CAUSES AND EFFECTS OF TOOTH LOSS AMONG PATIENTS VISITING THE UNIVERSITY OF NAIROBI DENTAL HOSPITAL.

INVESTIGATOR;

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BDS LEVEL III

A COMMUNITY DENTISTRY RESEARCH PROPOSAL SUBMITTED IN PARTIAL Fulfillment OF THE REQUIREMENT FOR THE BACHELOR OF DENTAL SURGERY (BDS) DEGREE OF THE UNIVERSITY OF NAIROBI.

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DECLARATION AND SUBMISSION FOR APPROVAL.
I Minneh Gathoni Kamau hereby solemnly declare that this is my original proposal for a research project and that it has not been submitted to any other university. I wish to submit the proposal to the Kenyatta National Hospital/University of Nairobi Research ethics and standards committee for approval.

Signed…………………………….. Date………………………………

SUPERVISORS APPROVAL.
This proposal has been submitted with our approval as University of Nairobi supervisors.

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Signed…………………… Date…………………………..

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Signed…………………… Date…………………………..
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LIST OF ABBREVIATIONS

UONDH…………….University of Nairobi Dental Hospital

WHO………………..World Health Organization .
ABSTRACT

BACKGROUND: There are some factors that lead to tooth loss and some effects that occur due to the loss of tooth loss. There is little known about the causes and effects of tooth loss in the country. Tooth loss affects the oral health related quality of life.

OBJECTIVE: To determine the causes and effects of tooth loss among patients visiting the UONDH.

STUDY DESIGN: A descriptive cross sectional study that is hospital based.

STUDY AREA: The University of Nairobi Dental Hospital along ArwingsKodhek Road.

METHODOLOGY: The study participants will comprise of 117 prosthetic patients. Seventy one completely edentulous and forty six partially edentulous patients. Self-administered questionnaires will be used to collect data to those who have qualified the inclusion criteria. Data will be analyzed using computer aided methods SPSS and MS EXCEL.

PERCEIVED BENEFIT: The results of this study will be used to educate the dentists on the effects and causes of tooth loss and encourage them to give the best dental treatment to improve quality of life to the population.

CHAPTER ONE

1.0 INTRODUCTION.

Edentulousness is the loss of teeth and can either be partial or complete where partial edentulousness involves loss of some teeth whereas complete involves loss of all the teeth. A study done in Palermo, Italy showed that complete edentulousness was present in 4.6% of the population while partial edentulousness was present in 60.6% of the population. Another study
done in India\textsuperscript{2} showed that 15.6\% were completely edentulous and 54.7\% were partially edentulous.

Causes of edentulousness are diverse and may include dental caries, periodontal diseases, extractions that could be as a form of traditional practices or due to removal of 3\textsuperscript{rd} molars, orthodontic treatment or trauma. A study done in 2012\textsuperscript{3} showed that of the 62\% of the tooth loss in the USA dental caries topped as the cause of tooth loss with 37.4\% followed by a combination of periodontal disease and dental caries with 12.2\%. Another done in Nigeria\textsuperscript{4} showed that the mean tooth loss was 4.5±\textpm 7.6 and the major cause of tooth loss was periodontal diseases with 98.7\% then dental caries 0.7\% and trauma 0.6\%. In Kenya a study done\textsuperscript{5} showed that the mean number of missing teeth in the population was 1.60. Among those with missing teeth the mean number of missing teeth was 3.35. Dental caries was the commonest cause with 52.6\% followed by periodontal diseases at 27.6\%, extractions as a form of traditional practices accounted for 12.3\%, orthodontic treatment 2.2\% and trauma 2.0\%.

Effects of tooth loss include loss of width and height of bone leading to facial changes and may lead to social effects. Loss of teeth lead to drifting and supra eruption of the adjacent teeth that may cause orthodontic problems as well as affect the aesthetics of the patient. These changes may affect the prospects of future replacements. Other effects include alteration of speech and how one eats and clinical effects may be experienced where other teeth may get affected depending on how the extraction was done.

Aim of the research is to determine the causes and effects of tooth loss. The research will benefit both the dental students and patients by helping them understand tooth loss causes and effects and motivating dentists to give the best treatment possible.

\textbf{1.1 JUSTIFICATION OF RESEARCH.}

Little is known about the causes and effects of edentulism in Kenya. This research will help in determining the causes and effects of tooth loss among patients visiting the UONDH prosthetic clinic. It will also benefit dental practitioners by helping them understand the problem and motivate them to give the best dental treatment to improve the quality of life.
1.2 GENERAL OBJECTIVE.
To determine the causes and effects of tooth loss among edentulous patients visiting the UONDH.

1.3 SPECIFIC OBJECTIVES.
1. To determine the causes of tooth loss among edentulous patients visiting the UONDH.
2. To determine the effects of tooth loss among edentulous patients visiting the UONDH.

CHAPTER TWO

2.0 LITERATURE REVIEW.
Edentulousness is defined as the condition of having no teeth. It can be classified as partial or complete where partial edentulousness is loss of some teeth and complete is the loss of all teeth. Tooth loss is high among adults. A study done showed that among the patients that attended the prosthetic clinic during that time 58.9% of the patients were completely edentulous and 41% were partially edentulous. Tooth extractions are among the various treatment procedures done in hospitals with a total of 33.4% and 12.3% in studies done in Nigeria. Tooth loss can be due to a number of reasons that include dental caries, periodontal diseases, traditional practices, orthodontic treatment, disimpactions, prosthetic reasons and tooth in fracture line.

Of the various causes of tooth loss, dental caries is the leading cause in all age groups and in all teeth types except for the incisors. Dental caries is defined as a multifactorial disease that leads to the demineralization of the tooth surface. In a number of studies done caries had the highest
prevalence with 20.8%, 56.4%, 32.6%. Highest proportion of extraction due to caries occurred between 21-30 years of age. More females lose their teeth due to dental caries. Most frequent extracted teeth due to caries are the molars in particular the first permanent molars with the Mandibular molars being mostly affected followed by the maxillary first molars. Extractions due to caries tend to increase posteriorly.

Periodontal diseases are the second leading cause of tooth loss with the prevalence of 24.6% and 11% in previous studies. The clinical manifestation of the periodontal disease leading to the tooth loss includes the furcation involvement, periodontal pocket and tooth mobility. Presence of initial attachment loss bone height and habit of smoking increase the risk of tooth mortality. There is a strong correlation between smoking the severity of periodontal disease and tooth mortality. More recent epidemiological data seem to suggest an increase of tooth loss due to periodontal reasons rather than caries. A cross sectional survey reported that lower anterior teeth were most frequently extracted due to periodontal disease followed by upper anteriors and upper second molars. However another study showed that maxillary teeth were lost more than mandibular teeth especially the maxillary left central incisor followed by the right central incisor. Extractions due to periodontal disease occurred between 41-50 years and 51-60 years. Extractions of periodontal disease tend to increase anteriorly. More males lost their teeth due to periodontal disease.

According to other studies, there are other reasons that led to tooth loss which includes failed root canal treatment which accounted for 1.5%, orthodontic treatment needs 1.2%, extractions of teeth in fracture line 1.0%, dental trauma 0.6%, extraction of supernumeraries 0.4% and extractions due to prosthetics 0.2%. A great number of variables are associated with tooth loss but there is no consensus whether dental disease related or socio-behavioural factors are most important risk factors. Age is strongly related to every measure of tooth retention and tooth loss. The mean number of teeth lost increases with age. A study done showed that institutionalized elderly people have in general more compromised oral health including fewer teeth than those at the same age living freely. Race and ethnicity was consistently related to these measures after adjustment for age and gender. Gender is also a risk factor, a study done showed that more extractions occurred in females 62.3% and less in males 37.7%. However females lost their teeth due to caries as compared to males who lose their teeth due to periodontal
disease Other risk factors include socio-economic status, habits such as cigarette smoking and caries experience.

There is a documented decline of edentulism in general. However, there exist great differences in prevalence between countries, between geographical regions, within countries and between groups with various backgrounds. There is an overall decline in the prevalence of tooth loss and edentulism in USA over the past several decades. A trend of decreasing incidence has also been witnessed over the last decade. However, the WHO goal of retaining at least 20 teeth at the age of 80 years has not yet been met but is being approached in some countries.

The loss of few or all natural teeth has been accepted as a handicapping condition for the aging elderly people. Studies on self-perception have demonstrated that tooth loss is associated with esthetic, functional, psychological and social impacts for individuals. According to a study done by Vinayak and published in 2011, 23% of the subjects had difficulty accepting tooth loss, 64% had no difficulty accepting tooth loss, and 13% were uncertain. The time taken for acceptance of tooth loss was also different with 35% having accepted tooth loss immediately, 53% accepted it within 6 months, 5% within 1 year, 3% required more than 1 year, and 4% have still not accepted the loss. The partial dentate group were more concerned about tooth loss than complete edentulous patients. 32% of subjects talked about tooth loss with others, 60% talked to their dentists, 55% talked to their friends, 31% talked to their spouses, and 55% talked with their family and relatives. 25% of the subjects were not prepared for the effects of tooth loss, 70% felt prepared, and the rest had no answer. More than half the people who were unprepared for the tooth loss felt that a consultation with the dentist along with education, motivation, and awareness would have reduced their problems. A total of 96% did not feel any difference in their confidence, while the rest were indifferent. More than 50% of the subjects felt restricted with their food choices and enjoyment of food. Position of lost teeth was associated to perceived functional limitation. Perceived impacts were more frequent in women than men. People who experienced difficulties in accepting their tooth loss were more likely to feel less confident, restrict food choice, enjoy food less, avoid laughing in public and avoid forming close relationships than those people with no difficulties with accepting tooth loss. This shows that tooth loss has an effect on the oral health related quality of life.
Tooth loss can be corrected through various ways. For complete edentulous cases, complete dentures are fabricated and used to correct edentulousness. They can be implant supported or implant retained and supported. Partial edentulousness is corrected through implants, crowns supported, fixed bridges, and removable partial dentures. The patient can also decide to have no treatment done. Although patients usually expressed prosthodontic treatment needs, clinical and financial issues are determinant factors for tooth replacement. Financial limitation was considered the most important factor that restricted access to treatment.

2.1 STATEMENT OF RESEARCH PROBLEM.
Edentulism has several causes and the two leading causes are dental caries and periodontal disease. Edentulism affects the quality of life. It has functional limitations. One has difficulty in speech and trouble pronouncing. It lowers the self-confidence of a person as well as alter their self-image. Some even do feel embarrassed. It alters the socialization of a person and the forming of close bonds. One is limited to the choice of foods and this leads to a compromised nutritional status in some of these patients and their general health status is affected too.

2.2 HYPOTHESIS.
Edentulousness has negative effects on patients visiting the UONDH.

CHAPTER THREE

3.0 METHODOLOGY.

3.1 STUDY DESIGN.
This will be a descriptive cross-sectional study.

3.2 STUDY AREA.
This study is to be conducted in the prosthetic clinic in the University of Nairobi Dental Hospital. The UONDH is situated opposite the Nairobi Hospital and Lee Funeral home. It is situated along the ArwingsKodhek Road.
3.3 STUDY POPULATION
The study will be conducted among both the partially and completely edentulous patients visiting the UONDH.

3.4 SAMPLE SIZE.
The sample size will be computed using the following formula;

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

Where;
N = sample size
Z = Z value = 1.96
P = prevalence of completely edentulous = 15.6%
C = 1 - prevalence
Population for completely edentulous = 71
Z = Z value = 1.96
P = prevalence of partially edentulous = 54.7%
C = 1 - prevalence
Population for partially edentulous = 46
Total population = 117

3.5 INCLUSION CRITERIA.
All people who are either partially or completely edentulous.

3.6 EXCLUSION CRITERIA.
All people who are not partially or completely edentulous.
3.7 TOOLS AND TECHNIQUE OF COLLECTION OF DATA
A questionnaire will be used to collect data. The questionnaire will be handed to the involved participants, those who will have fulfilled the inclusion criteria. An investigator will administer the questionnaire and the answers will be noted with a tick on the corresponding column of the survey.

3.8 ETHICAL CONSIDERATIONS.
Permission will be sought from the Kenyatta National University of Nairobi Research Ethics and Standard Committee. Informed consent will be obtained from all the participants who make the inclusion criteria. Patients will be assured of confidentiality of their answers and that the use of information will be for research purposes only.
4.0 BUDGET AND TIME FRAME.

4.1 BUDGET.

PROPOSAL

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DATA COLLECTION.

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REPORT WRITING.

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Grand total 5234

SOURCE OF FUNDS…………self

4.2 TIME FRAME.

Proposal writing and submission for approval………June

Data collection, analysis and report writing………..July-august

Submission of final report…………………………………September\October
5. REFERENCES.


7. Frauke Müller¹, Manuel Naharro¹, Gunnar E. Carlsson², What are the prevalence and incidence of tooth loss in the adult and elderly population in Europe. DOI: 10.1111/j.1600-0501.2007.0i459x 18 Jun 2007.


### APPENDIX I

**CAUSES AND EFFECTS OF TOOTH LOSS AMONG PATIENTS VISITING THE UONDH**

**QUESTIONNAIRE**

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Gender (m/f)</th>
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<tr>
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</tbody>
</table>

**KEY**

1. Dental caries  
2. Periodontal disease  
3. Orthodontic treatment  
4. Trauma  
5. Prosthetic reasons  
6. Traditional practices  
7. Tooth in fracture line  
8. Failed RCT

#### 1st Quadrant

<table>
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<th>TOOTH</th>
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<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
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#### 2nd Quadrant

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#### 3rd Quadrant

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#### 4th Quadrant
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAUSE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Effects of tooth loss

<table>
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<th>YES</th>
<th>NO</th>
<th>I DON’T KNOW</th>
</tr>
</thead>
<tbody>
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<td>Difficulty in speech and trouble announcing.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limitation to choice of food.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totally unable to function.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Had to interrupt meals.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being self conscious about having no teeth.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Being embarrassed as an appearance of having no teeth.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Felt life less satisfactory.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty doing usual jobs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduced participation in social activities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoid smiling as being toothless.</td>
<td></td>
<td></td>
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</tbody>
</table>

7.0 APPENDIX II

Consent form
Dear Participant,

I am a third year student at the UON pursuing a bachelors degree in dental surgery. I wish to request for your permission in a study that will be part of my degree work. Participation is purely voluntary and you may withdraw from the study at any stage.

The study will involve letting me conduct an interview regarding the causes and effects of tooth loss. You are free to ask any questions if you require any clarification. The purpose of the study is to investigate the various causes and effects of tooth loss among patients visiting the UONDH.

There are no risks involved because the procedure is non invasive. Participation is voluntary and the information will be treated with utmost confidentiality. The entire examination is free.

Investigator

Minneh Gathoni

I would therefore appreciate your consent by signing here below.

I Minneh Gathoni confirm that I have explained the relevant parts of my study to the participants.

Signed………….                                            Date………………..

I hereby confirm that I have understood the relevant parts of the study and give consent to participate.

Signed…………                                             Date……………..

8.0 APPENDIX III

FOMU YA KISWAHILI

Kwa Mhusika,

Babadhi ya mambo utakayo changia ni:

Mahojiano kuhusu sababu za watu kupoteza meno na madhara yanayofuatia

Kuniuliza swali lolote ikiwa hujaelewa

Kuhusika kwako hakutakabiliwana hatari yoyote. Mahojiano yetu yatatuhusu tu sisi na hayatajuzwa wahusika wengine.

Mwanafunzi,

Minneh Gathoni

Nitashukuru ukinisaidia.

Sahihi ............................................

Tarehe ............................................

Nimesoma na kuelewa nitakavyohusika na sahihi yangu ni kuwa thibitisho kuwa nitahusika.

Sahihi ............................................

Tarehe ............................................