THE PATTERN AND REASONS FOR USE OF HERBAL REMEDIES IN THE MANAGEMENT OF TOOTHACHE AMONG PATIENTS ATTENDING KENYATTA NATIONAL HOSPITAL DENTAL UNIT AND UNIVERSITY OF NAIROBI DENTAL HOSPITAL.

Investigator:
Ganda Antony E. Amimo
BDS level 3
V28/36271/2010

A research project report submitted in partial fulfillment of the requirements for the award of the bachelor of Dental Surgery Degree at the University Of Nairobi.

2013
DECLARATION

I, Ganda Antony E Amimo, hereby declare that the information submitted in this proposal is my original work and has not been presented by any other person to any other institution for any other degree.

Sign………………………………………… Date_______________

Ganda Antony E. Amimo
SUPERVISORS APPROVAL

This research project has been submitted for examination with our approval as supervisors, University Of Nairobi:

PROF F. G. MACIGO BDS, MPH, PGD-STI (NBI)

Department of Periodontology/Community and preventive Dentistry, School of dental sciences, University of Nairobi.

Signed__________________________ Date _________________

DR KAVIN WAKOLI BDS (NBI), MSC (UNIVERSITY OF LONDON)

Department of Oral and Maxillofacial Surgery, Oral Pathology and Oral Medicine Dental sciences, University of Nairobi..

Signed__________________________ Date _________________
DEDICATION

To my parents BKO GANDA and SELINE AWINO OOKO for their endless support.
ACKNOWLEDGEMENT

I would like to acknowledge my supervisors, PROF F. G. MACIGO and DR KAVIN WAKOLI, for their guidance. My Sister BERYL GANDA, and my cousin OCHIENG OPERE their endless support.
# TABLE OF CONTENTS

DECLARATION ........................................................................................................................................... ii

SUPERVISORS APPROVAL .......................................................................................................................... iii

DEDICATION .................................................................................................................................................... iii

ACKNOWLEDGEMENT ................................................................................................................................... iv

TABLE OF CONTENTS .................................................................................................................................. vi

LIST OF TABLES: ......................................................................................................................................... vii

LIST OF FIGURES: ....................................................................................................................................... vii

LIST OF APPENDICES: .............................................................................................................................. vii

LIST OF ABBREVIATIONS: ............................................................................................................................ viii

ABSTRACT .................................................................................................................................................... 1

CONCLUSION ............................................................................................................................................... 2

RECOMMENDATIONS ................................................................................................................................. 2

CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW .................................................................... 3

1.1 INTRODUCTION .................................................................................................................................... 3

1.2 LITERATURE REVIEW ........................................................................................................................... 4

1.3 PROBLEM STATEMENT ........................................................................................................................ 12

1.4 JUSTIFICATION .................................................................................................................................... 13

1.5 OBJECTIVES ......................................................................................................................................... 13

1.6 STUDY VARIABLES ............................................................................................................................. 14

CHAPTER TWO: MATERIALS & METHODS ............................................................................................. 14

2.1 STUDY AREA ....................................................................................................................................... 14

2.2 STUDY POPULATION ............................................................................................................................ 14

2.3 STUDY DESIGN .................................................................................................................................... 14

2.4 SAMPLE SIZE ...................................................................................................................................... 15

2.5 SAMPLING TECHNIQUE ....................................................................................................................... 16

2.6 SCREENING AND RECRUITMENT ........................................................................................................ 16

2.7 INCLUSION AND EXCLUSION CRITERIA: .......................................................................................... 17

2.8 DATA COLLECTION METHODS .......................................................................................................... 17

2.9 QUALITY ASSURANCE ........................................................................................................................ 17

2.10 DATA HANDLING AND STATISTICAL ANALYSIS ............................................................................ 17

2.11 STUDY FEASIBILITY .......................................................................................................................... 18

2.12 ETHICAL CONSIDERATION .............................................................................................................. 18

2.13 STUDY BENEFITS ................................................................................................................................ 18

CHAPTER 3: RESULTS ................................................................................................................................ 19

RESULTS ...................................................................................................................................................... 19

CHAPTER 4: DISCUSSION, CONCLUSION AND RECOMMENDATION ......................................................... 25

4.2 DISCUSSION ......................................................................................................................................... 25

4.3 CONCLUSION ..................................................................................................................................... 28

4.4 LIMITATIONS ....................................................................................................................................... 28

4.5 RECOMMENDATIONS .......................................................................................................................... 28

4.6 REFERENCES ....................................................................................................................................... 29

APPENDIX I: CONSENT EXPLANATION ................................................................................................. 32

APPENDIX II: CONSENT FORM ................................................................................................................ 33

APPENDIX III: QUESTIONNAIRE ............................................................................................................... 34
LIST OF TABLES:

TABLE 1: Commonly used herbal remedies in Kenya........................................9
TABLE 2: Patient History..................................................................................21
TABLE 3: Source of information on Herbal remedies.................................22
TABLE 4: Usage of Herbal remedy and type..................................................22
TABLE 5: Reason for use of herbal remedies.................................................22
TABLE 6: Reasons for not using herbal remedies.........................................22
TABLE 7: Comparison of herbal remedies with conventional medicine.........24

LIST OF FIGURES:

FIGURE 1: Flow chart of screening and recruitment......................................16
FIGURE 2: Enrollment flow chart.................................................................19
FIGURE 3: Distribution of participants age..................................................20
FIGURE 4: Gender Distribution .................................................................20
FIGURE 5: Reason for use of Herbal remedies...........................................23

LIST OF APPENDICES:

Appendix 1- Consent Explanation.................................................................32
Appendix II- Consent form...........................................................................33
Appendix III- Questionnaire........................................................................34
LIST OF ABBREVIATIONS:

CAM: Complementary and alternative medicine
WHO: World Health Organization
UN: United Nations
UON: University Of Nairobi
KNH: Kenyatta National Hospital
SPSS: Statistical Package for social scientists
ABSTRACT

Background

Toothache is increasingly being recognized as significant causes of negative effects on daily performance and quality of life. In order manage the pain emanating from the tooth, some individuals seeks alternative means. Herbal remedies are one such alternative. The efficacy and safety of such herbs however are not well known. Some herbs such as Cloves have well known side effects, some of which are: Nausea, vomiting, abdominal pain, diarrhea, burns in the mouth and throat, sore throat, seizures, difficulty breathing, rapid heartbeat, sleepiness, intestinal bleeding, and liver or kidney failure.

The aim of this study was to determine the pattern and reasons for use of herbal remedies in the management of toothache among patients attending Kenyatta National Hospital Dental Unit and University Of Nairobi Dental Hospital. This was a descriptive cross sectional study using hospital based study groups. A sample of 40 patients per hospital was selected using stratified random sampling. Data was collected using questionnaires.

Objective: To describe the pattern and reasons for use of herbal remedies in the management of toothache among patients attending Kenyatta National Hospital Dental unit and university of Nairobi Dental Hospital.

Study Design: A descriptive cross sectional study using hospital based study groups.

Study participants: Adult patients (aged 18yrs and above) attending University of Nairobi Dental Hospital & Kenyatta National Hospital Dental Unit.

Study site: Kenyatta National Hospital Dental Unit and University of Nairobi School of Dental Sciences

Materials and Methods

An interviewer administered questionnaire will be used to collect data from patients who meet the inclusion criteria and gave consent to participate in the study.

A sample of 40 was from each of the two hospitals to achieve the total sample size of 80.
Results: Dental caries was reported to be the main source of toothache among the patients sampled (83.8%). Conventional analgesics were the major mode of relief (82.6%) used by these group of patients. Only 5.8% currently used herbal remedies. However one quarter (26.3%) have used herbal remedies before but stopped, about half (47.6%) of which are in ready-made form and the other use direct plant sources (stem roots leaves twigs). The main reason why they used herbal remedies was because they needed immediate relief (47.6%). A large number of patients purchased the herbal remedy (47.6%), a significant proportion were self-acquired (42.9%). Two thirds of the patients sampled had knowledge on the use of herbal remedies in managing toothache, 40% of whom acquired this knowledge from Sales people. Less than half of patients sampled (30%) consider herbal remedies to be effective and a significant proportion (73.8%) do not consider them safe.

CONCLUSION
1. This study has shown a high prevalence of use of herbal remedies among dental patients.
2. Both ready made products and direct plant extracts are used in almost the same proportion among the patients.

RECOMMENDATIONS
1. This observation, coupled with the documented effects of the commonly used herbal products, should alert dental health caregivers to inquire about herbal supplement use when evaluating or treating their patients.
2. Further and larger study with many different study sites (especially rural areas) would add greater evidence into this pool.

3. It follows that these complementary or alternative interventions must be validated by stringent research before they can be reliably integrated into Western medicine. And this may also go further into resuscitating the almost dormant sector of alternative medicine in Kenya which has since been locked out.
CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW.

1.1 INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with a real or potential tissue injury\(^1\). When an individual is experiencing pain, he or she may exhibit altered behavior and experience changes in daily routine activities\(^2\).

Oral diseases can cause pain, suffering, embarrassment, and social hardship resulting in losses at the individual and collective levels\(^3\). Oral health problems are increasingly recognized as significant causes of negative effects on daily performance and quality of life at both the individual and community level\(^4\). In addition to being a source of physical and emotional stress, toothache significantly affects quality of life and represents a substantial economic burden to society because of high treatment costs and loss of productivity\(^5\).

The use of plants as medicines predates written human history. Ethno botany (the study of traditional human uses of plants) is recognized as an effective way to discover future medicines. In 2001, researchers identified 122 compounds used in modern medicine which were derived from "ethno medical" plant source. Herbal therapy falls under a diverse group of medical treatments known as complementary and alternative medicine (CAM). The use of herbs to treat disease is almost universal among non-industrialized societies, and is often more affordable than purchasing expensive modern pharmaceuticals. The World Health Organization (WHO) estimates that 80% of the populations of some Asian and African countries presently use herbal medicine for some aspect of primary health care.

The use of these herbal practices has also been incorporated into Dentistry. Numerous studies have been conducted to evaluate vegetable species in Dentistry, natural agents that are economically feasible and provide effective alternatives for treating oral diseases\(^6\).

In the light of conventional medicine either being not easily accessible or expensive, patients with toothache are still using herbal remedies despite not having the correct knowledge on correct dosage and adverse effects.

Although various studies have evaluated the reasons for and individual factors associated with the use of herbal remedies by primary care patients, the characteristics of the population that use herbal medicines for oral health problems are relatively unknown.
1.2 LITERATURE REVIEW

1.2.1 TOOTHACHE

According to the International Association for the Study of Pain (IASP), pain is an unpleasant sensory and emotional experience associated with a real or potential tissue injury. Pain occurs throughout the lifespan of humans and is one of the great challenges of science because of its numerous implications. When an individual is experiencing pain, he or she may exhibit altered behavior and experience changes in daily routine activities. Oral diseases can cause pain, suffering, embarrassment, and social hardship resulting in losses at the individual and collective levels.

It is the most common symptom that leads to patient consulting a doctor in the United States of America. It has been reported that about 25% of the USA population is suffering from chronic pain, 40% of whom experience a degrading impact on the lives. (National Centre of Health statistics).

Oral health problems are increasingly recognized as significant causes of negative effects on daily performance and quality of life at both the individual and community level. Toothache is also known as odontalgia or, less frequently, as odontalgyc. Toothache is defined as pain emanating from either within or around a tooth. It may be sharp or dull in nature and is aggravated by heat, cold or pressure. In cases of severe pain, identifying the exact tooth that is painful is difficult for the patient. Normally the patient would point to the side of the jaw that is affected, or intra orally on the arch.

Toothache is one of the most frequent sources of pain in humans; because of failures to manage the social determinants and materials used to promote oral health, millions of people suffer from toothaches and an associated low quality of life. In addition to being a source of physical and emotional stress, toothache significantly affects quality of life and represents a substantial economic burden to society because of high treatment costs and loss of productivity. A study in Brazil showed a 27% prevalence of toothache among Brazilian adults 35 to 44 years. In Kenya, toothache is one of the main reasons people seek dental care as evidenced by the overwhelming number of patients seen at the government dental units. In a study set out to find out Factors
associated with toothache among African American adolescents living in rural South Carolina. Age, frequent consumption of cariogenic snacks and number of cans of non-diet soft drinks have been found to be associated with toothache.\(^8\)

The causes of toothache can be broadly classified into two: Dental and Non Dental causes.

**Dental causes**

These include: Pulpits, Dental caries (tooth decay), Periodontitis, Gingivitis, Tooth fracture, Exposed roots, Trauma, Food impaction between open contacts, Pericoronitis, and Abscesses.

**Non Dental causes**

These include; Trigeminal neuralgia, referred pain from otitis media and angina pectoris.

Atypical odontalgia is a form of toothache present in apparently normal teeth, or which persists after the supposedly offending tooth has been removed.

Of all the causes of toothache, dental caries is the most common. In the United States Dental caries is the primary pathological cause of tooth loss among children.\(^9\) Worldwide approximately 2.43 billion people (36% of the population) have carious permanent teeth.

**1.2.2: HERBAL MEDICINE**

Herbal medicines are drugs of plant origin used to treat diseases or to attain a condition of optimal health mostly in their original form or with minimal synthesis.

Plants have the ability to synthesize a wide variety of chemical compounds (phytochemicals). Many of these phytochemicals have beneficial effects on long-term health when consumed by humans, and can be used to effectively treat human diseases. At least 12,000 such compounds have been isolated so far; a number estimated to be less than 10% of the total. Chemical compounds in plants mediate their effects on the human body through processes identical to those already well understood for the chemical compounds in conventional drugs; thus herbal medicines do not differ greatly from conventional drugs in terms of how they work. This enables herbal medicines to be as effective as conventional medicines, but also gives them the same potential to cause harmful side effects.\(^10,11\)
The use of plants as medicines predates written human history. Ethnobotany (the study of traditional human uses of plants) is recognized as an effective way to discover future medicines. In 2001, researchers identified 122 compounds used in modern medicine which were derived from "ethnomedical" plant sources; 80% of these have had an ethnomedical use identical or related to the current use of the active elements of the plant. Many of the pharmaceuticals currently available to physicians have a long history of use as herbal remedies, including aspirin, digitalis, quinine, and opium.

Herbal therapy falls under a diverse group of medical treatments known as complementary and alternative medicine (CAM). The use of herbs to treat disease is almost universal among non-industrialized societies, and is often more affordable than purchasing expensive modern pharmaceuticals. The World Health Organization (WHO) estimates that 80% of the populations of some Asian and African countries presently use herbal medicine for some aspect of primary health care.

In modern herbal medicine, Many herbs have shown positive results in-vitro, animal model or small-scale clinical tests, while studies on some herbal treatments have found negative results.

Herbalists criticize the manner in which many scientific studies make insufficient use of historical knowledge, which has been shown useful in drug discovery and development in the past and present. They maintain that this traditional knowledge can guide the selection of factors such as optimal dose, species, time of harvesting and target population.

A survey released in May 2004 by the National Center for Complementary and Alternative Medicine focused on who used complementary and alternative medicines (CAM), what was used, and why it was used. The survey was limited to adults, aged 18 years and over during 2002, living in the United States. According to this survey, herbal therapy, or use of natural products other than vitamins and minerals, was the most commonly used CAM therapy (18.9%) when all use of prayer was excluded.

Several parts of the plant such as the flower, stem, leaf or root are used for medical purposes. There are many forms in which herbs can be administered, the most common of which is in the
form of a liquid that is drunk by the patient—either a tisane or a (possibly diluted) plant extract. Whole herb consumption is also practiced either fresh, in dried form or as fresh juice.

In terms of safety, a number of herbs are thought to be likely to cause adverse effects. Furthermore, "adulteration, inappropriate formulation, or lack of understanding of plant and drug interactions have led to adverse reactions that are sometimes life threatening or lethal." Proper double-blind clinical trials are needed to determine the safety and efficacy of each plant before they can be recommended for medical use.

Although many consumers believe that herbal medicines are safe because they are "natural", herbal medicines and synthetic drugs may interact, causing toxicity to the patient. Herbal remedies can also be dangerously contaminated, and herbal medicines without established efficacy, may unknowingly be used to replace medicines that do have corroborated efficacy.

In practice a herbalist is: A person whose life is dedicated to the economic or medicinal uses of plants/One skilled in the harvesting and collection of medicinal plants/One who is trained or skilled in the dispensing of herbal prescriptions/One trained or skilled in the therapeutic use of medicinal plants.

Herbalists must learn many skills, including the wild crafting or cultivation of herbs, diagnosis and treatment of conditions or dispensing herbal medication, and preparations of herbal medications. Education of herbalists varies considerably in different areas of the world. Lay herbalists and traditional indigenous medicine people generally rely upon apprenticeship and recognition from their communities in formal schooling.

In some countries formalized training and minimum education standards exist, although these are not necessarily uniform within or between countries. For example, The National Herbalists Association of Australia is generally recognized as having the most rigorous professional standard within Australia.

When it comes to government regulations, The World Health Organization (WHO), the specialized agency of the United Nations (UN) that is concerned with international public health, published Quality control methods for medicinal plant materials in 1998 in order to support WHO Member States in establishing quality standards and specifications for herbal materials, within the overall context of quality assurance and control of herbal medicines. In the United States, most herbal remedies are regulated as dietary supplements by the Food and Drug Administration.
In Kenya, Herbalists are also well considered, ion April 2012 a newlaw was to see qualified practitioners of alternative medicine or herbalists in Kenya registered in a bid to lock out quacks from the sector. The then Medical Services Minister was reported to have said, "We want to ensure that we have qualified practitioners working in the field of alternative medicine. The sector can solve many of the health problems in Kenya but it has to be regulated before we can see its benefits".

1.2.3: HERBAL MEDICINE IN DENTISTRY.

The use of these herbal practices has also been incorporated into Dentistry. Numerous studies have been conducted to evaluate vegetable species in Dentistry, natural agents that are economically feasible and provide effective alternatives for treating oral diseases. Singh, et al. 1996 showed that the prevalence of oral diseases is high and medicinal plants are increasingly gaining attention because of their antimicrobial properties. Abdulwahab and Al-Kholani confirmed the increasing interest in natural products by presenting a study about a herbal dentifrice (are agents used along with a toothbrush to clean and polish natural teeth) tested in a randomized trial, and demonstrating that there was no difference between using this dentifrice in comparison with the traditional one.

In Africa, a common practice is to use teeth cleaning twigs. A Teeth cleaning twig, also referred to as twig toothbrush, chew stick, or chewing stick is a tool made from a twig from a tree with antimicrobial properties. Teeth cleaning twigs can be obtained from a variety of tree species. The tree species include: Salvadorapersica, Sassafras, tea tree, neem, Gouanialupuloides, cinnamon, Dogwood.

When compared to conventional toothbrushes, teeth cleaning twigs have several advantages:

1. Reported similar dental protection as toothbrushes
2. More ecological in its life-cycle
3. Lower cost (0-16% of the cost of a toothbrush
4. Independence from external supplier if made at home from privately owned trees
5. Low maintenance, with some twigs need moistening with water if they become dry, to ensure the end is soft. The end may be cut afresh to ensure hygiene, and should not be stored near a sink. The twig is replaced every few weeks to maintain proper hygiene.
6. Can combat bad breath (e.g. Cinnamon)

Disadvantages

- Over extensive scrubbing with chewing sticks can damage the gums.
1.2.4 : Chewing sticks

The miswak (miswaak, siwak, sewak) is a tooth cleaning twig that is vastly used among the Arabs. It is made from a twig of the Salvadorapersica tree, a traditional alternative to the modern toothbrush, it has a long, well-documented history and is reputed for its medicinal benefits. 2003 scientific study comparing the use of miswak with ordinary toothbrushes concluded that the results clearly were in favor of the users who had been using the miswak, provided they had been given proper instruction in how to brush using it. The World Health Organization (WHO) recommended the use of the miswak in 1986 and in 2000 an international consensus report on oral hygiene concluded that further research was needed to document the effect of the miswak.\(^{31}\)

Chewing sticks are widely used in Nigeria for dental and oral hygiene. In-vitro susceptibility tests were done with crude extracts from nine popular sticks on four species of Bacteroides. Serindeiawarneckeai chewing stick had the greatest and most consistent inhibitory effect on the four species; extracts from bark and pulp were bactericidal at concentrations of 1 %. Extracts of other sticks, when inhibitory, were only so at higher concentrations-in the range 2-30%. All the black-pigmented oral anaerobes were very susceptible to eight of the nine chewing-stick extracts but non-pigmented anaerobes showed variable susceptibilities\(^{32}\)

1.2.5: Commonly used herbal remedies in the management of toothache.

The table below is a list of commonly used herbal remedies in the management of toothache in Kenya\(^{33}\).

<table>
<thead>
<tr>
<th>Local name</th>
<th>Scientific name</th>
<th>Preparation</th>
<th>prescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahacha (Swahili)</td>
<td>Acalyphafruiticos a</td>
<td>Stem &amp; roots</td>
<td>Toothache</td>
</tr>
<tr>
<td>Olando-Makwar (Luo)</td>
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</tr>
<tr>
<td>Mfulwe (Giriama)</td>
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<tr>
<td>Plant Name</td>
<td>Common Name</td>
<td>Part Used</td>
<td>Use</td>
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<tr>
<td>Mataliha (Kakamega)</td>
<td>Ajugaremota</td>
<td>Leaves</td>
<td>Toothache</td>
</tr>
<tr>
<td>Samata (Nyamwezi)</td>
<td>Achyropsisconfera</td>
<td>Roots</td>
<td>Gum disease</td>
</tr>
<tr>
<td>Mvumanyuki (Swahili)</td>
<td>Agathiscinthemeumbajeri</td>
<td>Leaves</td>
<td>Toothache</td>
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<tr>
<td>Mutongo/Kitongu (Kikuyu)</td>
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<td>Mutondo/Mutungu (Kamba)</td>
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<tr>
<td>Mtunguja (Swahili)</td>
<td>Solanumincanum</td>
<td>Roots</td>
<td>Toothache</td>
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<tr>
<td>Mrongo (Taita)</td>
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<td>Machoge, Ochok (Luo)</td>
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<td>Labotwa (Marakwet)</td>
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<td>Maduranzura (Kakamega)</td>
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<td>Kitongatongu (Kamba)</td>
<td>Soliumindicum</td>
<td>Roots</td>
<td>Toothache</td>
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<tr>
<td>Jibokemnerkeny (Marakwet)</td>
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<tr>
<td>Mueza-Moyo (Giriama)</td>
<td>Salvadorapersica</td>
<td>Branches</td>
<td>Toothache, Gum disease</td>
</tr>
<tr>
<td>Mukayau (Kamba)</td>
<td>Ethoni (Turkana)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kizungumoto (Taita)</td>
<td>Fuerstiaafricana</td>
<td>Leaves</td>
<td>Toothache</td>
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<td>Muroroe/Mwekanya (Kikuyu)</td>
<td>Toddaliaasiatica</td>
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<td>Mtungudja (Swahili)</td>
<td>Solanumtaisense</td>
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<tr>
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<td>Leaves</td>
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</tr>
<tr>
<td>Birirwob-Sot/Piriwob-Sot (Kipsigis)</td>
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<td>Kalaku (Kamba)</td>
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<td>Achyranthesaspera</td>
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<td>Mbalazi (Digo)</td>
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<td>Mbalazi/Mbalazi (Chonyi)</td>
<td>Cajanuacajan “pegonpea”</td>
<td>Roots</td>
<td>brushing &amp; Gum disease</td>
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<td>chugu(Taita)</td>
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<td>Mchungu, Njugu (Embu)</td>
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<td>Mbaazi (Swahili)</td>
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<td>Mbalazi (Giriama)</td>
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<td>Musuu, Nzuu (Kamba)</td>
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<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Part Used</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Njugu, Mzou (Kikuyu)</td>
<td>Mbaazi (Kisii)</td>
<td>Luo (Mbas)</td>
<td>Lantana camara</td>
</tr>
<tr>
<td>Magwagwa (Luo)</td>
<td>Fagaraamanienis</td>
<td>Bark</td>
<td>Toothache</td>
</tr>
<tr>
<td>Mugoshwa (Kikuyu)</td>
<td>Mfwakumbi (Sukuma)</td>
<td>Ximaniaamericana</td>
<td>Fruits, Roots</td>
</tr>
<tr>
<td>Mukenea (Kamba)</td>
<td>Fagarachalybea</td>
<td>Roots</td>
<td>Toothache</td>
</tr>
<tr>
<td>Dora (Kikuyu)</td>
<td>Kitula (Kamba)</td>
<td>Ximaniaamericana</td>
<td>Fruits, Roots</td>
</tr>
<tr>
<td>Chemogong (Kipsigis)</td>
<td>Muvwaia (Kamba)</td>
<td>Okwero (Acholi)</td>
<td>Shikuma (Kakamega)</td>
</tr>
</tbody>
</table>

Herbs have also found their place in modern day clinical dental practice biomedical medications. About 25% of all biomedical medications commonly prescribed today for example phenolic compounds like menthol, eucalyptol contain at least an active ingredient from plants. Tooth brushing with a dentifrice is the most widely practiced form of oral hygiene in most countries (34). Most of the herbal based toothpaste contains ingredients such as chamomile, sage. Chamomile is documented to have anti-inflammatory properties thus reduce pain, while sage is said to have anti-bleeding properties. However herbs also have documented side effects in dental practice which include xerostomia, dysguesia, oral candidiasis, gingival hyperplasia and oral ulceration e.g. gingko and feverfew have been linked to increased risk of bleeding, oral ulcers (35)
Most of the information available about the popular and obscure supplements is marketing directed and not supported by a clinical study. Researches from Harvard found that most sites providing information on herbals were either selling products or linked to a vendor. Because of this, there is concern among dental professionals that consumers might be misled by unsupported claims that herbal supplements are the best to treat, prevent, diagnose and cure specific diseases. A lot more research is needed in this to validate use of herbs correctly.  

1.3 PROBLEM STATEMENT

Oral health problems are increasingly recognized as significant causes of negative effects on daily performance and quality of life at both the individual and community level. Toothache is one of the most frequent sources of pain in humans; because of failures to manage the social determinants and materials used to promote oral health, millions of people suffer from toothaches and an associated low quality of life. In addition to being a source of physical and emotional stress, toothache significantly affects quality of life and represents a substantial economic burden to society because of high treatment costs and loss of productivity.

In the light of conventional medicine either being not easily accessible or expensive, patients with toothache are still using herbal remedies despite not having knowledge on correct dosage and adverse effects.

The dental team must be aware of oral products containing herbs and supplements and recognize both positive effects and potentially dangerous side effects of these combinations.
1.4 JUSTIFICATION

Although various studies have evaluated the reasons for and individual factors associated with the use of herbal remedies by primary care patients, the characteristics of the population that use herbal medicines for oral health problems are relatively unknown. However, by means of studies along these lines, health managers and researchers are able to find strategies for future studies on herbal medicines and health Professional training.

My study thus seeks to describe the pattern and reasons for use of herbal remedies in the management of toothache among patients attending two dental units within Nairobi as a step towards increasing the pool of knowledge in this grey area.

Once the extent of use of herbal remedies is established by the study, it will open doors and recommend for further studies like extent of harmful (side) effects for which local data is also unavailable.

1.5 OBJECTIVES

General objectives

To describe the pattern and reasons for use of herbal remedies in the management of toothache among patients attending Kenyatta National Hospital Hospital Dental unit and University of Nairobi Dental Hospital.

Specific objectives

1. To determine the proportion of the patients using herbal remedies to manage toothache.
2. To identify the various types of herbal remedies used by the patients.
3. To determine the reason for choice of herbal remedies to conventional medicine.
4. To determine the effectiveness of herbal remedies in the management of toothache as perceived by the patient.
5. To describe the side effects of the herbal remedies as perceived by the patients.
1.6 STUDY VARIABLES

Demographic data: age, sex, occupation, level of education, residence

Dependent variables:
- Use of herbal remedies
- The type of herbal remedy used (roots, stem, and leaves)
- Duration of use of herbal remedy

Independent variable
- Reasons for use of herbal remedies.
- Side effects of Herbal remedies.
- Perceived effectiveness of herbal remedies.

CHAPTER TWO: MATERIALS & METHODS.

2.1 STUDY AREA: This study was conducted in the following hospitals:

i) University of Nairobi School of dental sciences situated opposite Nairobi Hospital at the junction of Argwings Kodhek Road and Valley road on Ralph Bunche Road. It is a dental institution for teaching and training members of the dental profession at an undergraduate and postgraduate level. It is also a national referral hospital.

ii) Kenyatta National Hospital currently is the largest referral and teaching hospital in the country. The hospital is situated along hospital road in Upper hill. It covers an area of 45.7 hectares and within the KNH complex are College of Health Sciences (University of Nairobi); the Kenya Medical Training College; Kenya Medical Research Institute and National Laboratory Service (Ministry of Health). KNH has 50 wards, 22out-patient clinics, 24 theatres (16 specialized) and Accident & Emergency Department.

2.2 STUDY POPULATION: Adult patients (aged 18yrs and above) attending University of Nairobi Dental Hospital & Kenyatta National Hospital Dental Unit. Both old and new patients were interviewed.

2.3 STUDY DESIGN: A descriptive cross sectional study using hospital based study groups.
2.4. SAMPLE SIZE:

For this study a confidence level of 95% was used and a prevalence of patients using herbal remedies estimated at 50%. The formula for calculating the sample size is as follows.

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

\[
N = 1.96^2 \times 0.5 \times (1-0.5) \\
0.05^2
\]

= 384

Where, \(Z\) = Z value

\(P\) = prevalence (prevalence of the patients using herbal remedies)

\(C\) = 1-confidence level (1-0.95)

The population of this study was less than 10,000

\[
f = \sqrt{1 + \frac{n}{N}}
\]

Where \(nf\) = sample size for a population < 10,000

\(n\) = sample size derived for a population > 10,000

\(N\) = estimated size of the population with the characteristic of interest under investigation.

\(n\) = 384

\(nf\) = 100

\[
f = \frac{384}{1 + \frac{384}{100}}
\]

\(N\) = 79

A sample size of 80 was used.
2.5 SAMPLING TECHNIQUE:

Consecutive patients who satisfy the inclusion criteria were included in the study.

2.6 SCREENING AND RECRUITMENT:

- The principal investigator recruited patients from Kenyatta National Hospital Dental Unit and University of Nairobi School of Dental Sciences.
- Each patient was recruited once.
- For those who satisfied the inclusion criteria, the purpose of the study was explained to them and consent sought.
- Once recruitment, the questions were self-administered by the principal investigator.

| Patients in KNH dental Unit and UON Dental hospital approached (80 patients from each study site) |
| Informed consent |
| Yes | No |
| Exclusion criteria |
| Yes | Excluded |
| None |
| Recruitment |
| Questionnaire administered |
**Fig.1** Flow chart for screening & recruitment

### 2.7 INCLUSION AND EXCLUSION CRITERIA:

**Inclusion criteria**
- All patients above 18 yrs. attending Kenyatta National Hospital dental unit and UON dental hospital.
- All patients willing to participate in the study and give informed consent.

**Exclusion criteria**
- All participants below 18 yrs.
- All patients not willing to participate

### 2.8 DATA COLLECTION METHODS

A questionnaire (appendix 1) was self-administered to all recruited patients at Kenyatta National Hospital and a trained university student in University Of Nairobi Dental Hospital. It covered:

- Demographic data: age, sex, occupation, level of education, residence, History of the toothache,
- Herbal remedy use history

### 2.9 QUALITY ASSURANCE

All the questionnaires were self-administered.

### 2.10 DATA HANDLING AND STATISTICAL ANALYSIS

Once data was collected, it was verified and entered into data entry sheets. Statistical analysis will be done using statistical package for social scientists (SPSS) version 16.0. Means, medians, frequencies and standard deviation was computed. Analyzed data will be presented in form of tables, pie charts and graphs.
2.11 STUDY FEASIBILITY
At KNH Dental Unit approximately 250 patients are seen weekly, they include both new patients and those on follow up treatment.

At UON Dental Hospital, approximately 450 patients are seen weekly, they include both new patients and those on follow up treatment.

Data was collected in approximately 2 weeks to achieve the sample size.

2.12 ETHICAL CONSIDERATION
Approval from the University of Nairobi and Kenyatta National Hospital research ethics and standards committee was sought. Informed consent was to be obtained from those willing to participate in the study. Information obtained was confidential. Study results will be made available to health care providers and managers of the two hospitals.

2.13 STUDY BENEFITS
The information on this project will increase the knowledge of Dental and medical practitioners handling patients, design programs against herbal remedies with no proven benefits and known side effects. The Research report also will be presented in part of fulfillment of the Degree of Bachelor of Dental surgery.
CHAPTER 3: RESULTS

RESULTS:

This study was carried out between the months of August and September 2013. Ninety two patients were consecutively screened for recruitment. Twelve patients were not eligible for the study, all of whom declined consent to be included. A total of eighty patients were enrolled, 40 from each study site (Kenyatta National Hospital dental unit and University of Nairobi Dental Hospital). The desired sample size was achieved. Complete questionnaire data was obtained from the enrolled patients.

Figure 2: Enrollment flow chart
SOCIO-DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION

Demographic characteristics of the study patients are shown in figure 1 and figure 2. The mean age of patients was 35 years with an age range between 18-72 years.

Figure 3: Distribution of participants by Age.

Figure 3 shows age distribution elicited by the study patients. The patients were then grouped into 10 year age categories. The peak age bracket for the patients was 21-30 years. Majority (70%) of patients had a basic and post basic level of education, majority (57.5) having achieved tertiary education. There was no illiterate patient. (figure 3) Most of the patients were from Nairobi County (78%).

Figure 4: Gender distribution

Most study participants were female 71.3% giving a female to male ratio [2.47:1] as shown in Figure 4.
Table 2: Patient History

The general history of patients enrolled showed that the number of new patients (48.7%) was almost equal to that of old patients on ongoing treatment (51.3%). Majority of patients reported that they had ever suffered from a tooth ache (83.8%)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reason for hospital visit</strong></td>
<td></td>
</tr>
<tr>
<td>New Patient</td>
<td>41 (51.3)</td>
</tr>
<tr>
<td>On-going treatment</td>
<td>39 (48.7)</td>
</tr>
<tr>
<td><strong>Cause of pain</strong></td>
<td></td>
</tr>
<tr>
<td>Trauma</td>
<td>8 (11.6)</td>
</tr>
<tr>
<td>Dental caries(cavity)</td>
<td>55 (79.7)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>4 (5.8)</td>
</tr>
<tr>
<td><strong>Severity of pain</strong></td>
<td></td>
</tr>
<tr>
<td>Mild</td>
<td>9 (13.0)</td>
</tr>
<tr>
<td>Moderate</td>
<td>12 (17.4)</td>
</tr>
<tr>
<td>Severe</td>
<td>48 (69.6)</td>
</tr>
<tr>
<td><strong>Ever suffered from a toothache</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67 (83.8)</td>
</tr>
<tr>
<td>No</td>
<td>13 (16.3)</td>
</tr>
<tr>
<td><strong>Time when suffered from toothache</strong></td>
<td></td>
</tr>
<tr>
<td>Days ago</td>
<td>11 (15.7)</td>
</tr>
<tr>
<td>Weeks ago</td>
<td>8 (11.4)</td>
</tr>
<tr>
<td>Months ago</td>
<td>15 (21.4)</td>
</tr>
<tr>
<td>Years ago</td>
<td>36 (51.4)</td>
</tr>
<tr>
<td><strong>Pain Management</strong></td>
<td></td>
</tr>
<tr>
<td>Conventional analgesics</td>
<td>57 (82.6)</td>
</tr>
<tr>
<td>Herbal remedies</td>
<td>4 (5.8)</td>
</tr>
<tr>
<td>None</td>
<td>7 (10.1)</td>
</tr>
<tr>
<td>Other (salty water)</td>
<td>1 (1.4)</td>
</tr>
</tbody>
</table>

Dental caries was reported as the main cause of tooth ache (79.7%) and only a small number (6%) were unaware of the cause of their tooth pain. Significantly, only 13% of toothache was reported to be mild in nature.

In terms of pain management, conventional analgesics were the major mode of relief (82.6%) used by this group of patients, only (5.8) reported to have used herbal medicine.
Table 3: Source of information on Herbal remedies.

<table>
<thead>
<tr>
<th>Source of information on herbal remedies</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Media</td>
<td>7 (10.9)</td>
<td>22 (34.4)</td>
</tr>
<tr>
<td>Told by someone</td>
<td></td>
<td>9 (14.1)</td>
</tr>
<tr>
<td>Watched someone</td>
<td></td>
<td>26 (40.6)</td>
</tr>
<tr>
<td>Approached by someone selling</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approximately one quarter of the patients (23.8%) had no knowledge of herbal therapies used in dentistry. However among the two thirds who had the knowledge, most (40%) had acquired this from sales men who approached them, media only played a part in (10.9%) of information acquisition.

Table 4: Usage of herbal remedy and Type of Herbal remedy.

<table>
<thead>
<tr>
<th>Ever used herbal remedies for toothache</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>21 (26.3)</td>
<td>59 (73.8)</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of herbal remedy</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ready-made</td>
<td>39 (47.6)</td>
<td>3 (14.3)</td>
</tr>
<tr>
<td>liquid</td>
<td></td>
<td>10 (47.6)</td>
</tr>
<tr>
<td>Solid</td>
<td></td>
<td>7 (33.3)</td>
</tr>
<tr>
<td>Gel</td>
<td></td>
<td>1 (4.8)</td>
</tr>
<tr>
<td>Powder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plant source (root, flower, stem, leaf)</td>
<td>41 (50.4)</td>
<td></td>
</tr>
</tbody>
</table>

Significantly one quarter (26.3%) of the patients had ever used herbal therapy before. Among those who had used herbal therapy, about half 47.6% used it in ready-made form and the remaining half as a direct plant source (stem, flower, and root). A large number of the patients purchased the herbal therapies (47.6%), while a good number also self-acquired them (42.9%). The most common mode of use of herbal therapy among this group of patients was direct application onto the pain area (52.4%).

Table 5: Reason for use of Herbal Remedy

<table>
<thead>
<tr>
<th>Reason for use of herbal remedies</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>High cost of medication</td>
<td>1 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Dental health facility far</td>
<td>1 (4.8)</td>
<td></td>
</tr>
<tr>
<td>Needed immediate relief</td>
<td>10 (47.6)</td>
<td></td>
</tr>
<tr>
<td>No other medication available</td>
<td>3 (14.3)</td>
<td></td>
</tr>
<tr>
<td>Advised to use for immediate relief</td>
<td>4 (19.0)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2 (9.5)</td>
<td></td>
</tr>
</tbody>
</table>
Almost half (47.6%) of those who used herbal therapy reported to have the need for immediate relief as the reason for use. (Figure 5)

Chronic use (≥ 1 month) of herbal therapy was reported among 9.6% of this group. However most (52.5%) used them only for a short duration of time (≤ 1 week).

A significant number, two thirds (66.7%) of those who used herbal remedies reported relief from use. And only 4.8% got adverse effects from use of herbal therapy.

Conventional analgesics was very popular alternative to herbal remedies ; this was reported among 95.2% of the patients in the herbal remedy category use.

Advice of use of herbal remedies to others by the patients was significant at 42.9%.

Fig 5: Reasons for use of herbal remedy
Table 6: Reason for not using herbal remedies

<table>
<thead>
<tr>
<th>Reasons for never using herbal remedies</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of awareness</td>
<td>14 (33.3)</td>
</tr>
<tr>
<td>Fear of use</td>
<td>12 (15.0)</td>
</tr>
<tr>
<td>Lack of belief in herbal remedies</td>
<td>6 (14.3)</td>
</tr>
<tr>
<td>No reason</td>
<td>9 (21.4)</td>
</tr>
</tbody>
</table>

Among those who had never used herbal remedies, most (33.3%) reported the reason as being due to lack of awareness of their use or existence.

Table 7: Comparison of herbal remedies to other conventional medicine

<table>
<thead>
<tr>
<th>Comparison of herbal remedies to other conventional medicine.</th>
<th>Count (Percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More effective:</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (30.0)</td>
</tr>
<tr>
<td>No</td>
<td>56 (70.0)</td>
</tr>
<tr>
<td>More costly:</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>43 (53.8)</td>
</tr>
<tr>
<td>No</td>
<td>37 (46.3)</td>
</tr>
<tr>
<td>Safer to use:</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21 (26.3)</td>
</tr>
<tr>
<td>No</td>
<td>59 (73.8)</td>
</tr>
</tbody>
</table>

The patient’s opinions on herbal remedies vs. conventional therapy were sought. Close to one third (30%) of patients thought that herbal remedies were more effective than conventional therapies. Half (53.8%) the patients reported to herbal remedies to be more costly and one quarter (26.3%) thought herbal remedies were a safer mode of therapy.
4.2 DISCUSSION

The main objective of the study was to describe the pattern and reasons for use of herbal remedies in the management of toothache among patients attending Kenyatta National Hospital Hospital Dental unit and University of Nairobi Dental Hospital.

Toothache is increasingly being recognized as significant causes of negative effects on daily performance and quality of life. Dental pain interferes with many aspects of normal functioning. Self-care strategies have been found to generally take precedence over conventional professional health services. Pain sufferers commonly use a combination of self-care and formal strategies.

According to the 2007 National Health Statistics Reports, approximately 38% of adults and 12% of children in the US had used complementary and alternative medicine (CAM) therapy within the last 12 months. The trend toward use of CAM therapies is particularly common in patients with chronic pain.

The increased use of herbal products among dental patients has been documented previously, however knowledge of prevalence patterns and reasons for use of herbal products locally has not been well documented. In this present study evidence was sought on the proportion of patients who use herbal remedies among the dental patients attending the two main public dental facilities in the country; also evidence of patterns and reasons of use.

From the results the sample studied was young with a mean age of 35 years of whom over two thirds were women. The finding of a young population with female gender preponderance has also been found in non-local studies. Literature suggests that females frequently perceive the impacts of oral health impairments on quality of life as being greater than males. Our finding reflects this generic trend, although the reasons behind it are less clear. Possible causes could relate to females in general having heightened perceptions of health impairments, including heightened perceptions of pain, impact on function and quality of life. The study population was found to be generally well educated, with majority coming from Nairobi country; this of course being due to proximity to the facility. However this being referral centers’ in the country, the regions outside Nairobi were also well represented by about one quarter of the patients.

Most (83.8%) of the patients in the study had suffered toothache and this was the major reason for seeking medical attention during the interview visit. This coincides well with what is reported worldwide as toothache being one of the most common dental complaints world over and often the main reason why people finally visit a dentist.

In this study, dental carries ranked highest (79.7%) among the cause of dental pain. This just confirms the worldwide trend that untreated dental decay has been documented as the most
common cause of toothache although fractured teeth, exposed dentine due to wear and tear, periodontal disease and tooth surface wear may also cause pain.

Over two thirds of the study sample had knowledge of herbal remedies use in dental health, those selling the herbal remedies ranked highest in terms of passing this information. One quarter (26.3%) of the patients had ever used herbal remedies for treatment of tooth pain. This is a significant number, considering they were seeking conventional treatment at the time of interview, close to similar results have been found in more developed countries. A similar study in 2011 studying Herbal supplement use among adult dental patients in a USA dental school clinic: prevalence, patient demographics, and clinical implications found 12.6% to be using herbal products. At a different site in the same country, A higher rate of complementary and alternative medicine (CAM) usage was found at dental school clinic population than rates previously reported in a general population. More than three-quarters (76.1%) of the respondents reported using at least one CAM treatment in the past 12 months; 93.3% reported using at least one CAM treatment at some time in their lives.

Also sought was to find out the types/form of herbal remedy used. Close to half the patients used ready made products, most commonly in solid and gel form, while the other half got them direct from the plant source as roots, leaves or flowers. In Africa, a common practice is to use teeth cleaning twigs which in Nigeria, In-vitro susceptibility tests were done with crude extracts from nine popular sticks on four species of Bacteroides. Serindeia warneckei chewing stick had the greatest and most consistent inhibitory effect on the four species; extracts from bark and pulp were bactericidal at concentrations of 1%. Extracts of other sticks, when inhibitory, were only so at higher concentrations in the range 2-30%.

In the USA, the common type used were ready made products which were applied to the area and natural products (eg garlic, ginger) which were chewed.

Most patients in this study reported need for immediate relief as among the most common reasons for use of herbal remedies (47.6%), advice from others also ranked high in this category (19%). The use of herbal therapies is not a new concept in the world of dentistry. Singh, et al.1996 showed that the prevalence of oral diseases is high and medicinal plants are increasingly gaining attention because of their antimicrobial properties. Abdulwahab and Al-Kholani confirmed the increasing interest in natural products by presenting a study about a herbal dentifrice (are agents used along with a toothbrush to clean and polish natural teeth) tested in a randomized trial, and demonstrating that there was no difference between using this dentifrice in comparison with the traditional one. The next decades will witness an increasing number of evidence-based research directed at establishing the best available evidence in complementary and alternative medicine (CAM). It is well known that patients use a method of treatment where the effectiveness has been witnessed. Of significance is that two thirds of our patients reported relief from the herbal remedies. “Mi swak” a well-documented tooth cleaning twig has evidence of effectiveness known. Herbs have also found their place in modern day clinical dental practice biomedical medications. About 25% of all biomedical medications commonly prescribed today for example phenolic compounds like menthol, eucalyptol contain at least an active ingredient from plants. Tooth brushing with a dentifrice is the most widely practiced form of oral hygiene in most countries. Most of the herbal based toothpaste contains ingredients such as chamomile,
sage. Chamomile is documented to have anti-inflammatory properties thus reduce pain, while sage is said to have anti-bleeding properties.\textsuperscript{32-34}

One third of our patients believe that herbal remedies are more effective than the conventional ones, this could be due to what they have witnessed as effectiveness either personally or among other dental pain sufferers.

Despite documented adverse effects of dental herbs e.g. xerostomia, disguise, oral candidiasis, gingival hyperplasia and oral ulceration,\textsuperscript{35} only one patient (5%) reported such effects. This could be due to many reasons, minimal dosing not enough to cause side effects, nontoxic herb use, duration of exposure being minimal among others.

It has been documented that a significant one quarter (26.3%) proportion of the patients despite seeking conventional medical treatment have before used herbal remedies, this finding is novel in these two study sites. And is in line with existing evidence that few patients use herbal remedies for relief of dental pain. A questionnaire was used, a reliable simple reliable tool to establish this evidence.

The Strength of the study is that a significant number of patients, from two study sites, and despite most patients being from one county, was a good representation of patients from areas outside Nairobi. The results of this study are thus unlikely to be explained by selection bias.
4.3 CONCLUSION
1. This study has shown a high prevalence of use of herbal remedies among dental patients.
2. Both ready made products and direct plant extracts are used in almost the same proportion among the patients.
3. The most common reason for use is need for immediate relief of tooth ache.
4. Among those who used herbal remedies, two thirds reported to have gotten relief of their tooth aches. One third of the study population believes herbal remedies are more effective than conventional therapy.
5. There was minimal report of side effects from the herbal remedies.

4.4 LIMITATIONS
1. Recall bias – subject recollection of some factors could have been biased based on current disease state or social desirability e.g. side effect use.

4.5 RECOMMENDATIONS
1. This observation, coupled with the documented effects of the commonly used herbal products, should alert dental health caregivers to inquire about herbal supplement use when evaluating or treating their patients.
2. Further and larger study with many different study sites (especially rural areas) would add greater evidence into this pool.

3. It follows that these complementary or alternative interventions must be validated by stringent research before they can be reliably integrated into Western medicine. And this may also go further into resuscitating the almost dormant sector of alternative medicine in Kenya which has since been locked out.
4.6 REFERENCES

1. International association for the study of pain (IASP) website.Template.cfm Section, Pain Definitions


22. WHO Quality Control Methods for Herbal Materials

23. Standard digital online newspaper 2/4/2012 "'Herbalists will now be registered, says health minister’’ By Ally Jamah


29. Pascal Fletcher “Commercial teeth cleaning twig at 8-16% of toothbrush cost, twig from private owned tree at 0". Nzherald.co.nz. 2007-06-19. Retrieved 2011-01-17
33. J.O Kokwaro’s Medicinal Plants of East Africa. Published 1976
APPENDIX I: CONSENT EXPLANATION

My name is Ganda Antony E Amimo. I am an undergraduate student in University Of Nairobi School of Dental Sciences. I am conducting a study:

1. To determine the proportion of the patients using herbal remedies to manage toothache.
2. To identify the various types of herbal remedies used by the patients.
3. To determine the reason for the use of herbal remedies.
4. To determine the effectiveness of herbal remedies in the management of toothache as perceived by the patient.
5. To describe the side effects of the herbal remedies as perceived by the patients.

If you agree to join in this study, we expect the following:

1. Sign a consent form.
2. Be required to answer several questions as shown in the study proforma.

You can withdraw from this study without losing any benefits. In case you have any questions related to this study you can contact the following:

1. GANDA ANTONY E AMIMO (Principal Investigator)
   0729-831804
APPENDIX II: CONSENT FORM

________________________________________, after reading the consent explanation form and having been explained to by GANDA ANTONY E AMIMO (the Principal Investigator) do voluntarily agree to take part in this research study on THE PATTERN AND REASONS FOR USE OF HERBAL REMEDIES IN THE MANAGEMENT OF TOOTHACHE AMONG PATIENTS ATTENDING KENYATTA NATIONAL HOSPITAL DENTAL UNIT AND UNIVERSITY OF NAIROBI SCHOOL OF DENTAL SCIENCES.

SIGNED: ________________________________

WITNESS: ________________________________

DATED: _________________________________
APPENDIX III: QUESTIONNAIRE

THE PATTERN AND REASONS FOR USE OF HERBAL REMEDIES IN THE MANAGEMENT OF TOOTHACHE AMONG PATIENTS ATTENDING KENYATTA NATIONAL HOSPITAL DENTAL UNIT AND UNIVERSITY OF NAIROBI SCHOOL OF DENTAL SCIENCES

QUESTIONNAIRE
Tick where appropriate or fill in the spaces provided.

Patients No:__________________  Date:………………………………

Interviewer (name)……………………..

1. Age (yrs.): …………

2. Sex: Male ( ) Female ( )

3. Education
a) None: ( )
b) Primary ( )
c) Secondary ( )
d) University ( )
e) others specify……………………

4. Residence: Nairobi ( )
Outside Nairobi (specify)________________________________________

5. Occupation:___________________________________________________

6. Why are you visiting the hospital?
a. New patient for medical attention
b. Patient treated previously now for review
c. Patient on ongoing treatment for review/continuation of procedure

7. Have you ever suffered from a toothache before? Yes ( ) No ( )
   (If yes go to 8 if no go to 12)

8. If so, when? Days ago ( ) weeks ago ( ) months ago ( ) years ago ( )

9. How severe was the pain?
   a. Mild ____________________________
   b. Moderate: ________________
   c. Severe: ____________________ (Unable to attend to normal duties)

10. What was the cause of the toothache?
    a. Trauma
    b. Cavity/carries
    c. Don’t know
    e. Others specify……………………

11. What did you use to manage the pain before seeking medical attention?
    a. Conventional analgesics
    b. Herbal medication
    c. none
    d. Others specify ……………………..

12. Do you know the name or description of any herbal remedies used to relieve toothache?
    Yes ( ) No ( )

   (If yes answer 13 to 14, if no go to 26)

13. How did you learn about them?
    a. Media (radio, newspapers, television, magazines, internet, etc)
    b. Told/referred by someone
    c. Watched someone use
    d. Approached/saw one selling

14. Have you used any of these herbal remedies to relieve toothache before? Yes ( ) No ( )
(If yes answer 15 to 23. If no go to 24.)

15. Which herbal remedy did you use/what sort?
   a. Ready-made liquid
   b. solid,
   c. gel,
   d. powder.
   e. Others specify………………………………………………

16. Where did you get the herbal remedies?
   a. Bought from herbalist/salesman
   b. Given by someone
   c. Gotten by self from the field/shamba
   d. Others specify………………………………………………

17. How did you use it?
   a. Drinking the herbal remedy
   b. Applying directly on affected part
   c. Gurgled and spit
   d. Chewing
   e. Others specify………………………………………………

18. Why did you use them?
   a) Cost of seeking medical attention is high \( \big(\) 
   b) Dental health facilities are far \( \big(\) 
   c) Pain was severe and you needed immediate relief \( \big(\) 
   d) No other medication available \( \big(\) 
   e) Advised to use them for immediate relief \( \big(\) 
   f) Others specify………………………………………………
19. For how long did you use them?
   a. Few days (<7 days)
   b. 1 week
   c. 1 month
   d. More than 1 month

20. Was there relief of pain there after the use? Yes ( ) No ( )

21. Did you experience any adverse reaction which you think may have been caused by its usage? Yes ( ) No ( )
   If yes specify the adverse reaction……………………………………………………………………
   a) Oral: Gingival bleeding ( ) Lip swelling ( ) Dry mouth ( ) Taste change ( )
      Tooth discoloration ( ) Irritation ( ) Oral ulcers ( )
   b) Extra oral
      i. Body rash or swelling
      ii. Central Nervous System - Nasea, headache, dizziness, blurred vision
      iii. Gastro Intestinal System – vomiting, nausea abdominal pains
      iv. Other

22. What was your reaction to the experienced adverse reaction?
   a) Stopped using herbal remedy ( )
   b) Changed to another product ( )
   c) Ignored ( )
   d) Others specify…………………………

23. What other types of remedies do you use when you experience a tooth ache?
   a. analgesics
   b. Toothpaste
   c. None
   d. Others specify…………………………………………
24. Have you ever advised someone else to use herbal remedies? Yes( ) No ( )

25. Why is it that you never used herbal remedies?
   a. Lack of awareness
   b. Fear of use
   c. Lack of belief in herbal remedies
   d. No reason
   e. Others specify…………………………………………

26. In your opinion, how do you compare herbal remedies to other conventional methods, in managing toothache?
   a) They are more effective Yes ( ) No ( )
   b) They are more costly Yes ( )No ( )
   c) They are safer to use Yes ( )No ( )
   d) Others specify…………………………