KNOWLEDGE ON THE RELATIONSHIP BETWEEN ORAL HYGIENE PRACTICES AND PERIODONTAL DISEASE AMONG PATIENTS VISITING THE PERIODONTOLOGY CLINIC OF UON DENTAL HOSPITAL

A community dentistry research project proposal submitted in partial fulfillment of requirements for the award of Bachelor of Dental Surgery degree of the University of Nairobi.

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LIST OF ABBREVIATIONS

1. CAL- CLINICAL ATTACHMENT LOSS
2. mm- MILLIMETRES
3. BOP- BLEEDING ON PROBING
4. CPI- COMMUNITY PERIODONTAL INDEX
5. CPITN- COMMUNITY PERIODONTAL INDEX BASED ON TREATMENT NEEDS
6. USA- UNITED STATES OF AMERICA
7. UON- UNIVERSITY OF NAIROBI
8. BDS- BACHELOR OF DENTAL SURGERY
9. MPH- MASTERS IN PUBLIC HEALTH
10. MSc- MASTERS IN SCIENCE

NBI- NAIROBI
SUMMARY

Background: Periodontal disease is an inflammatory disease of the supporting and investing tissues of the tooth. Its prevalence is very high in Africans. The main etiological agent is bacterial plaque, thus, oral hygiene practices greatly influence its incidence and rate. Knowledge on the relationship between oral hygiene practices and periodontal disease is useful in reducing the incidence of this condition.

Objective: to determine the level of knowledge of patients visiting periodontology clinic of UON dental hospital on the relationship between oral hygiene practices and periodontal disease.

Study population: this study will be conducted among all the adult patients visiting periodontology clinic who consent to being interviewed.

Study design: this will be a cross-sectional study.

Study area: this study will be done at the UON dental hospital in the periodontology clinic.

Materials and methods: a structured self-administered questionnaire will be used in the collection of data.

Perceived benefits: the findings of this study will provide current information on patient knowledge on periodontal disease. This information may be useful in the drafting of policies on community education about periodontal disease and how it can be prevented.
**INTRODUCTION**

Periodontal disease is an inflammatory condition affecting the supporting and investing tissues of the tooth: gingiva, periodontal ligament, cementum and alveolar bone. There is a very high prevalence of periodontal disease in Africans. Levels of clinical attachment loss (CAL) greater than 1mm are very prevalent with 70% in at least one site. There's a marked increase with age in the number of sites with CAL greater than 1mm. Worldwide, advanced gingivitis with deep periodontal pockets (6mm) affects 10-15% of adults. This represents gingival bleeding and calculus. In Kenya, most adults show signs of periodontal diseases. Severe periodontal disease affects about 50% of adults aged 45-54 years. This trend is on the increase as few people have knowledge on the relationship between poor oral health and periodontal disease.

The best approach in prevention of periodontal disease is effective and consistent removal of bacterial plaque, which is the main etiological agent. A high frequency of plaque-free surfaces results in little evidence of recurrent periodontal disease. In the industrialized world, one of the major factors identified as influential in altering the epidemiological characteristics of periodontal disease over time, is improved oral hygiene. There is an intimate spatial relationship between dental plaque and gingival and periodontal tissues. Within 2 days of cessation of oral hygiene practices, plaque is observed macroscopically in the mouth. Thus, poor oral hygiene, resulting in accumulation of plaque, leads to periodontal disease directly.

Many studies have indicated that awareness of individuals regarding their periodontal health status when accompanied by knowledge about periodontal disease process, how to manage and control it can help improve self-oral health care and hence prevention of periodontal disease. However there is only partial knowledge regarding periodontal disease with respect to causes, signs and symptoms, treatment, prevention and complications.

The aim of this study is to determine the relationship between patient knowledge on development of periodontal disease and their oral health practices.
Plaque induced periodontal disease is divided into two diagnostic categories: gingivitis, which is inflammation without loss of periodontal attachment and periodontitis, which is inflammation and apical migration of the junctional epithelium with loss of connective tissue and bone. Severity is classified as being mild, moderate or severe. Mild gingivitis is characterized by a slight change in color with slight edema but no bleeding on probing (BOP). Moderate gingivitis presents as redness, edema and glazing with BOP. Severe gingivitis shows marked redness and edema with a tendency towards spontaneous bleeding. Severity of periodontitis is determined by the amount of clinical attachment loss (CAL) in millimeters (mm). Thus, mild periodontitis is 1-2mm CAL, moderate is 3-4mm CAL and severe has CAL above 5mm. The extent of periodontal disease is a general description of its location and distribution throughout the mouth. Based on its distribution, it can be described as being localized if affecting less than 30% of the teeth and generalized if affecting more than 30% of the teeth.

Various indices have been developed for classifying extent and severity of periodontal disease. Among them is the community periodontal index CPI whose lowest score is 0-healthy periodontium and highest score is 4-deep pockets above 6mm. Microbial plaque is the main etiological agent of periodontal disease. Over 500 species of bacteria have been identified in plaque. The bacteria that play a role in the development of periodontal disease are mainly gram negative and include: Actinoebacillus actinomycetocomitans, Bacteroides forsythes, Porphyromonas gingivalis and Campylobacter rectus. Plaque-induced periodontal disease can be due to modification by various conditions: association with endocrine system such as in pregnancy and puberty, medication as seen with use of oral contraceptives and anti-seizure drugs, malnutrition, such as ascorbic acid deficiency. Non plaque-induced periodontal disease is caused by: specific bacteria; Neisseria gonorrhoea, viruses; Herpes virus, fungi; Candida species, genetic origin, manifestation of systemic conditions such as diabetes mellitus, allergies, trauma, foreign body reactions.

Baelum et al (1988) carried out a study in Kenya on plaque prevalence. The study had a
sample size of 1131 people between the ages of 15 and 65 years. Full-mouth assessments of tooth mobility, plaque, calculus, bleeding on probing, probing depth and clinical attachment loss was carried out. Plaque was found in 75-95% of population, calculus in 10-85%, pocket depth greater than 4mm in less than 20% of sites and clinical attachment loss of more than 1mm in 18-85% of sites. From this study it can be conclude that plaque-induced periodontal diseases are quite prevalent in Kenya.

Oral health knowledge is considered to be an essential pre-requisite for health related behavior. A weak association seems to exist between knowledge and behavior in cross sectional studies. Some studies have shown an association between increased knowledge and better oral health. General favorable trend of decrease in prevalence of dental caries and periodontal disease with improvement in oral hygiene and decrease in sugar consumption has not been seen in developing countries.

The signs and symptoms of periodontal disease are clinically: redness, swelling, tendency to bleeding on probing in gingival sulcus, decreased resistance to probing, tissue recession and increased tooth mobility. Histologically: inflammatory cell infiltrate, 1-2mm wide zone of gingival connective tissue adjacent to biofilm on the tooth and pronounced loss of collagen within infiltrated area. On radiograph there is loss of alveolar bone either horizontal or vertical. Horizontal bone loss is loss at a similar rate in certain part of dentition while vertical loss is at different rates.

A cross-sectional study in Jordan in 2004 was carried out to assess periodontal knowledge of an adult population between the ages of 20 and 60. The sample size was 722. The patients filled in questionnaires and a clinical examination, to determine CPITN score, was done. Results showed that bleeding gums, gum irritation, rough tooth surface and gum disease decreased with age. Correct periodontal knowledge- plaque definition and its role in disease etiology and prevention, decreased with age as well. The prevalence of people with healthy periodontium (score 0) also decreased with age: 41.1% of 20-29 year old people and 11.1% of 50-60 year old people. Calculus deposition was a major problem in all age groups above 29 years. Prevalence of periodontal pockets is
4.5%-18.6% for CPI score 3 and 2.9-11.1% for deep pockets. From the study it was concluded that health knowledge and status related to periodontal disease is still poor in northern Jordan\textsuperscript{14}.

The relationship between pre-referral periodontal health and periodontal status at time of referral was investigated in Kansas City, Missouri USA in 2006. 100 newly referred patients from 3 separate practices were studied. Data was collected by means of a clinical chart audit, clinical exam, patient response questionnaire on past professional care and personal oral care habits were assessed. It was concluded that dentistry was failing to address issues of timely diagnosis of periodontal disease, appropriate treatment and/or timely referral for treatment\textsuperscript{15}.

The oral health knowledge, attitude and behavior among Saudi school students was studied in Jeddah city in 2004. 2586 students between the ages of 12 and 18 were given a dental health questionnaire. 87.1% knew tooth brushing helps prevent periodontal disease, 33.1% knew dental floss is a preventative measure for periodontal disease. Male students used traditional brushes-mswak- more than female students who used tooth brushes for oral hygiene. Private school students used tooth brushes and floss more frequently than public school students. The most common reason for visiting a dentist among the students was dental pain. It was concluded from this study that knowledge, behavior and attitude needs improvement\textsuperscript{16}.

In 1999 a study on self-reporting of periodontal health status was carried out at the university of Dundee hospital among 100 patients. A self-reporting questionnaire was used as an epidemiological measure of periodontal status. A standard periodontal examination was also carried out, which consisted sites with plaque, percentage of sites with bleeding on probing, tooth mobility and CPITN score. It was found that self-reporting of periodontal health status was not successful as many people with indications of periodontal diseases appeared to be unaware of their condition. They also had not been informed of their condition nor were they being treated for it\textsuperscript{17}.
In Kuwait, oral health knowledge and behavior among male health science students was studied in 2001. A questionnaire was distributed to all male students, a sample size of 128. The study showed that oral health knowledge was limited and very few background factors were associated with it. More than half of the students had visited a dentist in the previous 12 months. A third of the students brushed their teeth two times or more daily. It was concluded that appropriate knowledge on some oral health topics was present but absent in some others. Moreover, tooth-brushing practices were still far behind the international recommended frequency of twice daily. The knowledge on why it should be done so frequently was also limited.
PROBLEM STATEMENT
Plaque-induced periodontal diseases have a high prevalence despite being easy to prevent and treat by removal of the main etiological agent, microbial plaque. This is as a result of poor patient knowledge, attitude and motivation, which can be attributed to ignorance or socio-economic factors. Many patients lose their teeth as a result of long-standing untreated periodontitis. They do not have adequate knowledge on etiology of periodontal disease and how it can be prevented. Those with knowledge either lack motivation or the proper attitude to practice good oral hygiene.

JUSTIFICATION
There is scanty data available on the relationship between oral hygiene practices and periodontal diseases. This study is aimed at evaluating the knowledge that patients have on this relationship and how they relate it to their oral hygiene practices. The data obtained from this study can be used in implementing policies to educate the public on etiology and prevention of periodontal diseases. This will lead to better oral hygiene practices and ultimately the reduction of prevalence of periodontal diseases.

OBJECTIVES
Main:
To determine the level of knowledge of patients visiting UON dental school on the relationship between oral hygiene practices and periodontal disease.

Specific:
To evaluate patients’ oral hygiene practices in relation to prevention of periodontal disease
To determine patients’ knowledge on the etiology of periodontal disease
To determine patients’ level of knowledge on ways of preventing periodontal disease

HYPOTHESIS
There is little knowledge on relationship between oral hygiene practices and periodontal disease.
VARIABLES

Socio-demographic
Age
Gender
Level of education

Independent:
Knowledge

Dependent:
Oral hygiene practices
METHODOLOGY

STUDY AREA
The study area will be the University of Nairobi dental hospital which is one of the teaching and referral hospitals in Kenya. It is situated in Nairobi which is the country’s capital city. The dental hospital is located between Ralph Bunche road to the east, Argwing’s Kodhek road to the south and Valley road to the north. It is approximately 2 kilometers from the city centre. The study will be conducted in the Periodontology clinic of the dental school, which on average examines 10 new patients daily.

STUDY POPULATION
This will include all the patients above the age of 18 years attending the periodontology clinic during the duration of the study who consent to being interviewed.

STUDY DESIGN
This will be a cross-sectional study done between July and September 2007.

SAMPLE SIZE DETERMINATION
This will be carried out using the following formula:

\[ N = \frac{Z^2 \cdot P \cdot (1-P)}{C^2} \]

Where \( N \) = sample size
\( Z \) = z value, which is 1.96 because confidence level is 95%
\( C \) = confidence level, which is 0.05
\( P \) = prevalence, which is 50%

\[ N = \frac{1.96^2 \cdot 0.50 \cdot (1-0.50)}{0.05^2} \]

\[ = \frac{3.8416 \cdot 0.25}{0.05^2} \]

\[ = \frac{0.9604}{0.0025} \]

\[ = 384 \]

Since the study population is less than 10,000 subjects, the following formula applies:

\[ n_f = \frac{n}{1 + n/N} \]
Where, \( n \)= sample size from previous formula
\( N \)= study population
\( n_f \)= sample size

Thus, \( n_f = \frac{384}{1 + \frac{384}{100}} \)
\( = 79.33 \)
Sample size is 80.

**DATA COLLECTION INSTRUMENTS AND TECHNIQUES**

Data will be collected by interviewing using a questionnaire.

**INCLUSION CRITERIA**

1. All consenting patients.
2. Patients above the age of 18 years.
3. Patients attending the periodontology clinic.

**EXCLUSION CRITERIA**

1. Non-consenting patients.
2. Patients below the age of 18 years.
3. Patients not attending the periodontology clinic.

**ANTICIPATED PROBLEMS**

1. Financial problems.
2. Time constraints.

**PERCEIVED BENEFITS**

1. This study will provide information on the knowledge patients have concerning periodontal diseases, which is currently limited.
2. The data collected can be used in implementing policies on community education on periodontal diseases.
ETHICAL CONSIDERATIONS

Approval to carry out this research will be sought from the Kenyatta National Hospital Ethics and Research and Standards Committee. Permission will be sought from the relevant authorities in Dental School. Informed consent will be obtained from the participants who will be assured of anonymity and confidentiality. The participants will be informed on their liberty to withdraw from the study at any point they wish.
BUDGET PROPOSAL

1. Proposal development

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2. Report writing

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**Total**       **3040**

3. Total estimated cost  Kshs. 5920
REFERENCES

13. Lindhe J., Clinical periodontics and implant dentistry 4th edition 2003 Blackwell Munksgaard Chapter 8, Examination of patients with periodontal disease pp 100-150


18. Al-Husari J., Honkala E., Honkala S. Oral health knowledge and behavior among male health science students in Kuwait BMC oral health 2001 3:
CONSENT FORM

Purpose of the study

I, Wanjiku Ndung'u, am a level III undergraduate student in the School of Dental Sciences at the University of Nairobi. I am currently conducting a study whose aim is to determine the level of knowledge of dental patients on the relationship between periodontal disease and oral hygiene practices. There is scanty information regarding this topic available in Kenya. Your participation in this study will help us generate data, which will be used in implementing policies on community education about periodontal disease.

Voluntary participation

I ____________________________ understand that I have entered this study voluntarily and that I can terminate that participation at will without consequences. I also understand that my participation does not entail any financial benefit.

Anticipated risk

There is no risk anticipated for participating in this study.

Confidentiality

The information given to the researcher will be kept in strict confidence. No information by which your identity can be revealed will be released or published.

I the undersigned ____________________________ having been informed about the study/having read the above, having had time to ask questions and having received answers concerning issues I did not understand, do willfully give consent to participate in the study.

(Patient signature or right thumbprint) (Date)

(Researcher) (Date)
QUESTIONNAIRE

KNOWLEDGE ON RELATIONSHIP BETWEEN ORAL HYGIENE PRACTICES AND PERIODONTAL DISEASE AMONG PATIENTS VISITING UON DENTAL HOSPITAL

This questionnaire is aimed at assessing the level of knowledge of patients attending dental hospital on periodontal disease and how their oral hygiene habits affect their periodontal health. It is a confidential questionnaire and it is not necessary for you to indicate your name or any other information that may be used to identify you. Participation is voluntary and confidentiality is assured.

1. Age

2. Gender

1) Male
2) Female

3. Occupation

1) None
2) Business
3) Employed
4) Casual laborer
5) Housewife

4. Level of education

1) Primary school incomplete
2) Primary school complete
3) Secondary school incomplete
4) Secondary school completed
5) Tertiary level
6) None

5. Is it normal when one bleeds from gums while brushing or on touching gums with fingers?
   1) Yes
   2) No
   3) Do not know

6. What is the cause of gum disease?
   1) Brushing
   2) Not brushing
   3) Eating hard foods
   4) Medication
   5) Pregnancy
   6) Others, specify

7. If your gums bleed you should stop cleaning the teeth
   1) Yes
   2) No
   3) Do not know

8. If one has gum disease how will they know?
   1) Pain on teeth
2) Change in color of gum
3) Swelling of gum
4) Mobile teeth
5) I don’t know
6) Others specify

9. How can gum disease be prevented?
1) Cleaning by dentist
2) Brushing regularly
3) Removal of teeth
4) Stop brushing
5) Others, specify

10. Do you clean your teeth?
1) Yes
2) No

11. If yes to the above question, how often do you clean them?
1) Once a day
2) Twice a day
3) More than twice a day
4) Once a week
5) Others, specify

12. What do you use to clean your teeth?
1) Chewing stick
2) Commercial toothbrush
3) Others, specify
13. Do you find having to brush your teeth necessary?
   1) Yes
   2) No
   3) Do not know

14. What happens when you don’t brush your teeth? List.