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Tobacco use among healthcare professionals and their readiness to implement cessation treatments among patients in Primary Care facilities in Soweto, Johannesburg

Alagidede, Ann Nhawinei

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Tobacco use among healthcare professionals and their readiness to implement cessation treatments among patients in Primary Care facilities in Soweto, Johannesburg

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Dr Ann Nhawinei Alagidede

Student number: 2321494

A research report submitted as a publishable manuscript to the

Faculty of Health Sciences,

University of the Witwatersrand, Johannesburg

in partial fulfilment of the requirements for the degree of

MMed (Family Medicine)

Supervisor: Professor Olufemi B. Omole MMED, MCFP(SA)

Johannesburg, 21st September 2024

Declaration

I, Ann Nhwawinei Alagidede, “hereby declare that this research is my unaided work, except where due acknowledgement for assistance received has been made. It is being submitted for the Master of Medicine (Family Medicine) degree at the University of the Witwatersrand, Johannesburg. It has not been submitted previously for any other degree or examination at this or any other Universit”y.

Signed … 

Dr. Ann Nhawinei Alagidede

Date: 21/09/2024

Dedication

I want to dedicate this work to:

Almighty God.

My late mother,

Mrs Agatha Muanah.

And

My wonderful family,

Prof. Imhotep Alagidede, Mr Johnson Yaw Muanah, and Dr. Ivan Muanah for their constant support and encouragement while I wrote this research report.

Acknowledgements

I sincerely thank Professor Olufemi O. Omole, Department of Family Medicine, University of the Witwatersrand, Johannesburg, who served as my primary research supervisor, for his invaluable mentoring, advice, feedback, and patience.

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Abbreviations

CDC	Centres for Disease Control and Prevention
CHC	Community Healthcare Centre
COVID-19	Coronavirus Disease 2019
DRC	District Research Committee
GATS	Global Adults Tobacco Surveys
GATSS	Global Adult Tobacco Surveillance Survey
HCP	Healthcare Professional
HREC	Human Resources Ethics Committee
KZN	KwaZulu Natal
NHRD	National Health Research Database
PHC	Primary Healthcare
REDCap	Research Electronic Data Capture
TCT	Tobacco Cessation Treatments
WHO	World Health organisation

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Acknowledgements: Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution. Authors are responsible for ensuring that anyone named in the Acknowledgments agrees to be named. Refer to the acknowledgement structure guide on our *Formatting Requirements* page.

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Tobacco use among healthcare professionals and their readiness to implement cessation treatments among patients in Primary Care facilities in Soweto, Johannesburg.

Authors

Ann Nhawinei Alagidede[1], Olufemi B Omole[1]

[1]Division of Family Medicine, Department of Family Medicine and Primary Care, School of Clinical Medicine, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa

*Corresponding author: AN Alagidede. Email: annmuanah@gmail.com

Abstract

Background: Despite its hampering influence on healthcare professionals' (HCPs) willingness to implement tobacco cessation treatments (TCT), tobacco use remains understudied in South Africa.

Objective: To determine the prevalence of tobacco use among HCPs and its influence on their readiness to implement TCT for their patients.

Methods: This cross-sectional study sampled 444 HCPs in five Community health centres in Soweto. A self-administered questionnaire collected information on socio-demography, tobacco use, quit attempts and HCPs' readiness to implement TCT for their patients. Readiness was defined as a construct of HCPs' rating of the importance of TCT and their confidence in implementing it.

Results: The mean participant age was 41 years. Most were female (80%;n=355), single (54.1%;n=240) and black (91.6%;n=405). About 22%(96) were ever-users of tobacco, 12.6%(n=56) current users and 9%(n=40) ex-users. Among current users, 64.3%(n=36) smoked only cigarettes, 17.9%(n=10) used only snuff, and 14.3%(n=8) used other products. About 56.6%(n=30) of current users had contemplated quitting in the past year. Approximately 68%(n=300) and 82.2%(n=365) of participants were ready and willing to implement TCT, respectively. Only 32%(n=143) and 25%(n=107) of participants had received any training on tobacco use and TCT, respectively. There was no significant association between tobacco use and readiness to implement TCT (p=0.50).

Conclusion: Tobacco use is prevalent among HCPs and has no influence on the implementation of TCT in South African primary health care. Although most HCPs reported readiness and willingness, there is a need to scale up training, both during formal health professions education and in continued professional development.

Contribution: This is one of few recent studies demonstrating the concerning rate of tobacco product use among HCPs in South African PHC. Although there is a high level of readiness to implement TCT for their patients, most HCPs still need training to ensure their self-efficacy.

Keywords: Tobacco use, Readiness, Willingness, Tobacco Cessation Treatments, Healthcare professionals, Training
Word count: 249

Introduction

Global tobacco smoking rates have steadily decreased over the last three decades, dropping from around 34.2% in 2000 to 23.0% in 2020.[1] However, according to the 2021 World Health Organization (WHO) report, over eight million people worldwide still die from tobacco use and exposure every year, with most of these deaths prematurely.[2] This figure is higher than the combined mortality from malaria, Human Immunodeficiency Virus, and tuberculosis.[3]

Tobacco use is still prevalent in South Africa despite a progressive tobacco control policy and regulatory program. The recent 2021 Global Adult Tobacco Survey (GATS) estimates that nearly 30% of South Africans use tobacco.[4] This is concerning because tobacco use is a known risk factor for several of the country's top ten leading causes of mortality from noncommunicable illnesses, including hypertension, ischemic heart disease, chronic obstructive pulmonary disease, malignancies and diabetes.[5] Aside from the harmful health implications, the economic cost of smoking was estimated to be R42 billion in 2016, with R14.8 billion spent on healthcare (hospitalisations and outpatient visits).[6]

According to the 2017 health budget for South Africa, 84% of the general population depends on public sector healthcare. More importantly, this population includes a high-risk population in the working class[7] – as indicated in the 2023 World Health Organization (WHO) report.[8] This gives healthcare professionals (HCPs) in the public healthcare sector ready access to the proportion of the general population who use tobacco, particularly at the primary healthcare (PHC) level. An efficient strategy to decrease tobacco-related morbidity and mortality would, therefore, be to ensure that primary healthcare providers act as good role models and advocates for anti-tobacco measures during the clinical encounter.

HCPs can positively influence tobacco users to quit; however, studies addressing their readiness and willingness to do this are yet to be explored in South African PHC. HCPs' readiness to implement tobacco cessation treatments (TCTs) is described by a combination of how important these TCTs are to them and how confident they are in executing them.[9] Their willingness to do so is defined by how eager they are to

conduct them. Indeed, their knowledge of anti-tobacco measures may influence their readiness to perform TCT.[10]

As health experts and patient advocates, HCPs in PHC are uniquely placed to respond to the tobacco epidemic. By implementing evidence-based tobacco cessation guidelines, HCPs in PHC can effectively counsel their patients on smoking cessation and treat tobacco dependence in patients.[11] The opposite has also been shown to be true elsewhere, as HCPs who use tobacco are less likely to be willing and/ or ready to implement TCT.[12] There are no recent data on the proportion of healthcare providers who use tobacco in South Africa. In addition, their willingness and readiness to intervene in their patients' tobacco use have not been quantitatively explored. A helpful starting point to achieve this will be to determine the prevalence of tobacco use amongst HCPs in PHC and determine how tobacco use influences their willingness to counsel their patients on tobacco cessation practices and implement treatments. It is currently unclear how many HCPs worldwide use tobacco (smoked, smokeless or heated), especially in low to middle-income countries where few studies have been conducted. A recent review estimated that between 2000 and 2014, around 21% of HCPs use tobacco,[13] with family physicians having the highest smoking prevalence at 24%.[13] However, rates vary by country, with some reporting lower percentages: Poland (7.8%)[14] and Estonia (6.7%).[15] The recent COVID-19 led to increased stress and burnout among HCPs, with a 2021 French study showing a 24% increase in nicotine dependence among HCPs after the lockdown. This suggests that HCPs may have turned to tobacco and other substances as a coping mechanism.[16] Within South Africa, three studies,[17,18,19] two in 2012 and the most recent in 2018, found that HCPs and health sciences students had smoking rates ranging from 8% to 17%. Also according to a study by Senkubege et al.,[18] data from 2008 showed that 18.6% of medical students used alternative tobacco products, such as water pipes, while 3.1% used smokeless tobacco. These findings suggest that tobacco use is common among healthcare professionals in South Africa and that a new population of users, beyond cigarette smokers, may have emerged. However, this habit undermines HCPs' moral authority in the fight against tobacco use, and those who use tobacco products are less likely to intervene in their patients' tobacco use.[11] The studies referred to above also revealed significant gaps in health professional students and HCPs' formal and

in-service training, respectively, as only a small proportion of both categories are well equipped to effectively assist tobacco users in quitting.

HCPs can help patients quit smoking with brief advice interventions, increasing cessation rates by up to three per cent per episode and cumulatively up to 50% in a lifetime.[20] However, studies show that physicians who smoke are less likely to offer tobacco cessation advice.[21] Hence, identifying factors influencing HCPs intervention in smokers is essential for improving tobacco control interventions. Also, a study in two communities in South Africa found that many smokers are willing to quit if their clinician advises but the health system's support to achieve this is inadequate.[22] Several reasons have been posited: According to Meijer et al.[23], primary healthcare providers face several challenges in providing interventions for tobacco addiction, including limited time, misconceptions about success rates, inadequate knowledge or counselling skills, and concerns about damaging the doctor-patient relationship. Some HCPs also regard smoking as a habit rather than a disease[23] and are even more reluctant if they are tobacco users themselves. These factors intertwine, creating a complex landscape that can hinder HCPs readiness to provide tobacco cessation services.

On the other hand, the Meijer et al. study [23] found that HCPs who are motivated, have positive attitudes, and have received cessation training are more likely to help patients quit using tobacco. HCPs who identify strongly as role models are also more likely to carry out interventions. Among patients, those who prioritise quitting, maintain a positive relationship with their clinician and use referral systems are more likely to succeed.

In South Africa, there is a dearth of literature on tobacco use among HCPs and no information on how this influences their readiness and willingness to implement TCTs in patients. Therefore, this study examines the prevalence of tobacco use among HCPs in five primary healthcare facilities in Soweto, Johannesburg district, South Africa. It further assesses HCPs readiness and willingness to implement TCT in their patients.

Methods

Study design and setting

This cross-sectional study was conducted in the five public community health centres within Soweto sub-district D, Johannesburg. Soweto is a large urban community with 23 primary healthcare facilities catering to about 1.3 million residents, who are mainly black South Africans.[24] A cross-sectional study was selected because it was appropriate for determining prevalence at a point in time, and the relationship between participants' tobacco use status and their readiness to implement tobacco cessation practices.[25]

Study Population

This study focused on HCPs who provide clinical services, including counselling, and have direct contact with patients in their facilities. The eligible HCPs include medical doctors, dentists, nurses, and community health workers (CHWs) who are 18 years or older and work in primary healthcare facilities in Soweto. The study excluded professional categories with limited or no patient contact as they are unlikely to influence patients' tobacco use behaviour. A total of 480 HCPs were eligible for the study in the five community health centres.

Sample size and sampling

With an eligible population of 480 HCPs, an acceptable margin of error of 5%, a 95% confidence level and a response distribution of 50%, the required sample size was estimated to be 214. However, the researcher enrolled all eligible HCPs in the five community health centres in the district to account for possible refusal and missing and incomplete information. After ethics clearance and permissions were obtained from the Human research and ethics committee and the district management, respectively, each facility manager was approached and asked for permission to access the primary healthcare facility to recruit study participants. All eligible HCPs were consecutively approached to enrol for recruitment into the study through the office of the Facility manager and the Heads of clinical units in each of the five community health centres in Soweto. Recruitment continued over 20 weeks (with two reminders/visits) until all eligible HCPs were approached.

Data collection

The data collection tool was a questionnaire adapted from the key tobacco questions in the Global Adult Tobacco Surveillance Survey (GATSS).[26] The World Health Organization and Centers for Disease Control and Prevention formulated and used this questionnaire for tobacco surveillance and monitoring activities. The questionnaire is available from the WHO's website at

https://www.who.int/publications/i/item/9789241500951.[26] This adapted questionnaire collected information on participants' sociodemographic characteristics, tobacco use patterns, quit attempts, and readiness to provide tobacco cessation treatments/interventions.

Measures:

- Socio-demographic characteristics included age, gender, marital status, ethnicity, years of experience and professional category. Tobacco use patterns include duration, quantity, and types of current use, past daily use for less than current daily smokers and past usage for current non-smokers, second-hand smoke exposure at home or in public places in the last month, and concurrent use of other non-tobacco substances such as alcohol and marijuana. The GATSS description for the tobacco use measures was employed as stated below:
    - Current tobacco user: A healthcare professional who uses tobacco products daily or occasionally[26]
    - Ex-tobacco user: A healthcare professional who has not used tobacco products within the last twelve months of this study's commencement.[26]
    - Never tobacco user: A healthcare professional who has never used tobacco[26]
- Exposure to second-hand smoke was defined as HCPs who do not smoke but reported smoking occurring in their home or have been exposed to tobacco smoke in the workplace within the last 30 days.[26]
- Quit attempts made by participants in the last year: This study categorised a quit attempt as an affirmative response "yes" to the question, "Have you ever attempted to quit tobacco use?" or if the participant reported trying to quit within the past year. The definition was intentionally crafted to avoid bias by not

requiring a specific duration of abstinence, which would exclude those with the least likelihood of quitting. Instead, the focus was on the participant's perception of making a serious effort to cease tobacco use permanently.[27]

- Participants' readiness to implement TCT (such as brief advice, counselling, pharmacotherapy, etc.) in their patients: The study defined participant's readiness as a combined construct of "their belief in the importance of offering tobacco cessation counselling and their confidence in being able to carry out this intervention(s) efficaciously".[9] This construct was operationalised using a five-point Likert scale for three questions (one to assess participant's perception of the importance of implementing TCT; the second to assess participant's confidence in being able to implement TCT; and the third to assess their willingness to implement TCT). Two ordinal scales from zero to ten were combined to determine participants' readiness to implement TCTs: the importance ruler and the confidence ruler.[28] Participants who scored six and above on both rulers were considered ready, and those who scored five or less on one or both were classified as "not ready" to offer tobacco use cessation interventions. A similar ordinal scale from zero to ten was used to measure the willingness of participants to implement TCTs.[28]

Data collection occurred as follows: At the weekly meetings, each of the Heads of units (medical, nursing and CHWs) issued each eligible HCP in their category that showed interest a copy of the participant information leaflet detailing the study's nature and purpose and a self-administered questionnaire. Questionnaires were completed at the convenience of the HCPs. Eligible HCPs who were absent during the meetings/researcher's visits but who expressed interest and gave their email addresses had an electronic copy of the participant information leaflet and questionnaire sent to them by email. These made up 22 HCPs. At the end of each day, the investigator securely collected completed questionnaires.

Pilot Study

To ensure the validity of the measurement tool, the self-administered questionnaires were piloted on a sample of 40 HCPs (20 nurse clinicians, ten doctors and ten CHWs) at Hillbrow Community Health Centre, Johannesburg - a facility in another sub-district. Following piloting, some questions were revised for clarity: Firstly, the word "unsure"

was removed from the ordinal scales (rulers), which made it easier for the participants to rate the level of importance, confidence, and willingness. Secondly, question E32 in the GATSS was limited to only current tobacco users rather than all participants, as the influence of their tobacco use on TCT can only be expressed by current users.

Data management and analysis

The data from each patient's questionnaire were captured on a secured Research Electronic Data Capture (REDCap) software platform and exported onto an MS Excel spreadsheet. A statistician used the SPSS statistical software 28 for the analyses.

Descriptive statistics were used to summarise participants' socio-demographic characteristics and determine the proportion of tobacco users. It also described participants' tobacco use patterns and the proportion of current users who had made a quit attempt. The analysis outcomes for categorical variables were expressed as frequencies and percentages. In contrast, the results for continuous variables were expressed as means with their standard deviations (SD) for normally distributed data and median with interquartile ranges (IQR) for skewed data.

Concerning the ordinal scales (of "0" to "10") used to determine participants' readiness and willingness to implement TCTs, a one-sample t-test was applied to determine if the average importance differed significantly from the central score of five. If the result was significant and the mean score was greater than five, the result was interpreted as significantly important. If the result was significant and the mean score was less than five, this was interpreted as significantly unimportant. Participants who scored six and above on both rulers were considered "ready", while those who scored five or less on one or both were classified as "not ready" to implement TCTs. The same analysis applied to the willingness ruler. Regarding the ordinal scale for willingness, participants who selected six or more on the willingness ruler were classified as willing to implement TCTs.

Using chi-squared, t-tests, or ANOVA as appropriate, comparisons and associations were conducted between participants who were "ready" and those who were "not ready" regarding sociodemographic factors, tobacco use status, and quit attempts. In all tests, statistical significance was deemed present when p was less than 0.05.

Ethical consideration

The Human Research Ethics Committee (HREC), University of The Witwatersrand, Johannesburg, granted ethical approval (clearance certificate number M210636). Johannesburg's Health District Research Committee (DRC) gave further clearance (DRC Reference: 2020-11-017). All eligible participants were given an information sheet before the study. This explained the study objectives, scope, and possible risks. Participation was voluntary, and confidentiality was maintained through unique codes assigned to each participant. No identifying information was collected, and the initial list of eligible participants was stored in a password-protected computer that was expunged before data analysis. The questionnaire responses were only accessible to the researcher. Our study followed the 1964 Helsinki Declaration. The Ethics committee waived the requirement of written informed consent for participation, as completing the self-administered questionnaire was deemed to imply consent to participate in the study.

Results

Of the 480, a total of 447 participants returned their questionnaires. Thirty participants did not return the questionnaire despite reminders, while three returned it uncompleted and were excluded from the analysis. The remaining 444 constituted the study's sample (Response rate of 92.5%).

Sociodemographic characteristics of the study participants

Table 1 summarises the sociodemographic profile of the study participants. Most participants were female (80%;n=355), single (54.1%;n=240) and black (n=91.6%;n=405). The mean participant age was 41 years (SD 11.0), and the median years of experience in healthcare were 12 years (IQR = 5 - 16).

[INSERT TABLE 1]

Tobacco use among healthcare providers

The prevalence of ever-use of tobacco among healthcare workers was 21.6%, composed of 8.9% (n=40) ex-users and 12.5% (n=56) current users. Among the current tobacco users, 64.3% (n=36) smoked only cigarettes, 17.9%(n=10) used only snuff, and 14.3% (n=8) used other forms of tobacco. The remainder (3.6%; n=2) smoked cigarettes with snuff use or other products. Males were significantly more likely to report having used tobacco than their female counterparts (44.6% vs 16.6% $p<0.001$). All current snuff users were female, 100% (n=11), while 98.8% (n=82) of male HCPs had never used snuff, the difference being statistically insignificant ($p=0.29$).

Tobacco use varied by professional category, with the highest prevalence among CHWs (35.7%). In bivariate analysis, more nurses had never smoked cigarettes while doctors and dentists tended to report being ex-cigarette smokers, and many CHWs were current smokers ($p<0.001$) - Table 2.

Among current tobacco users, many preferred mentholated manufactured cigarettes, 43% (n=24). None reported using cigars, pipes or chewed tobacco leaves (Table 3).

The mean age of initiating tobacco use was 24 years (SD = 9.9). Among current tobacco users, cigarette smokers had a mean duration of smoking of 10.9 years (SD = 7.3), smoked an average of five cigarettes per day (SD= 3.0), and averaged three-pack years of smoking (SD = 3.1). The mean duration of snuff use was eight years (SD = 8.9)), with an average of three dips per day.

The majority of current cigarette smokers, 44.7%(n=17), reported smoking both at their workplace and at home. About 31.6% (n=12) smoke at home only, and 13.2% (n=5) smoke exclusively at work. (Table 3).

With regards to other substances used with tobacco, 57%(n=32) drank alcohol whilst using tobacco. (Table 3).

[INSERT TABLES 2&3]

Prevalence of exposure to second-hand smoke or fumes

The prevalence of second-hand smoke exposure was 36.6% (n=142). Most passive smokers (33.1%;n = 47) reported exposure at both home and work, and 23.2% (n=33) exclusively at work. See Table 3. The mean duration of second-hand smoke exposure among 'never' users was 13 years (SD 11.9), and for ex-smokers, 7.4 years (SD 8.6).

Prevalence of factors that motivated the initiation of tobacco use

Among current tobacco users, 26.8% (n=15) expressed no specific reasons for initiating tobacco use, and another 21.4% (n=12) cited peer pressure. Other reported reasons shown in Table 3 include pressures from work, school and relationships, and mental health benefits.

[INSERT TABLE 3]

Quit attempts among current tobacco users

About 77% (n =41) of current tobacco users had tried to quit tobacco at some stage. An estimated 56.6% (n=30) indicated they had contemplated quitting in the past year, and of these, 58.5% (n =24) reported that their future health concerns were the main motivating reason to try quitting. A similar response pattern was observed among ex-users. The only motivating factor for quitting that borders on statistical significance in both groups was their concern about their health. As demonstrated in Table 4, most current users (70.7%,n=29) could not quit because they relied solely on their willpower.

[INSERT TABLE 4]

Healthcare provider's readiness and willingness to provide tobacco cessation treatments

About 80.5%(n=354) of the participants reported that it was important (i.e., extremely or very important) to implement TCT in their patients who use tobacco, as shown in Table 5. The study used a one-sample t-test to determine if the scores above the central point of five were significantly important or not. The results showed a mean score above the central point (mean 8.5, SD 2.3, $p<0.001$), implying that it was significantly important for participants to implement TCTs.

Regarding participants' confidence in implementing TCTs, most, 56.3% (n=245), felt reasonably confident. Overall, participants demonstrated significant confidence in implementing all levels of TCTs, with a mean score of 7.1 (SD 2.8).

On a scale of 10, most participants (82.2%;n=365) were reasonably willing to implement tobacco treatments, with a mean score of 8.27 (SD 2.028). In bivariate analysis, willingness to offer tobacco did not differ across sociodemographic characteristics, tobacco use status (p=0.344), or training received during clinical practice (p=0.28).

An estimated 68% (n=300) of participants who achieved a minimum score of six out of ten on the readiness scale were classified as "ready" to implement TCTs. Readiness to implement TCTs did not differ across sociodemographic characteristics, previous training on tobacco, quit attempts, or tobacco use status, as shown in Table 5. However, participants who were classified as ready to offer TCTs were significantly more willing than those who were not, $p<0.001$.

Concerning screening, 29.1% (n=129) reported that they always screened patients for tobacco use, and 13.5% (n=60) never screened. Regarding what activities they could confidently implement in TCT, most participants could give brief advice (62%;n=276). In contrast, fewer knew how to conduct in-depth counselling 22% (n=99), and only 9% (n=42) of participants knew how to prescribe drugs for tobacco use cessation.

About 42.9%(n=24) of current tobacco users reported that their tobacco use did not influence their ability to intervene in their patients' tobacco use. When all the participants were asked if healthcare providers who use tobacco were likely to implement TCTs, 59%(n=258) reported this was less likely. However, in bivariate analysis, there were no associations between tobacco use and the ability of HCPs to screen (p=0.68), give brief advice (p=0.37), provide in-depth counselling to patients(p=0.63), or prescribe smoking cessation drugs (p=0.68).

Most of the HCPs, 66.9% (n =297), did not receive training on tobacco use, its dangers, and TCT during their formal training/school, and 73.4% (n=326) had not received this training during their working years, either as standalone lectures, seminars, or workshops. For those who have received any training, lectures and assignments were the most frequently cited sources. In bivariate analysis, there were

no associations between readiness to implement TCT and reporting previous training on tobacco use during schooling (p=0.64) or working years(p=0.28). However, participants who received training at school were significantly more willing to offer tobacco cessation advice to patients who use tobacco (p<0.001).

[INSERT TABLE 5]

Discussion

This study found that tobacco use is common among HCPs in primary care. Medical doctors and dentists reported to be using newer tobacco products such as electronic cigarettes, hookah, and Hubble Bubble. While most current tobacco users have attempted to quit, there was no statistically significant difference between participants' readiness to implement TCTs and their tobacco use status. Participants who were determined "ready" to implement TCTs were significantly more willing to implement them. The outcomes of this study hold significant implications for clinical practice, policy-making, and public health, and underscore the importance of promoting TCTs among HCPs, providing training during and after formal healthcare education programs, and offering treatments and support to increase more quit attempts and consequently increased quit rates among tobacco users.

This study shows lower tobacco usage in South African HCPs compared to other developing countries, China (37%) and Central and South America (25%), as shown in a 2019 review.[11] This could be due to South Africa's more progressive tobacco control program.[29] Whilst previous studies on tobacco use in South Africa have primarily focused on the general population[4,30] no published research has been conducted nationally on HCPs and their tobacco use to compare the findings of this study.

This study found that the prevalence of tobacco use among HCPs is lower than that previously reported in the general population (21.6% vs 29.4%).[4] Additionally, this study reports a reduced smoking prevalence compared to the KZN study by Okeke et al. (16.2% vs 18.1%).[19] The latter study analysed smoking rates and patterns among all HCPs in three public hospitals. Of note, Okeke et al. could have reported a higher smoking prevalence in their sample, which comprised paramedics, administrative

clerks, and auxiliary HCPs with similar socioeconomic characteristics to the working class, where smoking is more prevalent.[31] Although lower than the national average, the high prevalence of tobacco use by HCPs is an established barrier to using HCPs as front liners in the tobacco control program since they are less likely to intervene in their own patients' tobacco use.[12] HCPs who use tobacco may feel a sense of cognitive dissonance when advising their patients to quit while they continue to use. This can be compounded by a fear of being perceived as hypocritical if they counsel their patients to quit tobacco.[32] On the clinical front, the negative influence of HCPs' tobacco use can be mitigated by helping them improve their health behaviour through a combined strategy of Screening, Brief Intervention and Referral to Treatment (SBIR/T). This technique will successfully assist individuals in modifying their risk behaviours and reduce adverse health outcomes in this critically skilled population.[33]

Regarding the intention to quit smoking, more than half of current smokers were considering quitting (56.6%), and the majority (77%) had attempted to quit in the last year. The main barrier to quitting was their reliance on willpower (70.7%). That most HCPs who are tobacco users intended to quit but use their willpower underscores the need to provide motivational counselling to these community role models and, where necessary, also provide pharmacotherapy that has been shown to increase further the odds of successfully quitting.[34] Also, relying on willpower is ineffective; only a small proportion of quitters will succeed.[35] The goal should be to provide ongoing treatments and support during each quit attempt, as the probability of success increases with each additional attempt.[27] However, the skill to provide motivational counselling and tobacco cessation drugs are not readily available in public healthcare services, highlighting the need for public and occupational health policy change to ensure the availability of evidence-based tobacco cessation therapies. Other interventions such as peer support groups, face-to-face counselling, and over-the-phone support through quitlines are also effective tobacco cessation interventions recommended by the WHO.[2] However, it appears that HCPs are unaware of these interventions' effectiveness for tobacco cessation and so do not use them. Hence, tobacco users who want to quit may not receive adequate support, and continued tobacco use increases their risk of health issues, higher healthcare costs, and lower quality of life.[36]

Many HCPs did not receive training on tobacco use and its cessation interventions during their formal education and ongoing employment. Perez et al.(2018) found that only about 36% of health sciences students in two major South African universities received formal training on tobacco use and TCTs, revealing a gap in their curricula.[17] This could explain why the years of experience as HCPs did not influence participants' readiness to perform TCTs, and it further suggests that HCPs do not utilise TCTs in their patient care nor the in-service training priorities. Indeed, an HCP's continuous practice of TCTs will increase their competence.[37] The lack of competence regarding TCTs among HCPs is an indictment of health professions training in South Africa, as tobacco-related illnesses account for a significant portion of the disease burden in the country.[38] Since health priorities and disease burdens should drive health professions training, this should also be appropriately represented in the curricula of all health-related disciplines and continued professional development. However, participants reporting receipt of training did not influence their readiness to implement TCT in this study, possibly because of ignorance about its effectiveness. On the contrary, HCPs reported willingness to intervene was significantly influenced by the lectures they received during their school years. This is consistent with previous studies in Ethiopia and Namibia, which reported that HCPs with formal training are more willing to practice TCTs.[39] Our study showed no relationship between formal tobacco cessation training and readiness for TCT. However, a review by Carson et al.[40] also found that HCPs who report receiving training on TCT are more likely to counsel, set a quit date and follow up with patients. Overall, the evidence suggests that well-designed and implemented training programmes can make a difference in HCPs delivery of TCTs.[40] However, the research landscape is nuanced, and several other factors might have been responsible for the findings observed in this study.

Most participants were ready and willing to implement TCTs for tobacco users, regardless of tobacco use, socio-demographics, or quit attempts. Surprisingly, most tobacco users reported that their use did not influence their ability to provide TCTs. This finding is counter-intuitive and contradicts the general belief that HCPs who use tobacco are less likely to offer smoking cessation counselling to their patients due to moral conflicts.[41] The literature is not settled on this issue, as Mostafa et al.[12] reported in a systematic review by Olayinka et al.[12] that in Egypt, doctors reported that whether or not they smoked did not affect how they helped people quit. However, studies

conducted among nurses in Croatia,[42] physicians in the United States[13] and Dentists in India[43] all reported that HCPs who use tobacco were less likely to implement TCTs in their patients. The unsettled evidence in this regard may indicate that the concept of willingness and readiness to implement TCT, though measured similarly, is a complex behaviour, and many factors other than HCP's training status may influence it. Hence, further studies may be required to fully understand HCPs' behaviours properly. Of note is that the sample in our study is mostly comprised of nurses, which could have skewed the findings in favour of nurses' opinions. However, nurses are the largest category of HCPs in South African primary health care, and to the extent that this is true, the study findings remain generalisable in this context.

Strengths and limitations

This study had some limitations. Firstly, the study was not a national study, and differences in the composition of HCPs may result in different patterns and prevalence of tobacco use, particularly as some sociodemographic characteristics may vary across settings and regions. For example, the underrepresentation of some ethnic groups may have led to an underestimation of the prevalence of tobacco use, as Coloured, White, and Indian populations typically have higher smoking rates compared to a nearly homogenously black population as in Soweto. Nonetheless, the study recruited the entire target population in the subregion, and its sample was, therefore, representative of what applies in the five CHCs. Secondly, the study relied on self-reports and lends itself to recall and social desirability biases. These could have influenced HCPs to under-report their smoking habits for fear of judgment since they are usually regarded as role models. To limit this, the study created a non-judgmental environment that enabled participants to report their tobacco use and habits truthfully. Finally, the cross-sectional design limits the generalizability of the study findings and cannot establish any causal relationships between the variables. Despite these potential limitations mentioned above, this study provides insight into the influence of HCPs' tobacco use status on their preparedness and willingness to implement tobacco cessation interventions in South Africa. This has clinical practice and policy implications.

Conclusion

This study found that the prevalence of tobacco use among HCPs in South African primary health care is high, and most of these professionals are making efforts to quit. These findings call for tobacco cessation programs that screen for tobacco use among HCPs and motivate and support users in this population to quit. Although most HCPs were willing/ ready to implement TCTs to varying degrees, there remains a need to scale up training on tobacco use and treatment for HCPs and integrate tobacco cessation treatments into routine services in primary health care. The unsettled evidence on how tobacco use status affects HCPs' willingness/ readiness to implement tobacco cessation treatments calls for further studies utilising more rigorous design and methods and more nationally representative samples of HCPs.

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Conflict of interest

The authors declare that they have no conflict of interest.

Authors contributions

ANA contributed to the manuscript's conceptualisation, data collection, analysis, and development. OBO supervised the study and contributed to its conceptualisation, analysis, and review. ANA and OBO approved the final draft.

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Data availability

The datasets used in this study are available from the corresponding author, A.N.A., on reasonable request.

Disclaimer

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TABLES OF RESULTS

TABLE 1: Sociodemographic characteristics of participants

Variable	Categories	N (%)
Age group of participants	*19 -29*	*79 (17.8)*
	30-39	*137(30.9)*
	40-49	*105 (23.6)*
	50-59	*84 (18.9)*
	60+	*29 (6.5)*
	Unspecified	*10(2.3)*
	Total	*444(100)*
Gender	*Female*	*355 (80.0)*
	Male	*83 (18.7)*
	Unspecified	*6((1.4))*
	Total	*444 (100)*
Professional category	*Medical practitioner*	*76(17.0)*
	Dental practitioner	*12(2.7)*
	Nurse clinician	*216(48.3)*
	Community health worker	*140(31.3)*
	Total	*444(100)*
Ethnicity	*Black*	*405(91.6)*
	Coloured	*3 (0.7)*
	Indian	*17(3.8)*
	White	*17(3.8)*
	Unspecified	*2(0.4)*
	Total	*444(100)*
Marital status	*Divorced*	*18(4.1)*
	Single	*240(54.1)*
	Married	*137(30.9)*
	Widowed	*19(4.3)*
	Separated	*5(1.1)*
	Cohabiting	*24(5.4)*
	Unspecified	*1(0.2)*
	Total	*444(100)*

Table 2: Prevalence of tobacco use among participants

Tobacco use	Response category	Professional category				Total	Pearson's chi-square/Fisher's exact	
		Doctor	Dentist	Nurse	Community health worker		Test statistic	p-value
		Frequency (% within professional category)						
Cigarettes	Never	64 (84.2)	10 (83.3)	196 (90.7)	102 (72.9)	372(83.8)	42.440	<.001*
	Ex-user	9 (11.8)	2 (16.7)	14 (6.5)	9 (6.4)	34(7.7)		
	Current user	3 (3.9)	0 (0)	6 (2.8)	29 (20.7)	38(8.6)		
	Total	76(100)	12(100)	216(100)	140(100)	444(100)		
Snuff	Never	76(100)	12(100)	211(97.7)	127(90.7)	426(95.9)	12.024	.036*
	Ex-user	0(0)	0(0)	2(0.9)	5(3.6)	7(1.6)		
	Current user	0(0)	0(0)	3(0.9)	8(3.6)	11(2.5)		
	Total	76(100)	12(100)	216(100)	140(44)	444(100)		
Other forms of tobacco	Never	71(93.4)	10(83.3)	212(98.1)	139(99.3)	432(97.3)	19.392	.001*
	Ex-user	0(0)	2(16.7)	1(0.5)	0(0)	3(0.7)		
	Current user	5(6.6)	0(0)	3(1.4)	1(0.7)	9(2.0)		
	Total	76(100)	12(100)	216(100)	140(100)	444(100)		

Table 3: Tobacco use patterns among participants

Type of Tobacco and average daily use				
	N	Percentage(%)	Mean	SD
Cigarette (number of cigarettes per day)	-	-	4.95	3.04
Snuff (number of dips per day)	-	-	2.38	1.746
Chewed tobacco leaves (number of times chewed per day)	-	-	0.75	1.50
e-cigarette (number of vapes per day)	-	-	0.75	0.957
Patterns of tobacco use among current tobacco users				
Item	*N*	*Percentage(%)*		
Manufactured cigarette – Non Menthol	16	29		
Manufactured cigarette – Mentholated	24	43		
Hand-rolled cigarette	1	2		
Pipe-tobacco	-	-		
Cigar	-	-		
Traditional Snuff	15	27		
Industrially prepared snuff	2	4		
Water-pipe / Hookah / hubbly bubble / Shisha	9	16		
Chewed tobacco leaves	-	-		
E-cigarette	3	5		
Other	-	-		
Reasons for initiating tobacco use among current tobacco users				
Item	***N***	***Percentage(%)***		
Peer pressure	12	21		
Traditional practices	9	16		
My parents used tobacco	3	5		
Pressures of school work	6	11		
Relationship Pressures	6	11		
Work pressures	6	11		
I do not know	15	27		
It helped my mental health state	8	14		
Other	4	7		
Areas of tobacco use (N=56)	***N***	***Percentage (%)***		
Home	12	31.6	-	-
Work	5	13.2	-	-
Home and Work	17	44.7	-	-
Designated smoking areas	1	2.6	-	-
Recreational places	2	5.3	-	-
Any place where they need to	10	26.3	-	-
Conjoint tobacco and other recreational products use (N=56)				
Item	***N***	***Percentage(%)***		
Marijuana	7	12.5	-	-
alcohol	32	57.1	-	-
Nyaope	1	1.8	-	-
Methamphetamine/Tick	-	-	-	-
Other	-	-	-	-
Secondhand smoke exposure (N=142)				
Item	***N***	***Percentage(%)***		
Home	46	32.4	-	-
Work	33	23.2	-	-

Both home and work	47	33.1	-	-
Other places	12	8.5	-	-

Table 4: Factors attributable to successful and unsuccessful quit attempts among tobacco users

A. A comparison of current and ex-tobacco users' motivations for quitting.					
Motivation to quit	**Current users**		**Ex-users**		P-value
	N=41	Percentage(%)	N=40	Percentage(%)	
My current health concerns	19	46.3	7	17.5	.005
My future health concerns	24	58.5	22	55.0	.748
Financial costs	12	29.3	7	17.5	.211
I am aware of the risks of tobacco use	21	51.2	21	52.5	.908
Concern for the health of my family	8	19.5	8	20.0	.956
Advice from a healthcare provider	6	14.6	2	5.0	.264
My tobacco use is socially unacceptable	2	4.9	2	5.0	1.000
Pressures from significant person(s)	0	0.0	4	10.0	.055
Restriction of tobacco use at work	3	7.3	0	0.0	.241
Restriction of tobacco use at home	0	0.0	1	2.5	.494
Anti-tobacco campaigns	0	0.0	2	5.0	.241
Influence of a significant person who stopped tobacco use	2	4.9	3	7.5	.675
My social or work stressors got better	4	10	3	7.5	1.000
My desire to be more financially prudent	4	10	4	10	1.000
B. Factors attributed to unsuccessful quit attempts among current tobacco users					

Item	Frequency (N)	Percentage(%)
I thought I could quit on my own (Self-will only)	29	71
Peer pressure	5	12
Tobacco is a source of pleasure to me	6	15
I did not want to gain weight	3	17
My significant one(s) also use tobacco	1	2
Work pressures	2	5
Stress in my social life	13	32
Nicotine cravings	12	29
I did not have treatment support	5	12
I could not handle the withdrawal symptoms	2	5
I do not know	2	5

Table 5: Readiness to Implement Tobacco Cessation Treatments among Participants

Sociodemographic characteristics, tobacco use, and quit attempts across readiness to implement tobacco cessation treatments.			
	READY Frequency (%)	NOT READY Frequency (%)	P VALUE
Age			
19-29	52(17.7)	27(19.1)	
30-39	93(31.7)	44(31.2)	
40-49	69(23.5)	36(25.5)	P=.967
50-59	59(20.1)	25(17.7)	
60+	20(6.8)	9(6.4)	
Total	141(100)	293(100)	
Gender			
Female	234(79.3)	121(84.6)	
Male	61(20.7)	22(15.4)	P=0.196
Total	295(100)	143(100)	
Marital status			
Divorced	10(3.3)	8(5.6)	
Single	160(53.5)	80(55.6)	
Married	95(31.8)	42(29.2)	P=0.837
Widowed	14(4.7)	5(3.5)	
Separated	3(1.0)	2(1.4)	
Cohabiting	17(5.7)	7(4.9)	
Total	299(100)	144(100)	
Professional category			

Medical practitioner	54(18.0)	22(15.3)	
Dental practitioner	8(2.7)	4(2.8)	
Nurse clinicians	145(48.3)	71(49.3)	P=0.913
Community health worker	93(31.0)	47(32.6)	
Total	300(100)	144(100)	
Ethnicity			
Black	269(90.3)	136(94.4)	
Coloured	2(0.7)	1(0.7)	P=0.257
Indian	15(5.0)	2(1.4)	
White	12(4.0)	5(3.5)	
Total	298(100)	144(100)	
Years of service			
1-5	81(28.3)	36(25.9)	
6-10	67(23.4)	33(23.7)	
11-15	66(23.1)	31(22.3)	
16-20	29(10.1)	15(10.8).	P=0.967
21+	43(15.0)	24(17.3)	
Total	286(100)	139(100)	
TOBACCO USE			
Never users	238(79.3)	110(76.4)	
Ex-users	28(9.3)	12(8.3)	P=0.50
Current users	34(11.3)	22(15.2)	
Total	300(100)	144(100)	
QUIT ATTEMPTS			
Attempted to quit	28(82.4)	13(68.4)	
Not attempted to quit	6(17.6)	6(31.6)	P=0.31
Total	34(100.0)	19(100.0)	

APPENDICES

APPENDICES A Human Research Ethics Committee Approval

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

Office of the Deputy Vice-Chancellor (Research and Innovation)

TO: Dr AN Alagidede
School of Clinical Medicine
Department of Medicine
Division of Family Medicine
Medical School
University

E-mail: annmuanah@yahoo.com

CC: Supervisor: Professor O Omole
<Olufemi.Omole@wits.ac.za>
and <HREC-Medical Research Office@wits.ac.za>

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

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

DATE: 2021/09/22

REF: R14/49

PROTOCOL NO: **M210636** (This is your ethics application reference number. Please quote it in all enquiries, oral or written, relating to this study.)

PROJECT TITLE: *Tobacco use among healthcare professionals and their readiness to implement cessation treatments amongst patients in primary care facilities in Soweto, Johannesburg*

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

MSWorks2000/Iain0007/Clearscan.wps

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R49 Dr AN Alagidede

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M210636

NAME: (Principal Investigator)	Dr AN Alagidede
DEPARTMENT:	School of Clinical Medicine Department of Medicne Division of Family Medicine Medical School University
PROJECT TITLE:	*Tobacco use among healthcare professionals and their readiness to implement cessation treatments amongst patients in primary care facilities in Soweto, Johannesburg*
DATE CONSIDERED:	2021/06/25
DECISION:	Approved unconditionally
CONDITIONS:	
NOTE:	If contact information regarding student study participants is required, please contact the Registrar's office - <Nicoleen.Potgieter@wits.ac.za>
SUPERVISOR:	Professor O Omole
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	2021/09/22

This Clearance Certificate is valid for 5 years from the date of approval. An extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office secretariat on the 3rd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **June** and therefore reports and re-certification will be due in the month of **June** each year. Unreported changes to the study may invalidate the clearance given by the HREC (Medical).

Signature of Principal Investigator

2021/10/01
Date

APPENDICES B Research Committee of Johannesburg Health District Approval

GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

Joburg
a world class African city

Research Committee of
Johannesburg Health District

Enquiries: Ms. Busisiwe Sikhosana
Tel: 011 694 3909
Email :Busisiwe.Sikhosana@gauteng.gov.za
Hillbrow CHC: Administration Building,
Cnr Smith Str. & Klein Street
Private Bag X21, Johannesburg,
South Africa, 2017

25th September 2021

5 Dyeri Place
Florida Glen
Roodepoort
1709

Email: annmuanah@gmail.com

Dear: Dr Ann nhawinei Alagidede

TITLE: ***Tobacco use among healthcare professionals and their readiness to implement cessation treatments among patients in primary care facilities in Soweto, Johannesburg in***

DRC Ref: 2020-11-017

NHRD Ref no: GP_202011_086

OFFICIAL APPROVAL

The Johannesburg Health District Research Committee (DRC) has reviewed your application. This letter serves as approval to access the Districts Health facilities (mentioned below) for the above research.

The following conditions must be observed:

- The facilities in which the research will be conducted are: CHIAWELO CHC, ITIRELENG CHC, LILLIAN NGOYI CHC, MOFOLO CHC, ZOLA CHC, HILLBROW CHC
- These facilities will be visited from: 25/08/2021 to 25/08/2022
- Participants' rights and confidentiality will be maintained all the time.
- No resources (Financial, material and human resources) from the above facilities will be used for the study. Neither the District nor the facility will incur any additional cost for this study.
- The study will comply with Publicly Financed Research and Development Act, 2008 (Act 51 of 2008) and its related Regulations.
- You will submit a copy (electronic and hard copy) of your final report. In addition, you will submit an annual progress report to the District Research Committee.
- Your supervisor and the University of The Witwatersrand will ensure that these reports are being submitted timeously to the District Research Committee.

- The District must be acknowledged in all the reports/publications generated from the research and a copy of these reports/publications must be submitted to the District Research Committee.
- You will liaise with the manager/s before initiating the study.

Contact	Sub District	Sub District Manager/ Area Manager	Contact No.	Cell phone
X	ABCEF	Ms Lombuso Matlala	011 440 1259	082 307 0267
X	D	Ms Maria Mazibuko	011 674 1200	082 781 9919
	G	Mr Peter Mathole	011 213 9603	072 483 6839
	CoJ A	Ms Nelly Shongwe	011 237 8010	082 467 9276
	CoJ B	Ms Zanozuko Mbane	011 718 9656	082 551 5804
	CoJ C	Mr Tebogo Motsepe	011 761 0200	084 655 5420
	CoJ D	Ms Busi Phiri	011 986 0164	082 467 9316
	CoJ E	Mr Vusi Mazibuko	011 582 1504	082 464 9547
	CoJ F	Mr M Monyamane	011 681 8130	082 467 9423
	CoJ G	Ms Olga Kruger	011 211 8936	083 286 0388

We reserve our right to withdraw our approval, if you breach any of the conditions mentioned above. Please feel free to contact us, if you have any further queries.

On behalf of the District Research Committee, we would like to thank you for choosing our District to conduct such an important study.

Regards,

Prof S. Moosa
Chairperson: District Research Committee
Johannesburg Health District
Date: 9th October 2021

Mrs M.L Morewane
Chief Director
Johannesburg Health District
Date: 18/10/2021

APPENDICES C Participant Information sheet

Good day,

I am Dr. Ann Nhawinei Alagidede from the Department of Family Medicine at the University of Witwatersrand Medical School. I am assessing the prevalence of tobacco use among healthcare workers in primary care facilities in Soweto and how ready (measured as to how important and confident) they are to counsel tobacco users to quit using tobacco. I would be grateful if you would consider participating in this research.

Why I am researching this topic

As you may be aware, tobacco use is detrimental to health. Healthcare providers are also well placed to assist their patients to quit this harmful behaviour. However, healthcare professionals who use tobacco may be less likely to intervene in their patient's tobacco use behaviours. To what extent this is true is not well known in South Africa. I am therefore interested in assessing what proportion of healthcare providers in primary care facilities in Soweto use tobacco and whether this affects their readiness to assist their patients to quit. It is hoped that the findings of these study can be used to formulate strategies to improve tobacco control policies in South Africa. In addition, the study findings will assist in helping healthcare workers to reduce their own risk of tobacco-attributable diseases and promote their implementation of tobacco cessation practices, more so in those who use tobacco.

What do I expect from the participants of this study? If you are willing to participate, you will be asked to complete a questionnaire of about 36 questions - focusing on your sociodemographic information, tobacco use and quit attempts (if applicable), previous training on tobacco use and health, and readiness to perform tobacco cessation and counselling during clinical encounters. The self-administered questionnaire does not include a consent form and will take approximately 20 minutes to complete. Acceptance to complete the questionnaire will be taken as consent to participate in the research.

No identifying data will be collected, and the data from the study will be kept confidential and only accessible to the research team for data analysis.

Benefits to participants: This study does not offer financial or other personal benefits. However, the telephone number of the Quitline is provided for assistance to tobacco users who want to quit. The findings from the study may also be used to inform the need for training and workshops on tobacco use, its health implications, and tobacco cessation treatments in your workplace in the future.

Risk to participants: This study poses minimal risk to participants. The likelihood and magnitude of possible harm to participants are no greater than those imposed by daily life in a stable society.

Withdrawing from the study: The study is voluntary, and not taking part in it carries no penalties. You may withdraw your consent and participation at any time during the study without any retribution.

Confidentiality: The questionnaire does not collect information on personal identifiers. All data will be kept on a password-protected computer, which can be accessed only by the research team.

If you have any queries, please contact Dr Ann Alagidede at 0838966480 or Prof. OB Omole, my research supervisor, at 0795235318.
You may wish to report any serious concerns about the study to the administration officer, Zanele Ndlovu of the Human Research and Ethics Committee (Medical), Faculty of Health Sciences, University of the Witwatersrand at **011 717 1252/2700/2656/1234**

Thank you.



Dr. Ann Alagidede

APPENDICES D Plagiarism declaration

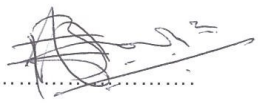
APPENDICES D PLAGIARISM DECLARATION

I, DR Ann Nhawinei Alagidede, hereby declare that this research is my own unaided work, except where due acknowledgement for assistance received has been made. It is being submitted for the degree of Master of Family Medicine at the University of Witwatersrand, Johannesburg. It has not been submitted previously for this or any other degree or examination at this or any other university.

signed 

[signature of the candidate]

Date: 28th May 2024

Signed..... 

[Signature of the supervisor]

Date: 04/06/2024.

APPENDICES E Questionnaire

''Tobacco use among Healthcare professionals and their readiness to implement cessation treatments among patients in Primary Care facilities in Soweto, Johannesburg.''

Please read each question carefully before answering it. Choose the answer that best describes what you believe to be correct and tick the corresponding box(es).

Code number: .....

Q1 – Q7a: ALL PARTICIPANTS

A. SOCIO-DEMOGRAPHIC INFORMATION

1. **What is your age at your last birthday?** …….. years

2. **How would you describe your Sex?**
   a) Female [ ]
   b) Male [ ]

3. **What is your marital Status?**
   a) Divorced [ ]
   b) Single [ ]
   c) Married [ ]
   d) Widowed [ ]
   e) Separated [ ]
   f) Cohabiting [ ]

4. **What is your professional category?**
   a) Medical practitioner [ ]
   b) Dental practitioner [ ]
   c) Nurse clinician [ ]
   d) Community health worker [ ]

5. How many years have you worked in healthcare?
   …….....

6. **Which of the following best describes your ethnicity?**
   a) Black [ ]
   b) Coloured [ ]

c) Indian [ ]
d) White [ ]
e) Others: Specify:.....[ ]

B. **TOBACCO USE INFORMATION**

7. Have you ever used tobacco in any form?

a) Yes [ ]
b) No [ ]

*** Instruction:** If you answered "No" to question B7, proceed to section D

8. If you answered "Yes" to question B7, how would you describe your tobacco use now?

You may choose more than one option

a) Ex- cigarette smoker [ ]
b) Current cigarette smoker [ ]
c) Ex-snuff user [ ]
d) Current snuff user [ ]
e) Current user of other forms of tobacco [ ]
f) Ex-user of other forms of tobacco [ ]

***Instruction:** If you are no longer using tobacco (i.e you are an ex-user), proceed to section C. If you are a Current tobacco user, continue Q9-20

Q9 – 20: CURRENT TOBACCO USERS

9. If you currently use cigarettes, snuff or other forms of tobacco, indicate the type(s) you use

a) Manufactured cigarette – Non-Menthol [ ]
b) Manufactured cigarette – Mentholated [ ]
c) Hand-rolled cigarette [ ]
d) Pipe-tobacco [ ]
e) Cigar [ ]
f) Traditional Snuff [ ]
g) Industrially prepared snuff [ ]
h) Water-pipe / Hookah / hubbly bubble / Shisha [ ]
i) Chewed tobacco leaves [ ]
j) E-cigarette [ ]
k) Other forms:
Specify.....……..

10. For how long have you used the form(s) of tobacco reported in question B9?

Types of tobacco	Duration of use in years
Cigarette	
Cigar	

Snuff	
Pipe tobacco	
Water pipe / Hookah	
Chewing tobacco leaves	
e-cigarette	
Others: specify	

11. **How old were you when you first used tobacco?** ..... years

12. **Which of the following facilitated your initiation into tobacco use**? (you may choose more than one)
    a) Peer pressure [ ]
    b) Traditional practices [ ]
    c) My parents used tobacco [ ]
    d) Pressures of schoolwork [ ]
    e) Relationship Pressures [ ]
    f) Work pressures [ ]
    g) I do not know [ ]
    h) It helped my mental health state [ ]
    i) Others: Specify
    ……

13. **If you currently smoke cigarettes, how many cigarettes do you smoke per day? ……**

14. **If you currently use snuff, how many times do you dip snuff per day?.....**

15. **If you currently chew tobacco leaves, how many times do you do so per day? .....**

16. **If you currently use an e-cigarette, how many times do you vape per day? ……**

17. **In which of the following places do you frequently smoke cigarettes? You may choose more than one option.**
    a) At home only [ ]
    b) At work only [ ]
    c) At both home and work [ ]
    d) Designated smoking areas [ ]
    e) Recreational places only [ ]
    f) At any place when I need to [ ]

18. Most times when I use tobacco, I also use the following (you may choose one or more):

a) Marijuana / Dagga [ ]
b) Alcohol [ ]
c) Nyaope [ ]
d) Methamphetamine / Tick [ ]
e) Other [ ] Specify
……

C. QUIT ATTEMPTS

Q21 – 24: CURRENT TOBACCO USERS ONLY. EX USERS PROCEED TO Q23

19. In the last one year, have you contemplated stopping tobacco use?

a) Yes [ ]
b) No [ ]

20. Have you ever attempted to quit tobacco use

Yes [ ]
No [ ]

21. If you have attempted to quit tobacco use, which of the following reason(s) motivated you to do so? You may choose more than one.

a) My current health concerns [ ]
b) My future health concerns [ ]
c) Financial costs [ ]
d) I am aware of the risks of tobacco use [ ]
e) Concern for the health of my family [ ]
f) Advice from a healthcare provider [ ]
g) My tobacco use is socially unacceptable [ ]
h) Pressures from significant person(s) [ ]
i) Restriction of tobacco use at work [ ]
j) Restriction of tobacco use at home [ ]
k) Anti-tobacco campaigns [ ]
l) Influence of a significant person who stopped tobacco use [ ]
m) My social or work stressors got better [ ]
n) My desire to be more financially prudent [ ]
o) Others;

specify..... [ ]

22. If you have tried quitting tobacco use and did not succeed, which of the following do you think played a role in you not succeeding? (You may choose one or more options)

a) I thought I could quit on my own self-will only [ ]

b) Peer pressure [ ]
c) Tobacco is a source of pleasure to me [ ]
d) I did not want to gain weight [ ]
e) My significant one(s) also use(s) tobacco [ ]
f) Work pressures [ ]
g) Stress in my social life [ ]
h) Cravings [ ]
i) I did not have treatment support [ ]
j) I could not handle the withdrawal symptoms [ ]
k) I do not know [ ]
l) Others: Specify.....

Q23-24: EX-USERS ONLY

23. How long ago did you stop?

a) 0 – 6 months [ ]
b) 7 – 12 months [ ]
c) >1 year [ ]

24. Which of the following reason(s) motivated you to quit? You may choose more than one.

a) My current health concerns [ ]
b) My future health concerns [ ]
c) Financial costs [ ]
d) I am aware of the risks of tobacco use [ ]
e) Concern for the health of my family [ ]
f) Advice from a healthcare provider [ ]
g) My tobacco use is socially unacceptable [ ]
h) Pressures from significant person(s) [ ]
i) Restriction of tobacco use at work [ ]
j) Restriction of tobacco use at home [ ]
k) Anti-tobacco campaigns [ ]
l) Influence of a significant person who stopped tobacco use [ ]
m) My social or work stressors got better [ ]
n) My desire to be more financially prudent [ ]
o) Others; specify..... [ ]

Q25-27: NEVER USERS / EX-USERS ONLY

D. SECONDHAND SMOKE EXPOSURE

25. Do you live or work where other people regularly smoke around you?

a) Yes [ ]
b) No [ ]

26. If you answered "Yes" to question D25, where is this? (You may choose one or more options)

a) Home [ ]
b) Work [ ]
c) Both at home and work [ ]
d) Other places [ ]
specify……

27. For how long have you had the exposure in question D26?
…… years

Q28 – 36: ALL PARTICIPANTS

E. HEALTHCARE PROVIDERS' TRAINING AND READINESS TO OFFER TOBACCO CESSATION TREATMENTS

28. During your school years, did you ever receive any training on tobacco use, its dangers and the treatment of nicotine dependence, as stand-alone lecture(s), seminar(s) or workshop(s)?

a) Yes [ ]; specify type of training (workshop, seminar, lecture or assignment)
……
……
……
……
b) No [ ]

29. Have you received any training on tobacco use and cessation interventions since you started practising as a medical/nursing professional or Community healthcare worker?

a) Yes [ ]
b) No [ ]

30. a) Which of the following best describes your opinion regarding your need to implement tobacco cessation treatments: "I consider it ……." (Choose one of the options below)

1. Not at all important [ ]
2. Slightly Important [ ]
3. I am not sure [ ]
4. Very Important [ ]

5. Extremely Important [ ]

b) Using the ruler below, rate how important it is to you to implement tobacco cessation treatment, where 0 means it is not important at all and 10 means it is extremely important:

0	1	2	3	4	5	6	7	8	9	10

Not at all **extremely important**

31. How frequently do you screen your patients for tobacco use?

a) Always [ ]
b) Most of the time [ ]
c) Sometimes [ ]
d) Never [ ]

32. As a healthcare provider, my use of tobacco: (You may choose one or more options)

a) has no influence on my intervening in my patients' tobacco use [ ]
b) makes it difficult for me to intervene in my patient's tobacco use [ ]
c) I do not know [ ]
d) sends conflicting messages when I advise my patients to quit tobacco use [ ]
e) exposes my vulnerability as a role model and shows my need for help [ ]

33. a) Regarding tobacco cessation treatment, which of the following applies to you?

Please indicate on the Likert scale below how confident you are to implement all the levels of tobacco cessation treatment. "**I consider myself….."**

1. Not confident [ ]
2. Slightly Confident [ ]
3. I am not sure [ ]
4. Very confident. [.]
5. Extremely confident [ ]

b) Using the ruler below, rate how confident you are to implement all the levels of tobacco cessation treatment, where 0 means you are not confident and 10 means you are extremely confident:

0	1	2	3	4	5	6	7	8	9	10

Not at all **extremely confident**

F. HEALTHCARE PROVIDERS' ABILITY IN IMPLEMENTING TOBACCO DEPENDENCE TREATMENTS

34. Regarding tobacco cessation treatment, which of the following applies to you?

"I am able to confidently **……" (You may choose more than one option)**

a) Screen for tobacco use [ ]
b) Give brief advice [ ]
c) Conduct in-depth counselling [ ]
d) Prescribe smoking cessation medications [ ]

35. a) How willing are you to offer tobacco cessation advice to patients who use tobacco

1. Not willing [ ]
2. I am slightly willing [ ]
3. I am not sure [ ]
4. I am very willing [ ]
5. I am extremely willing [ ]

b) Using the ruler below, rate how willing you are to offer tobacco cessation advice, where 0 means you are not willing and 10 means you are extremely willing:

0	1	2	3	4	5	6	7	8	9	10

Not at all **extremely willing**

36. In your opinion, how likely are healthcare providers who use tobacco likely to implement tobacco cessation interventions?

a) Less likely [ ]

b) More likely [ ]

Thank you for participating and completing the survey.

****** If you are currently using tobacco, you may contact the toll-free quit line at **0800 22 66 22** or visit any of your nearest primary care clinics for assistance to quit.

Tobacco use among Healthcare Professionals and their readiness to implement cessation treatments among patients in Primary Care facilities, Soweto, Johannesburg

STUDENT: DR. ANN NHAWINEI ALAGIDEDE

A research proposal submitted to the Department of Family medicine as part of the requirements for the Degree of Master of Medicine at the University of the Witwatersrand, Johannesburg, South Africa

Student Number: 2321494
Supervisor: Professor. Olufemi B. Omole

SYNOPSIS

Tobacco use is responsible for an estimated 7.2 million deaths annually worldwide. Of these, about 1.2 million tobacco-related deaths result from exposure of non-smokers to second-hand smoking. Currently, over 80% of tobacco users live in low- and middle-income countries, including South Africa, where about a fifth of the adult population are daily users.

Healthcare professionals significantly influence their patients' health beliefs and behaviors and can assist them in quitting tobacco use. However, their own tobacco use can prevent them from intervening in their patients' tobacco use. In recent times, several studies have been conducted on tobacco use, and its related health effects in South Africa, but very little has been done on the prevalence of tobacco use among South African healthcare professionals and the influence of this habit on their readiness to intervene in their patients' tobacco use. Therefore, the researcher aims to determine the proportion of healthcare providers that use tobacco in public health facilities in Soweto and their readiness to assist tobacco users to quit.

This study will be a cross-sectional design and utilize a standardized questionnaire adapted from the Global Adult Surveillance Survey (GATS). This questionnaire will be administered to a sample of healthcare workers in five primary healthcare facilities in Soweto. Information on demographic data, types of tobacco product use (if any), amount consumed, exposure to second-hand smoking, quit attempts, and readiness to offer smoking cessation interventions will be obtained. The main outcome measures of analysis will include the prevalence of tobacco use among healthcare professionals, their level of readiness, and how willing they are to incorporate tobacco cessation interventions among patients who use tobacco. This study's results may inform public health and clinical policies to improve tobacco cessation treatment in the study setting.

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ABBREVIATIONS

DALY	Disability Adjusted Life Years
ENDS	Electronic Nicotine Delivery System
GATSS	Global Adult Tobacco Surveillance Survey
GHPSS	Global Health Professional Students Survey
HCP	Healthcare Professional
SADHS	South African Demographic and Health Survey
SDG	Sustainable Development Goals
TCI	Tobacco use Cessation Intervention
UCT	University of Cape Town
WHO FCTC	World Health Organization Framework Convention on Tobacco Control
WHO	World Health Organization
WNTD	World No Tobacco Day

INTRODUCTION

1.1 Background

Globally, nearly eight million people die from tobacco exposure and use every year, with most of these deaths happening prematurely[1]. This figure is higher than the combined mortality from malaria, Human Immunodeficiency Virus, and tuberculosis[2].

Tobacco use is a risk factor for cardiovascular, respiratory, and cerebrovascular diseases and malignant conditions of the mouth, throat, lung, lip, and bladder[3]. Despite knowledge of the effects of nicotine addiction, some healthcare professionals consume tobacco[4].

The World Health Organization estimates that by 2025, about 1.3 billion of the world's population will be using tobacco[5]. A recent international review[4] on tobacco use among healthcare professionals in 63 countries reported a pooled prevalence rate of 21%. However, most of the data analyzed in this review came from high-income countries as there was little to no data from low and middle-income countries such as South Africa.

Literature from as early as the 1980s to date report that anti-smoking advice from a clinician (lasting only three minutes) can significantly impact positive changes in patient smoking behaviors[6]. However, studies have also indicated an inverse correlation between physicians' smoking habits and their willingness to offer tobacco cessation advice to their patients who use tobacco[7].

In South Africa, 84% of the general population depends on public sector healthcare[8]. More importantly, this population includes most people in the working class – as stated earlier, those most at risk. This gives clinicians ready access to the proportion of the general population who use tobacco. All of these factors indicate that an efficient strategy to decrease tobacco-related morbidity and mortality would be to ensure that primary care providers effectively act as good role models and advocates for anti-tobacco measures within the clinical encounter. However, there are no recent data on

the proportion of healthcare providers using tobacco and showing readiness to intervene in their patients' tobacco use. A useful starting point to achieve this will be to determine the prevalence of tobacco use amongst primary healthcare professionals and further gauge how their use of tobacco influences their willingness to encourage anti-tobacco cessation practices in their patients.

Considering the reports of previous studies, the researcher hypothesizes that primary care providers who currently use tobacco will be significantly less likely to report readiness to implement tobacco cessation interventions in this study.

1.2 Rationale for this study

Two years after the conception of the World Health Organization Framework Convention on Tobacco Control (WHO FCTC), the WHO chose the theme for World No Tobacco Day 2005 as 'Healthcare workers against tobacco'[9]. Before this campaign, healthcare professionals from 29 different multinational institutions met and outlined 14 action plans by which they can contribute to the fight against tobacco use.[9]

Based on current literature, mostly from developed countries, healthcare workers' use of tobacco products reduces their inclination to discuss tobacco cessation with patients[7]. Healthcare professionals are advocates in promoting tobacco control within the community, hence, there is the need to know the tobacco use prevalence among them, especially in a developing community such as Soweto, and to assess if the smoking status of health professionals inhibit their implementation of tobacco cessation practices in patients.

This study can contribute to data on tobacco use prevalence among healthcare professionals within South Africa and help identify factors that influence their level of readiness and willingness to assist patients who use tobacco to quit. Also, from the literature review, no studies have been done on tobacco use among healthcare professionals within South Africa in the last ten years. Additionally, there is no existing study that evaluates healthcare professionals' level of readiness in the implementation of tobacco cessation interventions in patients in South Africa.

1.3 Aim

To explore the relationship between tobacco use among healthcare professionals and their readiness to implement tobacco cessation treatments in primary health care facilities in Soweto, Johannesburg metropolitan health district.

Objectives

1. To describe the participants' sociodemographic characteristics.
2. To determine the proportion of participants who use tobacco and their tobacco use patterns.
3. To determine the proportion of tobacco users who have made a quit attempt.
4. To assess participants' readiness to implement tobacco cessation treatments.
5. To explore relationships between sociodemographic characteristics, tobacco use status, quit attempt, and readiness to implement tobacco cessation treatments.

1.4 Literature review

1.4.1 Epidemiology of tobacco use

1.4.1.1 Background

The most recent demographic and health survey report in South Africa (in 2018) [10] reported a tobacco-smoking prevalence of 21.9% (37% in males and 6.8% in females) while the prevalence rate of smokeless tobacco use was 3.9% (6.4% male and 1.3% female). Cumulatively, these figures mirror the global prevalence rates of 24.9%[5]. Although healthcare providers are known to have a lower prevalence of tobacco use than the general population[4], the prevalence among healthcare professionals in South Africa is currently unknown.

1.4.1.2 Tobacco use among healthcare professionals

An international review[4] estimated the prevalence of tobacco use in healthcare professionals at 31% in males and 17% in females. The highest percentage was found in male doctors in lower-middle-income countries at 45%. The prevalence rate for male doctors and male nurses was estimated at 21% and 28%, compared to 12% and 18% in their female counterparts. However, the prevalence rates of tobacco use in healthcare professionals vary from country to country - Poland[11] stands at 7.8%, Estonia at 6.7%[12], and Spain at 8.7%.[13]. This highlights the need to analyze local prevalence.

There are few epidemiological studies on the prevalence of tobacco use in health workers in developing countries. Only one review[14], conducted ten years ago, was identified on this subject. In this review, prevalence rates were highest at 62% in South and Central America, and lowest at 3% among physicians in two Nigerian hospitals. Research is needed to evaluate current trends.

Concerning healthcare professionals in South Africa, the only study identified was conducted in 2010 in three public hospitals in KwaZulu-Natal[15]. This study's findings revealed that male healthcare workers are over ten times more likely to be current smokers than their female counterparts (30.3% versus 2.4%, respectively). Smoking rates reviewed by professional categories identified significant differences. Of the 20% who smoked, about 12% were doctors, and 8% were nurses. Another study among Witwatersrand and University Of Cape Town (UCT) health professional students reported smoking prevalence of 14% and 10% respectively in 2013[16].

The Kwazulu-Natal study[15] indicated that race influenced the smoking behaviour of respondents. Whites had the highest prevalence of 22.2%, and blacks had the lowest at 7.7%, with Indians and coloureds falling between. The average daily consumption among smokers was 8.6 cigarettes per day and six per day in former smokers. The percentage of respondents who were exposed to second-hand smoke was 68%. This study, however, only focused on cigarette smoking, but recently, the South African market has been introduced to other tobacco products[17] such as the Electronic Nicotine Delivery System (ENDS), also known as 'e-cigarettes", dissolvable tobacco

products.[17] and water-pipes. Although smokeless tobacco may be less harmful than its smoking counterpart, it is not entirely harmless, a concept often misunderstood by most tobacco users.[18]

1.4.1.3 Healthcare professionals' implementation of tobacco use treatments

In South Africa, a study among tobacco smokers in Johannesburg and Kimberly reported that 72.9% and 41.7% of smokers were willing to stop smoking if counselled by their clinician[19]. The study further indicated that within these two communities in South Africa, tobacco users are motivated to quit using, but the support from the health system is not adequate. This suggests that the public is receptive to healthcare provider advice for smoking cessation. Primary care providers are uniquely positioned to screen for tobacco use and offer interventions according to the patient's valuation of importance and readiness to "change".

A Cochrane systematic review of 58 randomized controlled trials found nurse-led interventions had potential benefits in tobacco cessation, especially in nurses involved in health promotion[20]. Likewise, another study conducted in primary care facilities in the United States of America showed that nurses achieved comparable outcomes of smoking cessation to physicians; also, patients were more likely to report their smoking status to nurses than physicians (97.5% vs. 58.3%)[21]. Both studies identified the lack of a structured and consistent delivery of tobacco cessation interventions for tobacco users as a challenge. These studies noted its value on future benefits for tobacco use cessation. A study in Sweden showed that healthcare professionals stated that it was important to counsel patients about lifestyle behaviour; however, this failed to translate into their clinical practice[22]. A qualitative study done in a South African primary healthcare setting echoed these findings[23].

Randomized control trials[24][25] and systematic reviews [26] have demonstrated the efficacy of healthcare professionals' intervention's in tobacco use cessation. In a meta-analysis of 28 trials, it was reported that a brief advice intervention increased smoking cessation by one to three per cent[6]. A fundamental next step to improving healthcare professionals' interventions in tobacco control is identifying the factors that facilitate or inhibit them from encouraging smokers to quit.

1.4.1.4 Factors that act as facilitators and barriers to implementing tobacco use cessation interventions (TCI)

Healthcare professionals may recognize tobacco dependence treatment as important in the clinical setting[22]. However, lack of time, misconceptions about the efficacy of smoking cessation interventions, inadequate knowledge and counselling skills, unavailable smoking cessation resources, and a fear of jeopardizing the physician-patient relationship can affect their confidence in delivering this service[27]. Other barriers to tobacco use cessation interventions reported in a study in the Netherlands[28] were that some healthcare professionals perceived smoking as a habit and not a disease. Some organizational barriers included the inability to acquire pharmacotherapy, low priority for tobacco use cessation interventions in the health centers and health workers' smoking status.

Corresponding with the previous Dutch study, a second Dutch study[29] reported healthcare professionals were inclined to implement tobacco use cessation interventions if they were motivated, identified better with their roles as advocates, exhibited more positive attitudes, and had a previous smoking cessation counselling training. Of these, the strongest predictor to implement interventions was seen in healthcare professionals with a strong role identity, such that, even if they were unfamiliar with guidelines on tobacco cessation or lacked resources, they were still motivated to assist smoking patients to quit. In an American study[30], patient factors that facilitated TCI's were patients who stated tobacco cessation as a treatment goal, good clinician-patient relationship, and access to referral systems.

1.4.1.5 Summary and Conclusion

The literature review suggests that the use of tobacco products among healthcare professionals is not as common as it is in the general population. Additionally, this literature also finds that healthcare professionals are role models and haven a positive influence on patient behaviour; however, there is a suboptimal use of this influence in clinical encounters with patients. In South Africa, there is a dearth of literature on the prevalence of tobacco use among healthcare professionals, more so there is no data on their readiness and willingness to implement tobacco cessation interventions to patients. Therefore this study aims to determine the prevalence of tobacco use among

healthcare professionals and to assess their level of readiness and willingness in the implementation of tobacco use cessation interventions in patients.

2.0 METHODS

2.1 Research design

This research will be a cross-sectional descriptive study using a self-administered questionnaire. A cross-sectional study is selected because the relationship between the tobacco use status of participants and their implementation of tobacco cessation practices is being assessed only once, at a specific time[31].

2.2 Study site

The study will be conducted in five public health centers within Soweto, a large urban township located in sub-district 'D' of the Johannesburg metropolitan municipality, Gauteng province, South Africa. These facilities are Zola, Itereleng, Chiawelo, Mofolo, and Lillian Ngoyi Community Health Centers. These facilities provide clinical service delivery to the inhabitants of Soweto, who are mainly black Africans. However, the healthcare professionals' racial profile in this sub-district encompasses all the races nationwide and may be a good representation of the South African health workers population. Community health centers offer diagnosis, treatment, health promotion, counselling support, and rehabilitation for various medical conditions, including physical, mental, and social ailments. The local and provincial government authorities run these facilities. These facilities have all the healthcare professional categories.

2.3 Study population

The study population will comprise healthcare professionals within each facility who have contact with patients and are in a position to offer counselling services. This definition is limited to doctors and dentists, nurses (enrolled nurses and professional nurses), and community health workers. All further reference to healthcare professionals in this study is limited to these groups. According to the offices of the facility managers for the five facilities, there are 468 of the above healthcare

professionals. Other professional categories whose influence on patient behavior is limited due to minimal patient contact will be excluded.

2.4 Sampling and sample size

In a previous South African study on tobacco use conducted in 2010,[15] a prevalence of 11% was found among 650 healthcare workers. According to the offices of the facility managers for the five facilities, the total number of healthcare professionals by the study definition employed is 468. The number of healthcare professionals per facility is summarized in the table below. The researcher seeks to use the total population of healthcare professionals who meet the inclusion criteria and are willing to participate.

Clinic	Enrolled nurses	Professional nurses	Doctors	CHW's
Chiawelo	13	53	8	40
Zola	21	46	6	27
Itireleng	14	45	4	20
Mofolo	8	52	7	28
Lillian Ngoyi	12	40	10	14
Total	68	236	35	129

A list of names with phone numbers for healthcare professionals will be obtained from the human resource department in each facility or from the Unit Heads for each professional category. Each name on the list will be coded to match a specific code on a questionnaire. This is to enable questionnaires that are not returned to be traced and follow-up done. The coded questionnaire and a participant information sheet will be put in an envelope addressed to a named healthcare professional.

Doctors will be approached during one of their monthly continuous professional development meetings, and the purpose of the study briefly explained to them. Each doctor present will receive an addressed envelope with the questionnaire. Doctors who are absent will receive their questionnaires from the unit administrative office.

A duty roster for nurses will be used to approach nurses during their shift work. Day staff will be approached during the day and night staff at the end of their shift in the

morning. The addressed envelopes will be given to the nurses at these times. Absent nurses (maybe from sick leave or annual leave) will receive their questionnaires from their unit administrative office.

The researcher will approach the community health workers at the beginning of one of their weekly in-service trainings and introduce the study to them. The addressed envelopes will be distributed to the community health workers at this time. Those not in attendance of the training will receive their envelopes from the Outreach team leader.

Study participants will be informed that the completion of a questionnaire implies consent.

2.5 Measurement tool (see Appendix A)

A standardized questionnaire will be adapted from the Tobacco Questions for Surveys, a subset of key questions from the Global Adult Surveillance Survey (GATSS).[32] This questionnaire was formulated and used by the World Health Organization and Centers for Disease Control and Prevention for tobacco surveillance and monitoring activities. The questionnaire is available for use from the center for disease control's website at: *http://www.cdc.gov/tobacco/global/gats/.* This will collect information on sociodemographic characteristics, tobacco use patterns, quit attempts and participants' readiness to provide tobacco cessation treatments / interventions:

- Socio-demography (such as age, gender, marital status, ethnicity),
- Tobacco use patterns include duration, quantity, and types of current use, past daily use for less than current daily smokers and past use for current non-smokers, second-hand smoke exposure at home or in public places in the last one month, and concurrent use of other non-tobacco substances such as alcohol and marijuana.
- Quit attempts made by participants in the last one year
- Readiness to provide anti-smoking cessation treatment is defined by a study participant who feels it is essential to offer smoking cessation counselling and feels confident enough to offer this advice[33]. Participants' readiness in implementing tobacco use cessation interventions is measured by a combined measure of how important implementing tobacco cessation interventions (TCI) is to participants and how confident they are in implementing TCI. Using a five

point graded Likert scale,[34] five questions (two to assess importance and three to measure confidence) will focus on readiness to implement tobacco cessation interventions in clinical work. The minimum score a participant can score on each scale is three. Participants who score three or less on one or both scales will be assessed as 'not ready to offer anti-smoking cessation intervention'.

2.6 Study variables and definitions

The GATSS description for variables is employed for the variables below.
Smoking status:

- Current tobacco user: A healthcare professional who uses tobacco products daily or occasionally[32]
- New tobacco user: A healthcare professional who starts to use tobacco products during the study[32]
- Former tobacco user: A healthcare professional who has not used tobacco products within the last twelve months of study commencement.[32]
- Never smoker: A healthcare professional who never has smoked[32]

- Exposure to second-hand smoke is defined by 'health workers who report smoking occurs in their home or have been exposed to tobacco smoke in the workplace within the last 30 days'.[32]

2.7 Data collection

Facility managers, Unit Heads, and team leaders of healthcare professionals will be contacted to create awareness of the study, request permission, and schedule an appropriate time for access to healthcare professionals. Each category will be approached at places and times detailed above. Those who agree to participate will be given an envelope containing a coded questionnaire and an information leaflet. In addition to other information, they will be told that completing the questionnaire will be deemed consent to the study and that this could be done at their own convenience.
Participants will be told to return the completed questionnaires without the addressed envelope and put it in a locked box with an open slit. This box will be placed at the

reception area in each facility and checked weekly for the completed questionnaires. Unreturned questionnaires will be identified from the code list and the concerned healthcare professional sent a reminder by email or/ and SMS. Three telephonic calls and / or SMS / or emails, two weeks apart will be made to each person who do not return their questionnaires. All identifying markers on the questionnaires will be destroyed after data entry and when the data is ready to be analyzed.

The period allocated to data collection is four months depending on the response rates.

2.8 Data analysis

Data captured will be entered into an MS Excel spreadsheet. The data will then be exported to the STATA statistical software version 15 for coding and analysis.

Descriptive statistics will be used to summarize participants' socio-demographics characteristics with outcomes expressed as proportions with confidence intervals for categorical data and means and corresponding standard deviations for numerical data. Where data is not normally distributed, medians and interquartile ranges will be reported. The proportions of participants who currently smoke cigarettes and use other tobacco forms, the mean cigarette or smokeless tobacco use per day, and the duration of use will all be determined. The proportions of participants who are ex and current tobacco users who have made a quit attempt in the past one year will also be determined. Readiness to implement tobacco cessation interventions during patients' clinical encounters will be determined using a 5-point Likert scale for "importance" and "confidence" respectively. To be determined "ready", a participant has to score three out of five on the importance and confidence scale. Participants who score less than three on one or both scales will be assessed as being 'not ready' to offer tobacco use cessation interventions.

Group comparisons will be made between participants who are "ready" and those "not ready" in terms of sociodemographic characteristics, tobacco use status and quit attempt, using chi-squared, t-tests, and ANOVA as applicable. The findings of group comparisons will be expressed as odds ratios with 95% confidence intervals.

Thereafter, stepwise logistic regression analyses will be performed to determine sociodemographic and tobacco use characteristics that are independently associated with readiness to implement tobacco cessation interventions. Statistical significance will be deemed to exist at $p<0.05$.

Pilot study

A pilot study will be undertaken with thirty (30) health care professionals in the Hillbrow community health center. The facility for the pilot study is not included in the research study sites. The reason for the pilot study is to assess study feasibility, the time needed to complete the questionnaire and to identify problem questions for correction and modification.

2.9 Ethical considerations

The researcher will seek ethics clearance from the University of the Witwatersrand Human Research Ethics Committee (HREC). The researcher will also seek permission from the Johannesburg health district ethics committee for the study to be conducted in their facilities. No written informed consent will be obtained from participants before the administration of the questionnaire. Acceptance to complete the questionnaire will be taken as consent to participate in the study. The questionnaire will be anonymous with no identifying data. All data collected will be kept in the researcher's password-protected computer.

2.10 Bias and limitations

Some limitations may apply to this study: Firstly, the current smoking status may be under-reported as there is no biochemical verification of self-reported smoking. Secondly, positive behavioral responses may be over-reported due to social desirability bias. Thirdly, confidence to offer smoking cessation advice largely depends on the training the healthcare professionals have had on the subject, and community health workers who have less training in this field may be less likely to report being confident. Also, the self-report nature of this study design leaves room for information bias.

2.11 Timing

July-Aug 2020	Sept -Nov 2020	Feb–June 2021	Jun – Sept 2021	Oct 2021 – Jan 2022	Correction of drafts and final report: February - May 2022	Submission For examination June 2022
Proposal writing and submission						
	Submission for ethics approval					
		Data collection				
			Data analysis			
				Write up for publication		

2.12 Budget and funding

The researcher will bear all costs. There is no external source of funding for this research.

Item	**Unit price**	**cost**
Printing 1 photocopied page at POSTNET = R1.50 Each Questionnaire = 9 pages Sample size = 468	**1.50** **1.50 x 9 =13.50**	**R 6,318**
Transport cost 5 Dyeri place to Mofolo CHC 18Km (4 x trips) = 72Km 5 Dyeri place to Lillian Ngoyi CHC 15Km (4 x trips) = 60km 5 Dyeri place to Itireleng CHC 21Km (4 x trips) = 84km 5 Dyeri place to Zola CHC 20Km (4 x trips) = 80Km 5 Dyeri place to Chiawelo CHC 24Km (4 x trips) = 96km	AA rate/km = R9.70 See certificate 9.70 x 392 = R 3802.4	R3802.4
Statistician	2000	R2000
Scientific language Editor	2000	R2000
Total Cost		**R14,120.4**

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APPENDIX A

QUESTIONNAIRE

''Tobacco use among Healthcare professionals and their readiness to implement cessation treatments among patients in Primary Care facilities, Soweto, Johannesburg.''

Please read each question carefully before answering it. Choose the answer that best describes what you believe to be correct and tick the corresponding box(es).

Code number:
.....

Q1 – Q7a: ALL PARTICIPANTS

A. SOCIO-DEMOGRAPHIC INFORMATION

1. **What is your age at your last birthday?** …….. years

2. **How would you describe your Sex?**
   a) Female [ ]
   b) Male [ ]

3. **What is your marital Status?**
   a) Divorced [ ]
   b) Single [ ]
   c) Married [ ]
   d) Widowed [ ]
   e) Separated [ ]
   f) Cohabiting [ ]

4. **What is your professional category?**
   a) Medical practitioner [ ]
   b) Dental practitioner [ ]
   c) Nurse clinician [ ]
   d) Community health worker [ ]

5. How many years have you worked in healthcare?
   …….....

6. **Which of the following best describe your ethnicity ?**
   a) Black [ ]
   b) Coloured [ ]
   c) Indian [ ]
   d) White [ ]

e) Others: Specify:.....[ ]

B. **TOBACCO USE INFORMATION**

7. Have you ever used tobacco in any form?

a) Yes [ ]
b) No [ ]

*** Instruction:** If you answered "No" to question B7, proceed to section D

8. If you answered "Yes" to question B7, how will you describe your tobacco use now?

You may choose more than one option

a) Ex- cigarette smoker [ ]
b) Current cigarette smoker [ ]
c) Ex snuff user [ ]
d) Current snuff user [ ]
e) Current user of other forms of tobacco [ ]
f) Ex-user of other forms of tobacco [ ]

***Instruction:** If you are no longer using tobacco (i.e you are an ex-user), proceed to section C. If you are a Current tobacco users, continue Q9-20

Q9 – 20: CURRENT TOBACCO USERS

9. If you currently use cigarette, snuff or other forms of tobacco, indicate the type(s) you use

a) Manufactured cigarette – Non Menthol [ ]
b) Manufactured cigarette – Mentholated [ ]
c) Hand-rolled cigarette [ ]
d) Pipe-tobacco [ ]
e) Cigar [ ]
f) Traditional Snuff [ ]
g) Industrially prepared snuff [ ]
h) Water-pipe / Hookah / hubbly bubble / Shisha [ ]
i) Chewed tobacco leaves [ ]
j) E-cigarette [ ]
k) Other forms:
Specify.....

10. For how long have you used the form(s) of tobacco reported in question B9?

Types of tobacco	Duration of use in years
Cigarette	
Cigar	
Snuff	
Pipe tobacco	
Water pipe / Hookah	

Chewing tobacco leaves	
e-cigarette	
Others: specify	

11. **How old were you when you first used tobacco?** ..... years

12. **Which of the following facilitated your initiation into tobacco use**? (you may chose more than one)
    a) Peer pressure [ ]
    b) Traditional practices [ ]
    c) My parents used tobacco [ ]
    d) Pressures of school work [ ]
    e) Relationship Pressures [ ]
    f) Work pressures [ ]
    g) I do not know [ ]
    h) It helped my mental health state [ ]
    i) Others: Specify
    ……

13. **If you currently smoke cigarette, how many cigarettes do you smoke per day? ……**

14. **If you currently use snuff, how many times do you dip snuff per day?.....**

15. **If you currently chew tobacco leaves, how many times do you do so per day? .....**

16. **If you currently use e-cigarette, how many times do you vape per day? ……**

17. **In which of the following places do you frequently smoke cigarette? You may choose more than one option.**
    a) At home only [ ]
    b) At work only [ ]
    c) At both home and work [ ]
    d) Designated smoking areas [ ]
    e) Recreational places only [ ]
    f) At any place when I need to [ ]

18. **Most times when I use tobacco, I also use the following (you may choose one or more):**
    a) Marijuana / Dagga [ ]

b) Alcohol [ ]
c) Nyaope [ ]
d) Methamphetamine / Tick [ ]
e) Other [ ] Specify
……

C. QUIT ATTEMPTS

Q21 – 24: CURRENT TOBACCO USERS ONLY. EX USERS PROCEED TO Q23

19. In the last one year, have you contemplated stopping tobacco use?

a) Yes [ ]
b) No [ ]

20. Have you ever attempted to quit tobacco use

Yes [ ]
No [ ]

21. If you have attempted to quit tobacco use, which of the following reason(s) motivated you to do so? You may choose more than one.

a) My current health concerns [ ]
b) My future health concerns [ ]
c) Financial costs [ ]
d) I am aware of the risks of tobacco use [ ]
e) Concern for the health of my family [ ]
f) Advice from a healthcare provider [ ]
g) My tobacco use is socially unacceptable [ ]
h) Pressures from significant person(s) [ ]
i) Restriction of tobacco use at work [ ]
j) Restriction of tobacco use at home [ ]
k) Anti-tobacco campaigns [ ]
l) Influence of a significant person who stopped tobacco use [ ]
m) My social or work stressors got better [ ]
n) My desire to be more financially prudent [ ]
o) Others;

specify..... [ ]

22. If you have tried quitting tobacco use and did not succeed, which of the following do you think played a role in you not succeeding? (You may choose one or more options)

a) I thought I could quit on my own self-will only [ ]
b) Peer pressure [ ]
c) Tobacco is a source of pleasure to me [ ]
d) I did not want to gain weight [ ]

e) My significant one(s) also use(s) tobacco [ ]
f) Work pressures [ ]
g) Stress in my social life [ ]
h) Cravings [ ]
i) I did not have treatment support [ ]
j) I could not handle the withdrawal symptoms [ ]
k) I do not know [ ]
l) Others: Specify.....

Q23-24: EX USERS ONLY

23. How long ago did you stop?

a) 0 – 6 months [ ]
b) 7 – 12 months [ ]
c) >1 year [ ]

24. Which of the following reason(s) motivated you to quit? You may choose more than one.

a) My current health concerns [ ]
b) My future health concerns [ ]
c) Financial costs [ ]
d) I am aware of the risks of tobacco use [ ]
e) Concern for the health of my family [ ]
f) Advice from a healthcare provider [ ]
g) My tobacco use is socially unacceptable [ ]
h) Pressures from significant person(s) [ ]
i) Restriction of tobacco use at work [ ]
j) Restriction of tobacco use at home [ ]
k) Anti-tobacco campaigns [ ]
l) Influence of a significant person who stopped tobacco use [ ]
m) My social or work stressors got better [ ]
n) My desire to be more financially prudent [ ]
o) Others; specify..... [ ]

Q25-27: NEVER USERS / EX-USERS ONLY

D. SECONDHAND SMOKE EXPOSURE

25. Do you live or work where other people regularly smoke around you?

a) Yes [ ]
b) No [ ]

26. If you answered "Yes" to question D25, where is this? (You may choose one or more options)

a) Home [ ]
b) Work [ ]
c) Both at home and work [ ]
d) Other places [ ]
specify……

27. For how long have you had the exposure in question D26?
…… years

Q28 – 36: ALL PARTICIPANTS

E. HEALTHCARE PROVIDERS' TRAINING AND READINESS TO OFFER TOBACCO CESSATION TREATMENTS

28. During your school years, did you ever received any training on tobacco use, its dangers and the treatment of nicotine dependence, as stand-alone lecture(s), seminar(s) or workshop(s)?

a) Yes [ ]; specify type of training (workshop, seminar, lecture or assignment)
……
……
……
……
b) No [ ]

29. Have you received any training on tobacco use and cessation interventions since you started practicing as a medical/nursing professional or Community healthcare worker?

a) Yes [ ]
b) No [ ]

30. a) Which of the following best describes your opinion regarding your need to implement tobacco cessation treatments: "I consider it ……." (Choose one of the options below)

1. Not at all important [ ]
2. Slightly Important [ ]
3. I am not sure [ ]
4. Very Important [ ]
5. Extremely Important [ ]

b) Using the ruler below, rate how important it is to you to implement tobacco cessation treatment, where 0 means it is not important at all and 10 means it is extremely important:

0	1	2	3	4	5	6	7	8	9	10

Not at all **unsure** **extremely important**

31. How frequently do you screen your patients for tobacco use?

a) Always [ ]
b) Most of the times [ ]
c) Sometimes [ ]
d) Never [ ]

32. As a healthcare provider, my use of tobacco: (You may choose one or more options)

a) has no influence on my intervening in my patients' tobacco use [ ]
b) makes it difficult for me to intervene in my patient's tobacco use [ ]
c) I do not know [ ]
d) sends conflicting message when I advise my patients to quit tobacco use [ ]
e) exposes my vulnerability as a role model and shows my need for help [ ]

33. a) Regarding tobacco cessation treatment which of the following applies to you?

Please indicate on the Likert scale below how confident you are to implement all the levels of tobacco cessation treatment. "**I consider myself…..**"

1. Not confident [ ]
2. Slightly Confident [ ]
3. I am not sure [ ]
4. Very confident. [.]
5. Extremely confident [ ]

b) Using the ruler below, rate how confident you are to implement all the levels of tobacco cessation treatment, where 0 means you are not confident and 10 means you are extremely confident:

0	1	2	3	4	5	6	7	8	9	10

Not at all **unsure** **extremely confident**

F. HEALTHCARE PROVIDERS' ABILITY IN IMPLEMENTING TOBACCO DEPENDENCE TREATMENTS

34. Regarding tobacco cessation treatment which of the following applies to you?

"I am able to confidently **……" (You may choose more than one option)**

a) Screen for tobacco use [ ]
b) Give brief advice [ ]
c) Conduct in-depth counselling [ ]
d) Prescribe smoking cessation medications [ ]

35. a) How willing are you to offer tobacco cessation advice to patients who use tobacco

1. Not willing [ ]
2. I am slightly willing [ ]
3. I am not sure [ ]
4. I am very willing [ ]
5. I am extremely willing [ ]

b) Using the ruler below, rate how willing you are to offer tobacco cessation advice, where 0 means you are not willing and 10 means you are extremely willing:

0	1	2	3	4	5	6	7	8	9	10
Not at all					**unsure**					**extremely willing**

36. In your opinion, how likely are healthcare providers who use tobacco likely to implement tobacco cessation interventions?

a) Less likely [ ]

b) More likely [ ]

Thank you for participating and completing the survey.

****** If you are currently using tobacco, you may contact the toll free quit line at **0800 22 66 22** or visit any of your nearest primary care clinics for assistance to quit.

APPENDIX B

Participant Information sheet

Good day,

I am Dr. Ann Nhawinei Alagidede from the Department of Family Medicine at the University of Witwatersrand medical school. I am assessing the prevalence of tobacco use among healthcare workers in primary care facilities in Soweto and how ready (measured as to how important and confident) they are to counsel tobacco users to quit using tobacco. I will be grateful if you will consider participating in this research.

Why I am researching this topic: As you may be aware, tobacco use is detrimental to health. Healthcare providers are also well placed to assist their patients to quit this harmful behaviour. However, healthcare professionals who use tobacco may be less likely to intervene in their patient's tobacco use behaviours. To what extent this is true is not well known in South Africa. I am therefore interested in assessing what proportion of healthcare providers in primary care facilities in Soweto use tobacco and whether this affects their readiness to assist their patients to quit. It is hoped that the findings of these study can be used to formulate strategies to improve tobacco control policies in South Africa. In addition, the study findings will assist in helping health care workers to reduce their own risk of tobacco attributable diseases and promote their implementation of tobacco cessation practices, more so, in those who use tobacco.

What do I expect from participants of this study? If you are willing to participate, you will be asked to complete a questionnaire of about 36 questions -focusing on your sociodemographic information, tobacco use and quit attempts (if applicable), previous training on tobacco use and health, and readiness to perform tobacco cessation and counselling during clinical encounters. The self-administered questionnaire does not include a consent form and will take approximately 20 minutes to complete. Acceptance to complete the questionnaire will be taken as consent to participate in the research.

No identifying data would be collected, and the data from the study will be kept confidential and only accessible to the research team for data analysis.

Benefits to participants: This study does not offer financial or other personal benefits. However, the telephone number of the Quitline is provided for assistance to tobacco users who want to quit. The findings from the study may also be used to inform the need for training and workshops on tobacco use, its health implications, and tobacco cessation treatments in your workplace in the future.

Risk to participants: This study poses minimal risk to participants. The likelihood and magnitude of possible harm to participants are no greater than those imposed by daily life in a stable society.

Withdrawing from the study: The study is voluntary, and not taking part in it carries no penalties. You may withdraw your consent and participation at any time during the study without any retribution.

Confidentiality: The questionnaire does not collect information on personal identifiers. All data will be kept on a password-protected computer, which can be accessed only by the research team.

If you have any queries, please contact Dr. Ann Alagidede at 0838966480 or Prof. OB Omole, my research supervisor at 0795235318.
You may wish to report any serious concerns about the study to the administration officer, Zanele Ndlovu of the Human Research and Ethics Committee (Medical), Faculty of Health Sciences, University of the Witwatersrand at **011 717 1252/2700/2656/1234**

Thank you.

Dr. Ann Alagidede