EFFECT OF ORAL HYGIENE INSTRUCTIONS ON GINGIVAL INDEX AND PLAQUE SCORE AMONG PERIODONTAL PATIENTS VISITING THE UNIVERSITY OF NAIROBI DENTAL HOSPITAL.

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SUMMARY

Prevalence of periodontal disease is high in any given population. This is attributed mostly to poor oral hygiene. To try and reverse poor oral hygiene oral hygiene instructions are given to all dental patients. Despite motivation and oral hygiene instruction forming the initial step, significant changes have not been realized. This could be as a result of failure to achieve the goals of oral hygiene instructions. The effectiveness of these oral hygiene instructions therefore need to be evaluated.

This will be a descriptive cross-sectional study aimed at determining the effect of oral hygiene instructions on gingival index and plaque score among patients visiting the periodontology clinic in the University of Nairobi Dental Hospital in the year 2002-2004.

Random sampling will be used to select patient files. The data to be collected will include age of the patient, gender, date of diagnosis, date of the first visit, gingival index and corresponding plaque score on each visit. A sample of 196 files will be used in the study. Data collected will be recorded in data collection form. The study will be conducted in a period of three months. Results will be analyzed using SPSS for windows 11.00.

Expected results will be used by the institution to assess the effectives in the implementation of the treatment plan so as to aid in formulation of long term plans to aid in compliance with treatment plan among periodontal patients.
INTRODUCTION

Prevalence of periodontal diseases is on the rise in most African countries. Kenya is cited as a typical example as reported by Kaimenyi JT, 1993. This is in agreement with the findings of Baelum et al, 1988, who reported loss of attachment in up to 85% of the study population among Kenyan adults.

Poor oral hygiene is the major cause of periodontal diseases. According to Russel et al, 1960, active periodontal and gingival disease is rarely found in the absence of oral debris (plaque) or calculus. This was in agreement with Baelum 1988 finding of poor oral hygiene with plaque and calculus accompanying periodontal diseases. These findings were also shared by Ash et al, 1964, who concluded poor oral health affects the healing process in periodontal conditions.

On the other hand, good oral hygiene reduces the progression of periodontal diseases as was shown by Anerd et al, 1979, who found no increase in gingivitis where good oral hygiene was maintained.

Good oral hygiene can be enhanced and maintained by practicing oral hygiene procedures. Oral hygiene procedures are the preventive measures undertaken by an individual after instructions from his dentist or oral health care provider. It involves instruction on tooth brushing, use of dental floss, use of toothpicks and even the use of mouth rinses/washes.

The dentist undertakes to explain the frequency, type of brush and the method of brushing. The dentist explains the technique and the rationale of dental flossing. Uses of other inter-dental cleaning devices are also discussed. The dentist will also discuss with the patient the status of their oral structures and the method of prevention of periodontal diseases and treatment.

The aim of this study is to determine the effectiveness of oral hygiene instructions on the gingival index and the plaque score among periodontal patients visiting the university of Nairobi Dental Hospital.

The findings of this study will assist the oral health providers determine the effectiveness of oral hygiene instruction on gingival index and plaque score on
periodontal patients so as to assist in the formulation of programs to enhance the effectiveness of the oral hygiene instructions given to patients.
LITERATURE REVIEW.

Diseases of the periodontium may be broadly classified to be either gingivitis or periodontitis. Whereas gingivitis refers to an inflammatory process limited to the mucosal epithelial tissues surrounding the cervical portion of the teeth and the alveolar process, periodontitis is said to be present when there is at least some loss of clinical attachment.

Gingivitis begins in early childhood. A study by Stephens, 2004, reported 9-17% of children aged 3-11 years in the U.S suffer from gingivitis. The study also reported a rise in prevalence at puberty to 70-90%. Other Studies outside the US shows gingivitis in 48-85% of children between 3-6 year while that of adolescents remain 70-90%. Stephen, 2004 study showed more prevalence in males than females. It also showed that adults are more affected than children.

Periodontitis shows an almost similar trend, According to Kelly et al, 1972, the prevalence of periodontitis is approximately 45% at 10 years, 67% at 20 years, 70% at 35 years and 80% at 50 years.

Poor oral hygiene remains the major cause of periodontal diseases. Several studies including that by Ash et al, 1964, correlating poor oral hygiene and gingival disease, Green et al, 1960, oral hygiene and gingival diseases and that of Anerd et al, 1979 all reported increase in periodontal diseases with poor oral hygiene. This was in agreement with the Position paper of the American academy of periodontology, 1996, which reported increase of gingivitis shown with poor oral hygiene.

Intervention in periodontal diseases can be done by following simple oral hygiene procedures. This was shown in a Clinical finding in Karlstad Sweden by Anerd et al, 1979 who concluded that clinical loss of attachment in susceptible adults can be halted almost completely when meticulous self performed plaque control is combined with professional prophylaxis 3-6 times a year. These results were shared later by Philippot et al, 2005, who concluded that behavioral education
intervention is a more effective than a classical intervention based on information and training about prophylactic techniques.

The components of oral hygiene instructions including tooth brushing, flossing, inter dental brushing and use of toothpicks have all been evaluated. The results have been an improved oral hygiene with decrease in the mean gingival index and plaque scores. Studies have also been carries out to compare the effectiveness of various components.

Halla et al, 2004 evaluated the effect of flossing in the presence of calculus and gingivitis in school students undertaking supervised oral hygiene. The study involved dental flossing in addition to tooth brushing. Instructions on tooth brushing and dental flossing were provided at the beginning with re-instruction twice a week. The visible plaque index and gingival bleeding index were determined at the start and end of each 21 days. Results showed a decreased gingival bleeding index from 62.1 to 17.9% with flossing, and 59.3 to 22.2% without flossing for the first phase. The gingival bleeding index decreased further to 8.9% with flossing and to 17.3% without flossing.

Lewis et al, 2004, compared toothpick with dental floss in the improvement of gingival health. The study determined inter-proximal plaque index and bleeding index scores. 42 female and 13 male participants were used. They were divided into two groups. One group used tooth picks the other used dental floss. Plaque score decreased in both groups as the study progressed. The study concluded that the use of dental floss or tooth pick resulted in almost similar results on improvement of gingival health.

In yet some more studies Christon et al, 1998, compared untreated patients for efficacy of dental floss and inter-dental brushes in the reduction of plaque, gingival inflammation and probing depth in a spun of six weeks prior to sub-gingival debridement, with 26 patients 12 female and 14 male aged between 27-72 years using the two devices as adjunct to brushing. The study found out that plaque score decreased from a baseline of 3.09 to 2.15 for inter-dental brushes and 3.10 to 2.47 for dental flossing. The study concluded that there was no
significant difference between the use of dental floss and the use of interdental brushes.

Good oral hygiene has also been shown to improve periodontal disease conditions even in the presence of other disease conditions. In a study by Khalid et al, 2003, sixty subjects were studied to evaluate the effect of oral hygiene on diabetic type II male with periodontal disease. 20 non diabetics were used as the first group, 20 diabetics with type II diabetes with moderate periodontitis as the second group, the third group composed of diabetics with advanced periodontal disease. Results showed overall decrease in community periodontal index of treatment need. There was more than 47% reduction in overall percentage of plaque scores.

The purpose of this study is to determine the effect of oral hygiene instructions on plaque levels and gingival inflammation on patients visiting the periodontology clinic at the Nairobi University Dental Hospital.
PROBLEM STATEMENT

Continued poor oral hygiene worsens periodontal diseases. Gingivitis develops into periodontitis. Periodontitis progresses to cause loss of attachment, mobility, suppuration from the pockets and eventual loss of teeth. The success of periodontal disease depends on the realization of the initial goal of good health. Good oral hygiene can be achieved through motivation and oral hygiene instruction. Tooth brushing, tooth picking and dental flossing remain the most important parts of oral hygiene instructions. 

A steady improvement of gingival tissue with decrease in gingival index and plaque score is expected after oral hygiene instructions. This however does not seem the case locally where the change is slow.

JUSTIFICATION OF STUDY

Research is therefore needed to determine effectiveness of oral hygiene instructions and motivation on gingival index and plaque score. The study aims at determining the effects of oral hygiene instructions on gingival index and plaque score among patients attending the periodontology clinic in the University of Nairobi Dental Hospital. 

The results will be used by the institution to assess the effectiveness in the implementation of the treatment plan so as to aid in formulating long term plans to aid in compliance with treatment among the patients.
OBJECTIVES

Main objectives

To determine effectiveness of oral hygiene instructions and motivation on gingival index and plaque score of patients visiting the University of Nairobi Dental Hospital.

Specific objectives

- To determine the change of the mean gingival index after motivation and oral hygiene instructions
- To determine the change of the mean plaque score after motivation and oral hygiene instructions

HYPOTHESIS.

There is change in mean gingival index and mean plaque score after oral hygiene instructions.
VARIABLES

*Independent variables*

- Age of the patient.
- Gender of the patient.
- Date at diagnosis.
- Date at 1\textsuperscript{st} visit after diagnosis.

*Dependent variables*

- Gingival index.
- Plaque score.
MATERIALS AND METHODS

STUDY AREA

The study will be conducted in the periodontology clinic at the University Dental Hospital which is a referral hospital. It is situated in the outskirts of Nairobi town along the Argwing Kodhek road. It receives most of its patients from Nairobi and its environs.

STUDY POPULATION

The study will be conducted from a sample derived from the patient’s records visiting the Nairobi University periodontology clinic.

INDICES USED

The gingival index was adopted from Loe and Silness, 1963 to describe the clinical severity of gingival inflammation as well as location:

<table>
<thead>
<tr>
<th>APPEARANCE</th>
<th>BLEEDING</th>
<th>INFLAMMATION</th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>No bleeding</td>
<td>None</td>
<td>0</td>
</tr>
<tr>
<td>Slight change in color and mild edema with slight change in texture</td>
<td>No bleeding</td>
<td>Mild</td>
<td>1</td>
</tr>
<tr>
<td>Redness, hypertrophy, edema and glazing</td>
<td>Bleeding on probing/pressure</td>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>Marked redness, hypertrophy, edema, ulceration</td>
<td>Spontaneous bleeding</td>
<td>Severe</td>
<td>3</td>
</tr>
</tbody>
</table>
Teeth examined:

1) Maxillary right central incisor.
2) Maxillary right first molar.
3) Maxillary left first molar
4) Mandibular left central incisor.
5) Mandibular left first molar
6) Mandibular right first molar.

Surfaces examined on each tooth:

a) Lingual
b) Facial/buccal.

The plaque score was adopted from Eneigly and Hein, 1967. This employed the use of disclosing tablet and scores were made as follows:

<table>
<thead>
<tr>
<th>APPEARANCE</th>
<th>SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>No disclosing on any part of the tooth</td>
<td>0</td>
</tr>
<tr>
<td>Disclosing tablet on the cervical margin but not extending to the mesial or distal surface</td>
<td>1</td>
</tr>
<tr>
<td>Disclosing tablet on the cervical margins and extending to the proximal surfaces</td>
<td>2</td>
</tr>
<tr>
<td>Disclosing tablet covering the cervical third of the crown</td>
<td>3</td>
</tr>
<tr>
<td>Disclosing tablet covering the cervical two thirds of the crown.</td>
<td>4</td>
</tr>
<tr>
<td>Disclosing tablet covering the whole crown</td>
<td>5</td>
</tr>
</tbody>
</table>
STUDY DESIGN
The study will be a hospital based descriptive cross-sectional study

SAMPLING METHOD
Random sampling will be used.

SAMPLE SIZE

\[ N = Z^2 \times P \times (1 - P) \]

\[ C^2 \]

WHERE

\[ N = \text{sample size} \]
\[ P = \text{prevalence} \]
\[ Z = \text{corresponding value of confidence level from the Z table.} \]
\[ C = 1 - \text{confidence level.} \]

\[ N = 1.96^2 \times 0.85 \times (1 - 0.85) \]
\[ 0.05 \]

\[ N = 3.8416 \times 0.1275 \]
\[ 0.0025 \]

\[ N = 0.489804 \]
\[ 0.0025 \]

\[ N \geq 196 \]

Prevalence of periodontitis in Kenya of 85% (Baelum et al, 1998.)
INCLUSION CRITERIA

Records of all patients visiting the periodontology clinic in the year 2002-2004.

EXCLUSION CRITERIA

1. Patients file with incomplete record of gingival index and/or plaque score.
2. Patients file without treatment notes.
3. Patients file whose treatment other than oral hygiene instructions commenced on the diagnosis visit.

DATA COLLECTION METHOD

Data collected from the patients files will be recorded in a data collection form.
The data to be collected include age, sex, date of recall, mean plaque score and mean gingival index on diagnosis and subsequent visits.

DATA ANALYSIS AND PRESENTATION

Data will be analysed using SPSS for windows11.00. Frequencies, means, cross tabulation, chi square and the students t test will be used in analysis of the collected data.
Data will be presented in form of tables, graphs and pie charts.
DATA COLLECTION FORM

EFFECTS OF ORAL HYGIENE INSTRUCTIONS ON MEAN GINGIVAL INDEX AND MEAN PLAQUE SCORE AMONG PATIENTS VISITING THE UNIVERSITY OF NAIROBI PERIODONTOLOGY CLINIC

AGE

GENDER: MALE ☐
FEMALE ☐

<table>
<thead>
<tr>
<th>DATE</th>
<th>MEAN GINGIVAL INDEX</th>
<th>MEAN PLAQUE SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT DIAGNOSIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1ST VISIT AFTER DIAGNOSIS</td>
<td></td>
<td></td>
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</tbody>
</table>
REFERENCE

13. Lewis MW et al, department of restorative dentistry, University of Tennessee College of dentistry Memphis, USA. J. periodontology 2004 Apr, 75(4); 551-6.

