



COLLEGE OF HEALTH SCIENCES

SCHOOL OF HEALTH SCIENCES

**AN ANALYSIS OF METHODS USED BY AFRICAN
TRADITIONAL HEALTH PRACTITIONERS TO
TREAT ORAL HEALTH CONDITIONS IN
JOHANNESBURG, GAUTENG**

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**METHODS USED BY AFRICAN TRADITIONAL
HEALTH PRACTITIONERS TO TREAT ORAL
HEALTH CONDITIONS IN JOHANNESBURG,
GAUTENG**

Submitted as the dissertation component in fulfilment for the degree of

Master of Medical Sciences in Health Sciences

in the School of Health Sciences, University of KwaZulu-Natal

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Date : 23 June 2020

Preface and Declaration

Preface

The study “An Analysis of Methods Used by African Traditional Health practitioners to Treat Oral Health Conditions in Johannesburg, Gauteng” was conducted in order to understand the methods used by African traditional health practitioners in order to be able to make recommendations that could lead to improved treatment modalities and improved patient health outcomes.

Declaration

I, Mangoedi Kinder Ingridh Modisha, declare that:

- (i) The research reported in this dissertation, except where otherwise indicated, is my original work.
- (ii) This dissertation has not been submitted for any degree or examination at any other university.
- (iii) This dissertation does not contain other persons’ data, pictures, graphs or other information, unless specifically acknowledged as having been sourced from other persons.
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Declaration by Supervisor

This is a dissertation submitted to the Discipline of Dentistry, School of Health Sciences, University of KwaZulu-Natal, Westville, for the degree of Master of Medical Science.

This dissertation is presented in a journal article format. The presentation comprises of three chapters which include Chapter 1 (Introduction, Literature Review, Methodology), Chapter 2 (Journal Article Presentation), and Chapter 3 (Conclusion and Recommendations).

This is to certify that the contents of this dissertation is the original research work of **Ms Mangoedi Kinder Ingridh Modisha**, carried out under the supervision of **Dr Tufayl Ahmed Muslim**, at the Discipline of Dentistry, School of Health Sciences, Westville campus, University of KwaZulu-Natal, Durban, South Africa.

Supervisor: Dr TA Muslim

Signed: 

Date: 23 June 2020

Declaration of Prior Publication

I, **Mangoedi Kinder Ingridh Modisha**, hereby declare that this Dissertation has not been submitted for a degree at another university.

KModisha

SIGNATURE

NAME: Mangoedi Kinder Ingridh Modisha

A handwritten signature in black ink, appearing to read 'T. A. Muslim', with a horizontal line underneath.

SIGNATURE

SUPERVISOR: Dr Tufayl Ahmed Muslim

DATE: 23 June 2020

Contribution of Authors and Co-Authors

I, **Mangoedi Kinder Ingridh Modisha**, hereby declare that contributions of the authors to any conference posters, conference papers, journal articles and journal publications that may arise out of this study are as listed below:

Author: **Mangoedi Kinder Ingridh Modisha**

Contributions: Conceived and implemented the study design. Collected and analyzed data. Wrote first and final drafts of the journal articles. Made the major contribution in the formulation of the paper.

Co-Author: **Dr Tufayl Ahmed Muslim**

Contributions: Assisted in the contextualization of the paper. Helped conceive the study design. Provided field expertise, feedback on statistical analysis and early drafts of the journal article. Provided comments on the journal articles.

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1. Mangoedi Kinder Ingridh Modisha: Conceived and contributed to the design of the project, performed the data collection and analysis, and wrote the paper. Made the major contribution in the formulation of the paper.

2. Tufayl Ahmed Muslim: Assisted in the contextualization of the paper and provided comments on the paper.

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Table 1 Strategic Goals of the National Development Plan (NDP) 2015-2019

LIST OF ABBREVIATIONS

- BREC – Biomedical Research ethics Committee
- NHI – National Health Insurance Scheme
- PHC – Primary Healthcare System
- HPCSA - Health Professions Council of South Africa
- WHO – World Health Organization

ABSTRACT

Background

African traditional medicine is widely used in South Africa. African traditional health practitioners treat patients who present with a variety of medical conditions, including oral health conditions. The aim of this study was to determine the knowledge, and practices of African traditional health practitioners regarding oral health conditions.

Materials and Methods

A cross-sectional survey of 11 African traditional health practitioners who consented to be interviewed in the Johannesburg area was recruited to participate in a structured questionnaire survey, followed by focus group interviews with 10 practitioners. Ethical approval was obtained from the Biomedical Research Ethics Committee (BREC ref. no 451/19). Following the collection of data from the questionnaire administration, a focus group interview was conducted. Data on the knowledge, treatment practices, and post-treatment management of four common oral conditions was collected and analysed.

Results

Eleven participants who consented to be interviewed, their average age was 44.1 (± 8.1) years, with a range of 21-67 years, and a slight majority of female (55.5%, n=6). Ten further participants took part in focus group interviews. African traditional health practitioners were asked a series of questions, in non-dental terminology or language, related to their knowledge (causes); practise (what do you use to treat?, What advise do you give to the patient?); of four common oral health conditions. These are: sores on the lips, sores on the tongue, swollen gums and toothache. Participants reported using a variety of practices such as throwing bones, burning incense, using plants and animal product, as well as commercially manufactured products to treat and manage patients.

Conclusion

The results of the study reveal that there are vast differences in knowledge, management practices and treatment modalities of African traditional healthcare practitioners. Further research in the knowledge, practises and treatment of oral healthcare practitioners needs to be conducted. Mutual cooperation, collaboration and integrating African traditional health practitioners into primary oral healthcare services need to be urgently prioritised.

Key words: African traditional health practitioner, oral conditions, knowledge, Johannesburg, South Africa

CHAPTER 1: INTRODUCTION, LITERATURE REVIEW AND METHODOLOGY

1.1 Introduction

This chapter introduces the study, outlines the problem statement and provides background and the context of the study as well as a rationale for the study. The research question of the study is then presented, with the aim and objectives of the study outlined.

1.2 Background

Like most sub-Saharan countries, African traditional health practitioners are often the first point of contact for those seeking healthcare [Assefa, Wassie, Getahun, Berhaneselaasie and Melaku, 2005; Awah, 2006]. Hardy (1987) reports that traditional medicine is the first-choice treatment for at least “80% of Africans who suffer from fever and other common ailments”. It is postulated that most people rely on traditional medicine and healthcare because this type of treatment is affordable, in line with the patients cultural, religious and other beliefs and values, and that patients have confidence in African traditional healers as they are able to relate to and understand their needs and expectations of healthcare (Awah, 2006; Ayen, 2004).

An additional motivating factor for the use of African traditional healers is that their services are relatively affordable, easy to access as they are located within a community – often at the home of the African traditional health practitioner, and the majority of patients attested that they visited traditional healers because their treatment methods were pain-free. Kikwili and Hiza (1997) postulate that this has a positive psychological impact on the patients as the pain that patients expects to be inflicted with during dental treatment by allopathic dental practitioners causes high levels of anxiety.

1.3 Context of the Study

Traditional healers thus play an important role in the delivery of primary healthcare, particularly in remote communities. Puckree, Mkhize, Mgbhozi, and Lin (2002), reported that in KwaZulu Natal, South Africa about 70% of patients made use of a traditional health practitioner as their first choice for healthcare, including potentially life-threatening conditions. These researchers further concluded that since oral healthcare was an integral component of general healthcare in South Africa, healthcare professionals needed to be proactive in integrating traditional healthcare with westernized practices in order to promote health for all.

The introduction of the primary healthcare system (PHC) in South Africa heralded in the delivery of free basic oral healthcare services in the country. Whilst this has led to an increase in the number of dental clinic visits for basic treatment (tooth extractions), there still remains the failure to eliminate the social disparities that affect the quality of healthcare treatment as well as access to healthcare (Ayo-

Yusuf, Ayo-Yusuf and Olutola, 2013). Oral healthcare disparities in South Africa continue to widen, more so in economically disadvantaged and vulnerable groups wherein the vast majority of these populations experience the highest burden of oral disease (Ramphoma, 2016). A mal-distribution of oral healthcare services compounds the burden, coupled with an inadequate oral healthcare workforce in the public sector.

1.4 Description of Research Problem, Problem Statement and Significance of Research

Traditional health practitioners currently play a very important role in the provision of healthcare in the majority of South African populations. They are, in most cases, the first point of contact for healthcare provision seekers. However, there is very little known of the current common oral health conditions such as sores on the tongue, sores on the lips, sores on the gums and toothache by African traditional health practitioners in Soweto township, Johannesburg, Gauteng, South Africa.

The aim of the current study is to gain an understanding of the knowledge, diagnostic and treatment practices, as well as the post-treatment practices of African traditional health practitioners in Soweto, Johannesburg. This knowledge could prove to be valuable in the training, educational programme content development and policy development and initiatives for African traditional health practitioners, as well as for the collaboration and development of referral patterns between allopathic dental practitioners and African traditional health practitioners in South Africa.

1.5 Research question

There is currently limited known research into the methods used by traditional health practitioners in the treatment of oral health conditions, and management thereof. It is envisaged that an analysis of the methods used by traditional health practitioners on oral health conditions, would be of utmost importance. Many traditional health practitioners in South Africa provide treatment for oral diseases and yet there is no published information of their knowledge of basic oral conditions or the treatment they provide (Lewis, Rudolph, Mistry, Monyatsi, Marambana, Ramela, 2004).

1.6 Purpose of the study

There is a limited pool of knowledge that is available regarding the use of traditional medicine to treat oral health conditions. Additionally, there is minimal reference to traditional medicine as part of national, and provincial, oral healthcare policies, and even the National Health Insurance (NHI) policies.

The study will analyse the methods used by African traditional health practitioners, in Johannesburg area, to treat the following common oral health conditions: toothache; swollen gums; sores on the tongue and sores on the lips. The African traditional health practitioners will be interviewed to address:

- Identification of the condition
- Identification of the herbs used
- Treatment method used to treat the condition
- Patient management during the healing process

An analysis of the methods used to treat oral health conditions with traditional medicine practices, by African traditional health practitioners, could result in the incorporation of these practices into mainstream oral health condition treatment protocols and practices, and could contribute to improved population health outcomes.

1.7 Dissertation Outline

The study is presented in the following chapters. Chapter 1 is an introduction into the research topic, highlighting the background and purpose of the study. This chapter also focuses on the problem statement, the research question, the aims and objectives of the study as well as an outline of the dissertation. Chapter 1 also includes a literature review, and this chapter outlines the relevant local and international literature on African traditional healers and their treatment of oral conditions. This chapter also presents the research materials and methodology of the study.

Chapter 2 is a presentation of the journal article which is required as part of the dissertation presentation. This journal article has been submitted to a SAPSE accredited journal for consideration of publication.

The dissertation concludes with chapter 3 which contains the study strengths and limitations, presents the significance of the study and concludes with a list of recommendations that arise out of the study, and which establishes the extent to which the aims and objectives were achieved. The recommendations and conclusion of the study are also presented.

1.8 Literature Review

1.8.1 Introduction

This section provides an overview of the literature pertaining to African traditional medicine, traditional medicine versus modern medicine, socio-economic status, and the management of oral diseases by African traditional health practitioners. Due to the limited availability of recent research into the area of traditional medicine and the management of oral health conditions much of the literature is older than

five years, and this serves to highlight the importance of a study of this nature, in order to ascertain current trends and practices.

“Traditional medicine” is a comprehensive term used to refer to both systems such as traditional Chinese medicine, Indian Ayurvedic medicine, Arabic Unani-Tibb medicine, and to various other forms of indigenous medicine has been used for centuries to treat different types of ailments, including those related to oral health. The World Health Organisation (WHO) of the United Nations defines traditional medicine as including:

“diverse health practices, approaches, knowledge and beliefs incorporating plant, animal, and/or mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness” (WHO, 2000).

In countries where the dominant healthcare system used is based on allopathic medicine, or where traditional health has not been partially/fully incorporated into the national healthcare system, traditional medicine is often termed “complementary”, “alternate” or “non-conventional” medicine.” According to the World Health Organisation (WHO), more than 80% of Africans rely on traditional medicine to meet their healthcare needs (WHO, 2002). The vital role played by traditional medicine in the healthcare system of many developing countries was recognised and validated at the Alma Ata Conference of 1978, wherein it was recommended that governments should give priority to the utilisation of traditional medicine in national drug policies and regulations (WHO, 2002).

Researchers from disciplines such as anthropology, botany, biology and pharmacology have designed research projects to study different aspects of indigenous healing and its possible contribution to health practices, including: perception of health and disease, efficacy of the medicines, herbal medicine, and chemical properties of the medicines applied for remedial care (WHO, 2002). Although many populations in developing countries are reported as being heavily dependent on traditional medicine to help meet their healthcare needs, precise data of such usage is lacking (Peltzer, 2009).

Oral health is integral to general well-being and relates to the quality of life that extends beyond the functions of the craniofacial complex (Petkovic, Kesic, Kitic, 2015).

Traditional healers are the most respected people in communities, and their position is mainly derived from moral standards. They have the ability to provide answers to the community instantly, mainly because of their acquired knowledge and the ability to diagnose what the problem is at an instant.

The South African National Government, in its National Development Plan 2030 (NDP), announced the need for overall population health improvement and improved quality of healthcare delivery (NPC, 2016). In keeping with this, there are a number of strategic goals and goal statements which need to be met. These goals are indicated in the table below.

Table 1: Strategic Goals of the National Development Plan (NDP) 2015-2019

| |
|---|
| Strategic Goal 1: Strengthen Health Systems effectiveness |
| Strategic Goal 2: Reduce the burden of disease |
| Strategic Goal 3: Universal Health Coverage |
| Strategic Goal 4: Strengthen human resources for health |
| Strategic Goal 5: Improved quality of care |

Source: National Development Plan 2030 – Programme of Action. National Planning Commission (2016).

Within this plan, there is a need to ensure improved patient management in all spheres of health and healthcare. This includes the management of common orofacial oral conditions, as part of a basic basket of oral healthcare provision.

In Africa, it is estimated that the ratio of a traditional healers providing healthcare services in the rural communities is 1:500 (WHO, 2013). Traditional healers are the most respected people in communities, and their position is mainly derived from moral standards. They have the ability to provide answers to the community instantly, mainly because of their acquired knowledge and the ability to diagnose what the problem is at an instant (Freeman and Motsei, 1992). There are numerous articles on African traditional health practitioners and their general health activities, but there is very little published information on their oral health knowledge or practises (Freeman and Motsei, 1992).

The use of plants for healing purposes predates human history and forms the origin of much modern medicine (Sanjoy and Yongeshwer, 2002). Traditional medicine has been used for centuries to treat different types of ailments, including those ailments related to oral health. According to the World Health Organisation (WHO), more than 80 percent of Africans rely on traditional medicine to meet their health needs (Sanjoy and Yongeshwer, 2002).

Traditional medicine is still commonly used in both the rural and urban areas in Africa, even when modern healthcare facilities are available to meet wide range of healthcare needs of the population (Bamidele, Adebimpe and Oladel, 2009). De Jong (1991), postulates that the increased interest in traditional medicine use is due to a myriad of reasons, with the most important reason being that of culture. This then affirms theory that the use of traditional medicine is not only popular in rural areas, but also in urban areas, in keeping with cultural diversity and the trends of populations moving from rural areas to urban areas.

1.8.2 Traditional Medicine versus Modern Medicine

Traditional medicine is an ancient and culture-bound medical practice which has been in existence and use long before the introduction of modern medicine. The medicaments used in traditional medicine are mostly derived from natural products. However, many healthcare professionals still prefer the use of modern medicine over traditional medicine (WHO, 2002). This is because before modern medicine can be used, it goes through a number of testing, scientific validation and approval studies, and quality assurance processes as compared to traditional health which has little evidence of being rooted in a strong scientific background. Many practitioners of Western medical science think that such traditional health systems as being short of reliability; however, the use of traditional health is still used worldwide and is acceptable to many communities. The global need for alternative prevention and treatment options and products for oral diseases that are safe, effective and economical comes from the rise in the disease incidence, increased resistance by pathogenic bacteria to currently used antibiotics and chemotherapeutics, opportunistic infections in immunocompromised individuals and financial consideration in developing countries. (Torwan, Hongal, Goel and Chandrashekar, 2014).

1.8.3 Socio-Economic Status

In sub-Saharan Africa, traditional health practitioners often outnumber allopathic doctors by 100 to 1 (King, 2000). In South Africa, it is still easier to consult with a traditional health practitioner than it is to gain access to an allopathic healthcare provider, mainly because of cost and access implications. The limited availability of, and cost of visiting a dental practitioner, especially in rural areas, has made it difficult for the general public to access to an oral healthcare practitioner, thereby finding it easier and more readily accessible to visit a traditional health practitioner when seeking medical or dental attention (Ramphoma, 2016). Furthermore, dental treatment such as from an allopathic dental practitioner is expensive, especially for those who are not members of a medical aid scheme, and have to fund these cost out-of-pocket. These expenses are compounded by high cost of private sector restorations and other conservative care such as endodontic (root canal) treatment and these are additional reasons as to why more patients utilise the services of African traditional healers when seeking oral healthcare.

Poverty, improper distribution of healthcare facilities, shortage of healthcare personnel, rampant shortage of drugs and equipment in existing health facilities are other factors that have made traditional medicine an important component of healthcare in Africa (Agbor and Naidoo, 2019; Agbor and Naidoo, 2015).

1.8.4 Management of Oral Diseases by African Traditional Practitioners

Although there are numerous articles on African traditional health practitioners and their general healthcare activities there is very little published information on their oral healthcare knowledge or practices (Lewis et al., 2004).

Management of oral health conditions with plants has been reported in areas of Africa. A study done in Tanzania in 1994 by a team led by Ngilisho and colleagues found that sixty per cent of villagers who suffered from toothache sought traditional health medicaments and treatment from African traditional health practitioners in the Tanga region of Tanzania (Ngilisho, Mosha, and Poulsen, 1994), and that they were treated with plants (herbs). The study further reported that 40% of these patients reported having experienced relief for more than six months (Ngilisho et al., 1994).

Rudolph, Ogunbodede and Mistry (2007), reported from a study done that forty-six (93.9%) of the 49 respondents had never had any formal information on oral health, and that 43 (87.8%) were unfamiliar with the symptoms of oral diseases. However, these traditional healers stated that they had been offering oral healthcare treatment to their patients, mostly in the form of dispensing “muti” for rinsing. According to a study done by Hollist (2004), it was reported that about 10 different oral/dental conditions are treatable with plants in traditional health practice, including toothache, gingivitis, ulcerative gingivitis, angular stomatitis, mouth ulcers, swollen tonsils, oral thrush and black tongue (Hollist, 2004).

In the study done by Agbor and Naidoo (2016), it was reported that the diagnosis of oral pathology by African traditional health practitioners was mostly undertaken by visual examination. These authors also reported on other studies that were conducted in Africa wherein it was reported that most traditional healers diagnose toothache by means of visual examination only, and without palpation of the soft and hard tissues. Furthermore, others use the patients reported history of pain or obtain the cause of the pathology from a previous history of cause of extraction. African traditional healers were found to have little or no training in making an oral diagnosis when compared to allopathic dental practitioners who have been trained in anatomy, pathology, and other facets of dental medicine.

In keeping with the ideal of minimally invasive dentistry (MID) there is a move from being an extraction based treatment service to an oral and dental healthcare service that seeks to restore/preserve/repair tooth pathologies. head and neck anatomy, tooth anatomy as well as the progression of dental disease. However, tooth extraction is still widely practised in South Africa, and Willis, Harris and Hergenrader (2008), reports that tooth extraction has been a common practice of African traditional health practitioners for many hundreds of years. Whilst tooth extraction was the most common form of dental treatment provided by some African traditional health practitioners, other treatments reported included the management of gingivitis, oral ulcers and some oral HIV lesions (Agbor and Naidoo, 2016). In

Cameroon, traditional healers have been reported to treat a range of oral conditions, including to oral candidiasis, dental caries and gum diseases by using mouth washes made from plants and parts of plants such as the barks of trees, herbs and roots (Ayeni, 2004; Lewis et al., 2004).

In Uganda, traditional health practitioners follow a practice called “*ebino*”. This practise involves the extraction of unerupted primary canines because these teeth are believed to cause diarrhoea, vomiting and fever (Iriso, Accorsi, Akena, Amone, Fabiani, Ferrarese, Lukwiya, Rosolen, and Declich, 2000). In Cameroon, one of the reasons that African traditional health practitioners proffered for the removal of a tooth was “if it has a hole”. All African traditional health practitioners reported using herbs to control bleeding and pain after extractions (Agbor, Naidoo and Mbia, 2011).

In a study conducted amongst 300 predominantly male herbalists, the majority of the participant correctly identified photographs of dental caries and severe gingivitis, and more than 80% of them reported giving oral health advice to their patients (Ngilisho et al., 1994).

Therefore, the importance of African traditional health practitioners continues to remain a powerful and influential force in the management of oral healthcare conditions.

1.9 Aim and Objectives

The aim of the study is to investigate and analyse the methods used by African traditional health practitioners, and also gain an understanding of methods used to treat oral health conditions.

The objectives of the study are:

- To determine the diagnostic and treatment methods used by African traditional health practitioners to identify oral health conditions;
- To determine the type of herbs or treatment modality used by African traditional health practitioners to treat the oral health conditions; and
- To determine the type of management techniques used by African traditional health practitioners in the management of oral health conditions.

1.10 Research Methodology

1.10.1 Introduction to Methodology

This chapter outlines the methods and materials used to conduct the study. The study was conducted at in Soweto township, Johannesburg, Gauteng. Details about the methods used, the study design, study population, data collection, data analysis and other methods are outlined in the following sections..

1.10.2 Study Design, Setting and Population

This was a cross-sectional convenience qualitative study. Participants were asked to participate in a structured interview with questions being posed that are related to their knowledge and methods used to identify, treat and manage oral health conditions of their patients.

The study was conducted at different homes of the participants' around Johannesburg. These homes also serve as the consulting rooms of these practitioners.

In phase one the study population comprised of a sample of ten African traditional practitioners residing and rendering their health-related services in Gauteng, Johannesburg area, using mostly traditional medicine, to treat their patients. Phase two of the study involved a study population of ten African traditional health practitioners who were recruited to participate in a focus group study.

1.10.3 Inclusion and Exclusion Criteria

The following inclusion and exclusion criteria was applied to the study:

Inclusion Criteria

- Males and females who are recognised by their peers and the community as being African traditional health practitioners, and who openly provide traditional healing services..
- Using traditional medicine to provide healthcare in the Johannesburg area of Gauteng.
- Willing to participate in the study, and able to provide the required consent.

Exclusion Criteria

- Persons who are not recognised as being African traditional health practitioners by their peers.
- Persons who are not providing healthcare services using traditional medicine
- Persons not willing to participate in the study, and/or not able to provide the required consent

1.10.4 Pilot Study

In order to ensure the reliability and validity of the study the researcher conducted a pilot study. The pilot study was conducted in an area adjacent to Johannesburg (Alexandra township and the surrounding areas), which has a similar socio-economic and geographic status. The pilot study consisted of 15% of the main study population of 30, with the sample size being 21 participants. These African traditional health practitioners were purposively selected to ensure that they represent both males and females; that they met the inclusion and exclusion criteria of the participants in the main study; and that they represented the various languages spoken in the area. The pilot study consisted of only phase 1 of the study.

The purpose of the pilot study was to determine suitability of interview questions, and to highlight any potential problems in the study and the study methodology, and to inform the researcher of any difficulties experienced by the participants in understanding the contents of the questionnaires; any ambiguities in the questions; any technical and language difficulties; and any other issues that arose.

1.10.5 Data Collection Tools / Methods

A structured but open-ended question schedule was used in collecting data in phase one. Each participant was interviewed by the researcher in a private area. The researcher administered an open-ended structured questionnaire and recorded their responses. All the information about the study was explained to the participant by the researcher. The data collection occurred from October 2019 to February 2020 and ended when data saturation was reached. The interview schedule included questions that were aimed at gathering the following data: Demographics; questions relating to identification of oral health conditions; how they treat those conditions, traditional medicine used and management of those oral health conditions. Confidentiality was maintained at all times through the allocation of only numbers which were randomly allocated to the questionnaires and focus group participants.

After the completion of phase one the second phase of the data collection process commenced, which was a focus group interview with 10 new participants. The purpose of the focus group interview was to allow for triangulation and consensus of the data gained in phase one of the study.

1.10.6 Data Analysis and Management

Once all the questionnaires were collected, the primary data was extracted and captured onto a Microsoft Excel® spreadsheet using a data coding process. The captured data was checked for accuracy and correctness by both the researcher and the supervisor. Upon analysis the data was presented in graphic and textual forms to reflect central tendencies such as average, mean and range, and other measures such as correlations and tendencies. The different variables were analysed using descriptive measures such as mean and averages. The qualitative information, together with the results of the focus group interviews, was thematically grouped, key themes were identified, and then analysed using nVivo data analysis software.

The questionnaires are stored in a locked cupboard at the researchers office. Only the researcher and study supervisors have access to the data. All the data will be stored for a period of 5 years, and thereafter destroyed by means of shredding all paper data or overwriting and deleting all electronic data. Data from phase 1 of the study was captured on a Microsoft Excel® spreadsheet, and data from phase 2 was captured digitally as a voice recording and Microsoft Word® transcripts. All the data (both hard and soft copies) is being stored either as hard copies, or on a password protected USB flash drive, and these are placed in a locked cupboard at the researchers office for a period of 5 years post completion of the study. Thereafter the digital data will be double-deleted and overwritten, and the hard copies shredded and destroyed.

1.10.7 Reliability and Validity

Construct validity was used in the construction of the questionnaires to maintain validity of the quantitative data. Credibility is a form of internal validity in qualitative research to establish whether the research findings are a true reflection of the participants' original views. In this study credibility was established through peer debriefing. Transferability was facilitated through the use of a purposively selected sample for the focus group discussion. Dependability was established through the use of member check where the analysed data was sent to a few participants to evaluate the interpretations made by the researcher. Confirmability was established through quoting the actual dialogue of the participants.

1.10.8 Ethical considerations

In research that involves human sample subjects, the researcher has certain responsibilities towards research participants. The researcher must protect the dignity and welfare of the research participants and these participants, and these participants are further protected by having the freedom

to withdraw, without penalty, at any stage. The research participants' identities must be protected, and the confidentiality of research data maintained. The following ethical considerations were observed before and during the study.

Ethical approval was obtained from the Biomedical Research Ethics Committee (BREC) of UKZN (BREC Reference number: 451/19). All participants were assured of privacy and confidentiality, and this was maintained throughout the study, including during the report writing phase. Additionally, the researcher completed a training course in research ethics and this is attached as an appendix.

Written informed consent was obtained from all participants, and separate consent was obtained from the focus group participants to record the interviews. At all stages of the research project full and diligent due consideration was given to ensuring full compliance with all external and internal principles, rules and regulations such as the Helenski Declaration, and the University rules to ensure ethical compliance.

The results, outcomes and recommendations of this study will be disseminated via peer-reviewed journal articles and conference presentations. The results will also be made available to the participants in the form of a brief research report. Additionally, it is essential that the results of this survey also be disseminated to the various stakeholders such as traditional health healer societies, the Provincial and Municipal Departments of Health so that the results and recommendations can be reviewed, adopted and considered for future policy changes and oral health delivery service rendering.

1.10.9 Summary

In summary this chapter introduced the research topic and provided relevant background information on the significance of gaining an understanding of the knowledge, practises and management of common oral health conditions by African traditional health practitioners. The chapter also presented the aims and objectives of the study, outlined the research methodology and also provided a literature review. The following chapter presents the journal article that was submitted to a SAPSE accredited journal for review and publication.

CHAPTER 2: Journal Article

2.1 Introduction

This chapter presents the journal article that has been submitted to a SAPSE accredited journal, the African Journal of Traditional, Complementary, and Alternative Medicine.

AN ANALYSIS OF METHODS USED BY AFRICAN TRADITIONAL PRACTITIONERS TO TREAT ORAL HEALTH CONDITIONS IN JOHANNESBURG, SOUTH AFRICA

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Abstract

Background

African traditional medicine is widely used in South Africa. African traditional health practitioners treat patients who present with a variety of medical conditions, including oral health conditions. The aim of this study was to determine the knowledge, and practices of African traditional health practitioners regarding oral health conditions.

Materials and Methods

A cross-sectional survey of 11 African traditional health practitioners who consented to be interviewed in the Johannesburg area was recruited to participate in a structured questionnaire survey, followed by focus group interviews with 10 practitioners. Ethical approval was obtained from the Biomedical Research Ethics Committee (BREC ref. no 451/19). Following the collection of data from the questionnaire administration, a focus group interview was conducted. Data on the knowledge, treatment practices, and post-treatment management of four common oral conditions was collected and analysed.

Results

Eleven participants who consented to be interviewed, their average age was 44.1 (± 8.1) years, with a range of 21-67 years, and a slight majority of female (55.5%, n=6). Ten further participants took part in focus group interviews. African traditional health practitioners were asked a series of questions, in non-dental terminology or language, related to their knowledge (causes); practise (what do you use to treat?, What advise do you give to the patient?); of four common oral health conditions. These are: sores on the lips, sores on the tongue, swollen gums and toothache. Participants reported using a variety of practices such as throwing bones, burning incense, using plants and animal product, as well as commercially manufactured products to treat and manage patients.

Conclusion

The results of the study reveal that there are vast differences in knowledge, management practices and treatment modalities of African traditional healthcare practitioners. Further research in the knowledge, practises and treatment of traditional healthcare practitioners needs to be conducted. Mutual cooperation, collaboration and integrating African traditional health practitioners into primary oral healthcare services need to be upscaled and prioritised.

Key words: African traditional health practitioner, oral conditions, knowledge, Johannesburg, South Africa

Introduction

Oral health is integral to general well-being and relates to the quality of life that extends beyond the functions of the craniofacial complex (Petkovic, Kesic and Kitic., 2015). In Africa, it is estimated that the ratio of traditional healers providing healthcare services to population in the rural communities is 1:500 (World Health Organisation, 2013). Traditional healers are the most respected people in communities, and their position is mainly derived from moral standards. They have the ability to provide answers to the community instantly, mainly because of their acquired knowledge and the ability to diagnose what the problem is at an instant.

“Traditional medicine” is a comprehensive term used to refer both to traditional medicine systems such as Chinese traditional medicine, Indian ayurvedic medicine, Arabic unani-tibb medicine, and to various other forms of indigenous medicine. Traditional medicine has been used for centuries to treat different types of ailments, including those related to oral health. The World Health Organisation (WHO) defines *“traditional medicine as including diverse health practices, approaches, knowledge and beliefs incorporating plant, animal, and/or mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness”*. (WHO, 2000).

In countries where the dominant healthcare system is based on allopathic medicine, or where traditional medicine has not been incorporated into the national healthcare system, traditional medicine is often termed “complementary”, “alternative” or “non-conventional” medicine.” According to the World Health Organisation, more than 80 % of Africans rely on traditional medicine to meet their health needs. (WHO, 2002). The crucial role played by traditional medicine in the healthcare system of many developing was recognised and validated at the Alma Ata Conference in 1978, which recommended that governments should give priority to the utilising traditional medicine in national drug policies and regulations (WHO, 2002).

Oral health disparities in South Africa, continue to widen, more so in the disadvantaged and vulnerable groups where the vast majority experience the highest burden of oral diseases. (Ramphoma, 2016). Distribution of oral healthcare services is adding to the burden, coupled with shortage of oral health personnel in the public sector. Traditional healers play a very important role in the provision of healthcare in the majority of South African populations. They are, in most cases, the first point of contact.

In sub-Saharan Africa, traditional healers often outnumber doctors by 100 to 1 (King, 2000). In South Africa, it is still easier to consult with a traditional healer than it is to consult with an allopathic healthcare provider, mainly because of the cost implications. The scarce availability and cost of visiting a dental practitioner, especially in rural areas, has made it difficult for the general public to go to a

dental practitioner, thereby finding it easier and more-accessible to visit a traditional healer when seeking oral health treatment.

Management of Oral Diseases by Traditional Healers

Although there are numerous articles on African traditional health practitioners and their general health activities there is very little published information on their oral health knowledge or practices (Lewis, 2004). Management of oral health conditions with plants has been reported in many areas of Africa. A study done in Tanzania found that 60% of villagers that suffered from toothache sought treatment from traditional healers (Ngilisho, Moshia, and Poulsen, 1994). Tooth extraction, an ancient practice that is carried out worldwide, has been a common practice of traditional healers in Sub-Saharan Africa for centuries (Willis, Harris, and Hergenrader, 2008). The most common reasons for tooth extraction documented in Africa are mainly on ritual tooth extraction and infant tooth mutilations (Willis et al., 2008).

In Uganda, traditional healers follow a practice called “*ebino*”. This practise involves the extraction of unerupted primary canines because these teeth are believed to cause diarrhoea, vomiting and fever (Iriso Accorsi, Akena, Amone, Fabiani, Ferrarese, Lukwiya, Rosolen, and Declich, 2000). In Cameroon, one the reason traditional healers gave for the removal of a tooth was “if it has a hole”, and all traditional healers in the study reported using herbs to control bleeding and pain after extractions (Agbor, Naidoo and Mbia, 2011).

Materials and Methods

The study was carried out in the township of Soweto, Johannesburg. Soweto borders the city’s mining area in the south portion, and in 2019 had an estimated population of 1.57 million. The population density of Soweto is high, with around 6400 people per square kilometre, and the population is mostly Black. All 11 official languages of South Africa are spoken, and the fundamental ethnic groups present in Soweto are the isiZulu, Tswana, and Tsonga.

A cross-sectional survey of 11 African traditional health practitioners who consented to be interviewed in the Johannesburg area was recruited to participate in a structured questionnaire survey, followed by focus group interviews with 10 practitioners. The number of African traditional health practitioners in the Soweto township of Johannesburg is unknown, as no formal statistics or registers are maintained. The researcher canvassed “muti” sellers at the Mai Mai bazaar, which is on the corner of Anderson and Berea streets in the city centre of Johannesburg. This market, in the east of Johannesburg, is nicknamed “*Ezinyangeni*” – the place of healers. Jabu Vilakazi, the manager of the market, describes it as catering for the indigenous needs and practices of African traditional health practitioners, and as the “muti”

capital of Johannesburg, as most of its 176 units are dedicated to the sale of plants, animals and animal products used as traditional medicine.

Therefore, a convenience sample of 11 African traditional practitioners who could be located in the area was selected for phase one of the study, and a purposive sample of ten were recruited participate in the focus group interview for Phase 2 of the study. The study design was a cross-sectional convenience qualitative study. In phase one of the study participants were asked to participate in a structured interview with questions being posed that are related to their knowledge and methods used to identify and treat oral health conditions. Phase two of the study involved a focus group interview of 10 participants, using the same questions posed to the participants in phase one, in order to elicit more information and to ensure that data triangulation takes place.

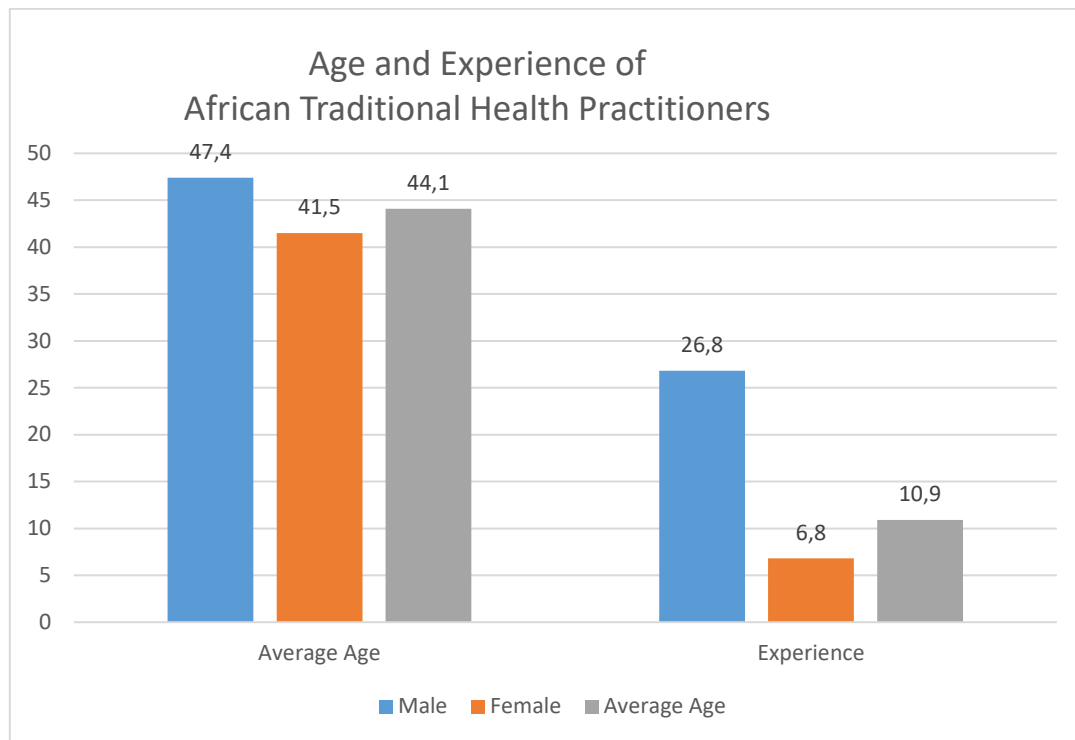
Ethical approval was obtained from the Biomedical Research Ethics Committee (BREC) of the University of KwaZulu-Natal (BREC Reference number: 451/19). Informed consent was obtained from the participants. Following the collection of data from the questionnaire administration, a focus group interview was conducted. Data on the knowledge, treatment practices, and post-treatment management of four common oral conditions was collected and analysed.

Results and Discussion

The sociodemographic characteristic of the research participants is summarised in Figure 1. Among the 11 participants who consented to be interviewed, their average age was 44.1 (± 8.1) years, with a range of 21-67 years. There was a slight majority of female (55.5%, n=6), and amongst the females the average age was 41.5 years with a range from 30-59 years, and with the males the age range was 30-59, with a range of 47.4%. Of these males 60% (n=3) were over the age of 60, with the oldest being 67 years old, and the youngest male participant being 21 years old.

The number of years of experience as an African traditional health practitioner varied widely amongst the research participants, with an overall average of 14.9 years (Range 3-50 years). Female African traditional health practitioners reported a range of years of experience (3-19 years) with an average of 6.8 years, whereas the male practitioners reported an average experience of 26.8 years with a range of 3-50 years.

Figure 1: Age and Experience Characteristics of African Traditional Health Practitioners



The research participants spoke a number of languages, all of which were recognised official South African languages. Pedi and Tsonga was each spoken by three participants, with Tswana being spoken by four and isiZulu being spoken by only one African traditional health practitioner who participated in the study.

The participants' responses to the questions related to knowledge, attitudes and practices of African traditional health practitioners follow.

Table 4: Analysis of Responses of African Traditional Health Practitioners

Causes of certain oral health conditions

| Participant | Sores on Lips | Sores on Tongue | Swollen Gums | Toothache |
|-------------|--|---|--|---------------------------------------|
| A001 | “Madi a ditshila” -blood infected with virus | Germs from not brushing your tongue | “Madi a magolo” - High Blood Pressure | “Sebokwana” - a worm |
| A002 | Germs from not brushing teeth | Crushing meat bones, small pieces prick your tongue | Crushing meat bones, small pieces prick your gums | “Sebokwana” - a Worm |
| A003 | Flu, Sexually transmitted Infections (STIs) | Flu, Sexually transmitted Infections (STIs) | Not sure what really causes swollen gums | “Sebokwana” - a Worm |
| A004 | “Kgala” - Toxic acid in the gut that moves up | “Kgala” - Toxic acid in the gut that moves up | “Kgala” - Toxic acid in the gut that moves up | “Sebokwana” - a Worm |
| A005 | Sexually transmitted Infections (STI), Toxic acid from the gut | Allergic reactions to some food | Not sure | Toxic acid from gut |
| A006 | Flu, Ancestral calling, A weak immune system from being HIV+ | Flu, Ancestral calling, A weak immune system from being HIV + | Flu, Ancestral calling, A weak immune system from being HIV+ | Ancestral calling, Germs and bacteria |
| A007 | Severe headaches, Toxic acid from the gut, Stress | Severe headaches, Stress | “Setshipidi” - a boil -like sore which has a worm moves around the gums. | “Sebokwana” - a worm |
| A008 | Ancestral calling | Ancestral calling | Ancestral calling | Ancestral calling |
| A009 | Flu, Severe headaches | Allergic reactions from food | Allergic reactions from food | “Sebokwana” - a Worm |
| A010 | Allergic reactions from food | Allergic reactions from food | Allergic reactions from food | “Sebokwana” - a Worm |

Treatment methods for certain oral health conditions

| Participant | Sores on Lips | Sores on Tongue | Swollen Gums | Toothache |
|-------------|---|---|--|---|
| A001 | Coarse salt | Coarse salt | use high blood medication | Thola |
| A002 | Pooetshela (a herb), salt water | Pooetshela and salt water | Pooetshela and salt water | Mokaikai (a root) and Thola |
| A003 | Kgopane (Aloe) and Molaka (a white bark) | Kgopane (Aloe) and Molaka (a white bark) | I have never treated swollen gums | Dental practitioner referral |
| A004 | Natural sores: vinegar, <i>Lejwe la Mokoti</i> , (Alon) and honey Sores from evil spirits: White dried mielies, <i>Thola</i> , Coarse salt | Natural sores: vinegar, stones of <i>Lejwe la Mokoti</i> (Alon) and honey Sores from evil spirits: White dried mielies, <i>Thola</i> , a Coarse salt | Natural sores: vinegar and stones of <i>Lejwe la Mokoti</i> , (Alon) and honey Sores from evil spirits: White dried mielies, <i>Thola</i> , Coarse salt | Thol |
| A005 | Elephant’s ear plant | <i>Lejwe la Mokoti</i> - Alon (colourless crystal) | <i>Lejwe la Mokoti</i> - Alon | Shell of ostrich egg |
| A006 | <i>Makgonatsohle</i> (Potassium Permanganate), <i>Mohlonyane</i> (African wormwood) | <i>Lejwe la Mokoti</i> (Alon). | <i>Lejwe la Mokoti</i> (Alon) Coarse Salt or even table salt | <i>Lejwe la Mokoti</i> (Alon) Coarse Salt or even table salt |
| A007 | Hlonya <i>Lejwe la mokoti</i> (Alon) | Hlonya <i>Lejwe la mokoti</i> (Alon) | Hlonya <i>Lejwe la mokoti</i> (Alon) | Morula bark coarse Salt |
| A008 | Falvic Acid, which is like a humus, but it is in powder form. | Falvic Acid | Falvic Acid | “uMfazi o thethayo” - a powder Aloe |
| A009 | <i>Sebaga</i> , Red Powder, | <i>Sebaga</i> , <i>Sekanami</i> , <i>Setimamollo</i> , | <i>Legala</i> which is a plant, | <i>Setimamollo</i> , <i>Thola</i> , |
| A010 | <i>Senoko maropa</i> <i>Molaka</i> | <i>Senoko maropa</i> <i>Molaka</i> | <i>Senoko maropa</i> <i>Molaka</i> | <i>Mpepho</i> (imphepho) Marula tree bark, <i>Thola</i> |

Treatment methods for certain oral health conditions

| Participant | Sores on Lips | Sores on Tongue | Swollen Gums | Toothache |
|-------------|--|--|--|---|
| A001 | Wrap a piece of white cloth around your finger and dip it in crushed coarse salt, and then rub the affected areas with it. | Wrap a piece of white cloth around your finger and dip it in crushed coarse salt, and then rub the affected areas with it. | They must drink the high blood medication they have. | Nil |
| A002 | Mix ground <i>Pooetshela</i> in warm water and rinse the mouth. You can also take warm salt water, and rinse your mouth morning and evening. | Mix ground <i>Pooetshela</i> in warm water and rinse the mouth. You can also take warm salt water, and rinse your mouth morning and evening. | Mix ground <i>Pooetshela</i> in warm water and rinse the mouth. You can also take warm salt water, and rinse your mouth morning and evening. | Boil the roots of <i>Makaikai</i> and rinse with the solution. If the pain continues, take the roots of Thola, and boil in water then rinse with that. |
| A003 | Boil the gel of the Aloe plant, then drink the mixture. Apply aloe on the affected areas | Boil the gel of the Aloe plant, then drink the mixture. Apply aloe on the affected areas | I have never treated swollen gums | Referral to a dentist |
| A004 | For natural sores: boil vinegar and alon crystals, add honey and drink. For sores that involve "moleko" / evil spirits: Take dry white mielie seeds, and "Thola" berry seeds, put them in boiling water, add coarse salt, then gargle. Whist gargling, report your issues to your ancestors to get rid of the evil spirit, and then spit out the mixture. | For natural sores: boil vinegar and alon crystals, add honey and drink. For sores that involve "moleko" / evil spirits: Take dry white mielie seeds, and "Thola" berry seeds, put them in boiling water, add coarse salt, then gargle. Whist gargling, report your issues to your ancestors to get rid of the evil spirit, and then spit out the mixture. | For natural sores: boil vinegar and alon crystals, add honey and drink. For sores that involve "moleko" / evil spirits: Take dry white mielie seeds, and "Thola" berry seeds, put them in boiling water, add coarse salt, then gargle. Whist gargling, report your issues to your ancestors to get rid of the evil spirit, and then spit out the mixture. | Boil Thola, and then gargle with it. Thola is able to penetrate through to the roots of the tooth where there is pain, and therefore brings relief. |
| A005 | Make small incisions on the lips and apply the liquid of the long leaves of the Elephant ear. | Suck on <i>Lejwe la mokoti</i> | Suck on <i>Lejwe la mokoti</i> | Boil a piece of egg-shell, strain and then drink the water thereof. Crush the egg-shells into a fine powder and place the powder on the aching tooth to relieve pain. |
| A006 | Add few granules of <i>Makgonatsohle</i> in water, and take cotton wool or clean cloth, dip in the water and wipe the sores with it | Grind Alon with water into a paste. Scrape the tongue with a piece of wood, and then apply the mixture onto the tongue. This will help to suck the sores out. | Unsure. | Unsure. |
| A007 | Lick the powder of <i>Hlonya</i> . Also suck on the stone of " <i>lejwe la mokoti</i> " | Lick the powder of <i>Hlonya</i> . Also suck on the stone of " <i>lejwe la mokoti</i> " | Lick the powder of <i>Hlonya</i> . Also suck on the stone of " <i>lejwe la mokoti</i> " | Boil marula tree bark and " <i>lejwe la mokoti</i> ," then rinse. This helps to kill the worm and minimise pain. Then rinse with salt water. |
| A008 | First I throw bones to check what is the origin of the problem, and then depending on the outcome I give them Falvic acid to apply on the area. | First I throw bones to check what is the origin of the problem, and then depending on the outcome I give them Falvic acid to apply on the area. | First I throw bones to check what is the origin of the problem, and then depending on the outcome I give them Falvic acid to apply on the area. | First I throw bones to check what is the origin of the problem, and then depending on the outcome I give them Falvic acid to apply on the area. |
| A009 | Boil <i>Sebaga</i> and gargle with it whilst the mixture is still warm. And take red powder and apply it to the affected area. | Boil <i>Sebaga</i> and <i>Setimamollo</i> let gargle with it while it is warm. | Take <i>Legala</i> , boil it and let the patient gargle with it. | Boil <i>Setimamollo</i> in water and gargle whilst warm, especially around the painful tooth, and the worm will get killed. |
| A010 | Grind the bark of <i>Senoko maropa</i> and <i>Molaka</i> into a powder, and mix it with warm water, then rinse and gargle. | Grind the bark of <i>Senoko Maropa</i> and <i>Molaka</i> into a powder, and mix it with warm water, then rinse and gargle. | Grind the bark of <i>Senoko Maropa</i> and <i>Molaka</i> into a powder, and mix it with warm water, then rinse and gargle. | Rinse the mouth with boiled <i>Mpepho</i> as it helps to kill the worm. Boil the marula bark and rinse with it. Also take Thola and poke it with a wire, then put it over an open fire. Inhale the smoke which will kill the worm and the toothache will be gone. |

Post-treatment management of certain oral health conditions

| Participant | Sores on Lips | Sores on Tongue | Swollen Gums | Toothache |
|--------------------|---|---|---|--|
| A001 | Patients must continue to brush their teeth, morning, day and at night. | Patients must brush their tongues when they brush their teeth. | Patients must continue taking their medication for high blood pressure. | If the "worms" are out, there is no need to come back. |
| A002 | Patient must continue rinsing mouth with salt water. | Patient must continue rinsing mouth with salt water. | Patient must continue rinsing mouth with salt water. | Patients must brush their teeth daily. |
| A003 | Patients must drink their medication accordingly and avoid kissing until they are healed. | Patients must drink their medication accordingly and avoid kissing until they are healed. | Patients must drink their medication accordingly and avoid kissing until they are healed. | Patients must consult a dentist. |
| A004 | Avoid things like kissing, and also keep to the treatment and do not default. | Avoid things like kissing, and also keep to the treatment and do not default. | Avoid things like kissing, and also keep to the treatment and do not default. | Avoid things like kissing, and also keep to the treatment and do not default. |
| A005 | Do not share anything with anyone, like eating utensils, also avoid kissing. | Avoid food with a lot of acid like cooldrinks, and oranges, because they have a high acid content. | If the gums are not getting better, I refer to the doctor. | When the toothache is persistent, I refer them to the dentist to get an extraction. |
| A006 | Check what is in your food, to make sure there are no things you are allergic to, and avoid kissing. | Avoid kissing, and also. check if the underlying issue has to do with ancestral callings as well. | Taking care of oral health, brush your teeth regularly. And also check if you do not have any chronic illnesses like high blood pressure. | Minimise the amount of sweets you eat |
| A007 | Don't breathe on other people. Don't bite small food stuff and give them to children, as you could infect them. | Don't breathe on other people. Don't bite small food stuff and give them to children, as you could infect them. | Don't breathe on other people. Don't bite small food stuff and give them to children, as you could infect them. | Continue rinsing with the mixtures, and if after some time the tooth is not getting better, then refer to the dentist for the tooth to be taken out. |
| A008 | Do not go around kissing people. | Do not go around kissing people. Once a month repeat the mixture and gargle with it, for the next six months. | Do not go around kissing people. Once a month repeat the mixture and gargle with it, for the next six months. | Do not go around kissing people. Once a month repeat the mixture and gargle with it, for the next six months. |
| A009 | Avoid things like kissing, and also keep to the treatment and do not default. | Once a month repeat the mixture and gargle with it, for the next six months. | Once a month repeat the mixture and gargle with it, for the next six months | Once a month repeat the mixture and gargle with it, for the next six months. |
| A010 | Avoid things like kissing, and also keep to the treatment and do not default. Do not breathe on other people as well. | Avoid things like kissing, and also keep to the treatment and do not default. Do not breathe on other people as well. | Avoid things like kissing, and also keep to the treatment and do not default. Do not breathe on other people as well. | Avoid things like kissing, and also keep to the treatment and do not default. Do not breathe on other people as well. |

Knowledge of Oral Conditions

African traditional health practitioners were asked a series of questions, in non-dental terminology or language, related to their knowledge (causes, post-treatment advice); practise (what do you use to treat?, What advise do you give to the patient?); of four common oral health conditions. These are: sores on the lips, sores on the tongue, swollen gums and toothache. Participants' responses will be presented under each condition. Responses from the 10 African traditional health practitioners that were interviewed as part of the focus group interview are in concurrence with the responses provided by the initial 11 participants who completed the questionnaires.

Sores on the lips

Sores on the lips, which include canker sores, are usually a minor irritation and last only a week or two. In some cases, however, they can indicate mouth cancer or an infection from a virus, such as herpes simplex. Cold sores are red, fluid-filled blisters that form near the mouth or on other areas of the face. In rare cases, cold sores may appear on the fingers, nose, or inside the mouth. They're usually clumped together in patches. Cold sores may persist for two weeks or longer.

A common virus called *herpes simplex* type 1 virus (HSV-1) causes cold sores and can spread from person to person through close contact, such as kissing. The sores are contagious even when they are not visible. There is no known cure for cold sores, and they may recur without warning. Certain prescription-only medications such as acyclovir, valacyclovir, and famciclovir can be used to treat cold sores and prevent recurrence. Home remedies include aloe vera (the cooling gel found inside the leaves of the aloe plant), petroleum jelly, and witch hazel (a natural astringent). Essential oils such as tea tree oil, peppermint oil, anise oil, oregano oil, lemon balm oil, thyme oil, ginger oil, chamomile oil, sandalwood oil and eucalyptus oil.

In response to the question "What causes sores on the lips?" five of the participants responded that sores were caused by sexually transmitted infections (STIs), and due to immunosuppression from being HIV+. Three respondents stated that sores on the lips were due to influenza symptoms and also attributed "*Kgala*" (toxic acid in the gut) as a cause. Two respondents proposed that when people have regular severe headaches, they tend to develop sores on their lips. Two of the African traditional healthcare practitioners proposed that the development of sores on the lips was the result of an ancestral calling. Only one practitioner mentioned that sores on the lips are caused by allergic reactions to certain food.

Sores on the Tongue

There are a number of common causes of sores in the tongue. These include: trauma caused by biting down hard on the tongue; eating very hot food that can burn the tongue and even blister it; grinding or clenching of teeth damaging the outer edges of the tongue; oral thrush; infections such as: hand, foot,

and mouth disease, human papillomavirus and syphilis; mouth ulcers; food sensitivity or allergy; smoking; vitamin deficiency and anaemia; dehydration; dry mouth; burning mouth syndrome; neuralgia; lichen planus; Behcet's disease; Moeller's glossitis; certain medications; pemphigus vulgaris; oral cancer and Sjögren syndrome. Other causes include a viral infection, heredity, hormonal changes in the body, a weak immune system, eating too spicy and salty foods, intestinal or stomach disorders, stress, and deficiencies of minerals and vitamins like zinc, folic acid, iron and the B group of vitamins. Treatment for sores on the tongue are usually directed at the cause, and include practicing good dental hygiene, brushing and flossing regularly, eating bland foods, using over-the-counter (OTC) oral pain medication and mouth-washes, and rinsing with salt water. Home remedies include, *inter-alia*: aloe vera; baking soda; hydrogen peroxide; salt; liquorice; lavender essential oil; honey; sage; cayenne pepper; and alum.

Three of the traditional healthcare practitioners stated that sores on the tongue were mainly caused by an allergic reaction to certain foods. Two others opined that a cause was from having influenza, and also linked the development of sores on the tongue to an ancestral calling. Two respondents attributed the sores to having sexually transmitted infections (STI's) and also having a weak immune system from being HIV+. Headaches, poor oral hygiene and toxic acid from the gut, were also included in the answers as to what causes sores on the tongue.

Sores on the Gums

Sores on the gums can be caused by a number of reasons such as: brushing too hard; having canker sores; wearing dentures; retainers or braces; hormonal changes in woman; pregnancy or menopause; and around the time of their menstrual periods. Gum sores may be a sign of more serious oral health issues like thrush, gingivitis, or periodontitis. Some of the allopathic and home remedies for sores on the gum include: saltwater mouth rinse; hot or cold compresses to help reduce pain; herbal poultices including certain herbs and spices such as turmeric (an anti-inflammatory), clove powder and Spilanthes (both analgesic herbs); essential oils such as sweet almond oil, peppermint oil, oregano oil, and clove oil made into a spray; teabags (black and green tea is high in astringent tannins); oral anaesthetic gels; medicated over-the-counter oral gels such as Bonjela and Orajel; and over-the-counter pain killers.

African traditional healthcare practitioners stated that the causes of sores on the gums include: toxic acids from the gut; high blood pressure; allergic reactions from certain foods; weak immune systems; and ancestral calling. Two of the Traditional practitioners said they were unsure as they had never treated anyone with sores on the gums.

Causes of Toothache

The most common cause of toothache is a dental cavity as a result of tooth decay. Another common cause of toothache is gum disease. Toothache can also be as a result of an injury or an abscess of the

tooth. Toothache symptoms can be caused by a problem that does not originate from a tooth or the jaw, of note is cardiac pain. Symptoms of toothache can be mimicked by sinus infection, shingles, and other diseases. Other causes of toothache can include trauma-related fractured teeth. Non-dental treatment of toothache includes OTC analgesics and anti-biotics, whilst dental treatment would be restorative (a filling) or therapeutic (root canal therapy or extraction). Home remedies and traditional remedies include: salt-water rinse; cloves; guava leaves; mango bark; pear seed and bark; sweet potato leaves; sunflower leaves; tobacco leaves and garlic.

Of the ten traditional health practitioners, 70% (n=7) stated that a toothache is caused by “*Sebokwana*,” - a worm which burrows itself deep in the tooth and causes a person to experience excruciating pain. Two of the traditional health practitioners said a toothache is mainly caused by ancestral calling, which is when a person is called by the ancestors to become a healer, whilst one stated that a toothache is mainly caused by toxic acid from the gut. Five (50%) of the ten traditional practitioners used *Thola* in treating toothache.

Traditional Medicants and Herbs Used

The table below presents a list of the medicants used by African traditional health practitioners, and the family, species and vernacular names of flora used by African traditional health practitioners are listed.

Table 5: Medicants and Substances used by African traditional healthcare practitioners

| Family and species name | Vernacular name |
|---|---|
| Leguminosae, <i>Acacia caffra</i> (Thunb.) Wild. ¹ | Poo-tshehla |
| Leguminosae, <i>Peltophorum africanum</i> Sond. ¹ | Setimamollo |
| Morala Gardenia, <i>Scelerocarya birrea</i> ² | Marula Tree |
| liquorice plant, <i>Helichrysum petiolare</i> ¹ | Imphepho (incense) |
| Forest knobwood, <i>Zanthoxylum davyi</i> ³ | Senokomaropa, Senoko-maropa |
| <i>Urginea sanguinea</i> ³ | Sekaname |
| <i>Pterodiscus ngamicus</i> ² | Seboana |
| <i>Tribulus terrestris</i> ² | Lengangale (Devil’s Thorn) |
| Lavender Croton, <i>Croton gratissimus</i> ² | Moologa |
| Spotted Aloe, <i>Aloe greatheadii</i> ¹ | Kgopane / Kgopha |
| Asteraceae, <i>Artemisia afra</i> ¹ | Lengana |
| <i>Dicoma anomala</i> ³ | Hlonya |
| Moringaceae <i>Moringa oleifera</i> ³ | Makgonatshole |
| Wild Verbena, <i>Pentanisia prunelloides</i> ³ | Setima-mollo, Icimamlilo |
| <i>Sebaga</i> , <i>S. ocampi</i> - A genus of beetles. ³ | Sebaga |
| THOLA - This is a special super multi-nutrient which was specially formulated for BIO-SIL (a private company). ¹ | Aloe, Camomile, Celery Seed, Cordyceps, MSM, Dandelion Root, Diatomaceous Earth, Fulvic Acid, Moringa, Nettle and Turmeric. |

Source: 1. Madikizelaab, B., Ndhalaac, A.R., RengasamyaL, K.R.R., McGawab, J., Van Staden, A. (2017).
 2. Mhlongo, I.S., Van Wyk, B. (2019).
 3. Mariod, A., Abdelwahab, S. (2012).

Conclusions

The results of the study reveal that there are vast differences in knowledge, management practices and treatment modalities of African traditional healthcare practitioners. This could be explained by the differences in the ages, training, home language spoken and experience of the African traditional health practitioners. Whilst the results of this study report on a small number of practitioners in just one area of South Africa, they cannot be extrapolated to the rest of the country. Therefore, further research in the knowledge, practises and treatment of African traditional healthcare practitioners needs to be conducted. Additionally, traditional medicine practitioners have expressed the need to collaborate with allopathic dental practitioners to improve both their knowledge and their patient treatment outcomes. Mutual cooperation, collaboration and integrating African traditional health practitioners into primary oral healthcare services need to be upscaled and prioritised.

Conflict of Interest/Competing Interests

The authors declare no conflict of interest or competing interests.

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2.2 Conclusion

The lack of standardised diagnosis, treatment and further management protocols for common oral health conditions by African traditional healers is cause for concern as the different treatment modalities may be counter-productive to ensuring optimal patient outcomes. Whilst this research is of limited scope due to the small number of participants, it is vital that this gap be reduced through a series of interventions such as training, curriculum content development and policy analysis and implementation by key stakeholders.

With the roll-out of the National Health Insurance scheme it is important to consider incorporating African traditional health practitioners into the mainstream health delivery market, thus improving access for the masses who may otherwise not be able to obtain the required oral healthcare that they may require.

2.3 Summary

This chapter presented the journal article that developed from the study. The developed journal article addressed the aim and all the objectives of the study.

CHAPTER 3: Concluding Chapter

3.1 Introduction

This chapter presents an analysis of how the aims and objectives of the study were addressed. An outline of the study limitations is presented. This is followed by a statement related to the significance of the study. The chapter concludes with a set of recommendations.

The aim of the study is to investigate and analyse the methods used by African traditional health practitioners, and also gain an understanding of methods used to treat oral health conditions. This aim was fully achieved during the course of the research and the researcher was able to foster a better understanding and gain improved knowledge into the knowledge, practices, and management of common oral health conditions by African traditional health practitioners in Soweto, Johannesburg.

The results of Objective 1, which was to determine the diagnostic and treatment methods used by African traditional health practitioners to identify oral health conditions. The participants were asked about their diagnostic and treatment of four common oral health conditions, namely: sores on the tongue, sores on the lips, sores on the gums and toothache. The African traditional health practitioners, both as part of the questionnaire study and as part of the focus group interviews, provided insight into their diagnostic practices, including diagnostic methods such as throwing the bones, and seeking ancestral intervention in formulating a diagnosis and treatment plan for the presenting patient and condition.

Regarding Objective 2, which was to determine the type of herbs or treatment modality used by African traditional health practitioners to treat the oral health conditions; and this objective was achieved in that the researcher was given insight into the multitude of plant and plant based medicants (flora), animal products (fauna), and spiritual practices such as communicating with the ancestors through the burning of *imphepho* (an incense which facilitates the process of “talking to the spirits/ancestors”). An extensive, but not exhaustive, list of plants and their derivatives, together with their scientific and vernacular names was compiled. It is envisaged that this list could be the basis of further scientific research into the medicinal and therapeutic properties of these plants and derivatives and be used in the mainstream treatment of oral health conditions in the future.

The results from Objective 3, which was to the type of management techniques used by African traditional health practitioners in the management of oral health conditions. The results revealed that whilst many African traditional health practitioners had a basic knowledge of oral hygiene and post pathology care, this was often limited to salt-water mouthwashes and basic daily toothbrushing. This emphasis the need for advance oral hygiene instruction education, and also post-procedure care advices following the treatment of these common oral health conditions.

3.2 Study Strengths and Limitations

In a study of this nature there are bound to be both obvious and hidden factors that could affect the study. The study had a number of limitations, including that due to the nature of traditional medicine it is often difficult to gain access to these practitioners by researchers. This is compounded by the fact that the principal researcher is a black female, and that cultural and masculine barriers made it difficult to gain access to the male African traditional health practitioners. This was compounded by the distrust held by African traditional health practitioners for academic researchers, with a number of the participants accusing the researcher of wanting to “steal information from them”, as other academic researchers had done in the past. The African traditional health practitioners were not willing to reveal their diagnostic and treatment methods. Their reason was that most researchers have visited them before, took the information and did tests on some of the plants that they revealed to them. These researchers then joined the modern pharmaceutical companies and when the experiments were a success, they did not acknowledge the traditional healers who provided them with information, and also did not financially compensate them. The researcher was able to convince the participants that this was not the case.

Another limitation is that the study is only being conducted in Soweto township of Johannesburg and not nationally. However, Soweto is regarded as a melting pot of South African culture, drawing people from all over the country, and hosting all South African languages, religions and cultures. This does not however allow for the results to be generalised provincially and nationally. Other limitations included not having an adequate sample size as it was problematic to recruit participants due to the fact that many African traditional health practitioners are not formally trained, registered or regulated.

3.3 Significance of the Study

The study provided valuable insight into the knowledge, practices and management of common oral conditions by African traditional health practitioners. This study contributed to the literature and scholarship of knowledge regarding the knowledge, practices and management of common oral conditions by African traditional health practitioners.

During the course of the research the researcher was able to gain an improved knowledge and understanding of the knowledge, practices, and management of common oral health conditions by African traditional health practitioners in Soweto, Johannesburg. This is of especial relevance to the researcher, as she is a dental practitioner in the public health sector that works in and provides services to residents of the study area. As such she has come across patients who were either treated by African traditional health practitioners or who were referred to the public health system by African traditional health practitioners. Of note is that the referral process used by these African Traditional health practitioners was not a formal one, with written notes of pertaining to diagnosis, management thus far

and a request for further management. Instead the patient was asked to go to the dental clinic or dentist, and this procedure is problematic as the patients may have already initiated a course of care that was commenced by an African traditional health practitioner, and this treatment may mask signs and symptoms of the presenting oral health condition, which could possibly lead to a misdiagnosis/underdiagnosis, resulting in sub-optimal patient care. An excellent of this will be where the patient was administered with a herbal medicant such as where a repeated application of swabs of the latex of the plant *Chlorophora tinctora* are placed on the tooth over a period of time for tooth extraction. Whilst no pain, trauma or bleeding is involved the careless application of this medicant could result in spillage or damage to adjacent teeth and may lead to unintended extraction of unaffected teeth.

Thus, by investigating the knowledge, practices and management of oral conditions by African traditional health practitioners and their ability to render appropriate management of common oral health conditions (sores on the lips, tongue and gums, and toothache). An understanding of the variety of dental and non-dental, traditional and spiritual treatment of these common conditions by the African traditional health practitioners has proved to be valuable in establishing a base from which further research can be conducted. Additionally, the gaps that were identified, and the recommendations that arise out of this study could lead to improved practitioner knowledge and treatment methods, and to improve patient health outcomes. Additionally, it could lead to an improvement in the referral relationship pathway between dental practitioners and African traditional health practitioners.

3.4 Recommendations

A number of recommendations arise out of this study. The first recommendation is that there are models that have been developed by the World Health Organization for institutionalizing African traditional health practice into health systems. Policymakers need to adopt and adapt these models to suit local South African conditions.

The second recommendation is to develop and offer training programmes to African traditional health practitioners in the areas of dental anatomy, diagnoses, atraumatic restorative techniques, management of post-operative complications, and with the advent of the covid-19 coronavirus, training in standard infection prevention and control measures.

The third recommendation arising out of this study is the need to conduct scientific research on the traditional medicinal flora and fauna used by African traditional health practitioners in the diagnosis, management, and treatment of oral conditions.

The fourth and final recommendation arising out of this study is that of the need to encourage, enhance and support collaboration between allopathic dental practitioners (dentists, dental therapists and oral hygienists) and African traditional health practitioners in an effort to improve patients access and quality of care outcomes, especially in view of the roll-out of the National Health Insurance scheme.

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5. Appendices

Appendix 1 Interview Schedule

Study Title: AN ANALYSIS OF METHODS USED BY AFRICAN PRACTITIONERS TO TREAT ORAL HEALTH CONDITIONS IN JOHANNESBURG, GAUTENG

ASSIGNED NUMBER/CODE: _____

SECTION A - DEMOGRAPHICS

Assigned Number _____

1. Age
2. Gender
3. Location
4. Ethnicity
5. Number of Years in Practice

SECTION B - KNOWLEDGE

6. What causes the following:

- Sores on the lips
- Sores on the tongue
- Swollen gums
- Toothache

SECTION C - ATTITUDES

7. Are you confident in treating the following conditions:

- Sores on the lips
- Sores on the tongue
- Swollen gums
- Toothache

8. How do you treat the following:

- Sores on the lips
- Sores on the tongue
- Swollen gums
- Toothache

9. Would you be comfortable in referring any patients who present with these conditions to a dental practitioner? At what stage would you refer the patient and why at that stage?

SECTION D - PRACTICES

10. What do you use (medication/herbs/other) to treat the following:

- Sores on lips
- Sores on the tongue
- Swollen gums
- Toothache
- Swollen face

11. Do you use any other treatment modalities? If yes please describe.

12. What advice do you give to your patients on manage the following:

- Sores on the lips
- Sores on the tongue
- Swollen gums
- Toothache

13. Is there anything else that you would like to tell me about your identification and treatment knowledge and practices of oral health conditions?

Thank you very much for your participation.

Appendix 2: Focus Group Interview Schedule

ASSIGNED NUMBER: _____

SECTION A: DEMOGRAPHICS

1. Age
2. Gender
3. Location
4. Ethnicity
5. Number of years in practice

SECTION B – Knowledge, Attitude and Practices

- As African traditional health practitioners you may have to treat patients presenting with the following conditions - Sores on lips, sores on the tongue, swollen gums, toothache and a swollen face. Besides the already mentioned knowledge that you possess is there any other knowledge that you may have gained (e.g. allopathic medicine knowledge)?
- Are you attending any continuous medical education courses to improve your knowledge of treating these oral conditions?
- Do you think that African traditional health practitioners can benefit from receiving training from an allopathic dental practitioner in order to be able to treat these conditions according to Western standards?
- Do you think that a combination of both traditional and allopathic medicine will present an ideal option in constructing a treatment plan for a patient presenting with these oral conditions? Or do you feel that a traditional health approach is the ideal?
- Have you had much success in treating oral conditions? Alone? Or together with a dental practitioner?
- Is there anything that you would like to tell me about your knowledge, attitudes and practices in treating patients presenting with oral health conditions?
- Thank you

Appendix 3 Information sheet

Study Title: AN ANALYSIS OF METHODS USED BY AFRICAN TRADITIONAL HEALTH PRACTITIONERS TO TREAT ORAL HEALTH CONDITIONS IN JOHANNESBURG, GAUTENG

Date:

Greeting: (Traditional greeting will be used)

My name is Mangoedi Kinder Modisha, from the Discipline of Dentistry, University of Kwazulu-Natal, Durban. My contact details are as follows: Ms Mangoedi Kinder Modisha at (011) 717 2594/5, kinder.modisha@wits.ac.za.

I am conducting a study on the knowledge, diagnostic and treatment methods used by African traditional health practitioners in the treatment of Oral Health Conditions in Johannesburg, Gauteng, South Africa. The study is part of the requirements for the Masters in Medical Sciences at the University of Kwazulu-Natal. You are being invited to consider participating in this study.

The aim and purpose of this research is to investigate and gain an understanding of methods used by African traditional health practitioners to treat oral health conditions. The study is expected to enrol ten participants. It will involve the following procedure: a short (15 minutes) face-to-face audio-recorded interview with the participant using an open-ended structured interview schedule. The duration of your participation if you choose to enrol and remain in the study is expected to be 15 minutes. The study is self-funded.

The study does not have any known risks. I hope that the study will create the following benefits: incorporation of the role of African traditional health practitioners diagnostic methods and treatment modalities in the treatment of oral health conditions at a macro (policy) and micro (implementation) level in South Africa. The study will have no immediate direct benefits to participants.

This study has been ethically reviewed and approved by the UKZN Biomedical Research Ethics Committee (approval number BE451/19).

In the event of any problems or concerns/questions you may contact the researcher at (011) 717 2594/5, kinder.modisha@wits.ac.za. or the UKZN Biomedical Research Ethics Committee, contact details as follows:

Biomedical Research Ethics Administration,

Research Office,

Govan Mbeki Building,

Westville Campus, Private Bag X 54001, Durban, 4000, KwaZulu-Natal, Tel: 27 31 2604557- Fax: 27 31 2604609, Email: BREC@ukzn.ac.za

Note that participation in this research is voluntary and participants may withdraw participation at any point by merely informing the researcher, and that in the event of refusal/withdrawal of participation the participants will not incur penalty.

There are no costs that you will incur as a result of participation in the study. There are no incentives or reimbursements for participation in the study, however refreshments will be provided to the participants.

Confidentiality

The information on the questionnaire will be kept confidential, and no names will be recorded on the form. Any data collected will be securely stored by the researcher, and destroyed after a period of five years.

Contact details of the researcher

If you have any queries or would like more information on the study, please contact

Ms Mangoedi Kinder Modisha at (011) 717 2594/5, kinder.modisha@wits.ac.za

Your participation will be highly appreciated.

APPENDIX 3

CONSENT

I _____ (Name) have been informed about the study entitled (provide details) by (provide name of researcher/fieldworker).

I understand the purpose and procedures of the study (add these again if appropriate).

I have been given an opportunity to answer questions about the study and have had answers to my satisfaction.

I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting any of the benefits that I usually am entitled to.

I have been informed about any available compensation or medical treatment if injury occurs to me as a result of study-related procedures.

If I have any further questions/concerns or queries related to the study I understand that I may contact the researcher at (provide details).

If I have any questions or concerns about my rights as a study participant, or if I am concerned about an aspect of the study or the researchers then I may contact:

BIOMEDICAL RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus

Govan Mbeki Building

Private Bag X 54001

Durban

4000

KwaZulu-Natal, SOUTH AFRICA

Tel: 27 31 2604557 - Fax: 27 31 2604609

Email: BREC@ukzn.ac.za

Additional consent, where applicable

I hereby provide consent to:

Audio-record my interview YES / NO

Signature of Participant

Date

Signature of Witness
(Where applicable)

Date

Signature of Translator
(Where applicable)

Date

Appendix 4 Research Ethics Clearance



29 October 2019

Ms Mzi Modisha (218088057)
School of Health Sciences
College of Health Sciences
dentaltherapist@hotmail.com

Dear Ms Modisha

Protocol: An analysis of methods used by African traditional medicine practitioners to treat oral health conditions in Johannesburg, Gauteng
Degree: MMedSc
BREC Ref No: BE451/19

EXPEDITED APPLICATION: APPROVAL LETTER

A sub-committee of the Biomedical Research Ethics Committee has considered and noted your application received on 18 June 2019.

The study was provisionally approved pending appropriate responses to queries raised. Your response received on 15 October 2019 to BREC letter dated 30 July 2019 has been noted by a sub-committee of the Biomedical Research Ethics Committee. The conditions have been met and the study is given full ethics approval and may begin as from 29 October 2019. Please ensure that outstanding site permissions are obtained and forwarded to BREC for approval before commencing research at a site.

This approval is valid for one year from 29 October 2019. To ensure uninterrupted approval of this study beyond the approval expiry date, an application for recertification must be submitted to BREC on the appropriate BREC form 2-3 months before the expiry date.

Any amendments to this study, unless urgently required to ensure safety of participants, must be approved by BREC prior to implementation.

Your acceptance of this approval denotes your compliance with South African National Research Ethics Guidelines (2015), South African National Good Clinical Practice Guidelines (2006) (if applicable) and with UKZN BREC ethics requirements as contained in the UKZN BREC Terms of Reference and Standard Operating Procedures, all available at <http://research.ukzn.ac.za/Research-Ethics/Biomedical-Research-Ethics.aspx>.

BREC is registered with the South African National Health Research Ethics Council (REC-290408-009). BREC has US Office for Human Research Protections (OHRP) Federal-wide Assurance (FWA 678).

The sub-committee's decision will be noted by a full Committee at its next meeting taking place on 10 December 2019.

Yours sincerely


Prof. V. Rambiritch
Chair: Biomedical Research Ethics Committee

cc: Fieldwork Officer: 2000120@ukzn.ac.za Supervisor: 2000120@ukzn.ac.za

Biomedical Research Ethics Committee
Professor V. Rambiritch (Chair)
Westville Campus, Govan Mbeki Building
Postal Address: Private Bag 904001, Durban 4000
Telephone: +27 (0) 31 201 2400 Facsimile: +27 (0) 31 201 4000 Email: brec@ukzn.ac.za
Website: www.ukzn.ac.za/research-ethics/biomedical-research-ethics.aspx

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Promoting the highest ethical standards in the protection of biomedical research participants

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du programme de formation TRREE en évaluation éthique de la recherche
of the TRREE training programme in research ethics evaluation



Professeur Dominique Sprumont
Coordonnateur TRREE Coordinator

Release Date: 2018/09/04
CID: 804602324



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[REV : 20170510]



Zertifikat

Certificado

Certificat

Certificate

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Professeur Dominique Sprumont
Coordinateur TRREE Coordinator



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