KNOWLEDGE, ATTITUDES AND PRACTICES REGARDING ORAL CANCER AMONG DENTAL PRACTITIONERS IN GAUTENG

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A research report submitted to the Faculty of Health Sciences, University of Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the

Degree of

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DECLARATION

I, **Itumeleng D Mahlomoje** (1024223), declare that this research report is my own original work. It is being submitted in partial fulfilment for the degree of Master of Science in Dentistry at the University of the Witwatersrand, Johannesburg, South Africa. It has not been submitted for any other degree or examination at this university or any other university.

Dr ID Mahlomoje _____

Signed at _____ (place) on the_____ day of_____in the year 2020

School of Oral Health Sciences

University of the Witwatersrand

DEDICATION

I am grateful to the Almighty God for blessing me with the opportunity to undertake and complete this Research Report.

I would like to express my gratitude towards my family for their encouragement which helped me in completing this study.

My beloved and supportive wife, Boitumelo who was always by my side when I needed her most and my loveable children ,Onthatile and Oabile who served as my inspiration to pursue this undertaking.

ABSTRACT

This study **aims t**o assess the knowledge, attitudes and practices regarding oral cancer among the dental practitioners in the Gauteng province. The **objectives** of the study are: (1) To describe the demographic characteristics of the Dental Practitioners in Gauteng, (2)To measure the level of knowledge, attitudes and practices among the different categories of dentists in Gauteng , (3) To determine factors associated with knowledge, attitudes and practice regarding oral cancer among dental practitioners in Gauteng. **Methods:** As part of a cross-sectional study design a self-administered questionnaire was used to collect data among dental practitioners in Gauteng. **Results:** The total number of study participants was 102 and with the median age of 36 years (30-45.5 years). The majority of participants were females (71.8%) and median number of years worked in public service was nine years (5-14.5 years).The dental practitioners had sound knowledge about oral cancer. Approximately 95.1 % correctly answered that the most common site of oral cancer besides lips is the tongue and floor of the oral cavity and the most common form of oral cancer is squamous cell carcinoma. About 98.1 % of the participants correctly identified tobacco use and alcohol consumption as the most common risk factors of oral cancer. About 26 % felt they were not adequately trained to examine oral cancer patients. Enrolled participants (64 %) agreed that their knowledge about oral cancer was not up to date. Longer years of service was significantly associated with a decrease in attitude scores (unfavorable attitude) [rs= 0.254 and p=0.045 value]. Time constrains were stated as a barrier from performing oral cancer examinations. **Conclusion:** Dental practitioners had adequate knowledge regarding oral cancer; however, they felt that they needed to be continuously capacitated in order to keep up with the latest developments regarding oral cancer. Time constraints, longer years and lack of training are barriers to dental practitioner's attitudes and practice. There is a need for education in oral cancer examination and diagnosis such as refresher training amongst dental practitioners to build confidence in the identification of premalignant lesions and patients at risk.

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TABLE OF CONTENTS

DECLARATION ii
DEDICATION iii
ABSTRACT iv
ACKNOWLEDGEMENTS v
TABLE OF CONTENTS vi
LIST OF FIGURES ix
LIST OF TABLES x
LIST OF APPENDICES xi
ABBREVIATIONS AND ACRONYMS xii
CHAPTER 1: INTRODUCTION 1
1.1 Introduction and Background 1
1.2 Oral cancer 2
CHAPTER 2: LITERATURE REVIEW 4
2.1 Definition of terms 4
2.2 Epidemiological trends of oral cancer 4
2.3 Assessment studies of knowledge, Attitude and Practice on oral cancer 5
2.4 Risk factors 8
2.5 Significance of the study 9
2.6 Concluding remarks **Error! Bookmark not defined.**
AIMS AND OBJECTIVES OF THE STUDY 10
CHAPTER 3: METHODOLOGY 11
3.1 Study Design 11
3.2 Study Population 11
3.3 Inclusion criteria 11
3.4 Exclusion criteria 11
3.5 Sampling Method 11

3.6 Sample Size 11

3.7 Study instrument 11

3.8 Data collection 12

3.9 Data management 12

3.10 Data analysis and statistics 13

3.11 Ethical Consideration 14

CHAPTER 4: RESULTS 15

4.1 Test for normality 15

4.2 Socio-demographic characteristics 15

4.3 Knowledge, Attitude and Practice on Oral Cancer 18

4.3.1 Knowledge and attitude percentage and scores among dentists and DT & OH 18

4.3.2 Knowledge of dental therapists and Oral hygienist group about oral cancer 19

4.3.3 Attitude of Dentists about Oral Cancer 20

4.3.4 Attitude of DT & OH about Oral Cancer 21

4.3.5 Practices of study participants in the management of oral cancer 22

4.4 Associations of demographic variables with knowledge, attitude and practice among dentists 25

4.4.1 Associations of demographic variables with knowledge and attitude among dentists 25

4.5 Association of demographic variables with knowledge, attitude and practice among DT & OH 29

4.5.1 Association of demographic variables with Knowledge and Attitude among DT & OH group 29

4.6 Relationship between attitude and practice among study participants 31

4.6.1 Relationship between knowledge and attitude among study participants 31

CHAPTER 5: DISCUSSION 33

5.1 Socio-demographic characteristics 33

5.2 Knowledge on Oral Cancer 33

5.3 Attitude on Oral Cancer 34

5.4 Practices of participants 35

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS 38

6.1 Conclusion 38

6.2 Recommendations 38

REFERENCES 39

APPENDICES 45

APPENDIX I: STUDY QUESTIONNAIRE 45

APPENDIX II: PARTICIPANTS INFORMATION SHEET 50

APPENDIX III: CONSENT FORM 51

APPENDIX IV: ETHICS APPROVAL LETTER 52

LIST OF FIGURES

Figure 4.1: Distribution of study participants by Sex……..16

Figure 4.2: Distribution of participants by occupation……16

Figure 4.3: Knowledge and attitude scores of participants in the study…….18

LIST OF TABLES

Table 4.1: Test for normality…….....15

Table 4.2: Demographic characteristics of the participants……17

Table 4.3: Knowledge of dentists about oral cancer……19

Table 4.4: Knowledge of Dental therapists and Oral Hygienists……20

Table 4.5 Attitude of dentists about oral cancer…… 21

Table 4.6: Attitude of DT & OH regarding training management of patients……22

Table 4.7: Practice of dentists and DT & OH about oral cancer……24

Table 4.8: Correlation coefficient between the knowledge and attitude scores and sociodemographic dentists…….25

Table 4.9: Relationship between sociodemographic characteristics of gender and district, knowledge and attitude percentage scores……..26

Table 4.10: Relationship between knowledge and practice dentists……27

Table 4.11: Relationship between attitude and practice dentists ……28

Table 4.12: Correlation between the knowledge and attitude scores and sociodemographic variables among DT &OH group……29

Table 4.13: Relationship between knowledge and attitude scores with gender and district among DT& OH group……..30

Table 4.14: Relationship between knowledge and practice among dental therapists……..31

Table 4.15: Relationship between knowledge and attitude among Dentists and DT/OH……32

LIST OF APPENDICES

APPENDIX I: Study Questionnaire

APPENDIX II: Participants Information Sheet

APPENDIX III: Consent Form

APPENDIX IV: Ethics Approval Letter

ABBREVIATIONS AND ACRONYMS

DHS: District oral health services

DT/OH: Dental Therapist/Oral hygienist

HPCSA: Health Professions Council of South Africa

NCD: Non-Communicable Diseases

SANOHS: South African National Oral Health Strategy

OHTI: Oral Health Training Institutions

OC: Oral Cancer

PHC: Primary Health Care

CHAPTER 1: INTRODUCTION

1.1 Introduction and Background

Oral cancer (OC) is a life threatening condition and has a negative impact on quality of life. The cost of managing the condition is high and weighs heavily on the health care system. (Daly et al., 2013).Until recently, not enough emphasis has been placed on effective dental public health intervention for oral cancer (Daly et al., 2013).

Evidence from the two South African National Oral Health Surveys (van Wyk et al., 2004; van Wyk and van Wyk, 2004) and other published data (Mqoqi et al., 2004; and Ayo-Yusuf et al., 2013) involving South African cohorts reveal that oral diseases are a salient epidemics that are prevalent among the most vulnerable groups.

Primary Health Care (PHC) services include oral health promotion, oral diseases prevention, and curative services including rehabilitative oral services at primary, secondary, tertiary and rehabilitative level (Naidoo and Willis, 2005). Prevention and promotion at primary level aims to reduce or eliminate exposure to disease in this case; oral cancer-predisposing factors (Thun et al., 2010). The Primary Health Care approach recognizes that chronic Non-Communicable Diseases (NCD) such as obesity, heart disease, diabetes and oral diseases share a set of particular risk factors such as poor diet, lack of exercise, excessive smoking and high consumption of alcohol (Sheiham &Watt, 2000; SANOHS,2005). According to the World Health Organization (WHO), 15 million people die from a NCD between the ages of 30 and 69 years annually. The exploding NCD epidemic is related to unhealthy life styles (WHO, 2018).

According to the South African National Oral Health Policy and Strategy, other oral diseases and conditions raising public health concerns in South Africa and in Africa are oral cancer, periodontal diseases and oral manifestation of HIV-AIDS and dental trauma (SANOHS, 2005). Cancers of the oral cavity and the oro-pharyngeal (OAP cancer) are amongst the leading cancer types in South Africa with an age standardised annual incident rate of incidence rate of $7.01/10^5$.

Oral cancer is a major public oral health problem. It has a high prevalence in South Africa where 7% of the overall deaths are due to oral cancer (Alwan, 2010). OC can be preventable as the major risk factors are well known and if diagnosed early oral cancer is treatable (Warnakulasuriya, 2009a). Oral cancer is expensive to treat due to the multi-disciplinary

nature of comprehensive management, (Torres-Pereira, 2010; Mqoqi et al., 2004; and Ayo-Yusuf et al., 2013).

South African Goals for 2030 are to reduce the burden of oral diseases. Oral health and general health care have a common aim of improving the well-being of South Africans. Therefore, solutions to control oral diseases are to be found through shared approaches with integrated chronic disease prevention. The integrated approach means that patients visiting health facilities should be screened holistically to assess common risk factors related to NCDs (Sheiham and Watt, 2000; Regional Committee for Africa, 2016).

In South Africa, the training of oral health professionals is done according to the needs as identified by the National Human Resource Plan in collaboration with the Directorate of Oral Health in the Gauteng province. The Academic Oral Health Training Institutions (OHTIs) provide critical service of producing knowledgeable, skilled, competent dental practitioners with positive attitude and values that ensure quality of oral care and making the best use of available resources (SANOHS,2005).

District oral health services (DHS) are purposefully selected to ensure a range of dental services to the majority of the people in the community (SANOHS, 2005). Districts form a cornerstone of the health system for Gauteng health service users. District clinics are geographically represented and linked to PHC facilities. In the Gauteng province the five districts, namely; Johannesburg metro, Sedibeng, West Rand, Ekurhuleni and Tshwane are coherently, geographically defined areas in which all health services are coordinated by one district health authority which is the lowest level of government (SANOHS, 2005). At this level where the dental practitioners are based, they are at an advantage of constantly being in contact with the people of all cultures and lifestyles.

1.2 Oral cancer

The term “oral cancer” (OC) includes a diverse group of tumours developing from the oral cavity including cancers of the lip, tongue and pharynx. Cancer of the oral cavity and oropharyngeal cancer are amongst the leading cancer types globally (Warnakulasuriya, 2009). Oral and oropharyngeal cancers grouped together are the sixth most common cancers in the world and the prevalence of oral cancer is particularly high among men (Warnakulasuriya, 2009). Incidence rates for oral cancer vary in men from 1-10 cases per 100,000 population in

many countries (Warnakulasuriya,2009) and in South Africa it ranges from 3-7cases /100000 (Ayo-Yusuf et al.,2013).The World Health Organization (WHO) reported oral cancer as having one of the highest mortality ratios amongst all malignancies and ranks 12th among all cancers (Warnakulasuriya,2009). The majorities of malignant neoplasms in the mouth are squamous cell carcinomas (SCC) and are among the top 10 occurring cancers in South Africa (Mqoqi et al., 2004). Oral and pharyngeal cancer continues to be a significant disease burden in South Africa (Ayo-Yusuf et al., 2013)

In South Africa it is estimated that cancer contributes to 7% of the overall deaths (29%) which are due to the non-communicable diseases (NCD) (Alwan, 2010). Oral cancer has severe impact on the individuals diagnosed with oral cancer. They have a survival period of five years and the overall disease specific survival rates of less than 60 % (Oral cancer foundation, 2014). Those that do survive often suffer major functional, cosmetic, and psychological burden due to dysfunction in their ability to speak, swallow, breathe, and chew (Oral cancer foundation, 2014). Poor survival rates are due to failure to detect the small oral lesions (less than 2cm in diameter) since at least 60% of patients present with oral lesions over 2cm, of those presenting with larger lesions about 60% of them die within 5 years (Global cancer, 2013).

Oral cancer is a public health problem with known risk factors; established and effective preventive strategies and treatments are available, yet the cases continue to be reported. In order to plan preventive measures, it is important to understand the risk factors associated with the disease. The major risk factors are well known such as alcohol, smoking and betel quid /areca nut chewing) as well as the presence of potentially pre-malignant lesions like leukoplakia and erythroplakia (Warnakulasuriya, 2009a).

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The review of this literature provides a comprehensive summary of published works sourced from popular medical databases. The focus of this section will be on the following aspects:

- Epidemiology of oral cancer
- Knowledge issues or gaps around screening for OC premalignant lesions
- Attitudes of practitioners with screening for OC premalignant lesions
- Practices of practitioners with screening and diagnosis for OC premalignant lesions

2.2 Definition of terms

For the purposes of this study, Dental Practitioner refers to any dental worker registered with the Health Professions Council of South Africa (HPCSA) as a Dentist, Dental Therapist, and an Oral Hygienist.

Knowledge

Information and understanding about a subject which a person has (Knowledge, 2018)
Attitude

The way you feel about something or someone, or a particular feeling or opinion (Attitude, 2018).

Practice

The action or process of performing or doing something (Practice, 2018)

2.3 Epidemiological trends of oral cancer

Oral cancer epidemiology has been extensively described in many countries regarding incidence prevalence, high mortality rates and morbidity (Torres-Pereira, 2010).A systematic review indicated that there is an increasing research interest in oral cancer prevention and early detection (Patton et al., 2008).The consensus of those studies was that the prevalence of intra- oral cancer appears to be rising worldwide. Oral cavity and oropharyngeal cancers are reported being the seventh most commonly occurring cancer and the ninth deadliest by cancer site in the world (Kebabcioglu and Pekiner, 2018). Oral Cancer is preventable and early

detection depends on the knowledge of dental practitioners being able to screen patients (Eltelety et al., 2014).

According to Antunes et al., data from 2001 in Brazil reveals the incidence rate of oral squamous cell carcinoma to be more common in males (9.69 per 100 000 men than in females (3.25 per 100 000 women) (Antunes et al., 2001). The incidence trends are reported as not decreasing. Similar studies were carried out in Italy (Colella et al., 2008), American Cancer Society (Rethman et al., 2010), Iran (Rizvi et al., 2015), India (Shaila et al., 2013), Malaysia (Saleh et al., 2014), Yemen (Al-Maweri et al., 2015) and Hassona et al., 2016 as well as in Jordan (2016), Eltelety et al., 2014 in Jeddah, Saudi Arabia and concluded on a high male to female ratio.

According to Torres-Pereira, 2010, a study using data from the National Cancer Institute Surveillance, Epidemiology and End results (SEER) program in the United States revealed that 8 out of 51 North American States exhibited increasing rates of oral cancer deaths despite the overall decrease in mortality over the past 30 years in the country (Torres-Pereira, 2010).

Rethman et al., 2010 also estimated that there would be 35, 720 new cases of the cancer of the oral and pharyngeal region in the United States in 2009, with 7,600 deaths from the disease and that there would be 23,110 new cases of cancer of oral cavity and 5,370 deaths (Rethman et al., 2010).

African studies are limited as a result of less effective methods of data capturing related to oral cancer in health facilities; it is therefore a challenge to accurately reflect incidences in African countries (Ahmed and Naidoo, 2017). A limited number of studies were identified through literature search on Google Scholar, Pubmed using key words "#1 oral cancer, AND #2 Knowledge, AND #3 Practices, AND #4 Attitudes, AND #5 dental workers / Oral health officials /oral health practitioners/dentists/dental therapist/oral hygienist. These studies are presented below.

2.4 Assessment studies of knowledge, Attitude and Practice on oral cancer

Gbotolorun et al., (2014) conducted a study in Nigeria involving general dental practitioners (GDPs) in both government and private hospitals in Lagos, Nigeria. The results showed that over 98% of respondents reported a good knowledge of risk factors for oral cancer and only 70% , 59% and 55% identified smokeless tobacco, increasing age (above 40 years old) and dietary intake as risk factors respectively. Only 58.1% of 453.4 respondents in the study reported they were up to date in the assessment of oral cancers. The authors concluded that

both educational intervention and a paradigm shift in dental practitioners' attitudes might be necessary for improvement in the early detection of oral cancers in this environment (Gbotolorun et al., 2014).

A study was conducted in Malaysia which aimed to determine the level of knowledge on early signs and risk factors associated with oral cancer and to identify factors which influenced dental practitioners' participation in prevention and early detection of oral cancer(Saleh et al., 2014).. The study found that the level of knowledge on early signs and risk habits associated with oral cancer was high and the majority (93%) reported to have conducted opportunistic screening and advised patients on risk habit cessation. The level of confidence of dental practitioners in performing opportunistic screening was related to them being recent graduates and having attended the Continuous Education programs on Oral Cancer. Saleh et al.,(2014) stated that dental practitioners in Malaysia are uniquely placed to treat oral ailments and are in a position to perform opportunistic screening for oral cancer during which the patient can be advised about risk factors related to oral cancer (Saleh et al., 2014). The study also found that successes of primary prevention are limited because the risky life styles are resistant to change in society today (Saleh et al., 2014).

Ahmed & Naidoo, 2017 conducted a study in Khartoum State, Sudan which sought to assess the knowledge, attitude, and practice of dentists regarding oral cancer prevention and early detection. The study involved 130 dentists working in public dental clinics. The majority of the dentists (90%) were knowledgeable about the major risk factors of oral cancer however more than half of the dentists (54%) reported they do not carry out any special examination to detect oral cancer among asymptomatic patients aged 40 and above. Lack of training was cited as the main barrier for conducting a comprehensive oral cancer examination and the majority of the dentists express their interest to have further oral cancer educational and training sessions (Ahmed and Naidoo, 2017).

Similarly, a review by Colella et al., (2008) indicated Knowledge, Attitude and Practices in regarding prevention and early detection of oral cancer, differed per country and findings varied. An overview of literature in areas that have been studied are as follows:
A study in Brazil found the level of knowledge and clinical expertise to be sub optimal. Therefore continuous professional education is relevant to improve knowledge and attitude of dentists on oral cancer (Leão et al., 2005). Whilst, a similar study in Istanbul, the concluded was that most dentists experienced difficulties in diagnosing some oral mucosal lesions

(Ergun et al., 2009). Similarly, a Malaysian, study highlighted knowledge deficits and practice shortcomings regarding prevention and early detection of oral cancer (Saleh et al., 2014). In India, a pilot survey identified existing gaps in knowledge and practice, among physicians and dentists (Shaila, et. al., 2013). The results were the same in Jeddah, Saudi Arabia, where oral cancer prevention /early diagnosis by dentists was reported is not to be optimal and thus Continuous Professional Education (CPE), required re-assessment (Eltelety et al., 2014). In a study conducted in Spain, the conclusion was that there is a need for improving the diagnostic abilities of general practitioners in the visual detection of oral cancer by strengthening CPE (Seoane et al., 2006).

A specific study by Ravazi et al., (2013) in Iran used a self-administered questionnaire on 150 dentists and found that just one fifth of the dentists reported to perform oral cancer examinations for all of their patients in age of 40 and above and about 34% of them were knowledgeable. The majority claimed that the lack of knowledge was the main barrier to the provision of routine oral cancer examinations. The opinion of dentists about the effectiveness of continuing education courses supported the development of these courses on oral cancer. In addition, the study concluded that more emphasis should be placed on oral cancer prevention in dental schools (Ravazi et al., (2013).

In a similar study in Saudi Arabia by Eltelety et al., (2014); approx. 95% of all dentists who participated, (94, 8%) were interested in taking continuing education courses regarding oral cancer. About 92 % agreed that oral cancer examination is effective in early detection of the disease and they should be adequately prepared to perform oral cancer examination. Only 18, 3% carried out oral cancer examination for every patient above 40 years and the reason for low uptake was either it takes a long time or they didn't know how to perform it. It appears that the current knowledge and practice in oral cancer prevention and early detection among dentists in Jeddah, Saudi Arabia was not up to the desired level. Accordingly, it was suggested that continuous education strategies in Jeddah should be reassessed and emphasis given to oral cancer prevention and early detection.

Haresaku et al., (2018) compared practices, knowledge, confidence and attitude toward oral cancer among oral health professionals between Japan and Australia. The study found that the level of knowledge and confidence regarding oral cancer among Japan oral health practitioners (J-OHPs) were significantly lower than among Australian oral health practitioners (A-OHPs). About 90% of J-OHPs felt that they needed additional training in oral cancer practices. Less than 40% of J-OHPs performed oral cancer screenings in their patients.

The low level of knowledge and confidence regarding oral among J-OHPs may contribute to their low performance of oral cancer practices.

2.5 Risk factors

Risk factors such as increased use of tobacco, snuff, cigars, cigarettes, excessive alcohol intake, and inadequate diet, viral infections, exposure to the sun, socio-economic status, previous history of cancer, genetic disposition and sexual activity are currently on the increase in society due to the pressure of modern lifestyles (Petti, 2009; Ahmed and Naidoo, 2017), and Carnelio et al.,2003), Torres-Pereira, 2010, indicated that tobacco consumption and alcohol drinking were the strongest and most important predictors for intraoral malignant transformation. The risks for both tobacco and alcohol are described as very dose-dependent (Torres-Pereira, 2010).

Preventive messages with strong motivation may lead the patient to quit smoking and preventive components such as primary prevention and early detection have been identified (Naidoo and Willis, 2005). Primary prevention refers to measures which promote good oral health and less risky oral life styles.

In a study involving 330 respondents by Hassona, et al., (2016), half of the participants (n=165) were general medical practitioners and the other half (n=165) were practising dentists. Almost all participants (96.7%) were able to identify tobacco as a main risk factor for oral cancer (Hassona, et. al., 2016).

In summary, the analysis of the literature in this section suggested that there were inconsistencies in the reported findings .The inconsistencies on the level of knowledge and practices among dental practitioners differed by country. There was a relatively small proportion of dental practitioners who practiced opportunistic screenings however, they had minimal knowledge what about resources to use for screening guidelines.

The review of literature also underscored the need for continuing education program for all categories of dental practitioners in order to improve their knowledge and competencies in prevention and early diagnosis of oral cancer.

2.6 Significance of the study

Studies throughout the world have shown that the best predictor of successful treatment outcomes for any cancer (including oral cancer) is related to diagnosis in the earliest stages (Petersen, 2009). Early diagnosis of oral cancer is important in improving survival rates of the disease hence dental practitioners play a major role in screening for the high risk patients so that early interventions can be initiated (Petersen ,2009) It is expected that dental practitioners should be able to make a quick diagnosis of the premalignant lesions however some studies have reported that dental practitioners have a lack of knowledge in detecting these lesions early (Jaber,2011 , Leão et al., 2005,Shaila et al., 2013, Eltelety et al., 2014,Razavi et al., 2013 and Haresaku et al.,2018).Systematically measuring the level of knowledge, attitude and practice among different categories of dental practitioners is of significant importance for the purpose of determining the factors associated with their performance in the primary prevention to eliminate oral cancer causing risk factors, early detection and secondary prevention through screening and treatment in order to increase the survival and cure rates (Haresaku et al., 2018; Al-Maweri, et al, 2015). The prevention and early detection of oral cancer can be achieved in part through dental practitioners who reflect on their knowledge, attitude and practice behaviour and own professional development. Hence the aim of the study was to ascertain the knowledge, attitudes and practices regarding oral cancer among dental practitioners in Gauteng, South Africa.

AIM AND OBJECTIVES OF THE STUDY

AIM

To assess the knowledge, attitudes and practices regarding oral cancer among the dental practitioners in the Gauteng province

OBJECTIVES

1. To describe the demographic characteristics of the dental practitioners in Gauteng
2. To measure the level of knowledge, attitudes and practices among the different categories of dental practitioners in Gauteng.
3. To determine factors associated with knowledge, attitudes and practice regarding Oral cancer among dental practitioners in Gauteng.

CHAPTER 3: METHODOLOGY

3.1 Study Design

A cross-sectional study design was conducted among dental practitioners in Gauteng province.

3.2 Study Population

The target population was all dental practitioners working in the public sector in Gauteng province.

3.3 Inclusion criteria

The study included all the dental practitioners (Dentists, Dental therapist and Oral Hygienists) working in the public sector in Gauteng province.

3.4 Exclusion criteria

Dental practitioners who were excluded from the study were all dental practitioners who were not available at the clinic and those who did not attended CPD meetings on the data collection days. The other group of practitioners excluded from the study were those who are in management positions and not in clinical practice as well as those who did not consent to be part of the study.

3.5 Sampling Method

Convenience sampling method was used where all dental practitioners available at the clinic and those who attended CPD meetings on the data collection days were approached directly. Those dental practitioners that consented to participate in the study were required to complete questionnaires until sample size was reached.

3.6 Sample Size

The sample size was not determined for this study. There are five health districts in Gauteng province namely, Johannesburg, Ekurhuleni, Sedibeng, Tshwane, and the West Rand. A total of 200 dental practitioners were confirmed to be employed in these districts, of the 200 dental practitioners 11 were in management positions and not in clinical practice as a result they were excluded from the study and the final sample was 189 dental practitioners.

3.7 Study instrument

A self-administered questionnaire was used to collect data describing the knowledge, attitudes and practices of dental practitioners related to the screening and detection of oral cancer

(Appendix I). The tool consisted of 26 item questions which were separated into four parts as adapted from Yellowitz et al., (1995), Eltelety et al., (2014), Ergun et al., (2009) and Rizvi et al., (2015). Part 1: Consisted of questions relating to the demographic characteristics of the participants like age, gender and years of experience. Part 2: consisted of questions on the measurement of knowledge variables which included oral cancer signs and symptoms, diagnostic and prognostic factors, common sites, populations at risk and associated risk factors .Part 3: Variables measuring attitudes which included assessing the need for and usefulness of oral cancer screening and opinions on referral as well as the time needed for examination. These variables were scored on a five-point Likert scale with scores of 'one' indicating strongly disagree with a statement and 'five' indicating strongly agree. Part 4 of the questionnaire comprised of five multiple choice questions assessing the practices of the dental practitioners in screening for oral lesions and variables used included: number of patients routinely screened for oral cancer, number of suspicious lesions identified, number of referrals made from identified lesions, and action done based on patients' risky lifestyle habits.

The questionnaire was piloted on the dental practitioners working at Wits Oral Health Centre for feasibility, ambiguity and time taken to complete the questionnaire. Few changes were made to questionnaire and they were related to the clarity of the Likert scale responses.

3.8 Data collection

Data collection was scheduled during the staff continuous professional education (CPD) meetings where most practitioners were expected to attend. The researcher visited the sites (clinics/hospitals) in the district during the scheduled dates where the dental practitioners were attending their CPD meetings and distributed the questionnaires. The participants had to read the participant`s information sheet (Appendix II) and then complete the consent form (Appendix III) should they wish to participate. The questionnaires (Appendix I) were placed in a sealed envelope for each participant together with the participant`s information sheet (Appendix II) and a return envelope. Each return envelope and its contents were coded with a unique number. These envelopes were handed to the various dental practitioners who were present in the scheduled meetings. Completed questionnaires were collected by the researcher at a date that was arranged with the facility. Data collection was conducted from July 2018-November 2018.

3.9 Data management

The knowledge, attitude and practice questionnaire were presented as categorical variables in a five-point Likert scale. The knowledge and attitude section were further converted into

percentage scores. For the knowledge section, the correct answer was coded as 'yes=1', 'don't know= 2' and the wrong answer was coded as 'no=3'. The scores were calculated to a percentage and the results were inverted, therefore, resulting into a knowledge percentage score, with the maximum possible score at 100% and the minimum possible score at 20%. A score of 20%-50% indicated poor knowledge, 51-80% =Optimal knowledge and 81%-100%=Good /Excellent knowledge.

For the attitude section, the good attitude was coded as 'yes=1', 'don't know = 2'and the bad attitude was coded as 'no=3'. The scores were calculated to a percentage and the results were inverted, therefore, resulting into attitude percentage score, with the maximum possible score at 100% and the minimum possible score at 20%. The result was further divided into categories with the cut off set at 50%. A score of less than 50% demonstrated a bad/unfavourable attitude and 51%-100% showed a good/favourable attitude.

3.10 Data analysis and statistics

All the collected data was captured from the questionnaires into Microsoft Excel, cleaned and verified and then exported in to SPSS software (version 26) after for further analysis. Descriptive summary statistics and measures of central tendency using median, interquartile, range, mode, frequencies and percentages were used to summarise data. Shapiro-Wilk test was used to test for normality. Inferential statistics of Kruskal-Wallis and Mann Whitney U was used to determine the significant difference between three and two groups respectively. The statistical significance level was set at $p \leq 0.05$.

Frequency tables were used to present categorical variables. During the data analysis, it was observed that participants could be placed into two categories: 1) Those that received more than three years training such as Dentists and 2) Those that were trained in three years or less. To address this potential confounder, the results on the three important outcome variables under study, namely: Knowledge, Attitudes and Practices were categorised by whether practitioner is a Dentist or Dental Therapist /Oral Hygienist (DT/OH).

3.11 Ethical Consideration

The Human Research Ethics Committee (HREC) of the University of Witwatersrand and the Gauteng Department of Health granted permission to undertake the study and the ethics clearance certificate is attached as Appendix VI (Ethics Clearance Certificate number M180734). The dental practitioners who participated in the study received an information sheet (see Appendix II) and a written consent form to participate in the study (see Appendix III), which they had to sign.

CHAPTER 4: RESULTS

This chapter focuses on the findings of the study and results will be presented according to the study objectives i.e. firstly, Sociodemographic characteristics according to age, gender, years,; secondly the knowledge, attitudes and practice of the oral health workers regarding oral cancer. Lastly, the factors associated with the outcome measures in the study.

4.1 Test for normality

The following variables were not normally distributed hence the median and interquartile range were used to report the results.

Table 4.1: Test for normality

	Shapiro-Wilk Test		
Tests of Normality	**Statistic**	**df**	**Sig.**
Public service	0.12	103	0.00
Hours/week	0.758	103	0.00
Patients/day	0.134	103	0.00
Age	0.133	101	0.00

4.2 Socio-demographic characteristics

Table 4.2 and Figures 4.1 and 4.2 describe the socio-demographic characteristics of the study population. The total of 103 participants were enrolled in the study; was 103 and one questionnaire was discarded due to incomplete information which resulted in the response rate of 54%. The participants' median age was 36yrs (IQR 30- 45.5yrs). A large proportion of participants (42.57%) were of ages between 30-39yrs. Females were in the majority (71.80 %) with 9 yrs (5-14.5yrs) as the median number of years worked in public service. About 60% have never worked in the private sector. The number of hours worked weekly was 40hrs while seeing a median number of 25 patients (18.5-30 patients) per day. Half of the participants were from both the Ekurhuleni and Sedibeng districts (25% respectively).

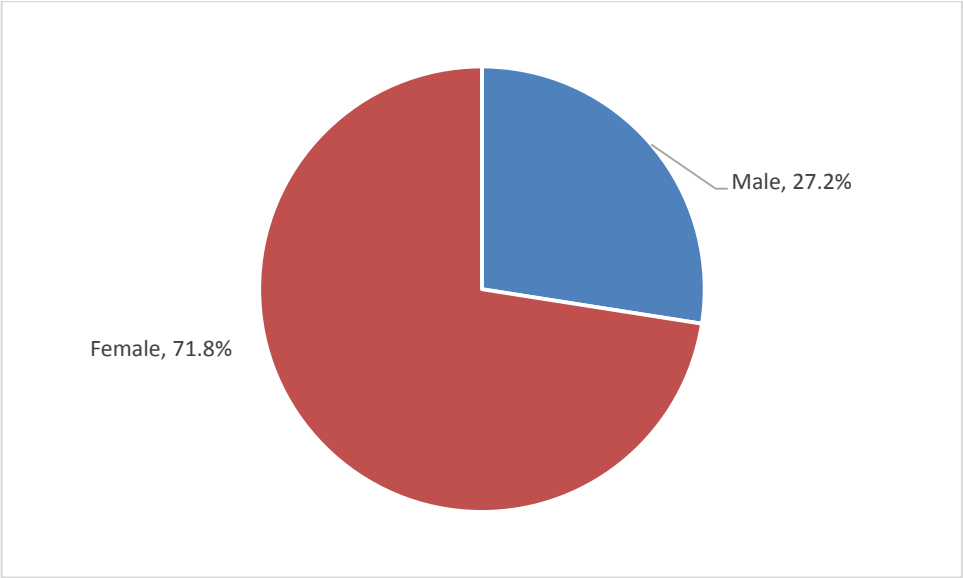

Figure 4.1: Distribution of study participants by Sex

About 65% of the participants were dentists and both categories of practitioners (Dentists& DT/OH) have spent about 9 years working in public service.

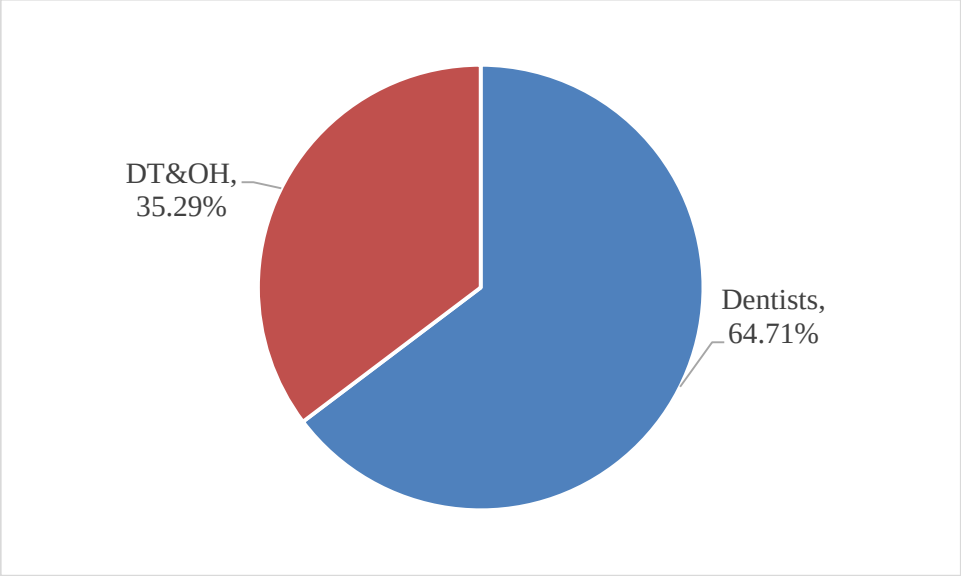

Figure 4.2: Distribution of participants by occupation

Table 4.2: Demographic characteristics of the participants

Demographics (n=103)	Dentists (n=66)	DT & OH (n=36)	Total (n=102)
Age in years, median (interquartile range)	37 (30.75 – 44)	35.5 (29.25 – 49.75)	36 (30-45.5)
Age group in years	**n (%)**	**n (%)**	**n (%)**
22-29	14 (21.54)	9 (25.00)	23 (22.7)
30-39	29 (42.46)	14 (38.89)	43 (42.57)
40-49	17 (26.15)	4 (11.11)	21 (20.79)
50 and above	5 (7.69)	9 (25.00)	14 (13.86)
Gender	n (%)	n (%)	n (%)
Female	44 (66.7)	30 (83.3)	74 (71.8)
Male	22 (33.3)	6 (16.7)	28 (27.2)
District	n (%)	n (%)	n (%)
Ekurhuleni	15 (22.7)	9 (25)	25 (24.3)
Sedibeng	17 (25.8)	8 (22.2)	25 (24.3)
Tshwane	12 (18.2)	8 (22.2)	20 (19.4)
Johannesburg Metro	12 (18.2)	7 (19.4)	19 (18.4)
West Rand	10 (15.2)	4 (11.1)	14 (13.6)
Hours worked per week, median (interquartile range)	40 (40 – 45)	40 (40 – 40)	40 (40 - 40)
Patient seen per day, median (interquartile range)	30 (20 – 30)	21 (10 – 30)	25 (18.5-30)
Public service years	9 (5 – 12)	9.50 (4 – 22.75)	9 (5-14.5)
Worked in private service	n (%)	n (%)	n (%)
Yes	39 (59.1)	20 (55.6)	44 (42.7)
No	27 (40.9)	16 (44.4)	59 (57.3)
Private service years, median (interquartile range)	0 (0 -5)	0 (0 – 2.75)	5 (2-8)

4.3 Knowledge, Attitude and Practice on Oral Cancer

4.3.1 Knowledge and attitude percentage and scores among dentists and DT & OH

The results in Figure 4.3 show that knowledge and attitude percentage scores of the Dentists were higher (77.14% and 80%) respectively compared to the scores for the DT& OH group (74.19 % and 77.14% respectively).There was no statistically significant difference in the knowledge scores between the two groups (p=0.324). There was statistical significant difference in the attitude scores between the groups, the dentist score were significantly higher in attitude compared to the dental technicians and oral health (p=0.02).

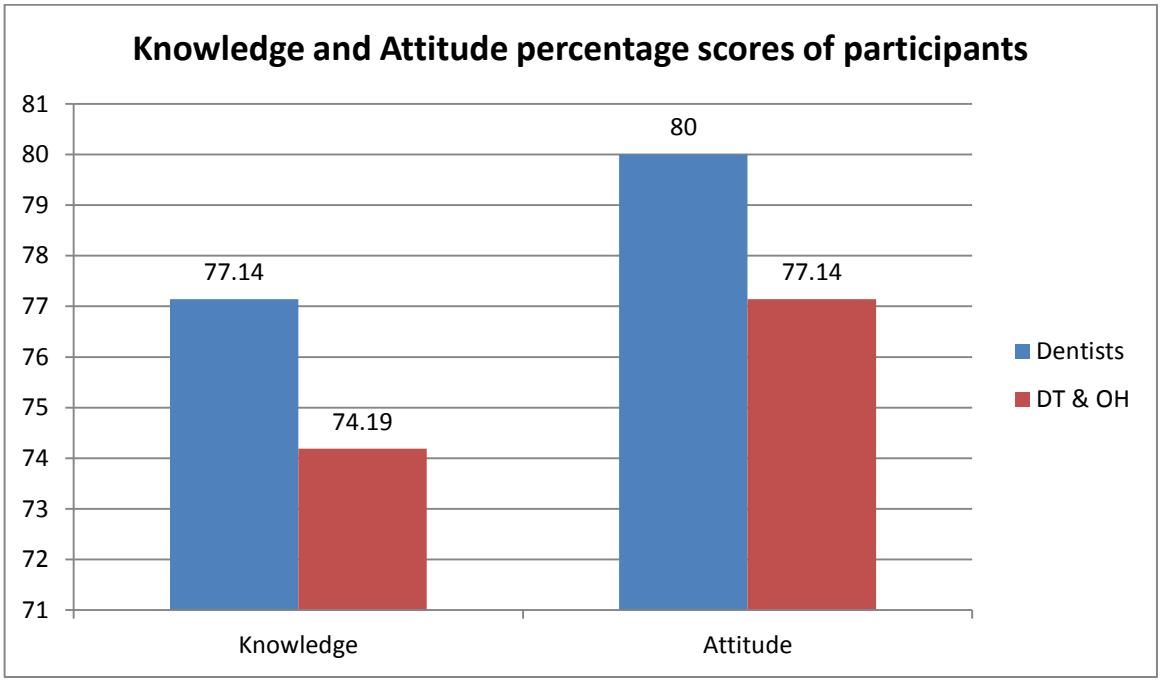

Figure 4.3 Knowledge and attitude scores of participants in the study

Table 4.3 below shows that the majority of the dentists had sound knowledge about oral cancer. 95.50% correctly answered that the most common site of oral cancer besides lips is the tongue and floor of the oral cavity and the most common form of oral cancer is the squamous cell carcinoma. Just over a third of dentists (38.9 %) did not know nor agree that the two finger method is the correct method of tongue examination for oral cancer. Regarding risk factors of oral cancer, 97 % of the participants correctly identified tobacco use and alcohol consumption as the most common risk factors of oral cancer.

Table 4.3: Knowledge of dentists about oral cancer

Knowledge (n=66), n (%)	**Yes**	**No**	**Don't know**
The most common site of oral cancer besides the lips is the tongue and oral cavity floor	63 (95.5)	2 (3)	1 (1.5)
The most common form of oral cancer is squamous cell carcinoma	62 (93.9)	3 (4.5)	1 (1.5)
Oral cancer typically presents at 30-49 years of age	36 (55.4)	24 (36.9)	5 (7.7)
In oral cancer, metastatic lymph nodes are fixed and non-tender with a stony hard consistency	52 (80)	7 (10.8)	6 (9.2)
A two-finger method is the right method for a tongue examination for oral cancer	36 (61)	10 (16.9)	13 (22)
Tobacco and alcohol consumption are the most common risk factors for oral cancer	64 (97)	1 (1.5)	1 (1.5)
The early detection of oral cancer increases five-year survival rates	59 (90.8)	2 (4.6)	2 (4.6)
Total knowledge score	77.14 (71.43-77.14)		

4.3.2 Knowledge of dental therapists and Oral hygienist group about oral cancer

Table 4.4 below indicates that the majority of the DT & OH had sound knowledge about oral cancer. Majority (94%) correctly answered that the most common site of oral cancer besides lips is the tongue and floor of the oral cavity and the most common form of oral cancer is the squamous cell carcinoma, same as dentists. Likewise, about a third (34.4%) did not agree nor know that the two finger method is the correct method of tongue examination for oral cancer just like dentists. Regarding the knowledge of metastatic lymph nodes, 19.4% did not know their clinical presentation of oral cancer. Regarding risk factors of oral cancer all of the participants correctly identified tobacco use and alcohol consumption as the most common risk factors of oral cancer.

Table 4.3 & 4.4 depicts that separately both Dentists and (DT/OH) had the same knowledge levels regarding oral cancer.

Table 4.4: Knowledge of Dental therapists and Oral Hygienists

Knowledge (n=36), n (%)	Yes	No	Don't know
The most common site of oral cancer besides the lips is the tongue and oral cavity floor	34 (94.4)	1 (5.6)	-
The most common form of oral cancer is squamous cell carcinoma	35 (97.2)	-	1 (2.8)
Oral cancer typically presents at 30-49 years of age	20 (55.6)	11 (30.6)	5 (13.9)
In oral cancer, metastatic lymph nodes are fixed and non-tender with a stony hard consistency	20 (64.5)	5 (16.1)	6 (19.4)
A two-finger method is the right method for a tongue examination for oral cancer	21 (65.6)	3 (9.4)	8 (25)
Tobacco and alcohol consumption are the most common risk factors for oral cancer	36 (100)	-	-
The early detection of oral cancer increases five-year survival rates	30 (85.7)	1 (2.9)	4 (11.4)
Total knowledge score	74.29 (68.57-80)		

4.3.3 Attitude of Dentists about Oral Cancer

Table 4.5 reports on the attitudes of the Dentists which showed that the majority of the dentists agreed with the statement that they felt adequately trained to examine oral cancer patients (70.8%) and they have received adequate oral cancer education at their previous dental school (76.6%). Meanwhile, nearly 22% were not sure. About 62 % felt that their knowledge about oral cancer was not up to date while 37% were unsure.

Table 4.5: Attitude of dentists about oral cancer

Attitude, n (%)	Favourable	Not sure	Unfavourable
I feel I received adequate oral cancer education at my previous dental school	49 (76.6)	14 (21.9)	1 (1.6)
I feel the quality of my previous education about oral cancer examinations is adequate	46 (70.8)	18 (27.7)	1 (1.5)
I feel my knowledge about oral cancer is not up to date	40 (61.5)	24 (36.9)	1 (1.5)
I believe it is important to annually examine all patients over 40 years	60 (90.9)	5 (7.6)	1 (1.5)
I feel comfortable referring patients with suspected oral lesions	66 (100)	-	-
I feel adequately trained to examine patients for oral cancer	45 (69.2)	18 (27.7)	2 (3.1)
Total score	**80 (77.14-80)**		

4.3.4 Attitude of DT & OH about Oral Cancer

Table 4.6 illustrates that half (50%) of the participants felt adequately trained to examine oral cancer patients while, only 1 (2.8 %) disagreed. About (61%) agreed that they have received adequate oral cancer education at their previous dental school while only 1 (2.8%) disagreed. About 64% felt that their knowledge about oral cancer is not up to date while only 33.3% were not sure that they received adequate oral cancer training at their previous dental school.

Table 4.6: Attitude of DT & OH regarding training management of patients

Attitude, n (%)	Favourable	Not sure	Unfavourable
I feel I received adequate oral cancer education at my previous dental school	22 (61.1)	13 (36.1)	1 (2.8)
I feel the quality of my previous education about oral cancer examinations is adequate	18 (50)	18 (50)	-
I feel my knowledge about oral cancer is not up to date	23 (63.9)	12 (33.3)	1 (2.8)
I believe it is important to annually examine all patients over 40 years	32 (88.9)	3 (8.3)	1 (2.8)
I feel comfortable referring patients with suspected oral lesions	35 (97.2)	1 (2.8)	-
I feel adequately trained to examine patients for oral cancer	19 (52.8)	16 (44.4)	1 (2.8)
Total attitude score	77.14 (74.29-80)		

4.3.5 Practices of study participants in the management of oral cancer

Table 4.7 describes the findings regarding the practices of all the study participants. A large proportion of the DT & OH group (52.8%) reported that they do not carry out oral cancer examinations for every patient including those patients under 30 years compared to 39.4% of dentists. Only 42% of the dentists reported to conduct the oral cancer examinations sometimes compared to 33% of the other group of practitioners and this difference was statistically significant ($p<0.05$).There was also a significant difference between the two groups when reporting the barriers to conducting these oral cancer examinations ($p<0.05$). Majority of the dentist (69.2%) stated that time constrains was the reason which prohibited them from performing oral cancer examinations while (32.4%) of the DT & OH group cited time constrains and lack of training as a barrier towards conducting Oral cancer examinations. When asked about action taken when discovering a red/white lesion, 68.2% of the dentists reported that they would refer the patient to a specialist compared to 86.1 % of DT &OH group. Only n=4, 11% of DT & OH group would take a biopsy compared to n=17, 26.2% of the dentists. Regarding detailed history taking including lifestyle habits, majority (48.5%) of the dentists and 25% of the DT & OH reported that they sometimes take a detailed history

regarding the lifestyle habits of all patients presenting themselves at their dental clinic while 18% and 16% respectively did not. All the study participants have correctly indicated that they assess all the most common risk factors.

Table 4.7: Practices of dentists and DT & OH about oral cancer

Practice (n=66), n (%)	**Dentists n=66**		**DT &OH n=38**		**p value**
	n	**%**	**n**	**%**	
Do you carry out oral cancer examinations for every patient, including those under 30 years					
Yes	12	18.2	5	13.9	0.430
No	26	39.4	19	52.8	
Sometimes	28	42.4	12	33.3	
Which of the following reasons prohibit you from performing oral cancer examinations					
Time constraints	45	69.2	11	32.4	**0.002***
Lack of training	6	9.1	11	32.4	
Other	15	22.7	12	35.3	
If you discovered a white/red patch on the gums, tongue, tonsil or lining of the mouth what will not heal, which action would you take					
Refer to a specialist	45	68.2	31	86.1	0.350
Take a biopsy	17	26.2	4	11.1	
Other	3	4.6	1	2.8	
Do you take a detailed history regarding the lifestyle habits of all patients presenting themselves at your dental clinic					
Yes	22	33.3	21	58.3	**0.035***
No	12	18.2	6	16.7	
Sometimes	32	48.5	9	25	
Which of the following risk factors do you assess during taking your patient history?					
Past cigarette smoking	24	16	9	25	0.067
Past chewing of snuff	3	2	2	6	
Past alcohol consumption	11	7	1	3	
Patient's family history of oral cancer	8	5	4	11	
All of the above	73	48	23	64	

*** p-value Significant using Chi-squared or Fischer Exact tests.**

4.4 Associations of demographic variables with knowledge, attitude and practice among dentists

4.4.1 Associations of demographic variables with knowledge and attitude among dentists

Spearman's correlation coefficient was used to measure the extent of the linear relationship between knowledge and attitude scores and sociodemographic variables. The results displayed in Table 4.8 indicate that there was a significant negative linear relationship between attitude scores and years in public service. An increase in years of service was associated with a decrease in attitude scores (unfavourable attitude).

Table 4.8: Correlation coefficient between the knowledge and attitude scores and sociodemographic dentists

Spearman correlation analysis	Knowledge		Attitude	
	rs	p-value	rs	p-value
Age	-0.077	0.567	-0.137	0.283
Years in public service	-0.073	0.586	-0.254*	0.045*
Patients per day	-0.009	0.945	0.163	0.207
Hours worked per week	0.118	0.377	-0.020	0.874

*p value significant

When comparing knowledge and attitude scores by gender and district, the results as shown in Table 4.9 show that there was no significant difference in the knowledge scores among the different genders and districts groups.

Table 4.9: Relationship between sociodemographic characteristics of gender and district, knowledge and attitude percentage scores

Knowledge	**Median (IQR)**	**Test statistic**	**p-value**
‡ **Gender**			
Male	75.71 (72.14 – 79.29)	370.5	0.874
Female	77.14 (71.43 – 78.57)		
‡‡ **District**			
Ekurhuleni	75.71 (71.43 – 79.29)	7.786	0.100
Tshwane	77.14 (71.43 – 79.29)		
Sedibeng	74.29 (68.57 – 75.71)		
Johannesburg metro	77.14 (72.14 – 80)		
West rand	78.57 (77.14 – 80)		
Attitude	**Median (IQR)**	**Test statistic**	**p-value**
‡ **Gender**			
Male	80 (77.14 – 81.43)	440.50	0.994
Female	80 (75 – 82.86)		
‡‡ **District**			
Ekurhuleni	75.71 (71.43 – 79.29)	0.890	0.926
Tshwane	80 (77.14 – 82.14)		
Sedibeng	80 (75.71 – 82.86)		
Johannesburg metro	80 (75 – 80)		
West rand	80 (77.86 – 82.14)		

‡ Mann Whitney U

‡‡ Kruskal Wallis test

Table 4.10 & 4.11 illustrates that there was no significant association between knowledge and practice and well as between attitude and practice among dentists.

Table 4.10: Relationship between knowledge and practice scores by dentists

Practice (n=66)	Median	Interquartile range	Kruskal Wallis	p-value
Do you carry out oral cancer examinations for every patient, including those under 30 years				
Yes	77.14	74.29 – 77.14	0.339	0.844
No	77.14	68.57 – 80		
Sometimes	74.29	71.43 - 80		
Which of the following reasons prohibit you from performing oral cancer examinations				
Time constraints	77.14	71.43 – 80	1.230	0.267
Lack of training	77.14	77.14 – 79.29		
Other	80	77.14 - 80		
If you discovered a white/red patch on the gums, tongue, tonsil or lining of the mouth what will not heal, which action would you take				
Refer to a specialist	74.29	71.42 – 78.57	0.263	0.608
Take a biopsy	77.14	74.29 – 78.57		
Other	71.43	65.71 – 77.14		
Do you take a detailed history regarding the lifestyle habits of all patients presenting themselves at your dental clinic				
Yes	75.71	74.29 – 80	0.746	0.689
No	77.14	68.57 – 77.14		
Sometimes	74.29	71.43 – 78.57		

Table 4.11: Relationship between attitude and practice dentists

Practice (n=66)	Median	Interquartile range	Kruskal Wallis	p-value
Do you carry out oral cancer examinations for every patient, including those under 30 years				
Yes	80	80 – 80	1.317	0.518
No	80	74.29 – 82.86		
Sometimes	80	77.14 – 82.86		
Which of the following reasons prohibit you from performing oral cancer examinations				
Time constraints	80	77.14 – 82.86	0.024	0.876
Lack of training	80	75.71 – 82.14		
Other	80	77.14 – 80		
If you discovered a white/red patch on the gums, tongue, tonsil or lining of the mouth what will not heal, which action would you take				
Refer to a specialist	74.29	71.43 – 78.57	0.00	0.986
Take a biopsy	77.14	74.29 – 78.57		
Other	71.43			
Do you take a detailed history regarding the lifestyle habits of all patients presenting themselves at your dental clinic				
Yes	80	77.14 – 82.86	2.477	0.290
No	80	77.14 - 80		
Sometimes	80	80 – 80		

4.5 Association of demographic variables with knowledge, attitude and practice among DT & OH

4.5.1 Association of demographic variables with Knowledge and Attitude among DT & OH group

Table 4.12 shows that there was no significant linear relationship between the knowledge and attitude scores and variables such as age, years in public service, patients per day and hours worked per week.

Table 4.12: Correlation between the knowledge and attitude scores and sociodemographic variables among DT &OH group

Spearman correlation analysis	Knowledge		Attitude	
	rs	p-value	rs	p-value
Age	-0.021	0.913	0.011	0.950
Years in public service	0.043	0.823	0.033	0.850
Patients per day	0.005	0.979	-0.320	0.057
Hours worked per week	-0.196	0.308	-0.048	0.779

The results in table 4.13 indicate that there is no significant relationship between knowledge scores among different gender groups & districts as well as between attitude scores among gender groups and districts & district

Table 4.13: Relationship between knowledge and attitude scores with gender and district among DT& OH group

Knowledge (n=36)	**Median (IQR)**	**Test statistic**	**p-value**
‡Gender			
Male	71.43 (67.14 – 80)	57	0.86
Female	74.29 (68.57 – 79.29)		
‡‡ District			
Ekurhuleni	74.29 (69.29 – 77.14)	6.229	0.183
Tshwane	72.86 (68.57 – 80)		
Sedibeng	78.57 (72.14 – 80)		
Johannesburg metro	74.29 (65.71 – 77.14)		
West rand	67.14 (65.71 – 68.57)		
Attitude	**Median (IQR)**	**Test statistic**	**p-value**
‡Gender			
Male	77.14 (74.29 – 78.57)	68	0.336
Female	78.57 (75 – 80)		
‡‡ District			
Ekurhuleni	77.14 (75 – 79.29)	4.52	0.34
Tshwane	80 (77.14 – 82.14)		
Sedibeng	78.57 (74.29 – 80)		
Johannesburg metro	77.14 (74.29 – 80)		
West rand	78.57 (74.29 – 82.86)		

‡ Mann Whitney U

‡‡ Kruskal Wallis test - Position

Table 4.14 indicates that there was no significant association between knowledge and practice among participants in the DT/OH group

Table 4.14: Relationship between knowledge and practice among dental therapists

Practice (n=38)	Median	Interquartile range	Kruskal Wallis	p-value
Do you carry out oral cancer examinations for every patient, including those under 30 years				
Yes	74.29	71.43 – 80	1.357	0.507
No	71.43	68.57 – 80		
Sometimes	74.29	67.14 – 77.14		
Which of the following reasons prohibit you from performing oral cancer examinations				
Time constraints	74.29	69.29 – 77.14	0.293	0.588
Lack of training	74.29	68.57 - 80		
Other	71.43	65.71 - 80		
If you discovered a white/red patch on the gums, tongue, tonsil or lining of the mouth what will not heal, which action would you take				
Refer to a specialist	71.43	68.57 – 77.14	3.267	0.071
Take a biopsy	78.57	75 - 80		
Other	-	-		
Do you take a detailed history regarding the lifestyle habits of all patients presenting themselves at your dental clinic				
Yes	74.29	68.57 – 77.14	1.042	0.594
No	80	74.29 - 80		
Sometimes	68.57	65.71 - 80		

4.6 Relationship between attitude and practice among study participants

4.6.1 Relationship between knowledge and attitude among study participants

Study results show that there is no linear relationship between knowledge and attitude scores among dentists and DT/OH.

Table 4.15: Relationship between knowledge and attitude among Dentists and DT/OH

	Dentists		**DT/OH**	
	Spearman Correlation coefficient	**p-value**	**Spearman Correlation coefficient**	**p-value**
Attitude	0.239	0.074	0.306	0.106

CHAPTER 5: DISCUSSION

Dentists and other oral health workers play an important role in reducing the incidence of oral cancer by early detection of potentially malignant lesions. Dentists are familiar with the structures and health of the oral cavity and are usually the first group of health practitioners who might examine patients for cardinal signs and symptoms of oral cancer. Early diagnosis of the oral cancers highly depends on dental practitioners' knowledge regarding the oral cancers (Kujan et al., 2006).

5.1 Socio-demographic characteristics

The total number of study participants who were enrolled in the study was 102 and with the median age of 36 years (IQR 30-45.5) and the majority of participants were females. These results are similar to those reported in Australia by Mariño et al., (2017) where n =335 study participants were enrolled for the study and were the majority of the participants ages ranged between 36 years -55 years. The response rate for the current study was 54% which is similar to the one (55-65%) reported by Gajendra et al., 2006 among dentists and oral hygienists. While several studies have shown varying response rates in surveys involving oral health professionals i.e. 96% (Jnaneswar et al., 2017), 86.9% (Ahmed & Naidoo, 2017), 41% (Saleh et al., 2014), and 9.4 % (Mariño et al., 2017), Parashos et al., (2005) has shown an expected response rate on surveys among oral health professionals to be around 30% .The current study response rate is relatively lower considering the support that was offered by the oral health district managers in conducting the data collection. A possible explanation could be a poor attendance of the CPD meetings on the dates of the data collection. The low response rate may have introduced non response bias and limited the generalisability of the results beyond the study cohort.

5.2 Knowledge on Oral Cancer

It is commendable that majority of the participants in the current study had reported sound knowledge about oral cancer as similarly reported by Saleh et al., 2014 (90%) and Ahmed & Naidoo, 2017 (93%).However, contrasting results have been reported in Egypt 32%(Khattab et al., 2019), Brazil 40% (Leão et al., 2005) and Saudi Arabia 54% (Eltelety et al., 2014) reported low knowledge levels. Separately both Dentists and (DT/OH) had the same knowledge levels regarding oral cancer. However, the study highlighted some gaps in the knowledge of pathology on oral cancer. A huge discrepancy in the pathological knowledge between the Dentists and the DT/OH groups was observed. The dentists (80%) consistently answered correctly to the question on the description of metastatic lymph nodes in oral cancer

while 16.1% of the DT/OH group answered incorrectly and 19, 4% did not know. The discrepancy could be attributed to some differences in the emphasis of some curricula content between the two professions whereby the detail in the pathology syllabus could have been limited in the DT/OH programs while overlooking the important role played DT/OH in the prevention of oral diseases. Another study by Gajendra et al., 2006 reported similar findings in New York whereby more than two thirds (66%) of dentists knew that the lymph nodes typically present in patients with oral cancer are hard, painless, and either mobile or fixed. On the other hand, about 50% (n=315) of dental hygienists were not aware of this clinical presentation (Gajendra et al., 2006).

A major proportion of dentists (n= 63,95.5%) and DT/OH (n=34, 94.4%) correctly answered that the most common site of oral cancer besides lips is the tongue and floor of the oral cavity and the most common form of oral cancer is the squamous cell carcinoma. Similar results were reported by Razavi et al., (2013) in Iran and Jboor et al., (2019) in Qatar.

Regarding risk factors of oral cancer all of the participants correctly identified tobacco use and alcohol consumption as the most common risk factors of oral cancer. These findings were similar to those reported in most studies (Ahmed & Naidoo, 2017, Mariño et al., 2017 and Gbotolorun et al., 2014).

5.3 Attitude on Oral Cancer

The undergraduate dental student curriculum includes training in the identification of pre-cancerous oral lesions, oral cancer examination and management protocols. Majority of the participants (61%-76.6%) in the study have reported that they have received adequate oral cancer education at their previous dental school. Jboor et al., (2019) in Qatar reported similar results.The results of this study revealed that 69 % of the dentists felt they were adequately trained to examine oral cancer patients while about 45% of the DT/OH were not sure if they received adequate training to examine oral cancer patients. In contrast, Ahmed & Naidoo, (2017) in Iran and Khattab et al., (2019) in Egypt reported that 66% and 29% respectively of the dental practitioners felt that their undergraduate training from their dental schools on the diagnosis of oral cancer was inadequate. This could also be attributed to the difference the emphasis on some curriculum content. Interestingly, even though the current reports noted that participants ‘received adequate oral cancer education at their previous dental school’ they (61%-64%) agreed that their knowledge about oral cancer is not up to date which is almost similar to the one reported in Sudan (66%) (Ahmed & Naidoo, 2017). On the contrary, Gajendra et al., 2006 found that 72% of dentists agreed that their knowledge about oral

cancer was up to date compared to less than 50% of the oral hygienists who agreed that their knowledge was current. These results are disturbing as the perceived lack of up-to-date knowledge on oral cancer may affect the practitioners' confidence in conducting oral cancer examinations. There is a need for provision of post graduate, in-service training and continuing education programs on oral cancer to improve the knowledge and resolve the knowledge and practice gaps between the dentists and DT/OH groups.

5.4 Practices of participants

In the current study, there was a significant difference between the dentists and the DT/OH groups regarding the practice of oral cancer patient examination. A large proportion of the DT & OH group (52.8%) reported not performing oral cancer examinations for every patient including those patients under 30 years, while about 42% of dentists reported to conduct the oral cancer examinations sometimes. The current study results are in contrast to reports by Mariño et al., (2017) and Gajendra et al., (2006). Mariño et al., (2017) found that more than half of the oral health practitioners reported performing oral cancer examinations on every patient and Gajendra et al.,(2006) reported that 85% and 78% of dentists and oral hygienists, respectively, indicated that they were providing oral cancer examinations to more than 80% of their patients aged 40 and above. The barriers reported by dentists to not providing oral cancer examinations were that oral cancer examination was not a necessary procedure and that they were not reimbursed for performing the oral cancer examinations, additionally, oral hygienists believed that it was not within the scope of their practice and that it was time consuming (Gajendra et al., 2006). Clarke et al.,(2018) found that majority of Oral Hygienists (64%) reported that oral cancer screening was part of their regular process of care compared to the proportion of DT &OH in this current study which is lower (44%). The results are consistent i.e. 44% in the current study with the findings that were reported by Ahmed & Naidoo, (2017) in Sudan and Eltelety et al., (2014) in Jeddah, Saudi Arabia.

There was also a significant difference between the dentists and the DT/OH groups regarding the reasons for not conducting the oral cancer examinations. Majority (69.2%) of the dentists in the current study stated that time constrains was a barrier to conducting oral cancer examinations while a relatively bigger proportion of DT/OH (32%) reported lack of training as the barrier to performing the oral cancer examination. Similar results have been reported by Ahmed &Naidoo (2017). Al-Maweri and co-authors (2015) state that several studies that investigated the undergraduate dental students' awareness of oral cancer and premalignant lesions support continuing educational training as a way forward (Al-Maweri et al., 2015).As the results have already shown that the DT/OH group perceived their undergraduate training

on oral cancer to be inadequate, this could also affect their confidence, attitude and practice in conducting oral cancer examinations. Mariño et al., (2017) has found that as the level of self-assessed knowledge of oral cancer increases so does the likelihood of performing oral cancer examinations (Mariño et al., 2017). The latter authors' findings are different to the current where knowledge did not influence practices of all dental practitioners.

These findings have implications for the upcoming National Health Insurance legistation in South Africa which seeks to employ mainly DTs and OHs at primary health care levels where the focus will be on primary prevention and basic care- this is the level which will be the first point of contact with the oral health system and referral will take place from here to more specialized services. So the ability to refer or raise suspicion is key as you want to refer for diagnosis in the early stages for the possible outcome. However, the problem is that many of the OH/DTs admit to not screening and having adequate training capacity in screening for oral cancer.

Although Petersen (2003) suggested that compared to other healthcare professionals, dentists have more time to include oral cancer preventative messages into their routine practice, participants in this study found the opposite to be true (Petersen, 2003).Time constrains as a barrier to oral cancer examination in this study is an expected finding because there is a huge demand for oral health services in all the districts and the most common treatment need is relief of pain and sepsis hence oral cancer screening can be perceived as adding extra time in the patient examination process and becomes time consuming.

Botha et al., 2018 has reported that the prevalence of oral squamous cell carcinoma (OSCC) in patients younger than 45 years in South Africa is higher than the global average and was not always associated with traditional risk factors. The results of this study are a cause for concern as it is a missed opportunity for early diagnosis of younger patients who are at risk. In the current study 52% of DT & OH group reported not to have been performing oral cancer screening for patients under the age of 30 years while 42% of dentists reported to be conducting oral cancer screening sometimes.

Regarding action taken when a suspicious oral lesion is identified during oral examination such a red lesions, 68.2% of the dentists in the current study reported that they would refer the patient to a specialist compared to only 52% that was reported by Ahmed & Naidoo, 2017 in Sudan. This practice is commendable as non-referrals may result in complication of lesion and lead to poor prognosis (Eltelety et al., 2014).

In oral cancer prevention, it is crucial for a practitioner to identify patients' exposure to the major known risk factors (tobacco and alcohol use) and be knowledgeable about the patient's risk of developing oral cancer (Jnaneswar et al., 2017). Almost half of (48.5%) of the dentists reported that they sometimes take a detailed history regarding the lifestyle habits of all patients presenting themselves at their dental clinic while 18% did not and this could also be related to the time constrains. The practice of minimal history taking may adversely disadvantage the patients. Services such as smoking cessation should be encouraged and initiated at this history taking level (Mariño et al., 2017) and avoid the missed opportunity.

5.5 Associations of Knowledge, Attitude and Practices with demographic variables.

No statistically significant associations between Knowledge and Practices of dental professionals and demographic variables were found in the study except between attitude and years in practice. Logically, longer years of service should translate to good work ethic and positive attitudes. It was unexpected that there was a significant negative linear relationship between attitude scores and years in public service has been found .This means an increase in years of service was significantly associated with a decrease in attitude scores (unfavorable attitude). The negative relative relationship could be attributed to the burn-out associated with increased workloads in the public service that leads to poor practitioner attitude (Awojobi et al., 2015) .Several barriers have been identified which hindered screening for early onset oral cancer in the dental setting which included unfavorable work conditions such as work overload and lack of financial incentives.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study used a convenient sample method therefore the results only apply to the sampled participants which is a limitation.The low response rate may have introduced non response bias as a result the study findings cannot be generalized beyond this study cohort.

From the results of this study one can conclude that:

- Dental practitioners had adequate knowledge regarding oral cancer however there was a discrepancy in the knowledge of pathology between the Dentists and the DT/OH groups.
- Knowledge does not always translate to attitude and behaviour change as the dental practitioners did not always carry our oral cancer examinations on every patient and were lacking on some practices and attitude
- Time constrains and lack of training was a barrier to conducting oral cancer examinations
- Dental practitioners felt that they did not received adequate oral cancer training at their previous dental school and their knowledge about oral cancer was not up to date.
- An increase in years of service was significantly associated with a decrease in attitude scores (unfavorable attitude).

6.2 Recommendations

Based on the study results, the following recommendations can be made:

- Educational and in-service training interventions are necessary to enhance attitudes and practice preventive measures which may lead reduce morbidity and mortality from oral cancer.
- Provision of post graduate and continuing professional education on oral cancer to enhance professionals' knowledge of oral cancer risk factors, diagnostic and management protocols and to maintain the knowledge current and updated.
- Improvement in the undergraduate curriculum in dental schools especially for the DT/OH programs.
- Address burn-out and negative attitudes related to long service through employer wellness programmes.

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APPENDICES

APPENDIX I: STUDY QUESTIONNAIRE

DEMOGRAPHIC AND SOCIO-ECONOMIC DETAILS

SOCIO-DEMOGRAPHIC DETAILS

PERSONAL DETAILS

Tell us about yourself,

1. What is your Age? _____ Years

Place a cross in the box that best describes your response

2. What is your Sex? ☐Male ☐Female ☐Other_____

3. How many years have you worked in the in the public sector? _____years

4. How many years have you worked in the private sector? _____years

5. Citizenship ☐South African ☐ Non South African

If Non South African, please specify country of origin_____

6. Your current position (Please tick √ the one that best describes your position)

Junior Dentist	
Senior Dentist	
Principal Dentist	
Chief Dentist	
Dental Therapist	
Oral Hygienist	

WORK ENVIRONMENT

7. On a weekly basis, how many hours would you say you work? _____

8. On each working day, how many patients do you treat on average? _____

A. Knowledge

Place a cross in the box that best describes your response

9. The most common site of oral cancer besides the lips is the tongue and oral cavity floor

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

10. The most common form of oral cancer is squamous cell carcinoma

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

11. Oral cancer typically presents at 30–49 years of age

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

12. In oral cancer, metastatic lymph nodes are fixed and non tender, with a stony-hard consistency

1.	Strongly Agree	
2.	Agree	
3.	Disagree	

4.	Strongly Disagree	
5.	Don't know	

13. A two-finger method is the right method for a tongue examination for oral cancer

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

14. Tobacco and alcohol consumption are the most common risk factors for oral cancer

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

15. "The early detection of oral cancer increases five-year survival rates"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't Know	

B. <u>Attitudes</u>

Place a cross in the box that best describes your response

16. " I feel I received adequate oral cancer education at my previous dental school"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

17. "I feel the quality of my previous education about oral cancer examinations is adequate"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

18. "I feel my knowledge about Oral Cancer is not up to date"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

19. "I believe it is important to annually examine all patients over 40 years and older for Oral Cancer"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

20. "I feel comfortable referring patients with suspected Oral lesions to specialists"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	
5.	Don't know	

21. "I feel adequately trained to examine patients for Oral Cancer"

1.	Strongly Agree	
2.	Agree	
3.	Disagree	
4.	Strongly Disagree	

5.	Don't know	

C. Practice

22. Do you carry out oral cancer examination for every patient including those under 30 years?

1.	Yes	
2.	No	
3.	Sometimes	

23. Which of the following reasons inhibit you from performing oral cancer examination?

1.	Time Constraints	
2.	Lack of training	
3.	Not interested/demotivated	
4.	Other	

24. If you discovered a white/red patch on the gums, tongue, tonsil or lining of mouth that will not heal which of the below actions would you take?

1.	Refer to a specialist	
2.	Take a biopsy	
3.	Change medication	
4.	Other	

25. Do you take a detailed history regarding life style habits of all patients presenting themselves at your dental clinic?

1.	Yes	
2.	No	
3.	Sometimes	

26. Which of the following risk factors do you assess during taking your patients history?

1.	Past cigarette smoking	
2.	Past chewing of snuff	
3.	Past alcohol consumption	
4.	Patient's family history of oral cancer	
5.	All of the above	

APPENDIX II: PARTICIPANTS INFORMATION SHEET

Study title: Knowledge, Attitudes and Practices regarding Oral Cancer among Dental Practioners in Gauteng.

Introduction:

I, Itumeleng Mahlomoje, from Department of Community Dentistry at University of Witwatersrand, am conducting a study on *Knowledge, Attitudes and Practices regarding Oral Cancer among Dental Practitioners in Gauteng*. The purpose of the study is to assess the knowledge, attitude and practice among dental practitioners in Gauteng so that the information can be used to identify if there are any areas that need improvement in the knowledge and inform the oral health service planning.

I would like to request your permission to give you a questionnaire so that you can answer a couple of questions relating to your knowledge and practice relating to Oral Cancer.

What is involved in the study?

You will be requested to fill in a questionnaire of 20 questions for 10 minutes

Risks of being involved in the study,
There are no risks associated with the study.

Participation is voluntary,
Your refusal to participate in the study will involve no penalty or loss of benefits.

Reimbursements
There will be no compensation for participating in the study.

Confidentiality
Your personal information will be confidential as you will be allocated a reference number and will not be required to disclose your name. Please be assured that the information recorded is kept confidential in a secure locked office.

Contact details of researcher:
If you have any queries or would like more information about the study please contact Dr Mahlomoje at Department of Community Dentistry, University of Witwatersrand on (011)717-2595, itumeleng.mahlomoje@wits.ac.za

For reporting of complaints / problems, you are welcome to contact the Wits Research Ethics Committee, through the secretary Ms. Zanele Ndlovu on (011) 717-1234.

Your cooperation in this regard will be appreciated

Dr I Mahlomoje

APPENDIX III: CONSENT FORM

I understand that I am free to refuse my participation or withdraw my consent and discontinue my participation in this project at any time.

I have been informed as to the procedure and requirements to be followed in this project.

Further I understand that should I have any questions regarding this project I can contact

Dr I Mahlomoje on (011)717-2595, Itumeleng.mahlomoje@wits.ac.za

In signing this consent form, I agree to participate in the study.

Name of Participant: _____

Name of clinic/hospital: _____

Participant's Signature: _____

Date: _____

APPENDIX IV: ETHICS APPROVAL LETTER

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG	HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

Office of the Deputy Vice-Chancellor (Research & Post Graduate Affairs)

TO: Dr I Mahlomoje
School of Oral Health Sciences
Department of Community Dentistry
Medical School
University

E-mail: Itumeleng.Mahlomoje@wits.ac.za

CC: Supervisor: Dr Y Kolisa and Professor V Yengopal
<Yolanda.Koliswa@wits.ac.za>
and <HREC-Medical.ResearchOffice@wits.ac.za>

FROM: Iain Burns
Human Research Ethics Committee (Medical)
Tel: 011 717 1252

E-mail: Iain.Burns@wits.ac.za

DATE: 25/09/2018

REF: *R14/49*

PROTOCOL NO: **M180734** *(This is your ethics application study reference number. Please quote this reference number in all correspondence relating to this study)*

PROJECT TITLE: *Knowledge, attitudes and practices regarding oral cancer among dental practitioners in Gauteng*

Please find attached the Clearance Certificate for the above project. I hope it goes well and that an article in a recognized publication comes out of it. This will reflect well on your professional standing and contribute to the Government funding of the University.

MSWorks2000/Iain0007/Clearscan.wps