Caries Experience of Third Molars Among Patients Attending the Oral Diagnostic Clinic of the University of Nairobi Dental Hospital.

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BDS Level 3

A Community Dentistry Research Project Report Submitted for Partial Fulfillment of the Requirements for the Award of Bachelor of Dental Surgery Degree, University of Nairobi

2013
DECLARATION

I Mangi K Somba, hereby declare that this is my original work and it has not been submitted to any other university by anybody else.

Signed……………………… Date……………….
APPROVAL

This research project report has been submitted with our approval as University of Nairobi supervisors:

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

I thank the Almighty GOD for providing me with strength and wisdom to complete this research. Sincere gratitude to my supervisors PROFESSOR MACIGO and DR. KAVIN WAKOLI, who worked tirelessly to ensure I was doing the correct work throughout the development of my study.

I am also grateful to my family and my friends for their positive critic and support.
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ABBREVIATIONS

BDS-Bachelor of Dental Surgery

KNH-Kenyatta National Hospital

SPSS-Statistics Program for Social Scientists

UoN-University of Nairobi

DMFT-Decayed, Missing, Filled Teeth
ABSTRACT

INTRODUCTION: Third molar teeth are likely to be affected by dental caries due to their posterior location in the mouth. Due to high frequency of partially erupted and impacted third molar, these teeth are likely to be below the second molar making effective brushing more difficult. Greater attention need to be payed to third molar teeth regarding prevention and early nintervention against dental caries.

OBJECTIVE: The study aimed at determining the caries experience of third molar teeth among adult patient attending the oral diagnostic clinic of the university of Nairobi dental hospital.

STUDY DESIGN: The study was Descriptive cross-sectional study using hospital based study participants.

SETTING: University of Nairobi dental hospital. The study participants were adult patients aged 18-70 years attending the oral diagnostic clinic at University of Nairobi dental hospital.

MATERIALS AND METHODS: Study group consisted of sample of 120 patients who were selected at the oral diagnostic clinic. The patients were recruited consecutively until the sample size is achieved. The patients were examined for third molars that were decayed, filled or missing due to caries. Data was collected using a modified WHO Dental caries examination form. Dental caries experience were computed from decayed, filled and missing third molars using SPPS version 12 and MS excel. The presentation is in the form of tables, graphs and pie charts.

RESULTS: 55% of the subjects had occlusal caries in at least third molar that erupted to the occlusal plane. 63 had a missing molar, 10 had a filling in the third molars. Female had more caries in the third molars (30% of the subjects) than the males at 25%. Mandibular third molar caries experienced more caries. The mean DMFT index of 38(0.37) which was the highest followed by 48(0.36). The mean DMFT index of 18 and 28 were 0.27, 0.35 respectively. The most age group affected by third molar caries was from age 20-29 years at 21%.
CONCLUSION: Mandibular teeth are more affected by third molar caries compared to maxillary. Female are more affected by third molar caries than males.

RECOMMENDATIONS; oral hygiene measures should be emphasized on third molars and early prophylaxis should be done to third molars.
CHAPTER 1: INTRODUCTION AND LITERATURE REVIEW

1.1 Introduction

Third molars teeth are likely to be affected by dental caries due to their posterior location in the mouth. The anatomic features of the teeth such as fissures and pits also increase the risk of dental caries. Due to the location of third molars, brushing efficiently is difficult and flossing to clean inter dental areas between the third molars and second molars. People are not able to clean both the lingual and palatal surfaces of the teeth because they cannot place the toothbrush in a comfortable way. The type of brushing technique also contributes a lot to accumulation of plaque which predisposes the tooth to dental caries.

Due to high frequency of partially erupted and impacted third molars, these teeth are likely to be below the second molar making effective brushing more difficult.

Data on the prevalence of third molar caries can be useful to both clinicians and their younger patients when considering the merits of retaining or removing third molars with no evidence of pathology. Surgical extraction of third molars and recovery after surgery are more difficult if the extractions are done in adulthood or late ages. The main aim of this is to determine the caries experience on the occlusal surface of third molars erupted to the occlusal plane.

1.2 Literature review

A longitudinal study convened by two academic centers, University of Kentucky and University of North Carolina (2010 March) to determine the prevalence of dental caries in the third molars had 6550 participants aged 52 to 74 years who underwent clinical examination for coronal caries experience. The results were that third molars caries was detected in 77% of the subjects. Caries was detected in only third molars in 1% of the subjects, and 1% of subjects were caries free. Subjects with less education (20%) and lower income (19%) were significantly more likely to dental caries.
Another study done by the University of North Carolina (2009) was designed to assess the prevalence at enrollment and incidence over 36 months of periodontal pathology and caries affecting third molars in a community-based study of people over the age of 65 years in North Carolina. Of the 197 subjects with caries experience, third molars were affected in 49% of subjects, less than the 87% in non third molars. Third molar caries experience was associated with caries experience on non third molar teeth.

by they assessed the prevalence of caries experience and periodontal pathology on asymptomatic third molars in young adults. In this study, healthy subjects with 4 asymptomatic third molars were enrolled in an institutional review board-approved study during a 5-year period. Overall, fewer subjects were affected by third molar caries experience than first or second molars.

A study done by Daniel A. Shugars and Thomas Jacks (2005) showed that 28% of the 303 patients with at least 1 third molar at the occlusal plane were affected by third molar caries. Patients 25 years or older had more caries experience in a third molar than those younger than 25 years, 39% versus 11% (P < .0001). Mandibular third molars were affected more often than maxillary third molars, 24% versus 18% (P < .0001). Nearly all patients, 76 of 80 (95%), with third molar caries experience also had caries experience in first/second molars, but only 80 of 223 (36%) of patients with first/second molar caries experience had a history of third molar caries.

A study done in Libya (2012) on the prevalence of eruption status of third molars in 200 Libyan dental surgery students (age 17-26 years), the results showed that 5% of third were congenitally missing, approximately 93.5% of the subjects had all four third molars, 1% had two third molars and 0.5% had one third molar with 2.5% having agenesis of all third molar.

A study done in India by Sandhu (2005) showed that the incidence of congenital missing third molars was 11.5% with a higher incidence in females. Of the 354 teeth examined, 24% of the teeth were found to be erupted and 76% were in various stages of eruption.
A study done at Lagos university teaching hospital(2006) showed that a total of 6.3% of patients requiring third molar surgical extraction were of 40 years or older. No intraoperative complications occurred in any of the patients. Only 9.7% developed minor postoperative complications (infected pockets, dry socket).

A longitudinal clinical investigation study done by kimono Divaris(2002) to study the third molar occlusal caries incidence and identify related patient level socio demographic, dental behavior and clinical risks factors showed that of the 215, 33% developed occlusal caries on 1 or more retained third molars. 90% of carious lesions are found in the pits and fissure of permanent posterior teeth. A study done to access the role of pit and fissure sealants in prevention of dental caries showed that the prevalence and intensity of dental caries had reduced among children of high socioeconomic status who had sealants. There was a 51-62 reduction in dental caries. There is clear evidence of reduction in caries increment with satisfactory placement of sealants. Schulte et al(2001) found in their study of twelve year olds in Heidelberg that children with sealed teeth had only half as many decayed, missing and filled those without sealants. A study in Marburg Germany found that children with sealed teeth were more than twice as likely to have healthy dentition as those without fissure sealants. This studies shows that third molars are likely to develop caries due to presence of fissures.
CHAPTER 2: PROBLEM STATEMENT AND JUSTIFICATION OF STUDY.

2.1 Problem statement

Dental caries in third molars is a common oral disease. It causes tooth sensitivity, dental pain, tooth mortality, periapical infection and dentoalveolar abscess. Extraction of carried third molars at advanced age can lead to complication like taking long time to heal in patients with systemic diseases such as diabetes at old stage. Greater attention need to be payed to third molar teeth regarding prevention and early intervention against dental caries.

2.2 Justification of study

No studies in Kenya have ever been done related to third molar caries experience. The need for this research to be done in Kenya is to show third molars caries experience in Kenya population, data obtained in this research will help to determine if its better to extract asymptomatic third molars at early stage before they become carious.

2.3 Objectives

General objective

To determine the caries experience of third molar teeth among adults patients attending the oral diagnostic clinic of the university of Nairobi dental hospital.

Specific objectives.

I. To determine the third molars dental caries experience among the patients.
II. To compare dental caries experience between the mandibular and maxillary third molars

III. To describe the age and sex distribution of third molar caries.

2.4 Hypothesis

Third molars caries experience is higher in mandibular than in maxillary third molars.

2.5 Variables

Social demographic variables

Age

Gender

`Independent variable.`

1. Location in the arch (right or left, maxillary or mandibular)
2. Eruption status (normal, impacted, direction of angulations)

Dependent variable.

1. Teeth filled due to caries
2. Teeth missing due to caries
3. Number of decayed teeth.
CHAPTER 3. MATERIALS AND METHODS

3.1 Study area

The study was conducted at university of Nairobi dental hospital at diagnostic clinic. The hospital is located along Argwings kodhek Road about 3km from the city centre. It is a teaching hospital and referral hospital located opposite Nairobi hospital Doctor’s Planza and Lee funeral home. It consists of five clinics: periodontology, prosthetic, conservation, oral and maxillofacial surgery and oral diagnostic clinic.

3.2 Study population

Males and females adults patients aged from 18 years to 70 years.

3.3 Study design

Descriptive cross sectional study using hospital based study groups.

3.4 Sample size

For a study population >10000 and assuming confidence level of 95% and a prevalence of 39% from a similar study (Daniel A Shugars 2004 62:973-979), sample size is calculated as follows:

\[ N = \frac{Z^2 \times p(1-p)}{c^2} \]

Where Z = Z value corresponding to 95% confidence level (1.960)
P = prevalence of third molar dental caries = (39%)
C = 1-confidence level
\[ N = \frac{(1.960)^2 \times 0.39(1-0.39)}{(1-0.95)^2} \]
N = 366

But for a study population <10000 formula \( \frac{n_f}{n} = \frac{n}{1+n/N} \) will be used to moderate the sample size.

Where \( n_f \) is derived sample size for population less than 10000
n = sample size derived from population >10000
N = estimated size of the population with characteristic of interest under investigation
n_f = 366/(1+366/150)
n_f = 106. For the purpose of the study sample size of 120 was used.
3.5 Sampling method

The oral diagnosis clinic was selected on basis of convenience in terms of accessibility and also is the entry point for new patients. Adult Patients attending oral diagnostic clinic during the period of study were recruited and examined consecutively until the sample size was achieved.

Inclusion criteria

1. Adult patients aged 18 years to 70 years attending the diagnostic clinic.
2. Patients who gave consent.
3. Patients with at least one third molar tooth.

Exclusion criteria

1. Patients who were unwilling to participate in the study.
2. Patients who were below the age of 18 years.
3. Patient who had no third molar tooth visible in the arch.

3.6 Data collection

Data was collected by the investigator, The examination took place at the oral diagnostic clinic. 6-8 patients were examined daily till the sample was achieved. Data was collected through examination of the patient who passed through oral diagnostic clinic and recorded in the data collection form (appendix 1). Any carious third molars was recorded. Dental probes were used in the diagnosis of dental caries. If any of the teeth had been extracted, the patient would explain the reason behind the extraction of the teeth and the reason would be noted if it is related to caries. Only third molars extracted due to caries were included the data. Third molars filled due to dental caries were recorded.
3.7 Minimizing errors

1. A clear diagnostic criteria according to WHO.
2. Calibration of examiner was done.
3. Detailed history to determine causes of filling or extraction of third molars was taken.

3.8 Data analysis and presentation

The caries experience was computed using DMFT index (appendix 2). SPSS version 12.0 was used to analyze the data. Mean and percentages were calculated and recorded and finding are presented through tables, graphs and charts.

3.9 Ethical considerations.

The research report was submitted to the University of Nairobi/Kenyatta National Hospital research ethics and standard committee for approval. Consent was sought before examination of the patient (appendix 2). The purpose of the study was explained to each patient. High degree of confidentiality was observed and the information was used for research purpose only. The right to withdraw from the study at any time was made clear.

3.10 Limitations

1. Patients could not be able to recall whether missing third molars were removed due to caries or other reasons.
2. Some of the impacted third molars teeth were not visible in the arch and history failed to reveal their status.

3.11 Perceived benefits

1. Research report will be submitted for the award of bachelor of dental surgery degree.
2. The data can be used to make decision regarding third molars caries preventive strategies and prophylactic removal.
CHAPTER 4: RESULTS.

Demographic characteristics

The total number of patients examined were 120. Among these 66 (55%) were men while 54 (45%) were women. The youngest subject was at the age of 20 years while the oldest was aged 68 years.

Prevalence of third molar dental caries

Among the 120 patients examined, 66 (55%) of the subjects had occlusal caries in at least one third molar that had erupted to the occlusal plane, 55 (43.3%) had no caries and 2 (1.6%) had clinically missing third molars. There were 63 patients (53%) with missing third molars and 10 (8.3%) with filled third molars.

AGE DISTRIBUTION OF THIRD MOLAR CARIES.

25 (21%) in the age group 20-29 had caries. 21 (17.5%) in the age group 30-39 had caries. 7 (5.8%) in the age group between 40-49 had caries. 12 (10%) in the age group between 50 to 59 had caries. 1 (1%) in the age group of 60-69 had caries. (figure 2)
Figure 1: Distribution of third molar caries by age

GENDER DISTRIBUTION OF THIRD MOLAR CARIES.

36 (30%) of the females had caries while 30 (25%) of the males had caries. In the age group between 20 to 29 years: 15 (12.5%) males had caries and 10 (8.3%) females had caries, between the age group 30 to 39 years: 9 (7.5%) males had caries and 12 (10%) females had caries. In the age group 40 to 49 years: 2 (1.6%) males had caries and 5 (4.1%) females had caries. In the age group between 50 to 59 years: 3 (2.5%) males had caries and 9 (7.5%) females had caries. In the age group between 60 to 69 years: 1 (1%) males had caries and 0% (0) had caries. (figure 1)
**Figure 2. Distribution of third molar caries by age and gender.**

**COMPARISON OF CARIES BETWEEN MANDIBULAR AND MAXILLARY THIRD MOLAR.**

Mandibular third molars were more affected compared to maxillary third molars. 18 had 18 (15%) decayed teeth, 28 had 21 (17.5%) teeth decayed, 38 had 23 (19.2%) decayed and 48 had 23 (18.3%) decayed teeth. The most affected tooth was 38. The least affected tooth was 18. (figure 3)
Figure 3: percentages of decayed third molar teeth by location

Caries experience in maxillary right third molar (18).

112 maxillary right third molar tooth (18) were examined. The sound teeth were 81 (67.5%), decayed were 18 (15%), 13 missing due to caries were 13 (10%), filled 1 (1%) and 7 (5.8%) were not visible in the arch. The mean DMFT was 0.27 (figure 4)
Caries experience in maxillary right third molar (18)

Caries experience in maxillary left third molar tooth (28).

112 maxillary left third molar tooth (28) were examined 70 (58.3%) teeth were sound, decayed were 21 (17.5%), missing were 19 (15.8%), filled were 2 (1.6%) and 8 (6.7%) were not visible in the arch. The mean DMFT index was 0.35 (figure 5)
Figure 5. Caries experience in maxillary left third molar tooth (28).

caries experience in mandibular left third molar tooth (38)

111 mandibular left third molar tooth (38) were examined, 70 (60%) of teeth were sound, decayed were 23 (19%), missing were 13 (10.8%), filled were 3 (2.5%) and 9 (7.5%) were not visible in the arch. The mean DMFT was 0.37 (figure 6)
Figure 6. caries experience in mandibular left third molar (38).

Caries experience in mandibular right third molar (48).

107 mandibular right third molar tooth (48) were examined. 53.8% (64) of the teeth were sound decayed 23 (19.1%), missing were 13.3% (16) due to caries, filled were 4 (3.3%), (10.8%) 13 were not visible in the arch. The mean DMFT was 0.37 (Figure 7)
Figure 7. Caries experience for mandibular right third molar teeth (48)
CHAPTER 5: Discussion, conclusions and recommendations.

5.1 Discussion

This was a descriptive cross sectional study using hospital based study groups involving examination of third molars caries among the patients. The objective of the study was to determine the caries experience of third molar teeth among adults patients attending the oral diagnostic clinic of the university of Nairobi dental hospital.

The results of the study show that 55% of the 120 patients were affected by third molar caries.

Females were more affected by third molar caries (30%) while men were (25%) of the total number of patient examined. The reason can attributed to the diet of females, females like sugary foods for example chocolates, biscuits which expose them to dental caries.

Patients of age group between 20 to 29 years had more caries in third molars than any other age groups (21%). The reason can be attributed to high number of them coming for dental checkup due to their concern of their oral health status and also taking of cariogenic foods such as sodas and sugary foods.

Mandibular third molars were more often affected than maxillary molars, 19% versus 15% (P-0.05). The 38 was the most affected tooth by caries, followed by 48. The reason can be most of the mandibular molars are partially erupted thus leading to food impaction that may lead to caries. The other reason can be pericoronitis is experienced more in mandibular third molars thus due to pain in that area many people tend not to brush the third mandibular molars. The most affected tooth was the 38 in which the possibility can be attributed to the fact that many people chew on the right side thus leading to plaque accumulation on the nonworking side which is 38, thus more caries.

Many of the patients had no filled third molars, 10 patients were the only ones who had filled third molars. The reason can be attributed to the possibility that many patients extract third molar which are carious and also doing a root canal treatment and a filling to third molars is not easy thus many dentist may prefer to extract them than preserve them.

The findings above are consisted with the study done by Daniel A. Shugars and Thomas Jacks (2005) which showed that 28% of the 303 patients with at least 1 third molar at the occlusal plane were affected by third molar caries. Mandibular third molars were more affected than maxillary molars. This is consisted with the study hypothesis which predicted that molar caries experience is higher in mandibular than in maxillary third molar.
5.2: Conclusion.
Third molars caries experience was high in the patient examined at 55%, which indicates that third molars are likely to experience dental caries.

Females are more affected by third molar caries compared to males. Younger age groups are more affected by third molar caries compared to older age groups.

Mandibular teeth were more affected by caries compared to maxillary teeth.

5.3: Recommendations
1. Oral hygiene measures should be emphasized on third molars.
2. Early prophylaxis should be done to third molars which are susceptible to caries.
REFERENCES


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Appendix 1: Clinical examination form.

CARIES EXPERIENCE OF THIRD MOLARS AMONG PATIENTS ATTENDING THE ORAL DIAGNOSTIC CLINIC UNIVERSITY OF NAIROBI.

NAME OF PATIENT.................................................. AGE....................
GENDER.........................................................

<table>
<thead>
<tr>
<th>18</th>
<th>28</th>
<th>38</th>
<th>48</th>
</tr>
</thead>
</table>

KEY
Sound-0
D-Decayed teeth (D)-1
M-Missing teeth due to caries M)-2
F-Filled teeth due to caries (F)-3
Filled due to other reasons-4
Not visible in the arch-9
Appendix 2: consent form

CARIES EXPERIENCE OF THIRD MOLARS AMONG PATIENTS ATTENDING THE ORAL DIAGNOSTIC CLINIC OF THE UNIVERSITY OF NAIROBI DENTAL HOSPITAL.

Dear participant,

I am a third year dental surgery student at UoN pursuing a bachelor’s degree in Dental Surgery. I wish to request for your permission to participate in a study that will form part of my degree work. Participation is purely voluntary and you may withdraw from the study at any stage.

The study will involve examination. You are free to ask questions about my study if you require any clarification.

I would therefore appreciate your consent by signing here below.

I, Mangi SOMBA confirm that I have explained the relevant parts of my study to the participant.

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

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

Signed…………………………………………………
date……………………………………………………..
Appendix 3: Letter of approval

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
P. O BOX 19676 Code 00202
Telegrams: varsity
(254-020) 2726380 Ext 44355

Ref: KNH-ERC/UA/90

Mangji K. Somba
School of Dental Sciences
College of Health Sciences
University of Nairobi.

Dear Somba

Research Proposal - Clearance “CARIES EXPERIENCE OF THIRD MOLARS AMONG PATIENTS ATTENDING THE ORAL DIAGNOSTIC CLINIC OF THE UNIVERSITY OF NAIROBI DENTAL HOSPITAL” (UP413/07/2013)

Your above proposal refers.

This is to inform you that permission has been granted by the KNH/UON-Ethics & Research Committee to carry out research on study titled “CARIES EXPERIENCE OF THIRD MOLARS AMONG PATIENTS ATTENDING THE ORAL DIAGNOSTIC CLINIC OF THE UNIVERSITY OF NAIROBI DENTAL HOSPITAL”

By a copy of this letter, I am requesting the relevant persons to accord you the professional support and other materials that may be useful to your research.

Yours faithfully

PROF. M. L. CHINDIA
SECRETARY, KNH/UON-ERC

cc. Prof. A.N. Guantai, Chairperson, KNH/UoN-ERC
The Deputy Director CS, KNH
The Principal, College of Health Sciences, UON
AD, Health Information, KNH
Supervisors: Professor Francis Macigo, Dr. Kavin Wakoli

“Protect to Discover”