

**KNOWLEDGE, ATTITUDES AND PRACTICES OF MEDICAL DOCTORS
ON PHARMACOTHERAPY FOR SMOKING CESSATION IN KHOMAS
REGION, NAMIBIA**

A RESEARCH THESIS SUBMITTED IN PARTIAL FULFILMENT

OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF PUBLIC HEALTH

OF

THE UNIVERSITY OF NAMIBIA

BY

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APRIL 2018

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ABSTRACT

Smoking is a major risk factor for non-communicable diseases and remains a significant public health challenge in many lower and middle income countries (LMIC). In spite of the fact that smoking cessation (SC) pharmacotherapy significantly reduces poor outcome, access to smoking cessation services in medical practice in Namibia is unknown. The study aims to assess the knowledge, attitudes and practice of SC pharmacotherapy among medical doctors in Khomas region, Namibia. A cross-sectional analytic study design was conducted among medical practitioners in private and public settings in Khomas region. Data on knowledge, attitudes and practice of SC pharmacotherapy were collected from stratified samples of private and public medical doctors using a self-administered questionnaire and analysed through SPSS v23 for inferential and descriptive quantitative analysis and associations using Chi-squared test and T-test. A total of 106 doctors participated; majority (60%) were general medical practitioners, 73(69%) practiced in public facilities, 40% were of the age category 30-40 years and 99.1% were non-smokers. Out of the 71(66%) doctors who offer smoking cessation services, 25% had good knowledge on the SC pharmacotherapy, 93% provide SC counselling services and 32% prescribe SC medications. Nicotine replacement therapy (53%) and Bupropion slow release (41%) are the most prescribed SC medications. Doctors in the private sector had better knowledge ($p=0.011$) and prescribed ($p=0.007$) SC pharmacotherapy more frequently than in the public sector. Majority 93(88%) of the doctors, had excellent attitude towards SC pharmacotherapy. Main barriers to provision of SC pharmacotherapy were – lack of competence and/or policy framework. The study concludes that despite the good attitude towards SC pharmacotherapy, knowledge

and practice remains limited among medical practitioners particularly in the public sector. There is a need for a policy frame work for the provision of SC services and pharmacotherapy as part of the essential primary health care (PHC) package.

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LIST OF ABBREVIATIONS AND ACRONYMS

AAMC	Association of American Medical Colleges
AHRQ	Agency for Healthcare Research and Quality
CDC	Centre for Disease Control and Prevention
COPDs	Chronic Obstructive Pulmonary Diseases
EBP	Evidence Based Practice
FDA	Food Drug Administration
ICD-10—CM	International Classification of Diseases, Tenth Revision, Clinical Modification
HPC	Health Care Professional
HPCNA	Health Professional Council of Namibia
LMIC	Low Middle Income Countries
MSH	Management Science for Health
MOHSS	Ministry of Health and Social Services
NCCN	National Comprehensive Cancer Network
NCDS	Non Communicable Diseases
NEMLIST	Namibia Essential Medicines List
NICE	National Institute for Health and Care Excellence
NMRC	Medicines Regulatory Council
NRT	Nicotine Replacement Therapy
PAD	Peripheral Artery Disease
SA	South Africa
SR	Slow Release
SC	Smoking Cessation

STG	Standard Treatment Guideline
SIDS	Sudden Infant Death Syndrome
WHO	World Health Organisation
USA	United States of America

ACKNOWLEDGEMENTS

First and foremost, I am very grateful to **God**, the **Almighty** for giving me the wisdom and courage to pursue this study. This study would not have been completed without the support, guidance, encouragement and contributions from a number of people, whom I am very grateful to.

I would like to express my deep and sincere gratitude to my supervisor, **Dr K. Amakali** and my co-supervisor **Ms A. Shilunga**, for their enthusiasm, inspiration and tireless efforts in assisting me during the course of my study.

I owe my sincere gratitude to **Mr D. Kibuule**, for his statistical knowledge that he imparted on me and for editing my thesis. His logical way of thinking has been of great value to me. His constant support, guidance and motivation enabled me to see this study to completion. I will forever be grateful.

My warm thanks go out to the **Ministry of Health and Social Services** that granted me permission to conduct this study in the health institutions in Windhoek. My sincere appreciation goes out to **Katutura Intermediate hospital and Windhoek Central hospital** management for granting me an opportunity to conduct the study in their hospitals and to the respondents who took time to respond to the questionnaire.

I am indebted to my dearest husband, **Eino Hango** for providing me with a loving environment, moral support and for continuously motivating me throughout the course of the study. Lastly, to everybody out there who supported and encouraged me in any way, your contribution is very much acknowledged.

DECLARATION

I, **Ester Ndapandula Naikaku**, student number **200414798**, hereby certify that this research report constitutes my own work, that where the language of others is used, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

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Ester N. Naikaku

Date/...../.....

CHAPTER ONE: INTRODUCTION

Chapter one presents an overview of the study. It covers a general introduction to smoking cessation services and the pharmacotherapy used. The chapter further highlighted the health burden of smoking both locally and globally. Lastly, the problem statement, significance of the study and the objectives were covered.

1.1. Introduction and Background

Recently, Namibia has enacted laws to control smoking in the public – an effort to reduce public health morbidities and mortalities related to smoking. Most smokers who desire to cease smoking opt to take medications, especially those available over-the-counter (Cahill & Stead, 2012). Unfortunately, lack of access to up-to-date information on the appropriate use of smoking cessation related interventions and services is an important barrier against reducing the public health burden of smoking in Namibia (Carson et al., 2013). The safe use of smoking cessation medicines depends on the advice provided by the health care professionals including medical doctors and pharmacists. Consequently the study aimed at assessing the knowledge, attitudes and practices of medical doctors towards pharmacotherapy of smoking cessation in the Khomas region of Namibia.

Tobacco smoking is an important risk factor for non-communicable diseases (NCDs) and related premature death globally (WHO, 2015). In 2011, tobacco smoking was linked to more than 6 million deaths globally and the majority (80%) of these live in LMIC (Blecher & Ross, 2013). The mortality associated to smoking

is estimated with escalate to 8 million people by 2030 if no control measures are implemented.

In the sub-Sahara Africa region, tobacco smoking associated morbidity and mortality is a growing burden to public health. Of major concern is that the sub-Saharan region has the highest prevalence of NCDs particularly cardiovascular diseases associated with tobacco smoking (Desalu, Adekoya, Elegbede, Dosunmu, Kolawole & Nwogu, 2009). In Namibia, morbidities related to smoking including cardiovascular diseases, chronic obstructive pulmonary disease (COPD) as well as cancers are on the increase (MOHSS, 2008). Moreover, in Namibia poor health outcomes of smoking among smokers such as lung cancer, low birth weight and sudden infant death syndrome among babies of maternal smokers are on the increase (MOHSS, 2008). Other universal health risks of tobacco smoking include reduced life expectancy and negative personal, economical and societal impacts.

Of major concern is that in most LMIC in Africa, integration of tobacco smoking cessation programmes in main stream line public health system has received little attention over the past years (WHO, 2015). The main reason for the little focus on smoking cessation programmes in LMIC has been low priority on NCD and because the prevalence of smoking related morbidities has been perceived to be low. However, as of current, the prevalence of tobacco use in Africa is on the rise. A study by WHO in 2010 reported that almost 16% of the African population smokes tobacco. This is alarmingly high prevalence which is expected to escalate to almost 20% if no interventions or policy measures are implemented (Blecher & Ross, 2013).

In Namibia, majority of the smokers start smoking tobacco at a younger age as early as 15 years. Men are more likely to smoke as compared to women (24% for men as compared to 8% in women) (MoHSS, 2006). Also the MoHSS reports that the educational level and socio-economic status have an effect on smoking pattern, whereby women with no education and women in the highest wealth quartile are at risk of smoking tobacco (MoHSS, 2006).

There are various strategies to reduce the health burden of smoking. These includes the implementation of public health policies, control the sales of tobacco products and creating public awareness on the dangers of smoking and smoking cessation pharmacotherapies (WHO, 2015). Smoking cessation is one of the most cost-effective preventative health care service as it reduces costs attached to current and future tobacco use. The European Respiratory Society defines smoking cessation as “sustained abstinence from cigarettes and other tobacco products for at least six months, but preferably one year, as confirmed by measurement of expired carbon monoxide or other objective tests” (Desalu *et al* ,2009, p. 1199). Smoking control programmes have not fully implemented the pharmacotherapeutic approaches in reducing this burden.

The WHO has classified intervention for smoking cessation into pharmacological therapies, behavioural and psychosocial interventions (WHO, 2015). Previous interventions on control of smoking have been on behavioural and psychosocial interventions with limited attention on pharmacotherapy (Stead & Lancaster, 2012). This study aimed at evaluating the practice, knowledge and attitudes of medical

doctors towards pharmacotherapies for smoking cessation in order to provide guidance of strengthening pharmacotherapy for smoking cessation in the public and private health care settings of Namibia. Smoking cessation pharmacotherapy involves the use of medications that smokers can take to assist them quit smoking (Cahill & Stevens, 2013). The medicines that are licenced for use in smoking cessation in Namibia include Nicotine Replacement Therapy (NRT) (Nicorette[®]), a Namibian schedule zero and one which are available as “over-the counter medications”, Bupropion (Zyban[®]) and Varenicline (Champix[®]) which are prescription only medicines of the Namibian Schedule 3 and 2 respectively (MoHSS-NMRC, 2015). Currently in Namibia, access to smoking cessation medicines is only in private pharmacy outlets. Moreover, cessation medicines are not included as part of the Namibia essential medicine list (Nemlist) used in public health facilities.

These NRTs are licenced as first-line therapy smoking cessation in many parts of the world, including the United States of America (USA) and the European Union (Cahill & Stevens, 2013). Bupropion, which is a non-cyclic antidepressant, is licenced as schedule 3 in Namibia. Bupropion has been recommended for smokers who fail to quit smoking while taking NRT(FDA, 2015). Varenicline is a selective nicotinic receptor agonist, which is registered as schedule 2 in Namibia (MoHSS-NMRC, 2015).

Medical doctors play a major role in smoking cessation programmes. These cadres not only are they perceived by clients as trusted source of information, but are in positions of influencing appropriate prescription and adherence to smoking cessation

(SC) pharmacotherapies. In addition, studies have report that advice-based therapy combined with pharmacological therapy have proven to have synergistic effects on smoking cessation (Zwar, Richmold, Borland, Peters, Litt, Bell, Caldwell, Ferretter, 2011). Several studies have indicated that advice on SC by medical doctors significantly increases the likelihood of sustained SC for the clients. However, literature reported that medical doctors are not being efficiently utilised to assist clients to quit smoking (Desalu *et al.*, 2009; Association of American Medical Colleges (AAMC), 2007).

Some studies argue that many medical doctors do not assist clients to quit smoking as they lack confidence in their ability to motivate clients, and to advise them on the appropriate therapies they can utilize to quit smoking. In that regard, Desalu *et al.*, (2009) argues that lack of confidence among medical doctors is attributed to lack of knowledge on cessation pharmacotherapy because their training on SC in medical schools was inadequate. Lack of knowledge and unfavourable attitudes may compromise treatment outcome and exacerbate smoking-related morbidities. Moreover, many medical doctors have also indicated that their lack of confidence in assisting smokers to quit were due to lack of guidelines on SC and smoking education programs in their respective countries (Association of American Medical Colleges (AAMC), 2007). The lack of relevant guidelines may compromise the success of SC among smokers willing to stop smoking. Henceforth and importantly, the success of SC may be determined by the knowledge and practices of the medical doctors.

Unlike in other parts of the world, there has not been any study done in sub-Saharan Africa that assessed the knowledge, practice and attitude of medical doctors with regard to the use of SC pharmacotherapy. The data from this study may help to improve the provision of smoking cessation services by the medical doctors and other health professionals in Namibia.

1.2.Statement of the problem

In Namibia, SC services are not systematic and are offered on *ad hoc* basis, depending on where the client presents (public or private), and also on the medical doctor's discretion on what they perceive as appropriate to prescribe. Inappropriate prescribing practices are presumed to be due to inadequate training in medical schools and lack of treatment guidelines for SC pharmacotherapy (Desalu *et al.*, 2009; Association of American Medical Colleges (AAMC), 2007). To date, there was no study done in Namibia on the prescribing practices regarding SC pharmacotherapy by medical doctors. Hence, there is a lack of evidence-based information on prescription of pharmacological therapy for SC in Namibia. Subsequently, the extent and appropriateness of prescribing pharmacotherapy for SC by medical doctors in the country is unknown. Similarly, little is known about the knowledge, attitudes and practices of medical doctors towards SC pharmacotherapy, thus need to be explored in order to provide guidance to strengthening of these services.

1.3. Aim and Objectives

1.3.1. Aim

The aim of this study was to assess the knowledge, attitudes and practices of medical doctors on pharmacotherapy for smoking cessation in Khomas region, Namibia.

1.3.2. Objectives

The specific objectives for this study were:

- To assess the knowledge, attitudes and practice of medical doctors on smoking cessation pharmacotherapy.
- To describe the knowledge, attitudes and practice of medical doctors on smoking cessation pharmacotherapy.

1.4. Significance of the study

The findings from the study document the current practices, highlight the gaps in practice and provide necessary background to design appropriate recommendations to improve quality of smoking cessation pharmacotherapy prescribing patterns among medical doctors. Furthermore, the outcome may be used to strengthen the pre and in-service training for potential prescribers of smoking cessation pharmacotherapy. Moreover, the findings from the study would be used to inform the development of evidence-based practice (EBP) or guide the development of a guideline or policies about the prescribing and use of smoking cessation pharmacotherapy in Namibia. This in turn, may reduce the burden of smoking-related morbidity & mortality in Namibia.

1.5. Research design and methods

This study used a quantitative, cross-sectional analytic design to describe the relationship between the knowledge, attitude (independent variables) and practices (dependent variable) of medical doctors in Khomas region on smoking cessation pharmacotherapy. Out of the 350 medical doctors in clinical practice, Epi Info 7 StatCalc set at 95% confidence interval, 5% confidence limit and an expected frequency of 50% was employed to calculate a sample size of 183 study participants. The doctors were stratified into private practitioners and state practitioners, and a proportionate sample was drawn from each group using random sampling method. A self-administered questionnaire that was divided into three sections (knowledge, attitudes, and practice respectively) was piloted in Oshana region among 18 medical doctors. After being validated, the questionnaire was distributed by field workers to the respondents. The respondents were given a period of 4 months, with a weekly follow up to respond to the questionnaire. The collected data was entered into Epi data and exported to Statistical Package for the Social Science (SPSS) statistics version 23 for cleaning, editing and analysis. The study variables were analysed using descriptive and inferential statistics. Chi-square was used to test the level of significance between the different variables. The level of significance was considered to be statistically significant if p-value <0.05.

1.6.Ethical consideration

Permission to conduct the study was obtained from the University of Namibia's "Centre for Research and Publication" and the MOHSS. A written informed consent was attached to the questionnaire, and the participants had to sign it before they could proceed with the questions. Additionally, participation was purely voluntary and anonymous. Confidentiality was observed by limiting the accessibility of data to the data collectors and the researcher. Lastly, it was upon the respondent's own discretion to decide how much and what kind of information to reveal, hence observing the principle of privacy.

1.7.Definition of concepts

Attitude: Hypothetical construct that represents an individual's degree of like or dislike for something positive or negative views of a place, person, thing or event (SCRIBD, 2017).

Knowledge: Familiarity with someone or something, which may consist of facts, information, descriptions, or skills acquired through experience or education. It may also refer to the practical or theoretical understanding of a subject (PREZI, 2017).

Medical doctors: a person trained and licenced to practice medicine (Republic of Namibia, 2008).

Pharmacotherapy: treatment of a disease through the administration of drugs (Merriam Webster Dictionary, 2017).

Practice: It is the act of doing something regularly or repeatedly to improve the skill of doing it (Cambridge Dictionary, 2017).

Smoking cessation: sustained abstinence from cigarettes and other tobacco products for at least six months, but preferably one year, as confirmed by measurement of expired carbon monoxide or other objective tests (Desalu et al., 2009).

1.8. Chapter Outline

Chapter 1- presented an overview of the study. It further covered a general introduction to SC services and the pharmacotherapy used. The chapter also highlighted the burden of smoking both locally and globally. Lastly, the problem statement, significance of the study, objectives and ethical principles were covered.

Chapter 2-The chapter presented the literature review with regards to SC pharmacotherapy. The emphasis was on the discussion of smoking and the historical background of SC. The likelihood of causative factors to smoking and the consequences were further discussed. Moreover, various methods that could be used to facilitate SC among smokers were described. Different country guidelines were also compared. Lastly, the knowledge, attitudes and practices of medical doctors regarding SC pharmacotherapy across the globe were explored.

Chapter 3- This chapter covered the study design and methodology. The study population, sampling process, sample size and the research instrument are discussed. The procedure for data collection and data analysis were also described.

Chapter 4- The findings of the study were presented systematically and statistically in this chapter. The data was presented by using tables and graphs to enhance understanding.

Chapter 5- The findings of the study were discussed while compared to the literature. The implications of the findings, study limitations and subsequent recommendations were also discussed in this chapter. The chapter were concluded with concluding remarks.

1.9.Summary

The first chapter provided background information on the global burden of tobacco smoking, SC as well as on the knowledge, attitudes and practices of medical doctors towards SC medicines in Namibia. The problem under study was outlined; the aim and specific objectives of the study were stated. Research design and methods applied in the study were also presented. The key concepts were further defined in the context of the study. This chapter further discussed how the outcomes from this study may enhance the existing body of knowledge by providing training on pharmacotherapy used in SC to different cadres within the health sector, which may ultimately reduce smoking related morbidities. The next chapter provides the review of the relevant literature.

CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

In chapter one, the background of the study was given. This chapter gives a detailed account of the literature on the knowledge, attitudes and practices of SC pharmacotherapy among medical doctors. A literature review is a process of analysing existing knowledge in order to make future decisions about practice, policy, future research areas and allocation of resources (Joubert; Ehrlich, 2007). This chapter serves to place the subject matter under study in the context of existing body of knowledge (De Vos, Strydom , Fouche, 2011). For the purposes of this study, a literature review regarding the knowledge, attitudes and practices of medical doctors locally, regionally and globally on the use of SC pharmacotherapy was conducted. For health professionals to appropriately assist smokers to cease smoking, it is very important to understand the reasons why people smoke.

2.2. Factors promoting tobacco smoking among populations

A major effort has been made to curb the use of tobacco. Governments have promulgated laws that restrict smoking in public places and increase taxation on cigarettes and other tobacco products (WHO, 2015). Study after study has shown a negative association between the use of tobacco products and health of an individual. In 2011, the use of tobacco killed more than 6 million people globally, where 80% of them live in low to middle income countries (Blecher & Ross, 2013). Despite the escalation in the prevalence of tobacco smoking and all the scientific evidence on the dangers of tobacco, people still continue to smoke. The WHO's report on trends of

tobacco smoking indicates that 22% of Namibia's population smoke tobacco (WHO, 2015).

There are many factors that influence the use of tobacco among different global populations. The commonest reason for tobacco smoking among youth is peer pressure (Cunningham, 2017). The transition period between childhood and adulthood is marked with a sense of insecurity and frustrations such that teenagers feel socially rewarded and accepted if they partake in group activities such as smoking. If a child in a social circle experiments with cigarettes, it is likely that others will follow too. Identically, as they mature into adults, they might constantly feel the need to please their peers, henceforth, they will continue to smoke. On the contrary, some schools of thought believe that teenagers experiment smoking because they get a thrill that comes with breaking rules imposed onto them by either parents, the community or country laws (Cunningham, 2017). In the same report, the researcher has reported that parenting has an influence on the smoking status of a child. Children who are raised up by smoking parents are likely to smoke as compared to children of non-smokers. The findings of the above study are comparable to a study that was conducted among the students of the University of Namibia, who indicated that students smoke largely because of peer pressure and the need to cope with life experiences (Amakali, Haoses-Gorases, & Taukuheke, 2013).

In addition to peer pressure, a study done in the United States of America (USA) among the African-American cigarette smokers stated that many people smoke to relax or reduce tension (Ahluwalia, Resnicow, & Clark, 2008). Furthermore, another study that was carried out among the Romania medical university employees also

indicated that the majority of staff members were smoking due to curiosity/boredom (Viragh & Viragh, 2014).

In diverse communities such as the USA, the role of ethnicity strongly influences tobacco use patterns. The South Asian community residing in the USA use tobacco products that originated from Asia to preserve cultural traditions and express ethnic identity in a diverse global community (Mukherjea, Morgan, Snowden, Ling, & Ivey, 2012).

A report by McKenna *et al* (2010) “Qualified nurses’ smoking prevalence: their reasons for smoking and desire to quit”, found that nurses in North Ireland smoke mainly due to addiction and enjoyment. The report further indicated that nurses who smoke are less willing to assist smokers who desire to quit (McKenna *et al.*, 2010).

2.3. Pathophysiology of nicotine addiction

Tobacco addiction is primarily due to the pharmacological effects of nicotine (Benowitz, 2010). When a smoker inhales smoke from the cigarette, nicotine is distilled from smoke and is carried by the smoke particles to the lungs, and absorbed through the pulmonary veins into the circulation. From the circulation, nicotine eventually enters the brain where it binds to nicotinic cholinergic receptors and causes the release of neurotransmitter known as Dopamine that gives off a plausible effect (Cahill & Stevens, 2013). Addiction to nicotine is due to a smoker associating specific moods, situations and environmental factors to smoking, such as smoking after a meal, smoking when drinking alcohol or socializing with friends who smoke

(Benowitz, 2010). Other factors that contribute to smoking addiction are the taste, smell, feel of smoke in the throat and manipulation of the smoking materials. Additionally, other pharmacological effects of nicotine include arousal, cognitive enhancement, appetite suppression, learning, memory enhancement, mood modulation and reduction of anxiety and tension, which leads to cravings and thus enhancing addiction (Koda-Kimble, Lloyd Yee, Brian, Robin, Guglielmo, Kradjan, Williams, 2008). Similarly, other scholarly believes that nicotine addiction occurs when the nicotine levels in the blood decreases, leading to withdrawal symptoms such as anxiety, restlessness, inability to concentrate and others. These symptoms begin a few hours after the last cigarette, and if they are not relived by smoking another cigarette, they worsen. Henceforth, smokers smoke on regular basis to avoid these withdrawal symptoms. It is these pharmacological effects of nicotine that are responsible for nicotine dependence. Some studies on genetics indicate that nicotine dependence is highly heritable. The variability in dependence, risk of cancers and response to SC treatment is due to the variation in the metabolism rate for each individual (Benowitz, 2010).

Nicotine addiction is classified as a ‘disease’ by the WHO (ICD-10-CM Diagnosis Codes, 2013; Saba, Bittoun, Kritikos, & Saini, 2013). The addiction requires an in-depth understanding of the pharmacology of addiction, specialized therapeutic knowledge and psychosocial intervention skills, repeated interventions and multiple attempts to quit (Saba *et al.*, 2013). Therefore, there is a need for a multidisciplinary approach to address individual smoker’s needs and provide appropriate treatment. Whilst many smokers are able to quit unassisted, therapeutic services need to be

individualized to suit the needs of those who cannot quit unassisted, especially those with history of unsuccessful quitting attempts and those that have relapsed on several occasions (Zwar *et al.*, 2011). On this basis, it is essential that prescribers of smoking cessation pharmacotherapy be equipped with evidence-based knowledge and skills to facilitate SC interventions. Despite the desired effects that people get from tobacco smoking, smoking is also accompanied by a lot of health hazards, as discussed in the next section.

2.4. Health risks associated with tobacco smoking

Tobacco smoking is the major cause of preventable morbidity and premature death globally, and is very harmful to the body. Tobacco contains over 6000 ingredients, of which around 69 of them are believed to cause cancer (Pietrangelo, Cherney, 2017). Tobacco smoking affects almost every part of the body. The effect of smoking on the body is classified based on the body system affected, such as the cardiovascular system; central nervous system; respiratory tract; skin, hair and nails; and others as explained in the next session.

2.4.1. Effects of smoking on the cardiovascular system

Among the many ingredients found in tobacco smoking is nicotine. When nicotine enters the body, it causes blood vessels to tighten, leading to reduced blood flow to the limbs especially the legs (Pietrangelo, Cherney, 2017). This condition is known as Peripheral artery disease (PAD). The commonest presenting symptom is leg pain when walking (claudication). In addition to PAD, nicotine also lowers the good

cholesterol in the body and increase blood pressure, which further stretches the arteries and lead to atherosclerosis. Tightening of coronary arteries causes coronary artery diseases and blood clots. The combination of blood clots and weakened blood vessels in the brain may lead to a stroke.

2.4.2. Effects of smoking on the central nervous system

Nicotine in tobacco has a stimulant effect on the brain, where it gives off a “good-feel” effect and energises the person. This effect only last for a little while, and as it wears off, one may begin to feel tired and crave for more tobacco. This may result in tobacco addiction. Additionally, smoking may also lead to poor sight, cataract and reduced sense of taste and smell (Pietrangelo, Cherney, 2017).

2.4.3. Effects of smoking on the respiratory tract system

The respiratory system has a limited ability to clear off all the toxic substances that are found in tobacco. Henceforth, over time, such toxins accumulate in the lungs, causing respiratory infections, colds and flu (Pietrangelo, Cherney, 2017). The toxins may also damage the alveoli, causing COPD (CDC, 2017). Long-term smoking is significantly associated with an increased risk of lung cancer (Pietrangelo, Cherney, 2017). Withdrawing from tobacco smoking may also lead to congestion and respiratory pain. Moreover, children who are born by smoking parents are prone to asthma attacks, pneumonia, bronchitis, wheezing and coughing (CDC, 2017). The carbon monoxide in smoke replaces oxygen on the haemoglobin, resulting into hypoxemia (Pietrangelo, Ann; Cherney, 2017).

2.4.4. Effects of smoking on the skin, hair and nails

Despite the effects of smoking on the internal organs, smoking also has a profound effect on the external features such as the skin, nails and hair. It has an ability of causing skin discolouration, wrinkles and premature aging (Pietrangelo, Ann, Cherney, 2017). Moreover, the skin and fingernails may also have yellowing stains from the cigarette smoke. The hair may have also smell of cigarettes even after putting it off (Pietrangelo, Ann; Cherney, 2017).

2.4.5. Smoking and other health risks

In the United States, more than 8 million people are affected by illnesses that are caused by smoking (Miller-Thomas, Leoutsakos, Terplan, Brigham, Chisolm, 2011). Other than the risks described above, smoking also causes many other health risks. On the digestive system, tobacco use can cause gingivitis, periodontitis, bad breath and cancer of mouth, throat, larynx, and oesophagus. Smokers are also at an increased risk of developing insulin resistance, making them more likely to develop type II diabetes mellitus (Pietrangelo, Cherney, 2017). In addition to the effects on the digestive tract, tobacco use also affects the reproductive system. Men and women who smoke are at a higher risk of infertility. Women may also experience early menopause. Moreover, they also have an increased risk of cervical cancer ; and if pregnant, the chances of miscarriages, premature birth, low birth weight, birth defects and sudden infant death syndrome (SIDS) may be high (Bosdriesz, Mehmedovic, Witvliet, & Kunst, 2014). Other than the cancers of the respiratory,

digestive and reproductive system, tobacco smoking also increases cancer of the bladder, blood and liver (CDC, 2017).

2.5. History of smoking cessation

In the 1950s, some medical doctors in the US began to link the cause of cancer, chronic lung diseases and heart attack to cigarette smoking. In 1964, a certain surgeon reported that cigarette smoking is the most important risk factor for the development of lung cancer, and that quitting smoking would greatly reduce the risk (CDC, 2017). Since then, SC has been a public health priority. Pharmacotherapy for SC has been shown to promote and sustain smoking abstinence with odds ratio of around four as compared to placebo treatment (Benowitz, 2010). On the contrary, a study done by researchers from the University of Sydney in Australia argued that a vast majority of people who have quit smoking have done so without any sort of assistance, be it pharmacological or any professional assistance (Chapman & Wakefield, 2013). Since the early 1960s, tobacco smoking has been substituted with less harmful products. There has been a shift from tobacco-containing products to much more safer nicotine delivery regimes such as e-cigarettes and NRTs, which are less addictive and have less potential of causing diseases (Chapman & Wakefield, 2013).

2.6. Benefits of smoking cessation programmes

According to the American Association of Medical Schools, smoking cessation is defined as total abstinence from tobacco (Association of American Medical Colleges, 2007). Tobacco smoking is the most preventable cause of disease, disability and mortality globally (Association of American Medical Colleges, 2007). Quitting smoking is a challenge, and it may require several attempts. People who quit smoking often relapse because of stress or withdrawal symptoms.

Due to the health and economical risks of tobacco smoking, quitting smoking is very important. There is substantial evidence that SC has immediate and major health benefits for both men and women of all ages. A report prepared by CDC reported that smoking cessation increases overall life expectancy, reduces the risks of lung cancer, heart attack, strokes and chronic lung diseases (Samet, 2007). A study that was conducted in the US on the longevity benefits of smoking cessation among various age groups found that life expectancy among smokers who quit at 35 years exceeds that of smokers by about 8 years for men and 7 years for women (Taylor, Hasselblad, Henley, Thun, & Sloan, 2002). The same study further reported that even those that quit much late in life still gain more years of life as compared to their smoker counterparts, thus concluding that cessation at any age increases longevity.

In addition to health benefits, quitting smoking also has economic benefits. Since smoking is associated with an increase risk in cardiovascular conditions such as stroke and acute myocardial infarction, which are expensive conditions to treat, prevention of such conditions provides a short term financial returns for the smoker and the health insurance (Lightwood & Glantz, 2007). A study conducted by Lightwood and Glantz (2007) report that there were fewer hospitalizations due to

acute myocardial infarctions and stroke which resulted in immediate savings of up to \$ 44 million in the first year of quitting smoking. In the light of the above benefits, researchers have discovered pharmacological agents that are helpful in assisting smokers to quit.

2.7. Pharmacotherapies for smoking cessation

Different SC approaches are being used, either alone or in combination with others. Pharmacological agents (medicines) are the commonest. They can be used alone or in combination with psychotherapy. There are a number of factors that must be taken into consideration when recommending a pharmacological agent to assist smokers to quit smoking. The choice of pharmacological agent for SC is guided by individual parameters such as preferences, contraindications and financial implications amongst others. Other factors that need to be considered include adverse drug reactions, availability of drugs, drug-drug interactions, convenience and the level of nicotine addiction (Carson *et al.*, 2013).

Countries like USA, UK, New Zealand and Australia have guidelines in place that serve as practical references for uniform prescribing and dispensing of pharmacotherapy for SC. The use of pharmacological agents is mostly recommended for people with evidence of nicotine dependence, whereas non-pharmacological therapies are recommended for smokers that do not show evidence of nicotine dependence or those that are not willing/unable to use the pharmacological agents (Carson *et al.*, 2013). First line therapy for smoking cessation in the US is approved by the U.S. Food and Drug Administration (FDA). It includes the use of NRT, Bupropion and Varenicline (Van Zyl-Smit, Allwood, Stickells, Symons, Abdool-

Gaffar, Murphy, Richards, 2013; Carson *et al.*, 2013; Cahill & Stevens, 2013). In conclusion, numerous medications have been proven to help people quit smoking in Europe and USA (Cahill & Stevens, 2013). However, only three are licenced for such purposes in Namibia: NRT, Bupropion and Varenicline. Their pharmacological profiles are explained in the next section.

2.7.1. Nicotine replacement therapy

Nicotine replacement therapy is available in many different dosage forms and strengths such as gum (2mg & 4mg), lozenge (2 & 4mg), spray (metered spray of 0.5mg nicotine in 50 μ L aqueous solution), transdermal patch (7, 14, 21mg 24-hour release) and oral inhaler 10mg cartridge, which delivers 4mg inhaled nicotine vapour (Koda-Kimble *et al.*,2008). Nicotine replacement therapy reduces the craving to smoke and minimizes the physiological and psychomotor withdrawal symptoms often experienced during an attempt to quit smoking, henceforth it increases the likelihood of remaining abstinent (Cahill & Stevens, 2013). A meta-analysis of 117 controlled trials, with more than 50,000 participants found that all forms of NRT are 1.6 times more likely to help smokers quit smoking as compared to the placebo (Silagy, Lancaster, & Stead, 2012). Nicotine replacement therapy products provide less nicotine as compared to cigarette smoking, and their primary mechanism of action is to reduce the severity of withdrawal symptoms associated with SC, making quit attempts more tolerable. The transdermal nicotine patch delivers between 5-52.5mg of nicotine over 24-hours. It offers a consistent blood levels of nicotine although it has a slow onset of action (Silagy *et al.*, 2012).

2.7.2. Bupropion slow release tablets

Bupropion SR on the other hand is a non-cyclic antidepressant, which counteracts depression through its effects on the neurotransmitters and receptors involved in nicotine addiction (Silagy *et al.*, 2012). It is used by smokers who fail to quit on NRT. The recommended dosage is 150mg once daily for 3 days, increased to 150mg twice daily for the next 7 to 12 weeks. Quitting attempts are started a week after starting on the therapy. It is licenced as schedule 3 medicine in Namibia and marketed under a trade name Zyban[®].

2.7.3. Varenicline tartrate tablets

Varenicline tartrate (Champix[®]) was first licenced in the UK in the year 2006 for SC. It is a selective nicotinic receptor partial agonist that works by reducing the urge to smoke and also helps to minimize the withdrawal symptoms (CDC, 2017). Varenicline works by attaching to the nicotinic receptors in the brain. By doing so, it partially prevents nicotine from binding to the same receptors thus mimicking its effect, hence reducing its effect and minimizes the withdrawal symptoms. In Namibia, varenicline is registered as a schedule 2 medicine. It is marketed under a trade name Champix (NMRC, 2015). Varenicline is formulated into two dosage strengths which are the 0.5mg and a 1mg tablet. The smoker is initiated on treatment a week before the set quit date (Pfizer Limited, 2016). For the first 3 days, varenicline is taken as 0.5mg once daily, which is increased to twice daily dosage from day 4-7. Thereafter, the dose is increased to 1mg twice daily from the 8th till week 12, which is the recommended duration of therapy. For smokers who are

unable to quit within the first 12 week period, they may continue taking varenicline for another 12 weeks to avoid relapses (Benowitz, 2010). Varenicline, like all medicines have side effects too. The commonest side effect includes inflammation of throat and nose, abnormal dreams, difficulty in sleeping, headache and nausea (Pfizer Limited, 2016).

To promote rational use of SC medicines, countries and health agencies have instituted treatment guidelines that are designed to assist the health care practitioner and the smoker in making appropriate treatment choices.

2.8. Smoking Cessation Guidelines

A standard treatment guideline (STG) is a systematically developed statement designed to assist practitioners and patients in making decisions about appropriate health care for specific clinical circumstances (MSH, 2007). Standard treatment guidelines have been in existence for many years. A STG is a comprehensive document for patient management that benefits the health care practitioners, the patient and other health care officials such as logistics managers. As for the health care providers, treatment guidelines generally provide standardized guidelines for them on treatment of specific conditions. As a result, treatment guidelines facilitate high quality care by directing practitioners to the most appropriate medicine for a specific condition. Moreover, it also allows the use of essential medicines, and help to provide assistance, especially to the lower level skilled staff members (MSH, 2007). Similarly, treatment guidelines ensure that patients receive optimal

pharmaceutical care, while ensuring consistent and predictable care from all levels within a given health care system.

Currently, the challenge with SC services offered in Namibia is that they are not systematic and are offered on *ad hoc* basis, depending on where the patient present (public or private), and also on the doctor's discretion on what they prefer to prescribe. Such practices could be attributed to the lack of standard guidelines to direct the doctor on the appropriate therapy for the patient. Henceforth, due to lack of standardized pharmacotherapy for SC to assist smokers who desire to quit, doctors prescribe these medicines using their own preference, a practice that can possibly compromise the success of SC.

A number of countries and institutions have introduced SC treatment guidelines, also commonly referred to some as clinical guidelines. These guidelines assist smokers who smoke all forms of tobacco products such as cigarettes, cigars, and rolled tobacco to quit smoking. The aim of SC guidelines is to standardize the provision of SC services, and to reduce tobacco related morbidities and mortalities. Based on the literature search, the researcher found the following guidelines to be applicable to the Namibian context.

2.8.1. The National Institute for Health and Care Excellence (NICE) guidelines, UK

The NICE guideline aims to treat at least 5% of the total smoker population, with an estimated success rate of at least 35% at four weeks after initiating the program. A smoker is declared to have ceased to smoke if he or she has not smoked for three to four consecutive weeks after the quit date. Furthermore, NICE recommends that

health care professionals may encourage the use of pharmacotherapy in people who desire to stop smoking. The guideline recommends the use of NRTs, bupropion and varenicline as part of the abstinence-contingent treatment, whereby a smoker makes a commitment to stop smoking on or before a particular date, known as “stop target date” (NICE, 2008). The prescription of such medicines should be enough to last for two more weeks after the set target date. Thereafter, further prescription of these medicines should only be done after re-evaluating the smoker and after they have demonstrated, with sufficient evidence, the continuity of their quit attempts. To increase successful quit attempts, NICE recommends that NRTs be used in combination with behavioural therapy.

Nicotine replacement therapy may be used in pregnant and breastfeeding women and those with unstable cardiovascular disorders after weighing the risks and benefits. Varenicline or bupropion SR may be used in patients with unstable cardiovascular disorders, subject to clinical judgement. The NICE guidelines however discourage the use of NRT, bupropion or varenicline in any combination. The guideline allows only for the combination of nicotine patch with any other form of nicotine dosage form, for example gum, lozenges, or nasal spray. This combination is particularly recommended for smokers who have high level of nicotine dependence or those who have found single forms to be inadequate. When making a pharmacotherapy choice, the clinicians need to take into consideration the contra-indications of such a medicine in certain population of patients, client’s personal preferences, previous experience with other smoking aid medicines.

2.8.2. Agency for Healthcare Research and Quality (AHRQ) Smoking cessation guidelines, U.S.A.

Agency for healthcare research and quality under the U.S Department of Health and Human Services developed a clinical guideline of smoking cessation pharmacotherapy, which is guided by evidence-based research. The guideline recommends the use of smoking cessation medicines for all smokers who wish to quit smoking. Special exemptions are made for those with medical contraindications, adolescent smokers, pregnant women and those that smoke less than 10 cigarettes per day (AHRQ, 2012). Furthermore, this guideline clearly stipulates the preferred first and second line treatment of choice. Nicotine replacement therapy (gum, inhaler, spray, and patch), bupropion and varenicline are recommended as the preferred treatment of choice. Due to insufficient evidence, this guideline does not provide any ranking hierarchy on the superiority of any medicines. Henceforth, it recommends clinicians to make a judgement on the specific first-line option based on factors such as patient preference, contraindications and clinician familiarity with the medicine. For patients who failed or have any contraindications on first line, Clonidine and Nortriptyline is the preferred second-line. As for patients who are concerned with weight gain, NRT or bupropion SR is recommended. Moreover, for smokers with a history of depression, this guideline recommends the use of bupropion SR and nortriptyline. As for smokers who have persistent relapses, medicines may be used for six months or more. This guideline further speaks to the NICE guideline on combining various forms of NRT to improve treatment outcomes (AHRQ, 2012).

2.8.3. National Comprehensive Cancer Network (NCCN) Guidelines

The NCCN recommends the use of SC medicines, behavioural therapy and follow-up in all smokers with cancer (Collins & Chase, 2013). Similarly to the NICE guidelines, the NCCN also supports smoking history taking and documentation for every patient diagnosed or treated for cancer. However, unlike the NICE guidelines, this guideline recommends the use of a combination NRTs or Varenicline as their first-line therapy; and varenicline plus combination NRT or bupropion plus combination NRT as the preferred second-line treatment (Collins & Chase, 2013). In addition to the international guidelines on SC pharmacotherapy, at regional level, South Africa (SA) also has guidelines on smoking cessation in place.

2.8.4. South African tobacco smoking cessation clinical practice guideline

The South African tobacco SC guidelines recommends the use of dual NRT, whereby the patch is used as a “controller” and gum/spray is used as a “reliever”(Van Zyl-Smit, Allwood, Symons, Lalloo, Dheda, 2013). The use of dual NRT, according to the guideline has an abstinence rate of over 36%. An NRT controller is commended to be used continuously, in titrated doses; whereas a reliever is recommended for use during breakthrough symptoms. Other medications recommended in this guideline include bupropion and varenicline (Van Zyl-Smit *et al*, 2013). The guideline further recommends that bupropion should be used in combination with NRT to increase its effectiveness. For smokers who are taking varenicline, close monitoring is highly recommended due to concerns of suicidal behaviours associated with it (Van Zyl-Smit *et al*, 2013). Unlike the NICE and

AHRQ, this guideline does not indicate which drug is to be used as first line or second line.

Smoking cessation pharmacotherapy and guidelines have been made available in many countries, but the prescribing and recommendations of such medicines by the health care providers is unknown. Furthermore, the knowledge and attitudes and practices of the prescribers are unknown.

2.9. Knowledge, Attitudes and Practices of health care professionals on smoking cessation

Health care professionals (HCP) play a crucial role in SC because they are usually the first point of contact with the patients or smokers. Of particular interest are the PHC professionals, such as pharmacist, medical doctors and nurses. Medical doctors are the primary prescribers for medicines, including those for SC. They play a crucial role in SC because they have the potential to influence the behaviours of smokers and the broader community, regarding the use of tobacco products. Therefore, they are in a better position of recommending and prescribing medicines to assist in quitting smoking. Medical doctors are one of the most important sources of information with regards to health risks as well as having a great influence on the types and designs of health care interventions, including those of SC. While HCP play a big role in SC, smokers too play a significant part not only in smoking but also in quitting (Association of American Medical Colleges, 2007). The success of

SC services provided by medical doctors depends on the knowledge acquired through their medical education and experience.

2.9.1. Medical doctors' knowledge of smoking cessation pharmacotherapy

Nicotine dependence is classified as a disease by the WHO International Classification of Diseases (ICD-10-CM Diagnosis Codes 2013). Addressing smoker's needs and providing sufficient treatment requires HCP to have adequate understanding of the pharmacology of addiction, the therapeutic interventions available together with the psychosocial skills that facilitates smoking cessation (Blecher & Ross, 2013). The knowledge of medical doctors is very crucial in assisting smokers to quit smoking. Medical doctors with good knowledge on different SC interventions are more likely to have a positive attitude towards cessation, which ultimately leads to improved cessation outcomes. The Canadian SC guideline (2000) stresses that medical doctors who are trained on SC are more likely to assist smokers in quitting smoking, as compared to their untrained counterparts.

A study that was conducted among medical doctors in Nigeria on their knowledge and practices of smoking cessation revealed that 89% of them had a good knowledge of tobacco use (p-value >0.001). Sixty seven percent of them were aware of SC therapy, but only about 30% had knowledge of SC therapy (Desalu et al., 2009). Moreover, majority of them reported that the common source of information about SC were the medical schools, though about 70% of them had indicated that tobacco training in the medical curriculum was inadequate. This was in agreement with another study conducted in the USA, where medical doctors also raised concerns of

inadequacy in education and training on smoking services offered in medical schools (Association of American Medical Colleges, 2007). The knowledge of medical doctors on SC services further influences their attitude towards the provision of such services.

2.9.2. Medical doctors attitudes towards smoking cessation pharmacotherapy

The attitude of medical doctors towards smoking and the cessation services offered depends on their knowledge. Results for a study by Desalu *et al* (2009) has shown that health care provider's smoking behaviour is associated with the provision of smoking cessation therapy. A study that was conducted in Nigeria among medical doctors indicated that those who smoke do not offer sustained support to smokers who are willing to quit (Desalu et al., 2009). The prevalence of tobacco smoking among the Nigerian physicians was 16 times as compared to their counterparts in USA. This in turn impacts on the physician's responsibility of motivating and assisting smokers to quit. This is in agreement with another study that was conducted in Poland, where the researchers reported that smokers feel more motivated to quit smoking if the doctor attending to them is a non-smoker (Buczowski, Marcinowicz, Czachowski, Piszczek, & Sowinska, 2013).

Medical doctors have varied beliefs and attitudes regarding smoking. Kling et al (2011) conducted a study in China where 73% of the medical doctors have agreed that it is part of their duty to offer help to smokers to quit. Even though medical doctors knew that they are supposed to assist smokers, only 13% believed that smokers will actual take their advices and follow them. This is in contrary to findings

in a study that was done among Saudi Arabians whereby over 75% of the doctors believed that the chances of quitting would be high if smokers are to be advised to quit smoking. On a study that was conducted among smokers, the researcher reported that smokers prefer it when their doctors continuously motivate and encourage them to quit before referring them to experts (Buczowski et al., 2013).

Most countries have national guidelines in place for SC. Most of these guidelines stipulate that doctors should be trained on SC. A study that was conducted in Saudi Arabia found out that over 90% of the doctors indicated that they needed to get specific training on SC techniques (Al-turkstani, Alkail, Hegazy, & Asiri, 2016). Consequently, the knowledge and attitudes of medical doctors greatly affect the meaningful provision of SC services.

2.9.3. Medical doctors' practices of smoking cessation pharmacotherapy

Different studies show diverse range of practices of health workers towards SC. The association of American Medical College conducted a study in 2007 that assessed the behaviours and practice patterns of physicians in SC. Despite 86% of physicians asking patients about the smoking status and advising them to quit, only less than 20% arrange follow-up visits and refers smokers to specialized smoking services (Association of American Medical Colleges, 2007). On the contrary, an Australian study revealed that only a third of their doctors reported to have been providing SC services (Young, Ward, 2010).

Smokers prefer to quit smoking if doctors spent adequate time in motivating them to quit, especially for health related reasons. Success rates are deemed to be high if smokers are identified in general practice and subsequently referred to experts. Nonetheless, some researches have revealed that counselling and motivation of smokers may not be so beneficial when done on routine basis. This was notably documented on Danish patients and general practitioners which revealed that SC services given on routine basis especially if the purpose of visit is not related to smoking problem irritates patients and impede on patient-doctor relationship (Gaussora, Baarts, 2010).

In the USA, over 60% of the doctors have indicated that the factors that often motivate them to assist smokers are the availability of more effective interventions. Unlike other physician specialists in the USA, psychiatrists reflected better cessation practices and favourable attitudes (Association of American Medical Colleges, 2007). A study done in Nigeria also revealed that 86% of the physicians take smoking history of their patients (Desalu et al., 2009), but only less than 4% prescribed antidepressants or NRTs for their patients. Similarly to the Americans, only less than 17% of the practitioners arranged follow-up visits with their clients in relation to smoking. When asked about the obstacles to providing services, the majority of them cited a lack of time and unavailability of NRTs. In Canada, several studies as cited in their SC guidelines revealed that brief counselling increases the quit rates by 2.5% as compared to no advise at all (University of Toronto, 2000). In fact, the same study revealed that one in every 40 smokers that receive brief counselling will quit smoking permanently, and since about 70% of the Canadian

population visit doctors at least yearly, doctors have an impactful role to play in promoting SC among smokers.

The challenge with tobacco smoking and its health risks is known worldwide. The same is true about the management, the treatment guidelines and the knowledge, attitudes and practices of doctors towards the provision of smoking cessation services. However, there is no research-based evidence in Namibia about the knowledge, attitudes and practices of medical doctor on smoking cessation services, particularly on the prescription of pharmacotherapy for smoking. Henceforth, the next chapter explores the methodology that was used in assessing the knowledge, attitudes and practices of Namibian medical doctors on smoking cessation pharmacotherapy.

2.10. Summary

This chapter provided an overview of the historical background of smoking cessation in general. The factors that cause smoking were also explained. The global burden and the consequences of smoking were further outlined, followed by the various methods such as behavioural and pharmacological therapies that could be employed to facilitate smoking cessation among smokers. The chapter further discussed and compared the guidelines on current practices of managing smoking by medical doctors in various countries such as the USA, UK and SA. The knowledge, attitudes and practices of medical doctors with regards to the prescription of smoking cessation pharmacotherapy were explored. Chapter three discusses the methodology used for this study.

CHAPTER THREE: RESEARCH DESIGN AND METHOD

3.1. Introduction

In chapter 2, an in-depth literature relating to the research topic was reviewed. This chapter focus on the research methodology that was employed in this study. Research methodology is about the choice and selection of particular methods to answer a research question (Smith, 2010). As emphasised by Mouton (2008), research methodology concentrates on each step in the research process, including the development of the data collection tool and the various actions to be taken.

3.2. Research design and method

This study used a cross-sectional, descriptive and analytic design that used quantitative data to explore and describe the relationship between the knowledge, attitudes and practice of smoking cessation pharmacotherapy among medical doctors in Khomas region. The design was a cross-sectional study that described the knowledge, attitudes and practices of the medical doctors on smoking cessation pharmacotherapy in Khomas region at one point in time (De vos, Strydom , Fouche, 2011). The relationship of the independent variables (knowledge and attitudes) and the dependent variable (practice) on pharmacotherapy smoking cessation by the medical doctors was analysed.

A quantitative study is a formal, objective and systematic process which utilises numeric data to describe and test the relationships and to examine the cause- and-effect interactions among variables (Burns & Grove, 2005). A quantitative method was relevant for this particular study because numerical data was collected and

analysed statistically. Moreover, through the quantitative method, the results that can be generalized to a larger population were generated from a reasonably large population.

A descriptive study, also known as observational study simply describes the frequency and distribution of a variable or a phenomenon in a population (Bonita & Beaglehole, 2006). Knowledge, attitudes and practice patterns of medical doctors regarding SC pharmacotherapy was described.

Cross-sectional study is a type of descriptive study that involves the collection of data at one-point in time (De Vos, 2011). Cross sectional studies are also known as point prevalence studies. In this study, the aim was to get a snap shot of knowledge, attitudes and practices of medical doctors at one point in time.

Analytical study, is a study design that aim to find the causes of or risk factors for a health problem by assessing whether particular exposures are related to health outcomes (Eale, 2017). In this study, an analytical method was applied to ascertain the association between the independent variables (knowledge, attitudes), and the dependent variable- (practice of medical doctors on the pharmacotherapy for SC).

3.3. Population and sampling

3.3.1. Study population

The study population is the group of people, cases, or events about whom the study is conducted to address the research question. The study population should be clearly defined in respect of person, place, time and any other factor that is deemed relevant to the study (Joubert & Ehrlich, 2007).

The study population included all 1127 medical doctors in Namibia registered with the Health Professional Council of Namibia (HPCNA) during 2016/17 calendar year. The target population included all medical doctors (350) practicing in Khomas region. Therefore, the sample size was calculated based on the target population of 350 medical doctors. Khomas region was chosen because it is the region with the highest density of medical doctors.

3.3.2. Inclusion and exclusion criteria

Inclusion: All medical doctors practicing in private and public health sector in Khomas region were included in the study. Moreover, the target study population was inclusive of all interns, general practitioners and specialists in all fields of medicine. Both the local and foreign doctors in the region were given equal opportunity to participate in the study. Medical doctors of all ages, gender and experience we included.

Exclusion: The study however excluded all the retired medical doctors because they were no longer practicing. Furthermore, medical doctors who were not in clinical setting and those on study leave during the period of study were excluded.

3.3.3. Sample and sample size determination

According to De Vos *et al.* (2011), a sample is defined as “elements of the population considered for actual inclusion in the study”. A sample is a sub set of the population that was chosen, which was later used in making inferences to the larger population. A sample of medical doctors was selected because studying the entire population would be too costly in terms of finances and time; and secondly, studying

a large population might give less accurate results because of challenges in logistics, and coordination.

3.3.3.1. Sample size

The sample size was calculated taking the following issues into consideration:

Confidence interval- this is the amount of error that the researcher is willing to allow as no sample is perfect. Confidence interval determines how higher or lower the population mean the researcher is prepared to let the sample mean fall. Confidence interval is also known as margin of error, and the common one is $\pm 5\%$.

Confidence level- provides a range of reasonable values that are intended to contain the parameter of interest with a certain degree of confidence. The commonly used confidence intervals are 90%, 95% or 99%. In this study, a confidence level of 95% was used. Standard deviation dictates the variance the researcher expects in the participants responses. For this study, the sample size was calculated using Epi Info 7 StatCalc for descriptive study design. Using the following parameters:

Population size = 350

CI = 95%

Confidence limit: 5%

Expected frequency: 50%

The calculated sample size is 183 participants, calculation of which is illustrated as follows:

$$n = \frac{N}{1 + N \times a^2} \quad n = \text{sample size, } N = \text{total population, and } a = \text{confidence limit } 5\% \text{ or } 0.05$$

$$= \frac{350}{1 + 429 \times 0.05^2} = \frac{350}{2.0025} = 183$$

n= 183 (sample size)

3.3.3.2. Sampling procedure

Probability sampling was used to ensure that all the respondents have an equal opportunity of being selected. Proportionate stratified method was used to warrant that the public and private practitioners proportionately contribute to the sample according to their distribution. The population was divided into two strata, the public sector medical doctors and the private sector medical doctors. Once the proportion of each stratum was established, simple random sampling was used with the help of random number generator to select the participants. The sampling procedure is summarised in figure 1.

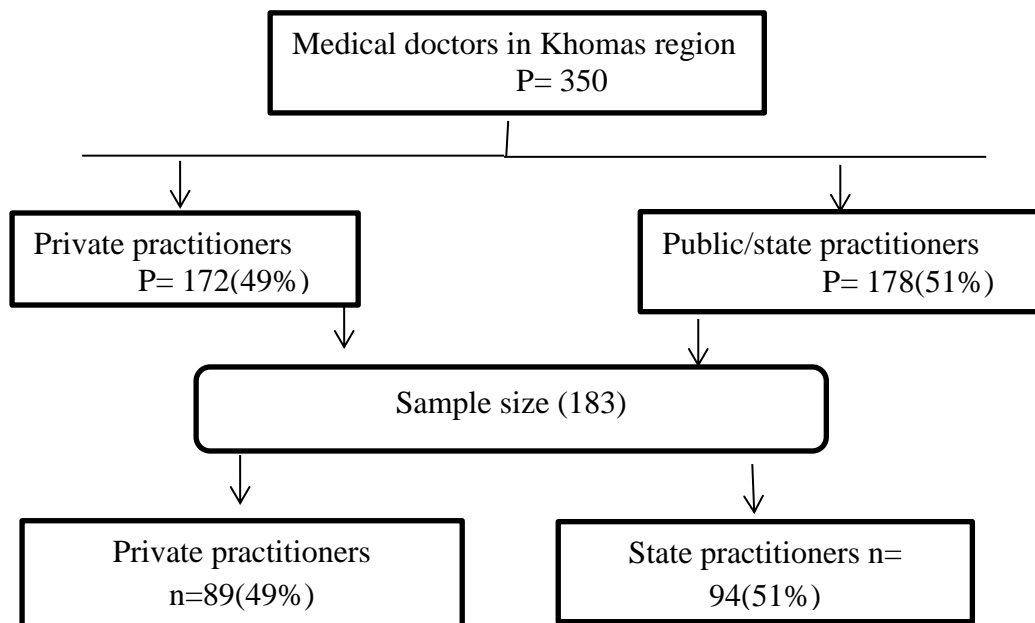


Figure 1: Schematic representation of the sampling design

3.4. Research instrument

An English version of a self-administered questionnaire was developed to collect the data. Babbie defines a questionnaire as a tool containing questions and other types of items designed to solicit information appropriate for data analysis (De Vos, Strydom; Fouche, Delpont, 2011). The aim of collecting data using questionnaires is to obtain facts and opinions about a phenomenon from subjects who are well informed on the matter. The questionnaire used in this study contained open and closed ended questions on the knowledge, attitude and practice of medical doctors on tobacco SC pharmacotherapy. The inclusion of both types of questions allowed the researcher to obtain more insight on different variables of interest (De Vos, Strydom, Fouche, Delpont, 2011). The questionnaire had different types of questions, all aimed to answer the objectives of the study. Moreover, the questionnaire was also informed by the previous studies that were conducted in the similar area. The questionnaire was validated by staff members from the statistics department, school of medicine and school of pharmacy at the University of Namibia with respect to the feasibility of the designed data collection instrument and to validate if all questions could be statistically tested.

The questionnaire had 3 sections: Section A contained questions on the demographic characteristics of the participants. Section B assessed the knowledge on SC pharmacotherapy; and section C assessed attitudes and practices of medical doctors on SC pharmacotherapy. The majority of the questions in the questionnaire were designed by the researcher because she could not find similar studies done elsewhere.

3.5. Pilot testing

A pilot study, also known as preliminary or feasibility study is described by Barker (2011), as cited by De Vos (2011) as “a procedure for testing and validating an instrument by administering it to a small group of participants from the intended study population (De Vos *et al.*, 2011). Pilot study is essential to ensure that the chosen procedures are suitable, valid, reliable, effective and free from errors. A pilot study was conducted among a number of medical doctors in Oshana region, Namibia. Oshana region was chosen as the participants have the same demographic characteristics as those in Khomas region. The main objective of pilot study was to test the reliability of the data collection instrument, and to make necessary adjustments to the data collection instrument (De Vos, Strydom & Fouche, 2011). A sample size of 10% of the actual study sample has been justified to pilot study the data collection instrument (Connelly, 2008). Hence the sample size for the pilot study was calculated as follows: $n = \frac{10}{100} \times 183 = 18.3 = 18$

The pilot study was conducted among medical doctors at Oshakati Intermediate hospital and among the private doctors within Oshakati town. The respondents were asked to complete a self-administered questionnaire. The pilot study took place over a period of four weeks from the August 8th- August 29th, 2016. A minimum of 11 questionnaires were given to medical doctors at Oshakati Intermediate hospital, whereas the remaining 7 questionnaires were distributed among the private medical practitioners. All cadres of medical doctors starting from interns to specialists were included in the study.

3.6. Procedure for data collection

Data collection enables the researcher to select the study subjects and gather the data from them to answer a research question or objectives (Joubert, Gina & Ehrlich, 2007). For the public sector, the number of medical doctors employed at Katutura Intermediate Hospital (KIH) and Windhoek Central Hospital were obtained from the management of the respective hospitals. As for the private sector, a list of medical practices in Windhoek was obtained from Khomas regional directorate office within the MoHSS. The names (and total number) and physical addresses of the private practitioners were obtained from the list. The respondents were randomly selected using random numbers generated in excel.

The data was collected using self-administered questionnaire that was delivered by hand to the respondents by 5 trained fieldworkers. Each questionnaire had a unique serial number. Self-administered questionnaire gives the participant an opportunity to complete the questionnaire at their own time. This is particularly beneficial in this study as medical doctors are almost always busy during the day, hence they can complete once when off duty.

Hand delivered questionnaires have limitations too. In this study, the physical delivery was costly in terms of finances and time, because the questionnaires have to be delivered and collected over a wide geographical area. Secondly, there were times when the respondents had lost the questionnaires or did not complete them, which prolonged the data collection period.

The respondents were given one week to complete the questionnaire, during which time they were reminded telephonically after every 48 hours. Follow-up was done again after 2 weeks to those who did not complete the questionnaires. In total, the respondents were given a period of four months to complete the questionnaire. All the questionnaires were securely stored by the researcher throughout the period of data collection and analysis.

3.7. Data analysis

The purpose of data analysis is to shrink the data to an understandable and interpretable form so that the relations of the research problem can be studied, tested, and conclusions drawn (De Vos, Strydom & Fouche, 2011). With the use of computer software programme Epi data v 3.1, a data entry sheet was created, which was similar to the questionnaire and all numbered questionnaires were entered into this data sheet. The data was then exported to SPSS statistics version 23, where it was edited, cleaned and later analysed. The variables (knowledge, attitudes and practices of CS) of the study were analysed using descriptive and inferential statistics. Chi square test and the level of significance were performed to test the relationship of the dependent (practices) variable to the independent variables (knowledge and attitudes). The level of significance was considered statistically significant if the P-value < 0.05. Categorical data was presented in a form of frequencies and percentages, whereas continuous data was presented as means and standard deviation (SD).

3.8. Validity and reliability

3.8.1. Validity

In order for a test instrument to answer the research question, it should measure exactly what it is supposed to measure. Validity aims at achieving two goals. Firstly, the instrument should measure the concept in question and secondly, the concept should be accurately measured (De Vos *et al.* 2011, p.173). The aim of this study was to determine the knowledge, attitudes and practices of medical doctors on the pharmacology for SC. Validity can be categorised into content, face, criterion and construct validity (Guest & Namey 2015; De Vos *et al.*, 2011). Content validity is when an instrument represents all the components of the variable to be measured. The instrument that was used in the study covered all variables pertaining to knowledge, attitudes and practice of medical doctors on smoking cessation pharmacotherapy to ensure face and content validity. To ensure construct validity, only variables that are relevant to smoking cessation pharmacotherapy were chosen. Face validity on the other hand refers to how well the measurement technique appears to measure what it is supposed to measure. The questionnaire was constructed based on literature reviews. The questionnaire was validated by the experts in the field of pharmacy and medicine. Moreover, the questionnaire was also presented to the statistician in the department of statistics at UNAM for content validity and to validate that the chosen statistical methods are feasible.

3.8.2. Reliability

According to Struwig & Stead, (2004), reliability is the extent to which the test scores are accurate, consistent, dependable, trustworthy and stable. In this study, only internal consistency was measured. Reliability occurs when an instrument measures the same thing more than once and results in the same outcome. If a procedure is reliable, it will produce the same results in the future as has done in the past (De Vos *et al.* 2011). In this study, reliability was observed by pilot testing the data collection tool on ten percent of the actual study sample size. The pilot study was done to identify any possible practical problems and to ensure that the questions are clear, well understandable and complete. Moreover, the data from all the participants was collected with the same data collection instrument (Guest & Namey, 2015).

3.9. Ethical considerations

Research should be based on mutual respect between all parties involved, and it is the responsibility of a researcher to protect the rights of the human subjects if they are involved. In this study, the ethical principles of biomedical research involving human subjects were honoured and applied as explained in the next sessions.

3.9.1. Permission

First and foremost, ethical clearance was obtained from the 'Centre for Research and Publications' at the University of Namibia. Secondly, permission to conduct the study among the medical doctors was obtained from the Ministry of Health and

Social Services. After it was granted, the researcher informed the medical superintendents of both hospitals about the study, its purpose and prospective dates of data collection.

3.9.2. Written informed consent

Respect of persons requires that the participants be given an opportunity to choose what should happen and what should not happen to them (Bonita & Beaglehole, 2006). In this study, the aim and objectives of the study, the expected duration of the participant's involvement, the credibility of the researcher as well as the benefits of the study were all explained to the participants prior to their participation. The consent letter was attached to the questionnaire, and the participant had to sign it before they could proceed to respond to the questions.

3.9.3. Voluntary participation

Rubbin and Babbie (2005, p.71) as quoted by De Vos (2011) emphasised that any participation in any research should be voluntary and no person shall be forced to participate. This ethical principle was indeed respected in this study, as no participant was forced or victimized to participate. Participation was entirely voluntary.

3.9.4. Privacy, anonymity and confidentiality

Privacy can be defined as the act of keeping to oneself that which is normally not intended for others to observe or analyse (De Vos *et al*, 2011). Every person has the right to privacy, and it is upon them when, where, to whom and to what extend his or her behaviours, attitudes and practice patterns will be revealed. In this study, it was

upon the participant's own discretion to decide on what kind and how much information they are willing to reveal. Confidentiality on the other hand is the agreement between persons that limit other's access to private information. Confidentiality in this study was observed by ensuring that the data collected was only accessible to the data collectors and the researcher. Lastly, participation was anonymous as the respondents were not required to enter their names or any form of identity on the questionnaire. Instead, the participants were identified by serial numbers.

3.10. Dissemination of results and Beneficence

The findings will be presented to the UNAM School of Public Health, and to both the Medical and Pharmaceutical society of Namibia. The findings from the study would be used to improve the prescribing pattern of smoking cessation pharmacotherapy by medical doctors in Namibia. This in return would improve treatment outcomes of smoking cessation therapy.

3.11. Summary

This chapter contained a detailed discussion of the research design and method used in the study. It explained the methods of data collection, data cleaning and data analysis using SPSS statistics version 23. Reliability, validity and ethical principles were also discussed. Chapter four presents the findings obtained from this study.

CHAPTER FOUR: RESULTS

4.1.Introduction

This chapter presents the findings of the knowledge, attitudes and practices about smoking cessation pharmacotherapy among medical doctors in the Khomas region. Both descriptive and inferential statistics were applied to present the findings. Descriptive statistics were applied to describe measures of central tendency such as proportions (%) and the means of the socio-demographic characteristics of the respondents as well as the level of knowledge, attitudes and practices of smoking cessation pharmacotherapy among the respondents.

Inferential statistics on the other hand were applied to describe the degree of association between knowledge, attitudes and practices on smoking cessation pharmacotherapy with various covariates including sociodemographic characteristics by use of bivariate analysis using Chi-square test, significance value expressed with *p*-values for a 95%CI and the strength of the association expressed with Cramer's test statistic.

This chapter is organised into four sub-sections 4.1, 4.2, 4.3 and 4.4. The first sub-section 4.1 describes the socio-demographic characteristics of the study respondents. Sub-section 4.2 covers the results on the knowledge on smoking cessation pharmacotherapy. Sub-section 4.3 represents the findings on the doctor's attitudes towards pharmacotherapy smoking cessation services; and lastly, sub-section 4.4 is about the practice patterns. The results are discussed in the subsequent chapter five.

4.2. Demographic characteristics of the study respondents

The demographic characteristic of the study respondents such as age, sex, specialization and smoking status are described in the various subsections under subsection 4.1.

4.2.1. Completion rate of self-administered questionnaires among study respondents

Figure 2 shows a flowchart of the questionnaire completion rate by the study respondents in Khomas region. Out of 183 medical doctors that were recruited for this study, the response rate in terms of completion of the self-administered question was 62.8% (115/183). Out of the 115 of the questionnaires received, nine respondents had incomplete data on demographic and/or on the main study outcome and were thus excluded from the analysis. The final response rate of this study was estimated to be 58.5 % (106). This is similar to other studies done among clinicians where the response rate was less than 50% (Templeton, 2007).

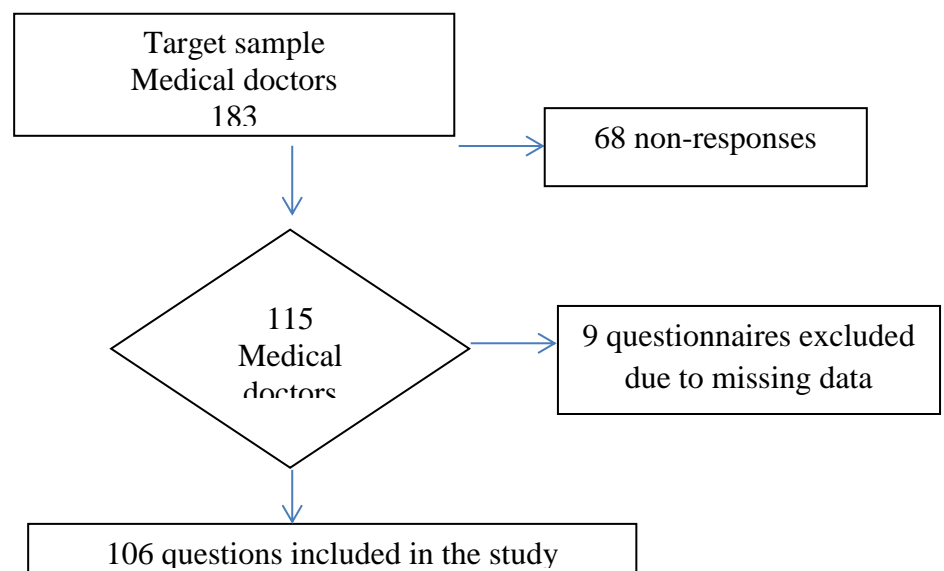


Figure 2: Schematic flowchart of recruitment of the study respondents

4.2.2. Bivariate analysis of socio-demographic characteristics of the study respondents by practice setting

Table 1 shows the distribution of socio-demographic of respondents by type of practice. Out of the 106 medical doctors that completed the study the number of females was similar to that of the males and, over two thirds 73 (69%) were employed in the public health sector of Namibia. Two out of every third respondent (61%) were intern doctors relative to general practitioners and consultant specialists. All the interns were working in the public facilities. Two thirds (67%) of the respondents self-reported to offer smoking cessation services to their clients. There was a significant association between the sex ($p=0.0337$), designation ($p<0.001$), smoking status ($p=0.048$) of the medical doctor and the practice setting. The bivariate analysis however showed weak association of the demographic characteristics (Cramer's $V \sim 0-0.3$). There was no significant association between the provision of the smoking cessation services with the type of practice setting ($p>0.082$) as shown in **Table 1**.

Table 1: Socio-demographic characteristics of respondents and practice setting

Socio-demographic characteristic	Frequency (%)	Practice setting		χ^2	df	p-value	Cramer's V
		Public N=73 (69%)	Private N=33 (31%)				
Sex of respondent							
Male	51(48)	33 (65%)	18(35%)	0.794 ^a	1	0.0337	0.087
Female	55(52)	40 (73%)	15(27%)				
Designation							
Interns	26 (25)	26(100%)	0	16.83 ^a	2	0.000	0.398
Medical officer	65 (61)	40 (62%)	25(38%)				
specialist	15 (14)	7 (47%)	8 (53%)				
Smoking status							
Active smoker	1 (0.9%)	1(100%)	0(0%)	6.053 ^a	2	0.048	0.239
Ex-smoker	7 (7%)	2 (29%)	5 (71%)				
Non smoker	98(92%)	70 (71%)	28(29)				
Provides smoking cessation services							
Yes	71 (67%)	45 (63%)	26 (37%)	3.020 ^a	1	0.082	0.169
No	35 (33%)	28(80%)	7 (20%)				

4.2.3. Distribution of the respondents by age categories (years) and gender

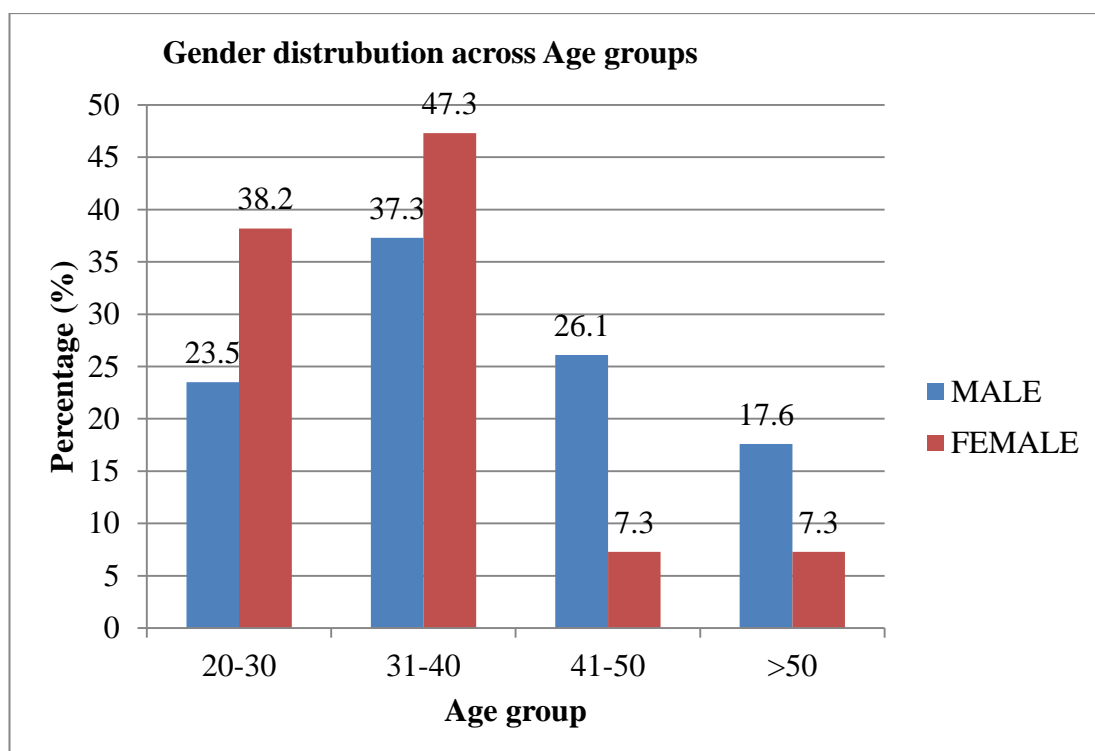


Figure 3: Gender distribution of medical doctors across age groups

Figure 3 is a bar chart showing the distribution of the respondents by age and gender. Out of the 106 medical doctors, the majority of the respondents were middle aged, with over 4 out of every 10 respondents (40%), who were in the age category 31-40 years. The mean age of the participants was 36.7 ± 10.757 . Majority of medical doctors aged above 40 years were male (43.7%), while a significant proportion of medical doctors less than the age of 30 years were female (38.2%).

4.2.4. Distribution of respondents by age categories (years) and practice setting

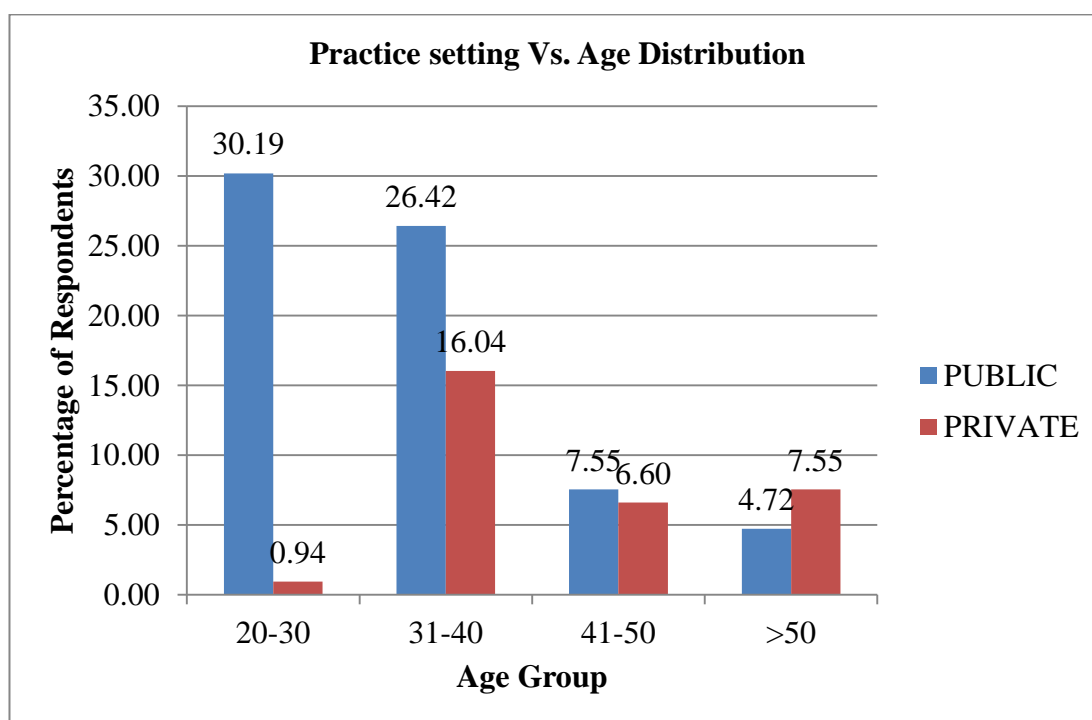


Figure 4: Practice setting versus age distribution of medical doctors

As shown in Figure 4, the majority of the medical doctors under the ages of 30 were employed in the public sector, while the majority above the ages of 40 year are in the private sector.

4.2.5. Distribution of the respondents by years of practice and practice setting

As shown in **Table 2**, about half (51%) of the medical doctors in the study had medical practice experience of 5 years or less. About one third (30%) of the respondents had practice experience of 10 or more years. The mode for the years of experience was one. More than two thirds (67%) of the participants employed in public sector had less than 5 years of experience with only about 18% had more than

10 years of experience. In the private sector, about 2 out of 10 respondents (18%) of the medical doctors had less than 5 years of experience.

Over 80% of the respondents that worked in the public sector had worked for less than 5 years within Namibia. About half (48%) of the respondents from the private sector had worked in Namibia for 5 years and less which was similar to the proportion (48%) that had worked for more than 5 years. There was a significant association between the years of experience and the practice setting ($p < 0.001$) as well the years of practice in Namibia and the practice setting ($p = 0.002$) – with less experienced respondents employed in the public setting as depicted in Table 2.

Table 2: Years of experience for public and private medical doctors

	Practice setting			χ^2	df	P-value	Cramer's V
	Public (n=73)	Private (n=33)	Total				
Practice experience (yrs)							
0-5	9(67.1%)	6(18.2%)	55(51.9%)	23.944 ^a	3	0.000	0.475
6-10	11(15%)	8(24.2%)	19(17.9%)				
11-20	7(9.6%)	8(24.2%)	15(14.2%)				
>20	6(8.2%)	11(33.3%)	17(16%)				
Years of experience in Namibia (yrs)							
0-5	61(83.6%)	16(48.5%)	77(72.6%)	15.116 ^a	3	0.002	0.378
6-10	7(9.6%)	8(24.2%)	15(14.2%)				
11-20	5(6.8%)	8(24.2%)	13(12.3%)				
>20	–	1(3.0%)	1(0.94%)				

4.2.6. Distribution of respondents by level of medical specialization

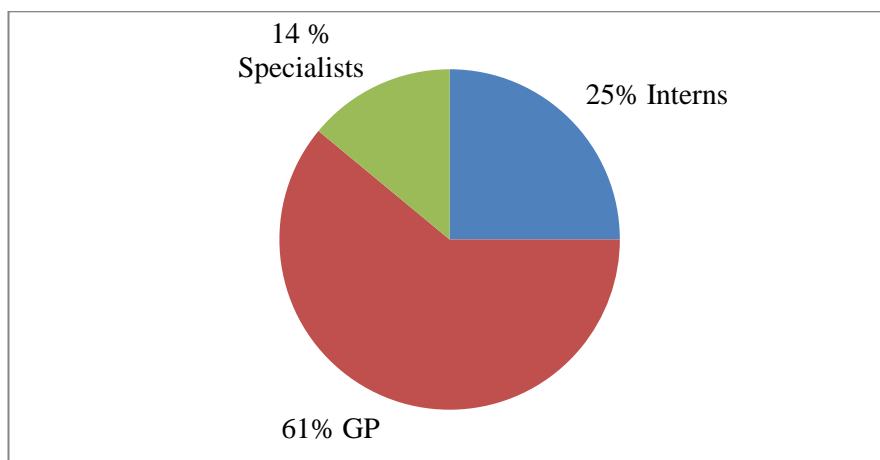


Figure 5: Distribution of medical doctors by speciality

According to Figure 5, the majority of the respondents were general practitioners compared to medical interns 26 (25%) and consultant specialists 15(14%).

4.3. Knowledge of medical doctors on smoking cessation pharmacotherapy

This subsection describes the knowledge of medical doctors on smoking cessation medicines. The score of doctors on knowledge was based on the set of questions summarised in table 3. Furthermore, the factors associated with the level of knowledge are also presented.

4.3.1. Level of knowledge among practitioners by question item

Table 4 shows the level of knowledge on the pharmacotherapy of smoking cessation therapy among medical doctors in Khomas region. Out of the 106 respondents, nearly two thirds 71 (66.4%) indicated that they offer smoking cessation services. The level of knowledge was determined using a 12 item questionnaire. All questions had a single correct response (Table 3). The participants answered the twelve questions focusing on the recommended medicines for smoking cessation in different patient population, duration of treatment, side effects and contraindications of medicines used. The respondents 64 (60%) who indicated that they know the medicines used in smoking cessation, were further assessed on the knowledge of smoking cessation medicines. Overall, the mean knowledge score on pharmacotherapy of smoking cessation was poor (15%). The mean knowledge score was comparably twice as low among practitioners in the public sector (10%) compared to the private sectors (20%). Overall knowledge level by specific item ranged between 3 – 31% (poor); 0 – 16% (very poor) among the practitioners in the public sector and 9-55% (very poor to good) among practitioners in the private sector.

Table 3: Knowledge on smoking cessation pharmacotherapy among doctors in the Khomas region (n = 71)

Knowledge question item	Medical doctors' knowledgeable (%)		Total
	Public	Private	
1. Which patient(s) should receive pharmacotherapy for smoking cessation?	32%	30%	31%
2. What is the first-line pharmacotherapy recommended for smoking cessation?	3%	12%	6%
3. What is the recommended second-line pharmacotherapy for smoking cessation?	0%	16%	15%
4. Which pharmacotherapy should be considered with patients particularly concerned about weight gain	1%	6%	3%
5. Which pharmacotherapy should be considered with patients with a history of depression	16%	55%	28%
6. How long after the “target stop date” do you prescribe the pharmacological interventions	0%	12%	11%
7. A high dose of Nicotine Replacement Therapy (NRT) is recommended for a patient who is highly nicotine dependent.	15%	24%	15%
8. A combination of NRT therapy is recommended for a patient who is highly nicotine dependent.	11%	9%	10%
9. Nicotine patch has been demonstrated to be safe in cardiovascular patients.	12%	45%	23%
10. Combining Varenicline with NRT agents is associated with lower rates of side effects such as nausea and vomiting.	10%	15%	11%
11. Patients on Bupropion SR should begin treatment 1-2 weeks before the quit date.	14%	6%	11%
12. NRTs should be avoided in patients with a history of cardiovascular disease	11%	9%	10%
Mean knowledge on SC Pharmacotherapy	10%	20%	15%
% of knowledge items with ≥ 50%	0%	1 (8.3%)	0%

4.3.2. Knowledge scores of medical doctors on pharmacotherapy of cessation medicines

Out of the 64 (60%) doctors who completed the question items related to the knowledge on smoking cessation pharmacotherapy, the majority attained an overall knowledge score of 25%. The level of knowledge on pharmacotherapy was scored as a percentage per respondent and was stratified into two levels as good knowledge ($\geq 40\%$) and poor knowledge with scores ranging between 0-39%. Based on these score categories, the mean knowledge score among the respondents was 1.5 ± 0.8 (mode 1.0). A total of 48 (75%) of the respondents had poor knowledge on the pharmacotherapy of smoking cessation, while 16(25%) had good knowledge. Figure 6 represents the dichotomous distribution of the doctor's knowledge score on cessation medicines.

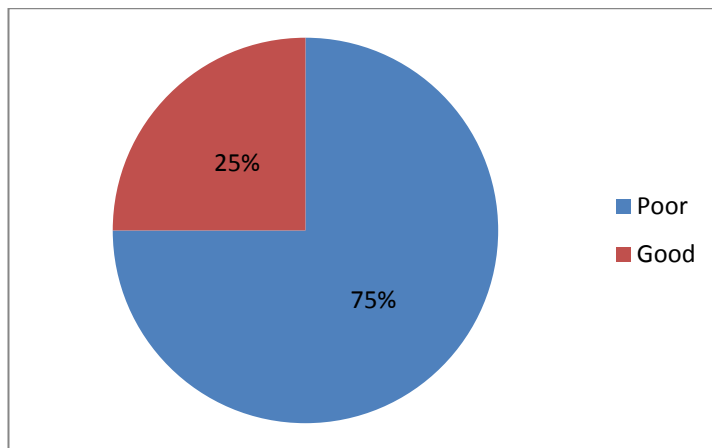


Figure 6: Knowledge scores of medical doctors on cessation medicines

4.3.3. Factors associated with the knowledge on pharmacotherapy of smoking cessation

Table 4 shows a bivariate analysis of the factors associated with the level of knowledge on the pharmacotherapy of smoking cessation. A total of 60(57%) of the doctors that provide smoking cessation services have poor knowledge on the medicines used in the management of smoking cessation therapy. However, there is no significant relationship between the provision of smoking cessation services ($p=0.137$), gender of the practitioners ($p=0.659$) and knowledge ($p>0.05$). The level of knowledge on the pharmacotherapy of smoking cessation services among private practitioners was significantly better as compare to those in the public sector (OR=0.23, 95% CI (0.1 – 0.8), $p=0.011$).

Table 4: Factors associated with the knowledge on smoking cessation pharmacotherapy

Covariates	Knowledge category (n=106)		Odds Ratio (95% CI)	95% CI	P-Value
	Good (>40%)	Poor (≤40%)			
Provision of smoking cessation services					
Yes	11(10%)	60(57%)	3.1	0.652-	0.137
No	2(2%)	34(32%)	(0.7 – 14.9)	14.895	
Sex					
Male	7(7%)	44(42%)	1.2	0.406-	0.659
Female	6(6%)	49(46%)	(0.4 – 4.2)	4.161	
Professional designation					
Non-specialist	11(10%)	80(75%)			0.715
Specialist	2(2%)	13(12%)			
Practice setting					
Public	5(5%)	68(64%)	0.230	0.069-	0.011*
Private	8(8%)	25(24%)	(0.1-0.8)	0.769	

4.4. Attitudes of medical doctors towards smoking cessation pharmacotherapy

Section 4.4 describes the attitudes of medical doctors towards smoking cessation pharmacotherapy. The attitude of medical doctors was evaluated using a five-item score and the overall attitude was established.

4.4.1. Attitudes of medical doctors towards pharmacotherapy of smoking cessation on a five score scale (n=106)

The distribution of attitudes towards the pharmacotherapy of smoking cessation is shown in figure 7. A five-item Likert scale score was used to assess the attitudes of medical doctors towards pharmacotherapy of smoking cessation services. A score=1 was assigned to attitude question that had an agreement response of either agree or strongly agree) and a score=0 for responses that disagree. The individual attitude score was calculated for each respondent as a percentage of the maximum score of 5 points. The respondent's attitude was rated as good attitude if the calculated percentage scored was $\geq 50\%$.

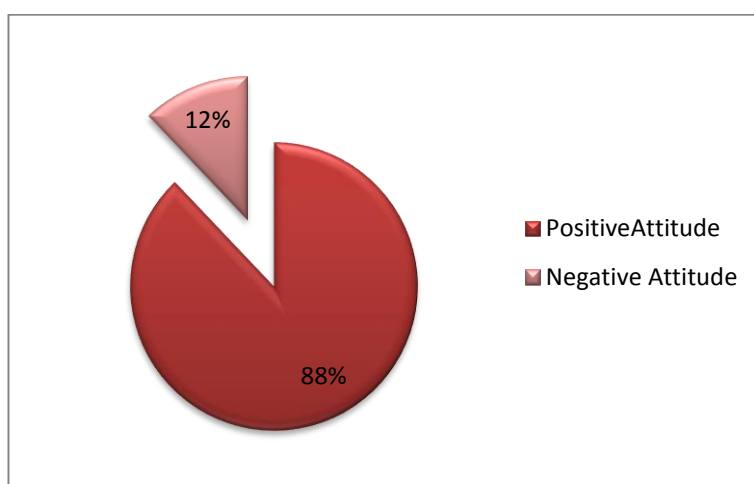


Figure 7: Overall attitude score of doctors towards smoking cessation pharmacotherapy

Based on the five attitude scores, majority of the respondents 93(88%) had an attitude score of $\geq 50\%$ towards the use of pharmacotherapy in smoking cessation, while 12% had a negative attitude.

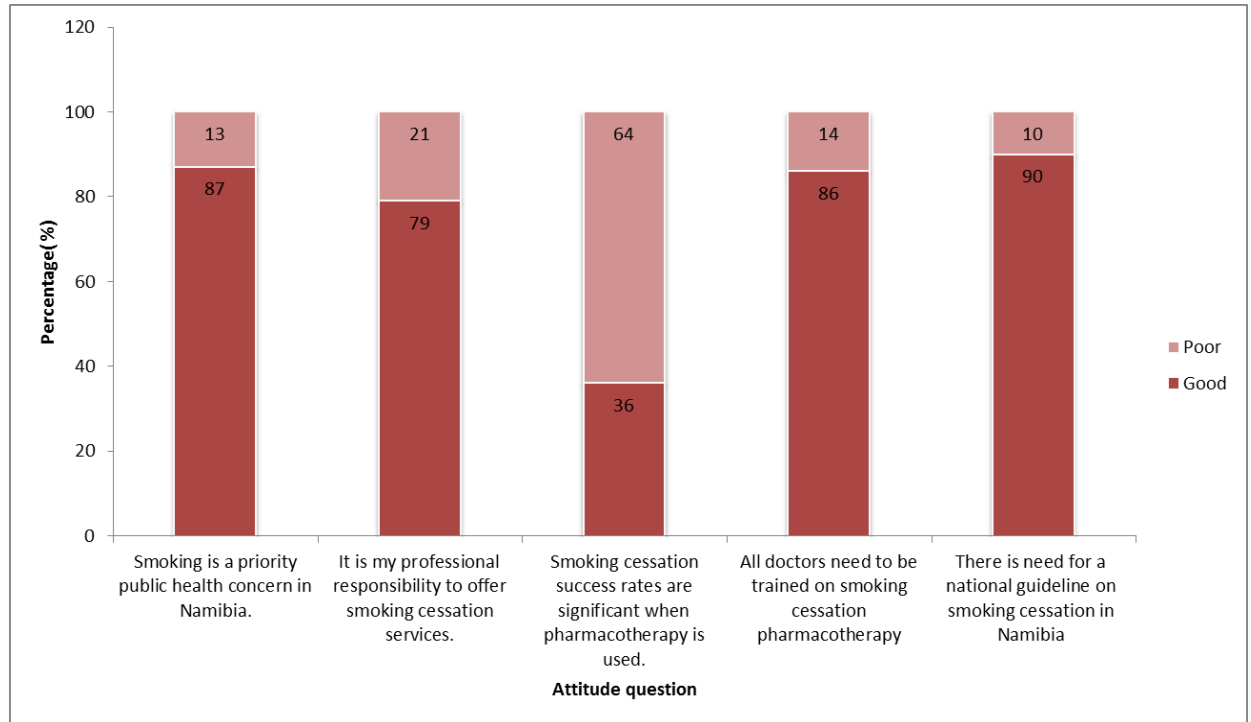


Figure 8: Attitude of medical doctors (on each of the five- item score on smoking cessation services

Based on figure 8, overall about 8 out of 10 doctors have a positive attitude towards smoking cessation pharmacotherapy except on the belief that pharmacotherapy increases smoking cessation rates. The mean score for attitude was rated very good (75.6%). The majority of the doctors had excellent attitudes (>80%) with belief that smoking is a public health concern, that doctors require training on medicines that are prescribed to assist smokers to quit smoking and that Namibia needs its own guidelines on smoking cessation. On the contrary, over 60% of the participating doctors did not believe that pharmacotherapy improves smoking cessation success rates.

4.4.2. Factors associated with the attitude towards smoking cessation pharmacotherapy

The attitudes of medical doctors were compared to their knowledge on smoking cessation pharmacotherapy as shown in table five. All the doctors that had good knowledge also had a positive attitude towards the provision of smoking cessation services. On the contrary, the majority 81(76%) of those with poor knowledge also had a favourable attitude towards smoking cessation services. The association between the knowledge and attitude was however not statistically significant as p-value was greater than 0.05.

Table 5: Factors associated with attitudes towards smoking cessation pharmacotherapy

	Attitude towards the use of Pharmacotherapy In smoking cessation		χ^2	d f	P-value
	Positive 94(88%)	Negative 13 (12%)			
Acceptable knowledge			2.047	1	0.153
Yes	13(12%)	0			
No	81 (76%)	13(12%)			

4.4.3. Perceived tools that would improve the prescription of smoking cessation pharmacotherapy

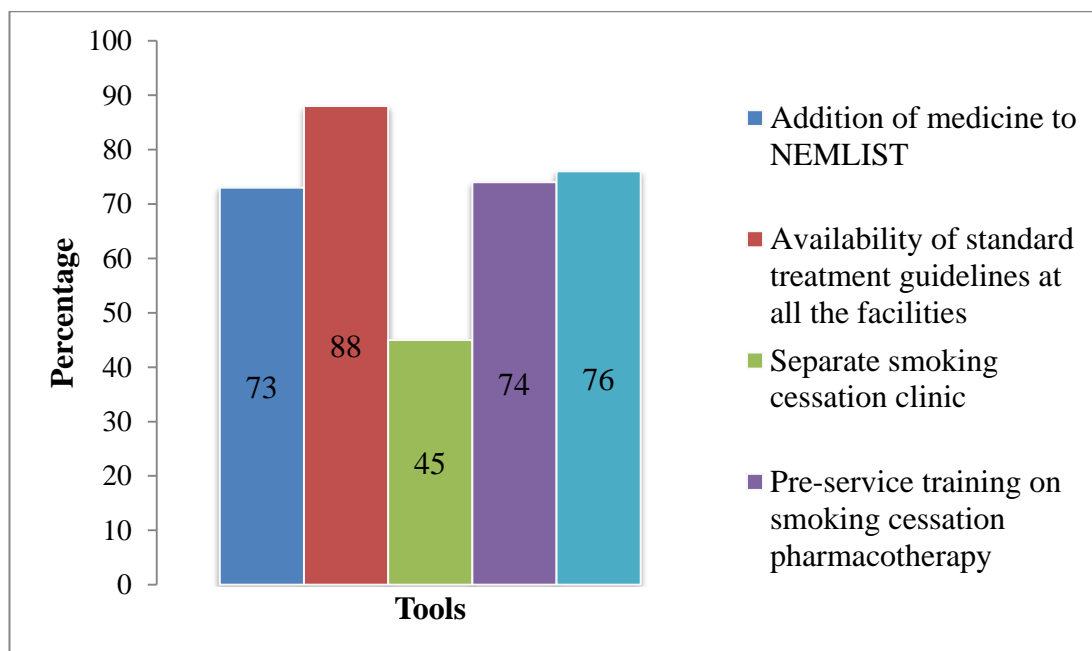


Figure 9: Percentage of doctors who suggested the different following tools may improve their prescribing of smoking cessation pharmacotherapy

Figure 9 shows the tools that the doctors thought would improve the competency in prescribing the medicines used in smoking cessation. The tools suggested to improve smoking cessation pharmacotherapy were categorized as policy, education, regulatory interventions and accessibility related factors. The policy related interventions that were suggested included the incorporation of pharmacotherapy in essential medicine list and treatment guidelines. Majority of the respondents 94 (88%) indicated that the availability of SC guidelines within their facilities would improve their prescribing practices. In addition, most of the respondents (73%) recommended that the use and prescription of such medicines would improve if they are to be added to the Namibia Essential Medicines List (NEMList) which is used in

all public health facilities. The education interventions included pre-service and in-service training programmes on SC pharmacotherapy. Over 70% of the respondents recommended the inclusion of smoking cessation services in the undergraduate medical education as well as post-registration training to improve their comfortability with such pharmacological agents. The regulatory or managerial interventions included the creation of unique access points for SC pharmacotherapy. In that regard, 49(45%) of the participants thought it would be necessary to have separate clinics that deals with smoking related issues.

4.5. Practices of smoking cessation among medical doctors

This subsection describes the practices of pharmacotherapy for smoking cessation by the medical doctors in Namibia. As for the doctors that do not offer smoking cessation services, the reasons for not offering the services were also outlined. Different types of SC services offered were described.

4.5.1. Distribution of respondents who offer smoking cessation services

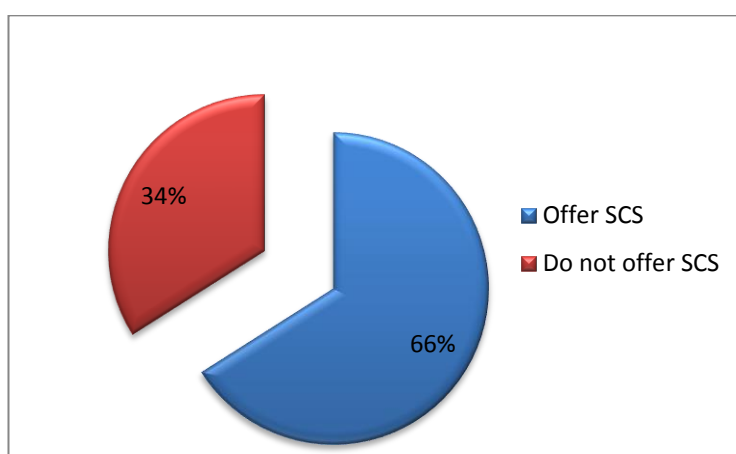


Figure 10: Distribution of respondents who offer smoking cessation services (N=106)

The results in figure 10 indicates that 71(66%) of the respondents offers smoking cessation services at their facilities while 36(34%) do not offer such services. Only the respondents who don't offer services were requested to provide further information on their reasons for not offering smoking cessation services.

4.5.2. Reasons for not offering smoking cessation services

Table 6: Reasons for not offering smoking cessation services (N=36)

Reasons	n (%)
Education	
I do not have training and exposure to offer smoking cessation service.	10 (28)
I have no capacity to offer smoking cessation services.	6 (17)
Smoking cessation services are time demanding/consuming.	2 (6)
Policy framework	
Smoking cessation is not a priority health service in Namibia.	1 (3)
No legal frame work/guidelines/policies for smoking cessation in Namibia.	1 (3)
Not sure of what interventions/guidelines to follow.	5 (14)
Others	
Low demand for smoking cessation service by my clients.	9 (25)
Very difficult to achieve positive outcomes in these clients.	1 (3)

The reasons why some medical doctors do not offer smoking cessation services are outlined in table 6. The reasons for not offering smoking cessation services were categorised as educational, policy framework and others. The educational reasons mostly highlighted a lack of educational training and capacity. Majority 10 (28%) of the respondents with regard to this item indicated that they were not trained on smoking cessation services and they were only exposed to such during their medical practice. In addition, some respondents (6%) felt it is time consuming if they are to provide cessation services. In terms of regulatory policies, the majority (14%) of the respondents in relation to this item do not offer smoking cessation services due to a lack of guidelines. Other reasons that were mentioned included low demands of services by the smokers (25%) and the challenges in achieving the desirable outcomes (3%).

4.5.3. Types of smoking cessation services offered by medical doctors

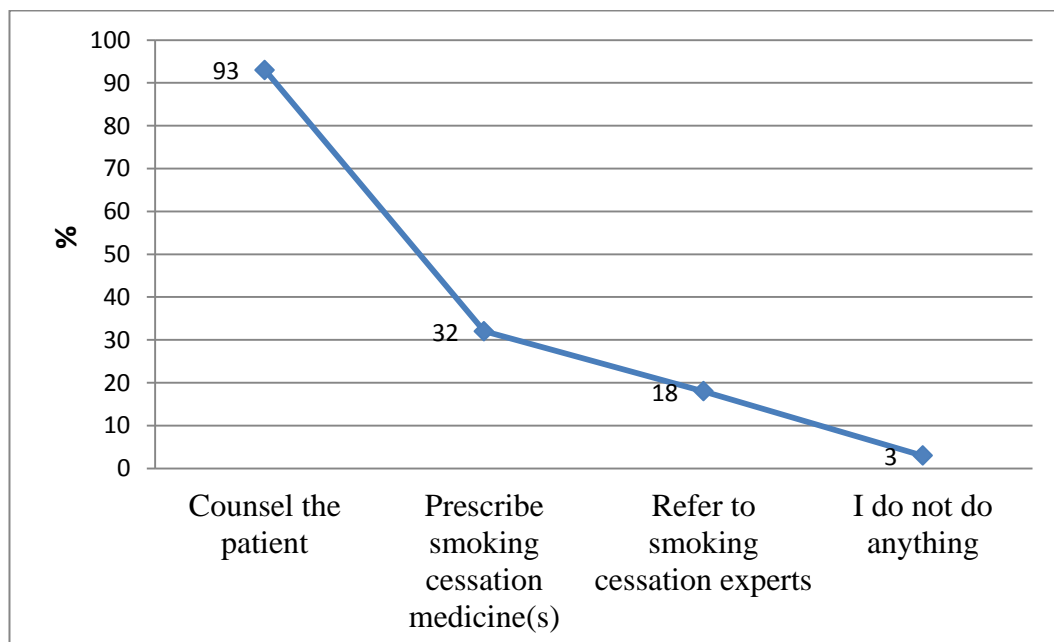


Figure 11: Types of smoking cessation services offered by medical doctors

The results in figure 11 indicate the most offered SC services. About one third (32%) offer pharmacotherapy on SC. Majority of the doctors (93%) offer counselling services to their patients during consultations. In terms of referrals to SC experts, only 18% of them do so. Lastly, three percent of the participants indicated that they do not assist patients in need of cessation services. All the doctors that participated in the study indicated that they do take smoking history. More than half (55%) of the participants have indicated that they always take smoking history: twenty two (31%) often take history; and 10 (14%) rarely take history.

4.5.4. The pharmacological classes of smoking cessation medicines prescribed by doctors (n= 70)

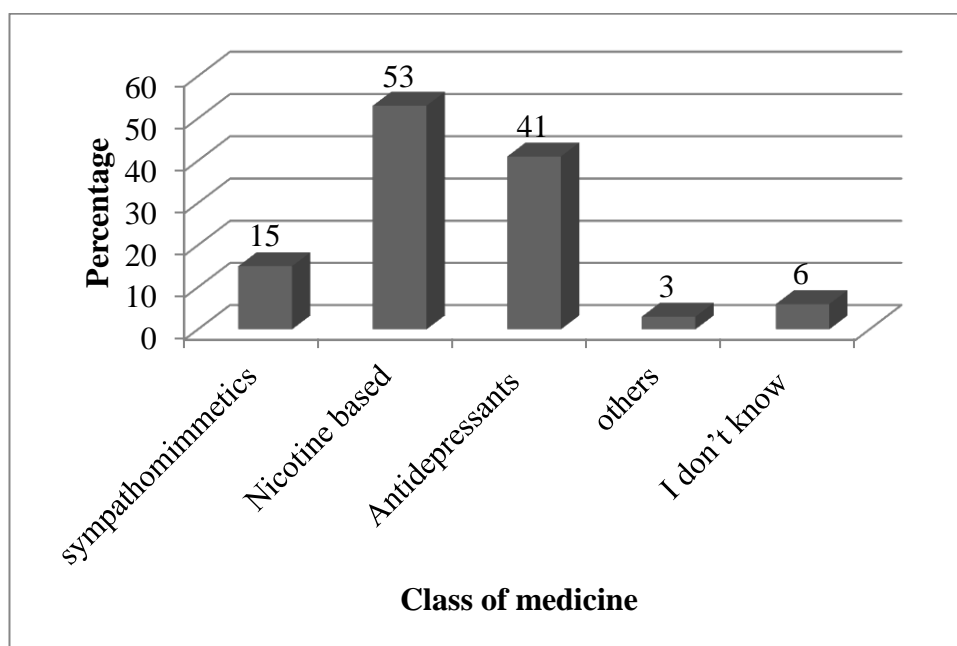


Figure 12: Pharmacological classes of medicine used in smoking cessation

The classes of smoking cessation medicines prescribed by the study participants are displayed in figure 12. The findings indicated that about half (53%) of the respondents have prescribed one or more forms of nicotine replacement therapy. Antidepressants

were prescribed by 41% of the doctors, and the sympathomimetic were prescribed least (15%). Six percent of the doctors did not know the class to which the medicines belong to. Only a minority (3%) of them prescribed drugs that fall into other pharmacological classes.

4.5.5. Percentage of doctors who “Usually” engage in specific cessation activities with patients who smoke

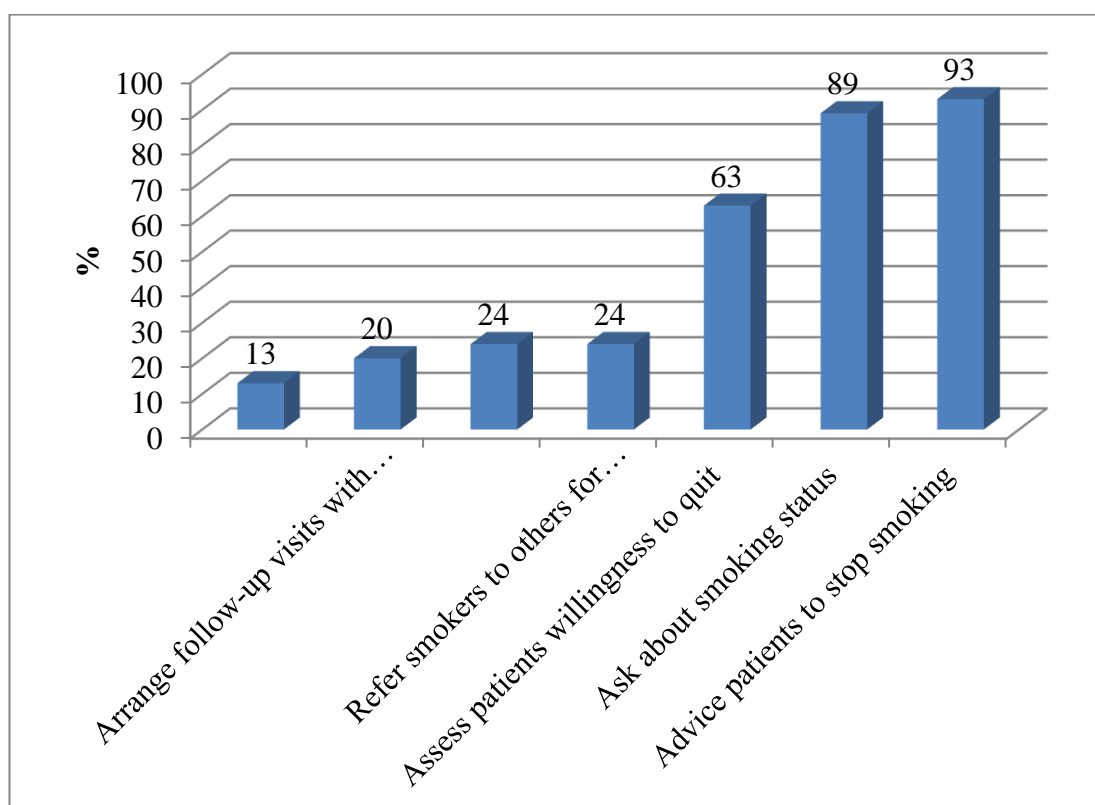


Figure 13: Percentage of doctors who “Usually” engage in specific cessation activities with patients who smoke (n=71)

Figure 13 shows the cessation services offered by the medical doctors. The findings indicated that about 90% of the doctors reported that they usually ask their patients about their smoking status and advise them to stop smoking. More than three-fifth of them assess the willingness of the smokers to quit. Only about 20% of them prescribe SC medications. Considerably few reported recommending over the counter

medications such as nicotine replacement gums. The doctors were less likely to arrange follow-up visits with smokers or refer them to other health care providers who are more competent in providing SC services.

4.5.6. Smoking cessation services offered per specialization

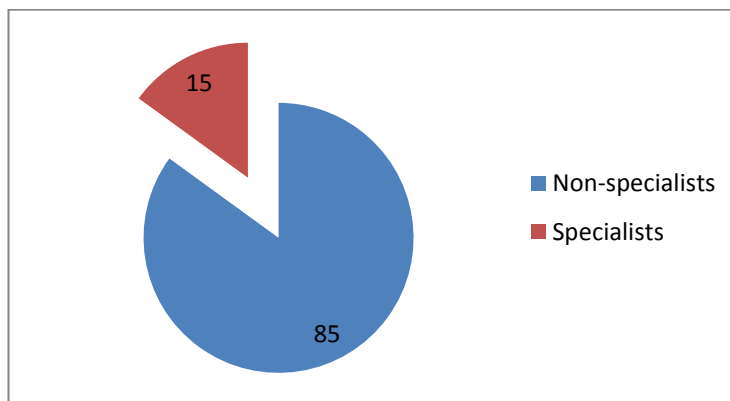


Figure 14: Proportion of doctors that offer smoking cessation services

The doctors' participation in SC services varied across the specializations as shown in figure 14. Some differences between the specialists and the non-specialist were statistically significant, others were not. From the 71 doctors that offer SC services, over 80% of them were non-specialist, and 15% of them were specialists.

4.5.7. Smoking cessation services versus specialization

Table 7: Smoking cessation services versus specialization. (n= 71)

	Specialist (N=11)	Non- specialists (N=60)	p-value
1. Ask about smoking status	9(82%)	54(90%)	1.000
2. Advice patients to stop smoking	9(82%)	54(90%)	0.528
3. Assess patients willingness to quit	4(36%)	41(68%)	0.083*
4. Recommend over-the-counter medicines	3(27%)	6(10)	0.080
5. Prescribe “prescription only” medicines	4(36%)	13(22%)	0.223
6. Arrange follow-up visits with patients to address smoking	3(27%)	11(18%)	0.393
7. Refer smokers to others for appropriate cessation treatment	5(45%)	12(20)	0.044*

As seen in **Table 7**, both the specialists and the non-specialists were taking smoking history and also advise smokers to quit smoking. Therefore, the difference between the two groups was not significant (p-value>0.05). However, the general practitioners and the medical interns were more likely to assess the patient’s willingness to quit smoking as compared to the specialists (68% vs. 36% respectively). In terms of recommending and prescribing medicines, the specialists were more likely to recommend and prescribe medicines as compared to the interns and general practitioners. Moreover, specialists were also more likely to arrange follow-up visits with the smokers. Specialists, as compared to non-specialists were also likely to refer smokers to other health care providers who were more specialized in handling smoking cases, and the difference between the two groups was statistically significant (p-value=0.044).

4.5.8. Comparison of smoking services offered in the private & public sector

Table 8: Comparison of smoking cessation services between private and public sector

	Private (N=26)	Public (N=45)	p-value
1. Ask about smoking status	24 (92%)	39 (87%)	0.621
2. Advice patients to stop smoking	26 (100%)	40 (89%)	0.113
3. Assess patients willingness to quit	22 (85%)	23 (51%)	0.006
4. Recommend over-the-counter medicines	7 (27)	2 (4%)	0.007
5. Prescribe “prescription only” medicines	16 (62%)	1 (2%)	0.000
6. Arrange follow-up visits with patients to address smoking	8 (31%)	6 (13%)	0.083
7. Refer smokers to others for appropriate cessation treatment	8 (31%)	9 (20%)	0.285

Various SC services offered by doctors in public and private sector are outlined in table 8. Out of the 71 medical doctors that offered SC services, over 60% of them were practicing in the public sector. Over 85% of medical doctors both in the private and public sector took smoking history and also advised their patients to stop smoking. More private doctors (85%) were likely to assess their patient’s willingness to quit, as compared to the public sector doctors (p-value<0.05). In addition, the private sector doctors were also more likely to recommend and prescribe medicines as compared to the public sector (p-value <0.05). In terms of arranging follow-ups and referring smokers to more specialized units, the private sector was much more

compliant as compared to the public sector, though the difference was not statistically significant.

4.6. Summary

Chapter four explained in details the findings of the study. The knowledge, attitudes and practices of medical doctors on the pharmacotherapy for smoking cessation were analysed and reported. Overall, doctors had poor knowledge (25%), positive attitude (88%) and good practices towards smoking cessation services. Chapter five discusses the findings of the study and concluded the study.

CHAPTER 5: DISCUSSION, RECOMMENDATION AND CONCLUSION

5.1. Introduction

The results of the study are presented in the previous chapter 4, following the descriptive and analytic analysis. This chapter explains the implications of the findings of the study based on the literature. The aim of the study was to assess the knowledge, attitudes and practices of smoking cessation pharmacotherapy among medical practitioners in Namibia. The knowledge, attitudes and practices of smoking cessation pharmacotherapy among medical doctors in Windhoek are compared with findings in studies done in similar and/or related settings. Implications, limitations and impact of the study findings are also discussed. The conclusions in this chapter were based on the key discussion points and the study objectives with cross reference to chapter 1 paragraph 1.6. The recommendations in this chapter were made based on the findings by study objectives in context with current trends in literature.

5.2. Discussion

5.2.1. Demographic characteristics of study respondents

The results of the study showed that over a half of the participants (52%) were females. Four out of every 10 respondents were middle aged (30-40 years) with the mean age of 36.7 ± 10.8 years. The proportion of female doctors decreased with age. These findings are contrary to a study done by Association of American Medical Colleges (2007) in which majority of the participants (73%) were males and of a higher age category (40-59). However, the results of the study in the US are similar to the current study, where females were relatively younger compared to males. The

disparity in gender could be attributed to the fact that Namibia has more females as compared to males (MoHSS, 2006), and secondly, enrolment into medical programs is higher among females in Namibia relative to developed countries like the USA. In addition, females were the majority among the first UNAM school of medicine graduates, where out of 35 students that graduated in 2016, 23 (66%) were females (MoHSS, 2006; NAMPA, 2016). This has an implication on the implementation of smoking services in Namibia as other studies have shown that men are more likely to smoke, thus less likely to provide smoking preventative programs (Al-turkstani et al., 2016; Amakali et al., 2013; Eldein, Mansour, & Mohamed, 2013). Female in the middle age category will be a critical target for the implementation of smoking cessation services in Namibia.

The study also found that about 7 out of every 10 doctors that participated work in the public sector - majority of these were younger than 30 years compared to those in the private sector who were aged more than 40 years. This could be due to the fact that majority of the doctors in this study were medical interns and/or newly recruited doctors who were working in the public health services in Namibia. The private health sector in Namibia is mainly manned by experienced and well established practitioners (MoHSS, 2008, 2014). Similar studies have shown that work force migration from the public to the private sector is driven by expertise, experience and incentives- the requirement which interns and young doctors may often lack (MoHSS, 2014). In addition, Namibia and many LMIC with limited human resources for health care thus recruit younger doctors at most of the public health facilities because they are inexpensive, and require further training through internship

programs, which is mostly offered at these facilities (MoHSS, 2008). This calls for a public-private partnership in the implementation of SC services in order to cross-breed and standardise such services among health care providers.

In this study, most medical doctors were non-smokers (99.1%) and there was a significant association between smoking status and the type of practice setting (Chi-square = 6.053, Cramer's V = 0.239, p-value = 0.048). About three-quarters of the doctors in the private sector were ex-smokers compared to one-third in the public sector. These findings are similar to those by the AAMC that also reported a prevalence smoking of about 1% among doctors (Association of American Medical Colleges, 2007). On contrary, studies done in Nigeria and Saudi Arabia revealed a higher incidences of smoking among doctors of about 18 and 26 times respectively compared to this study (Al-turkstani et al., 2016; Desalu et al., 2009). The disparities in the findings could be due to gender differences where majority of the respondents in the studies done in Nigeria (75%) and Saudi Arabia (68%) were male as opposed to the 48% male in this study. According to literature, males are fifteen times more likely to smoke as compared to females (Amakali et al., 2013; MoHSS, 2006; WHO, 2015).

Additionally, the findings of this study could be different from the similar studies done in Nigeria and Saudi Arabia because of the practice sector. This study was done in both the public and private sector, whereas in Nigeria and Saudi Arabia, the studies were solely done in the public sector. This low smoking prevalence among medical doctors in Namibia is critical for the implementation of smoking cessation

services as several studies have shown that doctors who smoke may negatively influence their patients and limit access to smoking cessation pharmacotherapy (Buczowski et al., 2013; Eldein et al., 2013). In addition, these smoking practitioners also negatively impact the general population because their role modelling of smoking undermines the advocacy of the danger of smoking and the importance of quitting (Al-turkstani et al., 2016; Association of American Medical Colleges, 2007; Bauld, Judge, & Platt, 2007; Buczowski et al., 2013).

In terms of working experience, over half medical doctors had work experience of less than 5 years, with two-thirds working in the public sector. There was a strong correlation between the work experience and practice setting (*p-value* < 0.001). Our findings are in agreement with a study published in the WHO bulletin that indicated that majority of the doctors and pharmacist in Sub-Sahara Africa are concentrated in the private sector mainly due to economic gains (Prata, Montagu, & Jefferys, 2005). On the contrary, a study done in SA found that the years of experience among doctors in both the public and private sectors were similar (45:55) (ECONEX, 2013). A high work experience among doctors in the private sector could be attributed to work force migration to the private sector after gaining the necessary expertise and experience for private practice (Prata et al., 2005).

In terms of practicing within Namibia, over 80% of doctors in the public sector have worked for less than 5 years. This could be attributed to the fact that most of the doctors in this sector are young graduates, and/or are expatriates employed on short-term contracts (Ministry of Home Affairs & Immigration, 2017). There was a

statistically significant association between the years of practice in Namibia and the practice sector (p -value= 0.002). The public sector in Namibia caters for the health needs of the majority of the population. Henceforth, the availability of less experienced doctors in the public sector could compromise the quality of SC services offered and thus exacerbate the global burden of smoking. Henceforth, there is a need to establish a SC centre of persons that coordinates capacity building among the inexperienced doctors.

5.2.2. Knowledge of medical doctors on smoking cessation pharmacotherapy

About two thirds (66.4%) of the doctors in this study provide smoking cessation services. The level of awareness on smoking cessation medicines among the doctors was sub-optimal (60%). Of concern is that three-quarters of the doctors in this study were rated poor (below 40%) on a smoking cessation pharmacotherapy knowledge score scale (**Figure 5**). In addition, only less than a third (30%) of the doctors knew the eligibility criterion for prescribing smoking cessation medications. The findings from this study differ from a study done in Saudi Arabia, where the majority of the doctors were knowledgeable on smoking cessation services (Al-turkstani et al., 2016). Similarly, another study conducted in Nigeria showed that 89% of the doctors had good knowledge on tobacco use (Desalu et al., 2009). The discrepancies between the current study and the literature could be attributed to the fact that the current study was predominantly focused on the pharmacotherapy other than broad smoking cessation services which were the primary focus in other studies (Al-turkstani et al., 2016; Desalu et al., 2009).

The study also found that males (7%) had a relatively better knowledge as compared to females (6%). This variation might be due to the fact that majority of the male doctors were working in the private sector and had access to smoking cessation medicine. Moreover, the doctors who were practising in the private sector were more knowledgeable on smoking cessation medicines as compared to those in the public health facilities, and the difference was statistically significant (p-value =0.011). The variation between the knowledge of doctors in the private sector and the public sector could be due to the fact that cessation medicines in Namibia are only available in the private sector, hence better knowledge for the private practitioners as compared to the public practitioners. Moreover, private practitioners have a better access to cessation education provided by pharmaceutical companies during product marketing (Wilkes, Bell, & Kravitz, 2000; Workneh et al., 2016).

The success of smoking abstinence and quitting is affected by the knowledge of health care practitioners, especially medical doctors since they are at the forefront of the health care systems (Association of American Medical Colleges, 2007; Buczkowski et al., 2013; Desalu et al., 2009; Eldein et al., 2013). Smoking services such as advising and assisting smokers to quit are dependent on the training, skills and confidence of the health care provider. Such knowledge empowers doctors to prescribe and recommend pharmacotherapy and other services required by smokers to quit smoking. Amongst others, medical doctors can be empowered to manage smokers through training in medical schools and continuous education during

practice. The use of standard treatment guidelines may also assist in standardising the therapy across the board.

In summary, this study shows that doctors in Namibia lack knowledge of smoking cessation when compared to their counterparts in other countries. This might be due to inadequate education on smoking in medical schools and lack of smoking interventions during practise. This study disclosed the lack of emphasis on smoking education since around 80% of the participants have indicated the need to include smoking cessation pharmacotherapy services into the training curriculums of medical schools; and also through continuous professional trainings. The lack of emphasis was also reported by other researchers (Desalu et al, 2009; Buczkowski et al, 2013).

5.2.3. Attitudes of medical doctors on smoking cessation services

Health care professionals play a crucial role in assisting patients to quit smoking. Previous research has shown that health care worker's attitudes is associated with the provision of smoking cessation services (Klink, Lin, Elkin, Strigenz, & Liu, 2011).

Smoking is a major public health concern. Over 6 million people globally smoke tobacco (Blecher & Ross, 2013). Henceforth, SC has been in the forefront agenda of various health government institutions. In this study, 87% of the doctors have reported that smoking is indeed of public health concern in Namibia. This is similar to the findings of the studies conducted in China and Saudi Arabia, where around 80% of the doctors have acknowledged their responsibility towards assisting smoker

to quit (Al-turkstani et al., 2016; Klink et al., 2011). Likewise, studies conducted in Nigeria, USA and Saudi Arabia have also indicated the awareness that it is the responsibility of doctors to offer smoking cessation services (Al-turkstani et al., 2016; Association of American Medical Colleges, 2007; Desalu et al., 2009). Moreover, majority of the doctors also thought that training in pharmacotherapy of SC was essential in their practice. This finding is similar to the findings of a study conducted in Nigeria which underscores the need of smoking cessation education in medical schools and continuous education during practice (Desalu et al., 2009).

Literature has provided substantive evidence on the need for a treatment guideline. Treatment guidelines are designed to assist practitioners and smokers in making decision about the appropriate services for smoking cessation, while at the same time ensuring standardization of care across all sectors and levels of the health care (MSH, 2007). Countries like the USA have a smoking treatment guideline in place, which has improved the care of smokers in their setup. Moreover, based on the study that was done among the doctors in the USA, there was a clear message from the respondents that the availability of a guideline has improved that practice (Association of American Medical Colleges, 2007). The findings of this study have also revealed that majority (90%) of doctors in Namibia reported the need of a national guideline on smoking management. On the contrary, 36% of the doctors believed that the use of medicines improves the outcomes of SC. The decreased trust in the use of medicines may be attributed to the unavailability of medicines, particularly in the public sector.

In overall, this study revealed that majority (88%) of the doctors in Namibia had positive attitudes towards the use of smoking cessation services, particularly the pharmacotherapy. There was however no significant relationship between the level of knowledge and the attitudes of doctors (p-value >0.05).

5.2.4. Practices of doctors on smoking cessation pharmacotherapy

Majority of the medical doctors self-reported their involvement in providing SC services. However less than a third of doctors have ever been directly involved with SC service. The main reasons cited for not providing services were: “*lack of training in smoking cessation interventions during their medical training*”; and “*also a lack of exposure during their practice*”. Others reasons included a “*limited market or demand for SCS smokers in Namibia*” and “*the lack of SCS guidelines to follow in providing services*”. These outcomes might be due to the inadequate training in medical schools and also a lack of national treatment guidelines. This is in agreement with other studies, which also indicated that, a lack in smoking cessation practice may be attributed to inadequate training in medical schools (Desalu et al., 2009). These outcomes justify the need to integrate smoking cessation pre-service education in medical schools and in-service as a public health priority.

Up-to 9 out of every 10 doctors take a history on smoking status of clients during assessment and advise smokers to quit respectively. However, only less a quarter of the doctors prescribe SC medicines and/or arrange follow-ups and refer smokers for specialized services. These findings are consistent with the findings obtained in a

study by the AAMC, in which nearly 8 out of 10 doctors ask about smoking and advice smokers to quit, but with only 20% of them arranging follow-up visits (Association of American Medical Colleges, 2007; Buczkowski et al., 2013; Desalu et al., 2009). Studies have revealed that follow-up visits during abstinence period give the doctor an opportunity to review the progress, and identify stumbling blocks that could further be addressed to assist the smoker to quit smoking (Desalu et al., 2009; Eldein et al., 2013; Gaussora, AD, Baarts, 2010). The low referral rate may be attributed to the lack of awareness of the specialized smoking cessation facilities available in the country. There was a significant association in referrals between the specialists and the general practitioners. Specialists tend to refer smokers for specialized cessation services as opposed to the general practitioners (p-value = 0.044). Moreover, specialists were also likely to prescribe anti-smoking medicines, though the difference was not significant.

When the practice was assessed between the private versus public sector doctors, doctors in both sectors take history and advice the smokers to quit. However, a significant proportion of private doctors were more willing to assess the smoker's willingness to quit (p-value= 0.006) and prescribe medicines (p-value <0.008) as opposed to their counterparts. Low prescription and recommendation of both the prescription-only and over-the-counter medicines by the public sector doctors may be attributed to the unavailability of such medicines in the public sector.

5.3. Limitations of the study

5.3.1. Strength of the study

This study made use of a self-administered questionnaire. Since the questionnaires were self-administered, it helped the participants to freely express themselves without fear of intimidation. Likewise, the study was conducted among the medical doctors who are at the forefront of the health care system, henceforth assessing their knowledge, attitudes and practice of smoking cessation may help to inform current practices and also design measures to reduce smoking-related morbidity and mortality rates. Despite the strengths demonstrated in this study, the study also had its delimitations and limitations.

5.3.2. Delimitations

The study was only conducted in one region in Namibia, which is Khomas region. Henceforth, the findings of the study were only limited to Khomas region, and may not be generalised to the entire country.

5.3.3. Limitations

The data was gathered with the use of a self-administered questionnaire. The accuracy of the information was dependent on the participants understanding of the question. Moreover, the reliability of the data was dependent on the honesty of the participants. As for the public sector, only the doctors that were present during the study period were involved. Medical doctors that were absent due to study leave, maternity leave and those that were assisting at facilities outside Windhoek were

excluded from the study. Another major limitation for this study was a low response rate from the participants. Some participants that were sampled from the population did not participate in the study. This was particularly so in the private sector whereby a good number of them refused to fill the questionnaire because of the time constraints and a lack of willingness to participate. In the end, all those questionnaires that were not filled after the due date for data collection (four months) were left out.

Lastly, the use of a self-administered questionnaire does not provide an opportunity to follow-up and clarify issues that respondents might have. Identically, self-reported information is subjected to missed information and errors.

5.4. Conclusion

Smoking is the leading preventable cause of illness and premature death globally. Smoking cessation interventions such as behavioural and pharmacological have been proven to assist smokers to quit. The medications that have been proven to be effective and are licenced for this purpose in Namibia include NRTs, Bupropion SR and Varenicline tartrate. The knowledge, attitudes and practices of medical doctors on pharmacotherapy for smoking cessation in Khomas region were assessed. Overallly, medical doctors in Khomas region had a poor knowledge on the pharmacotherapy for smoking cessation. Better knowledge on the smoking cessation pharmacotherapy was associated with the private sector, elderly practitioners, non-smokers and male medical practitioners. This implies the need to strengthen

competencies of medical doctors and other health care practitioners through multi-sectoral interventions. Generally, majority of the doctors in the Khomas region had an excellent attitude towards smoking cessation services. However, a significant number of doctors do not believe that smoking cessation pharmacotherapy is an effective intervention in smoking control. Henceforth, further research is needed to identify reasons for the poor attitude of doctors towards the use of smoking cessation medicines and to pilot a study on the effectiveness of these medicines in Namibia. Though a good proportion of doctors in Khomas region offer smoking cessation service, only a small fraction of them offers smoking cessation pharmacotherapy. Smoking cessation pharmacotherapy is mainly offered by doctors in the private sector and by specialists. Therefore, there is a need for a policy on a comprehensive package on smoking cessation management that can be implemented in both sectors.

5.5. Recommendations

Smoking tobacco is an expensive exercise both to the smoker and the national health care systems. Smokers spend countless amount of money in purchasing tobacco products, money that could be used to improve their lives and those of their loved ones. Similarly, it is also costly to the government and the medical insurers, not only due to the increase in the costs of medical treatment, but also due to loss of productivity, impact on health and premature loss of life.

Quitting smoking is often difficult and challenging. Many smokers have attempted to stop smoking, but many have also relapsed. Interventions which works at ensuring

that smokers gain access to effective smoking cessation therapies are required. It is well documented in literature that smokers are more likely to quit if assisted by HCP, particularly medical doctors. This study came up with the following recommendations that could improve the knowledge, attitudes and practices of medical doctors toward the use of smoking cessation pharmacotherapy:

5.5.1. Improve doctor's knowledge and practices on smoking cessation pharmacotherapy through education and training

Since the majority of the medical doctors in the study have indicated inadequate training and exposure to smoking cessation medicines in medical schools, strategies are needed to further improve their knowledge on medicines and their practice as well. As evident from this study, around 75% of the doctors thought that there was a great need to train the doctors on the pharmacology of smoking cessation. This can be done through inclusion of smoking education in the medical programs offered by academic institutions like UNAM. If doctors are adequately trained on the management of smoking, their confidence in assisting smokers to quit will improve, thus reduces smoking related morbidities. Moreover, such programs may also create clinical role models that will influence young doctors to address smoking as an integral part of their daily activities. The recommendation and prescribing of cessation medicines can further be improved via continuous education during the course of medical practice offered by different medical associations. This can be implemented through the provision of short courses, and on-job trainings.

Additionally, assessments on smoking management can be included in the licensing examination by the Health professional Council of Namibia (HPCNA), which intern doctors have to undergo before practicing as medical doctors. While some specialists have good understanding of smoking management due to the nature of their training and areas of speciality, collaboration between specialities and general medical practice is advisable to ensure cross-fertilization of skills. Comparatively, clinical experience can be transferred from the clinicians who have been working with smokers over a long period to junior clinicians and interns through mentoring programs. Mentorship can be established at a national or institutional level, and also through public-private partnerships. It has a potential of broadening access to information on best practices and also increase the level of skills and confidence in health promotion. On this basis, it is essential that prescribers of smoking cessation pharmacotherapy be equipped with evidence-based knowledge and skills to facilitate smoking-cessation interventions

5.5.2. Develop national standard treatment guidelines on smoking

Standard treatment guidelines are designed for both the health care practitioners and patients. Standard treatment guidelines assist in harmonising treatment across all levels of care, be it primary or tertiary health care; or public versus private practice. Unlike in many countries, smoking cessation services in Namibia are offered at an *ad hoc* basis, depending on the facility and also the practitioner managing the patient. This kind of practice could be attributed to the lack of national guidelines in Namibia. Therefore, standardizing therapy could result in improved cessation rates,

as reported in countries such as the USA and UK. The findings of this study have demonstrated a greater need for a standard treatment guideline (88%) and the inclusion of cessation medicine into the NEMList (73%). So far, there is a general treatment guideline for the management of common disease conditions in Namibia, in addition to specific treatment guidelines for the major infectious diseases like HIV/AIDS, TB and malaria. It can therefore be highly recommended that smoking management be added to the existing Namibia Standard Treatment Guideline (STG), or to come up with a smoking specific guideline. The development of smoking cessation STG can be done by the PHC division under the MoHSS. The inclusion of smoking in treatment guideline will ensure that resources are allocated to its management and also ensure uniformity in the provision of services. The end result will be a reduction in smoking-related morbidities. Moreover, guidelines will also ensure that both private and state patients get the same services.

5.5.3. Increase accessibility and availability of smoking cessation medicine

The availability of medicines and other services influence health care. The doctors may feel limited in the range of services, including medicine to prescribe if the medicines are not available. Moreover, they might be demotivated in learning and understanding smoking cessation if such services are not offered in their work place. Concurrently, the availability of medicines that smokers cannot afford may also discourage doctors from offering cessation interventions. This study therefore recommends the inclusion of cessation services into the STG and the addition of smoking cessation medicines into the NEMList by the Essential Medicines List

Committee (EMLC) to ensure universal accessibility to the population that utilises the public health facilities. If such medicines are to be made available, then HCP will be encouraged to improve their knowledge of them, and subsequently prescribing them to patients who require them.

Currently, the medical aid companies in Namibia do not cover cessation treatment including medicines. This could be a significant barrier to quitting. Given this, it is important to advise various medical aid schemes to expand insurance coverage to include cessation treatment and support services such as counselling and the use of pharmacotherapy. In order to increase the availability of smoking cessation medicines, they need to be offered at an affordable cost. Henceforth, the government and the medical aid association need to regulate the price of cessation medicines in order to promote their rational use.

5.5.4. Recommendation for further research

This study has highlighted important findings on the knowledge, attitudes and practices of medical doctors on smoking cessation pharmacotherapy. The limitations of the study were also discussed. The study was only limited to Khomas region. Further research is required to assess the knowledge, attitudes and practices of medical doctors on smoking cessation medicine in other regions within Namibia; and also at the neighbouring countries. Moreover, more studies that will document the cost-benefit of providing smoking cessation pharmacotherapy need to be done. Likewise, further research is needed on how to effectively integrate smoking

cessation pharmacotherapy at all levels of health care in both the private and public sector.

5.5.5. Advocacy of smoking cessation services

This study further recommends the advocacy of smoking and the smoking cessation services to create awareness among health care professionals and the general public. Since smoking is one of the major causes of non-communicable diseases like diabetes, the study recommends the integration of SC in health promotion services such as the diabetic campaigns. Moreover, over-the-counter smoking cessation medicines may be promoted for use to the general public with the approval from the HPCNA. That would create awareness to smokers and possibly reduces the smoking burden when smokers are aware about the medicines that may assist them to quit.

5.6. Summary

In this chapter, knowledge, attitudes and practices of medical doctors on the pharmacotherapy for SC were discussed in details by comparing with those of similar studies done in other countries. Weaknesses, strengths and limitations of the study were also discussed. The overall recommendations of this study are the inclusion of smoking cessation medicines in the national standard treatment guidelines and to improve doctor's knowledge and practices through training and education.

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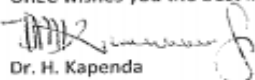
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APPENDICE A: ETHICAL CLEARANCE CERTIFICATE BY UNAM

	UNAM UNIVERSITY OF NAMIBIA
ETHICAL CLEARANCE CERTIFICATE	
Ethical Clearance Reference Number: SOM/89/2016	Date: 19 February, 2016
<p>This Ethical Clearance Certificate is issued by the University of Namibia Research Ethics Committee (UREC) in accordance with the University of Namibia's Research Ethics Policy and Guidelines. Ethical approval is given in respect of undertakings contained in the Research Project outlined below. This Certificate is issued on the recommendations of the ethical evaluation done by the Faculty/Centre/Campus Research & Publications Committee sitting with the Postgraduate Studies Committee.</p>	
Title of Project: ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES OF MEDICAL DOCTORS ON PHARMACOTHERAPY FOR SMOKING CESSATION IN KHOMAS REGION, NAMIBIA	
Nature/Level of Project: Masters	
Researcher: Ester N. Nalkaku	
Student Number : 200414798	
Faculty: School of Nursing and Public Health	
Supervisor : Dr. K. Amakali (Main) Ms. A. Shilunga(Co)	
Take note of the following:	
(a) Any significant changes in the conditions or undertakings outlined in the approved Proposal must be communicated to the UREC. An application to make amendments may be necessary.	
(b) Any breaches of ethical undertakings or practices that have an impact on ethical conduct of the research must be reported to the UREC.	
(c) The Principal Researcher must report issues of ethical compliance to the UREC (through the Chairperson of the Faculty/Centre/Campus Research & Publications Committee) at the end of the Project or as may be requested by UREC.	
(d) The UREC retains the right to:	
(i). withdraw or amend this Ethical Clearance if any unethical practices (as outlined in the Research Ethics Policy) have been detected or suspected,	
(ii). request for an ethical compliance report at any point during the course of the research.	
UREC wishes you the best in your research.	
	
Dr. H. Kapenda Director –Centre for Research and Publications <u>ON BEHALF OF UREC</u>	

APPENDICE B: ETHICAL CLEARANCE CERTIFICATE BY MOHSS



REPUBLIC OF NAMIBIA

Ministry of Health and Social Services

Private Bag 13198
Windhoek
Namibia

Ministerial Building
Harvey Street
Windhoek

Tel: 061 - 203 2510
Fax: 061 - 222558
E-mail: Ester.Shaama@mhss.gov.na

OFFICE OF THE PERMANENT SECRETARY

Ref: 17/3/3

Enquiries: Ms. E.N. Shaama

Date: 05th April 2016

Ms. Ester N. Naikaku
P.O. Box 41527
Ausspannplatz

Dear Ms. Naikaku

Re: Assessment of Knowledge, Attitudes and Practices of Medical Doctors on Pharmacotherapy for Smoking Cessation in Khomas Region, Namibia.

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
 - 3.1 The data to be collected must only be used for completion of your Masters in Public Health;
 - 3.2 No other data should be collected other than the data stated in the proposal;
 - 3.3 Stipulated ethical considerations in the protocol related to the protection of Human Subjects' information should be observed and adhered to, any violation thereof will lead to termination of the study at any stage;
 - 3.4 A quarterly report to be submitted to the Ministry's Research Unit;
 - 3.5 Preliminary findings to be submitted upon completion of the study;

A handwritten signature in black ink, appearing to be 'E.S.' or similar, located at the bottom right of the document.

3.6 Final report to be submitted upon completion of the study;

3.7 Separate permission should be sought from the Ministry of Health and Social Services for the publication of the findings.

Yours sincerely,



Handwritten signature of Andreas Mwoombola, consisting of a stylized 'A' with a horizontal line through it.

Andreas Mwoombola (Dr)
Permanent Secretary



APPENDICE C: RESEARCH PERMISSION LETTER BY UNAM

University of Namibia, Private Bag 13301, Windhoek, Namibia
340 Mandume Ndemufayo Avenue, Pioneers Park
☎ +264 61 206 3111; URL.: <http://www.unam.edu.na>



Date: 24 February 2016

TO WHOM IT MAY CONCERN

RE: RESEARCH PERMISSION LETTER

1. This letter serves to inform that student: **N Naikaku** (Student number: **200414798**) is a registered student in the School of Public Health at the University of Namibia. His/her research proposal was reviewed and successfully met the University of Namibia requirements.
2. The purpose of this letter is to kindly notify you that the student has been granted permission to carry out postgraduate studies research. The School of Post-graduate Studies has approved the research to be carried out by the student for purposes of fulfilling the requirements of the degree being pursued.
3. The proposal adheres to ethical principles.

Thank you so much in advance and many regards.

Yours truly,

Name of Main Supervisor: Dr K Amakali (Main) Ms A Shilunga (Co)

Signed: _____

Dr. M Hedimbi

Signed: _____

Director: Centre of Postgraduate Studies

Tel: 206 4662

Fax: 206 3290

E-mail: mhedimbi@unam.na

APPENDICE D: RESEARCH PERMISSION LETTER BY KATUTURA INTERMEDIATE HOSPITAL



Republic of Namibia

Ministry of Health and Social Services

Private Bag 13215
WINDHOEK
Namibia

Intermediate Hospital Katutura
Independence Avenue
WINDHOEK

Telephone (061) 203 4004/5
Telefax (061) 222706

Enquiries: Ms. P. S. Swartbooi

Date: 19 August 2016

OFFICE OF THE MEDICAL SUPERINTENDED

**Ms. Ester N. Naikaku
P. O. Box 41527
Ausspannplats**

**RE: ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES OF
MEDICAL DOCTORS ON PHARMACOTHERAPY FOR SMOKING
CESSATION IN KHOMAS REGION, NAMIBIA.**

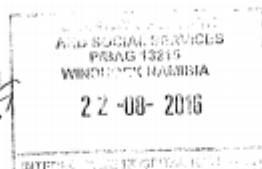
The above mentioned subject refers:

This office hereby grants you permission to do research Assessment of Knowledge, attitudes and practices of Medical Doctors on Pharmacotherapy for smoking cessation at Intermediate Hospital Katutura in the Khomas Region, Windhoek, Namibia.

Thank you

Yours in health


DR. F. M. SHIWEDA
CHIEF MEDICAL OFFICER



APPENDICE E: RESEARCH PERMISSION LETTER BY WINDHOEK CENTRAL HOSPITAL

9 - 0/0001



REPUBLIC OF NAMIBIA
Ministry of Health and Social Services

Private Bag 13215 Windhoek Namibia	Harvey Street Windhoek Central Hospital Ref.	Tel. No: (061) 203 3024 Fax No: (061) 222886 Date : 07 September 2016
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OFFICE OF THE MEDICAL SUPERINTENDENT
WINDHOEK CENTRAL HOSPITAL

Ms. E. Naikaku
P.O.Box 41527
Windhoek
0812062778

Dear Ms. Naikaku

RE: PERMISSION TO CONDUCT A RESEARCH ON ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTISES OF MEDICAL DOCTORS ON PHARMACOTHERAPY FOR SMOKING SESSION IN WINDHOEK.

Kindly be informed that permission has been granted for you to conduct a research at Windhoek central Hospital on the above mentioned subject:

- 1.1 Patients /clients information should be kept confidential at all times.
- 1.2 The purpose for research is only for your study purposes as you have requested and it does not include any remuneration.

Thank you for your kind gesture.

Yours sincerely


DR. S. SHALONGO
MEDICAL SUPERINTENDENT



"Health for All"

APPENDICE F: INFORMED CONSENT

Introduction and Purpose:

Hello. My name is Ester Naikaku. I am an MPH candidate at the University of Namibia. I am hereby inviting you to participate in my research study. The purpose of this exercise is to assess the knowledge, attitudes and practice of smoking cessation pharmacotherapy among medical doctors in the Khomas region, Namibia. The findings from the study will document the current practices, highlight the gaps in practice (if any) and provide necessary background to design appropriate recommendations expected to improve quality of smoking cessation pharmacotherapy prescribing habits/patterns among prescribers.

Procedures:

Please answer the following questions about your knowledge, attitudes and practice of smoking cessation pharmacotherapy in the spaces provided. Your genuine responses will be greatly appreciated. Your participation is absolutely voluntary and there is no penalty for refusing to take part.

Confidentiality:

All information recorded will be kept strictly confidential; your name and address will not be used and you will not be identified in any way, they shall remain anonymous.

Risks/discomfort and Benefits:

There is no serious risk to you if you agree to participate in this survey activity. I want to assure you that all information collected will be kept confidential. This study will help the health care providers to better the smoking cessation pharmacotherapy services to assist Namibian population whose health is exposed to risk due to smoking. We will use this information to identify best practices for smoking pharmacotherapy and identify strategies for improving the smoking cessation pharmacotherapy services, thus reduce smoking related morbidity and mortality.

Persons to contact:

If you have any questions you would like to ask about the purpose or procedure of this questionnaire, I can be contacted on the following number: 081 4091875.

Are you able to proceed with the questionnaire? Yes _____ No _____

The participant's signature below verifies that informed consent has been obtained

Sign _____ Date ____/____/2016

Please Contact me for any further question

Ms. Ester Naikaku (Principle Investigator)

Email: enaikaku@unam.na

Box 13301, University of Namibia,

School of Pharmacy

Telephone: +264 61206 5058

Mobile: +264 814091875

APPENDICE G: QUESTIONNAIRE

Serial #: _____ Date: ___/___/____ Data collector initials: _____

SECTION A: PRACTICE OF SMOKING CESSATION PHARMACOTHERAPY

1. Do you offer smoking cessation services in your practice(s)?

Yes	1	No	2
-----	---	----	---

If you answer NO to question 1, continue with question 2.

If you answer YES to question 1, please continue from question 3.

2. What is the main reason why you do not offer smoking cessation services? (Tick only one box)		
2.1	Low demand for smoking cessation service by my clients.	
2.2	Smoking cessation services are time demanding/consuming.	
2.3	I have no capacity to offer smoking cessation services.	
2.4	Not profitable to offer smoking cessation services (low clientele).	
2.5	Very difficult to achieve positive outcomes in these clients.	
2.6	Smoking cessation is not a priority health service in Namibia.	
2.7	I do not have training and exposure to offer smoking cessation service.	
2.8	No legal frame work/guidelines/policies for smoking cessation in Namibia.	
2.9	Not sure of what interventions/guidelines to follow.	
2.10	Medical aid programmes will not pay for smoking cessation services.	
2.11	Other reason:	

If you have answered question 2, please go to question 12 on page 3.

3. Approximately how many patients do you see in a month: _____

4. Approximately how many of these patients smoke: _____

5. **Have you ever prescribed any medicine(s) to assist with smoking cessation?**

Yes	1	No	2
-----	---	----	---

If Yes, please specify the name of the medicine _____

10. How do you come about choice of medicine in Q5?		Yes	No
5.1	Treatment guidelines	1	2
5.2	Prior knowledge / Experience	1	2
5.3	Prior training	1	2

11. Please indicate by putting a tick to how frequently you practice the following: (Tick (✓) where appropriate)		Never	Rarely	Often	Always
11.1	I ask my clients/patients about the use of tobacco.	1	2	3	4
11.2	I advise my clients who are smokers to quit smoking.	1	2	3	4
11.3	I assess my client's willingness to make a quit smoking attempt.	1	2	3	4
11.4	I prescribe over-the-counter medicines for smokers willing to quit smoking? Mention: _____	1	2	3	4
11.5	I prescribe ' prescription only ' medicines to smokers who are willing to quit	1	2	3	4

	smoking? Mention: _____				
11.6	I arrange follow-up visits for smoking-cessation.	1	2	3	4
11.7	I refer smokers to cessation experts or specialized services who are willing to quit to smoking.	1	2	3	4

SECTION B ATTITUDES TOWARDS SMOKING CESSATION PHARMACOTHERAPY

12.	(Tick (v) where appropriate)	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
12.1	Smoking is a priority public health concern in Namibia.	1	2	3	4	5
12.2	It is my professional responsibility to offer smoking cessation services.	1	2	3	4	5
12.3	Smokers are more likely to quit if helped by a doctor.	1	2	3	4	5
12.4	Doctors play a lesser role in smoking cessation.	1	2	3	4	5
12.5	Smoking cessation services in Namibia are well structured.	1	2	3	4	5
12.6	Smoking cessation success rates are significant when pharmacotherapy (medicines) is used.	1	2	3	4	5
12.7	All doctors should use pharmacotherapy in all patients for smoking cessation.	1	2	3	4	5
12.8	All doctors need to be trained on smoking cessation pharmacotherapy.	1	2	3	4	5
12.9	There is need for a national guideline on smoking cessation in Namibia to be used at all levels of care.	1	2	3	4	5
12.10	Smoking cessation services should be accessible only at a doctor's practice.	1	2	3	4	5

13. In your opinion, what tools do you think will improve your comfort with prescribing pharmacotherapy for smoking cessation? (Tick (v) where appropriate)		Yes	No
13.1	Addition of smoking cessation pharmacotherapy to the Essential Medicines List (NEMLIST).	1	2
13.2	Health education sessions.	1	2
13.3	Availability of standardized guidelines at health care facilities.	1	2
13.4	Separate smoking-cessation facility.	1	2
13.5	Pre-service training on smoking-cessation pharmacotherapy.	1	2
13.6	In-service training on smoking-cessation pharmacotherapy.	1	2

If other, please specify: _____

SECTION C: LEVEL OF KNOWLEDGE ON SMOKING CESSATION PHARMACOTHERAPY

14. Are you aware about the **pharmacotherapy** for smoking cessation? Yes 1 No 2

If **NO**, skip to Section D.

15. What pharmacotherapy is recommended for smoking cessation?		Yes	No
15.1	Nicotine replacement therapies	1	2
15.2	Antidepressant based therapies	1	2
15.3	Sympathomimetic based therapies	1	2
15.4	Other	1	2

If other, please specify: _____

16. Which patient(s) should receive pharmacotherapy for smoking cessation? (Tick only one box)

All smokers	1
All smokers who are trying to quit	2
All smokers who are trying to quit except in the presence of special circumstances	3

17. What is the **first-line pharmacotherapy** recommended for smoking cessation? (Tick only one box)

Bupropion SR, Varenicline, Nicotine replacement therapy (NRT)	1
NRT, Bupropion SR, Clonidine	2
NRT, Varenicline, Clonidine	3
NRT, Clonidine, Nortriptyline	4
I do not know	5

18. What is the recommended **second-line pharmacotherapy** for smoking cessation? (Tick only one box)

NRT, Bupropion SR	1
Varenicline, Clonidine	2
Nortriptyline, Clonidine	3
I do not know	4

19. Which pharmacotherapy should be considered with patients particularly concerned about **weight gain**? (Tick only one box)

NRT, Bupropion SR	1
Bupropion SR, Nortriptyline	2
NRT, Varenicline	3
I do not know	4

20. Which pharmacotherapy should be considered with patients with a history of **depression**? (Tick only one box)

NRT, Bupropion SR	1
Bupropion SR, Nortriptyline	2
NRT, Varenicline	3
I do not know	4

21. Typically, in smoking cessation, a "**target stop date**" is set. For how long after the "target stop date" do you prescribe the pharmacological interventions? (Tick only one box)

Two weeks after the "Target stop date"	1
Four weeks after the "target stop date"	2
Six weeks after "target stop date"	3
No duration	4
I do not know	5

22. State whether the following statements are TRUE or FALSE.		True	False
22.1	A high dose of Nicotine Replacement Therapy (NRT) is recommended for a patient who is highly nicotine dependent.	1	2
22.2	A combination of NRT therapy is recommended for a patient who is highly nicotine dependent.	1	2
22.3	A combination of different NRT formulations is recommended for a patient who is highly nicotine dependent.	1	2
22.4	Nicotine patch has been demonstrated to be safe in cardiovascular patients.	1	2
22.5	Combining Varenicline with NRT agents is associated with lower rates of side effects such as nausea and vomiting.	1	2
22.6	Patients on Bupropion SR should begin treatment 1-2 weeks before the quit date.	1	2

22.7	NRTs should be avoided in patients with a history of cardiovascular disease.	1	2
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SECTION D: SOCIODEMOGRAPHIC CHARACTERISTICS

23. Sex of the respondent:

Male	1	Female	2
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24. Professional designation:

Medical intern	1
Medical officer/General practitioners	2
Specialist	3

If Specialist, state area of specialization: _____

25. Type of current practice:

Public sector	1
Private sector	2
Non-profit organisation	3
Other:	4

26. Level of health care categorization of practice:

Primary health care (Clinic/ health centre)	1
Secondary care (Hospital)	2
Tertiary care (referral hospital)	3
Other:	4

27. How many years have you been practicing as a medical doctor: _____

28. How many years have you been practicing as a medical doctor in Namibia? _____

29. Age in years: _____

30. What is your smoking status?

Current smoker	1
Ex-smoker	2
Never-smoker	3

Thank you for taking time to complete this questionnaire

APPENDIX H: LETTER OF EDITOR AND STATISTICIAN

SCHOOL OF PHARMACY
University of Namibia, Private Bag 13301, Windhoek, Namibia
Florence Nightingale Street, Windhoek North
URL - <http://www.unam.edu.na>



TO: Whom it may concern

DATE: 24 January 2018

Dear Sir/ Madam

**SUBJECT: STATISTICAL ANALYSIS AND EDITING OF MS. E. NAIKAKU'S
MPH RESEARCH THESIS, 2017**

This is to acknowledge that I Dan Kibuule mentored and supported Ms. E. Naikaku regarding the univariate and bivariate statistical analysis of her thesis titled "Knowledge, attitudes and practices of medical doctors on pharmacotherapy for smoking cessation in Khomas region, Namibia" using the SPSS v23 software. I glad that Ms. E. Naikaku can now perform similar statistical tests.

I would also like to confirm that I supported the scientific and English editing of her report.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Dan Kibuule', is written over a horizontal line.

Dan Kibuule
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