did you solve the problem?

a. I brushed more in terms of frequency or force No [__] Yes [__]

b. I resorted to use mouth wash/antiseptics No [__] Yes [__]

c. I used chewing gum No [__] Yes [__]

d. I went to the dentist/doctor No [__] Yes [__]

e. I did nothing No [__] Yes [__]

f. Other (specify).....

20. Have you ever smoked cigarette? No [__] Yes [__]

21. How many cigarettes do you smoke per day?

a. Less than ten cigarette per day No [__] Yes [__]

b. More than ten cigarette per day No [__] Yes [__]

c. Twenty(1 packet) or more per day No [__] Yes [__]

22. Where you successful in quitting smoking? No [__] Yes [__]

23. How long since you quit smoking?

a. One week No [__] Yes [__]

b. one month No [__] Yes [__]

c. more than five months No [__] Yes [__]

THANK YOU FOR RESPONDING TO MY QUESTIONS.

Appendix II (b): Questionnaire (Swahili version)

DodosokuhusuhaliyamagonjwayafizikwawagonjwawenyematatizoyafigowanaohudhuriamatibabuHospitaliya taifa ya Muhimbili

a. Nambayamgonjwa [__][__][__]
b. Tareheyakuzaliwa (Mwaka) [_____]
c. Jinsia: Mwanaume [__] Mwanamke [__]
d. Kazi.....
e. Elimu (Tiki kimoja): Hajasoma [__] Elimu ya msingi [__]
   Elimu ya sekondari [__] Elimu ya chuo/chuo kikuu [__]

TAARIFA MUHIMU KUTOKA KWENYE JALADA LA KUMBUKUMBU ZA MGONJWA

a. Aina ya ugonjwa.....,
b. BP:Systolic.....

c. BP.Diastolic.....

1. Je, umewahi kwenda kwa daktari wa meno? Ndio [__] Hapana [__]
2. Kama ndiyo,mara ya mwisho ilikua lini?
   a. Siku moja iliyopita Ndio [__] Hapana [__]
   b. Wiki moja iliyopita Ndio [__] Hapana [__]
   c. Mwezi mmoja uliopita Ndio [__] Hapana [__]
   d. Mwaka mmoja uliopita Ndio [__] Hapana [__]
   e. Zaidi ya mwaka mmoja uliopita Ndio [__] Hapana [__]
3. Ni tatizo gani lililokufanya ukaenda kwa daktari wa meno?
   a. Matatizo ya fizi. Ndio [__] Hapana [__]
   b. Meno bandia Ndio [__] Hapana [__]
   c. Mpangilio wa meno Ndio [__] Hapana [__]
   d. Kuziba meno Ndio [__] Hapana [__]
   e. Kung’oa meno Ndio [__] Hapana [__]
   f. Uchunguzi Ndio [__] Hapana [__]

4. Ulishawahi kuugua magonjwa sugu? Ndio [__] Hapana [__]
5. Kama ndio, ni magonjwa gani?
    a. Kisukari Ndio [__] Hapana [__]
    b. Magonywa ya moyo Ndio [__] Hapana [__]
    c. Magonjwa ya mapafu Ndio [__] Hapana [__]
    d. Shinikizo la damu Ndio [__] Hapana [__]
    e. Mengineyo. Taja.....

5. Kuna dawa zozote unatumia kwa sasa? Ndio [__] Hapana [__]
6. Ni aina gani za dawa unazotumia?

a. Za kisukari Ndio [__] Hapana [__]
    b. Za moyo Ndio [__] Hapana [__]
    c. Za mapafu Ndio [__] Hapana [__
    d. Za shinikizo la damu Ndio [__] Hapana [__]
    e. Nyinginezo. Taja.....

7. Je, huwa unayatunza meno yako? Ndio [__] Hapana [__]
8. Kama ndiyo,(kuwa mkweli) ni mara ngapi kwa siku?
    a. Mara moja Ndio [__] Hapana [__]
    b. Mara mbili Ndio [__] Hapana [__]
    c. Mara tatu Ndio [__] Hapana [__]
    d. Zaidi ya mara tatu Ndio [__] Hapana [__]
9. Ni wakati gani hasa unapiga mswaki?
    a. Kabla ya kifungua kinywa Ndiyo [__] Hapana [__]
    b. Baada ya kifungua kinywa Ndiyo [__] Hapana [__]
    c. Baada ya chakula Ndiyo [__] Hapana [__]
    d. Kabla ya chakula cha jioni Ndiyo [__] Hapana [__]
    e. Kabla ya kulala Ndiyo [__] Hapana [__]

10. Je huwa unatumia nini kusafisha meno yako?

    a. .Mswaki wa plastiki na wakijiti Ndio [__] Hapana [__]

    b. Mswaki wa plastiki tu Ndio [__] Hapana [__]

    c. Mswaki wa kijiti tu. Ndio [__] Hapana [__]

    d. Vinginevyo,taja.....

11. Je, unatumia dawa ya meno yenye floraidi wakati wa kupiga mswaki?

    Ndio [__] Hapana [__]

12. Je, ni aina gani ya dawa unayotumia kwakati wa kupiga mswaki?

    a. Colgate Ndio [__] Hapana [__]

    b. Whitedent Ndio [__] Hapana [__]

    c. Sensodyne Ndio [__] Hapana [__]

    d. Aquafresh Ndio [__] Hapana [__]

    f. Nyingine, taja.....

14. Je, unatumia pombe? Ndio [__] Hapana [__]

15. Je, unatumia kiasi/kiwango gani kwa siku?

    a. Chupa moja Ndio [__] Hapana [__]

    b. Chupa mbili Ndio [__] Hapana [__]

    c. Chupa tatu Ndio [__] Hapana [__]

    d. Chupa nne Ndio [__] Hapana [__]

    e. Zaidi ya chupa tano Ndio [__] Hapana [__]

16. Je, ulishawahi kupata matatizo ya fizi? Ndio [__] Hapana [__]

17. Kama ndio, ni magonjwa gani?

    a. Fizi kutoa damu Ndio [__] Hapana [__]

    b. Fizi kuuma Ndio [__] Hapana [__]

    c. Fizi kuvimba Ndio [__] Hapana [__]

    d. Meno kulegea Ndio [__] Hapana [__]

    e. Mengineyo(taja).....

17. umewahi kuwa na tatizo la kutoa harufu mbaya mdomoni?

Ndio [__] Hapana [__]

18. Ulijuaje kama unatatizo hilo?

a. Nilihisi kwa uzoefu wangu Ndiyo [__] Hapana [__]

b. Kutoka kwa mtu wangu wa karibu Ndiyo [__] Hapana [__]

c. Kutoka kwa wafanyakazi wenzangu kwamba natoa harufu mbaya kinywani ninapozungumza. Ndiyo [__] Hapana [__]

19. Je ulitatuaje tatizo hilo?

a. Nilipiga mswaki mara nyingi na kwa nguvu zaidi Ndiyo [__] Hapana [__]

b. Nilitumia dawa ya maji Ndiyo [__] Hapana [__]

c. Nilitumia vimen'genya kama bigijii nk Ndiyo [__] Hapana [__]

d. Nilienda kwa dakitari Ndiyo [__] Hapana [__]

e. Vinginevyo (taja).....

20. Je umewahi kuvuta sigara? Ndiyo [__] Hapana [__]

21. Unavuta/ ulikuwa unavuta sigara ngapi kwa siku?

a. Chini ya sigara kumi kwa siku Ndiyo [__] Hapana [__]

b. Zaidi ya sigara kumi kwa siku Ndiyo [__] Hapana [__]

c. Ishirini na zaidi kwa siku Ndio [__] Hapana [__]

22. Je ulishajaribu kuacha kuvuta sigara? Ndiyo [__] Hapana [__]

23. Lini uliacha kuvuta sigara?

a. Wiki moja Ndio [__] Hapana [__]

b. Mwezi mmoja. Ndio [__] Hapana [__]

c. Zaidi ya miezi sita Ndio [__] Hapana [__]

AHSANTE KWA USHIRIKIANO WAKO

Appendix I11: Clinical Examination Form

Date…………………………………………………. Patient ID No……………………

Tooth #	PERIODONTAL STATUS																																			
	Plaque (0,1)						Gingival bleeding (0,1)						Calculus (0,1)						Gingival Recession (mm)						Periodontal Pocket Depth (0,1,2)						Peridontalattachmet Loss (mm)					
	B			L/P			B			L/P			B			L/P			B			L/P			B			L/P			B			L/P		
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GUIDANCE FOR PERIODONTAL STATUS SCORING

PERIODONTAL STATUS	CRITERIA	CODING/SCORE
Gingival bleeding	Absent	0
	Present	1
Plaque score	Absent	0
	Present	1
Calculus	Absent	0
	Present	1
Periodontal pocket depth	Not exceeding 3.5mm	0
	Present ranging between 3.5-5.5	1
	Present ranging 5.5 and above	2
Gingival recession	Absent	0
	Present	Measurement in mm