

**ASSOCIATION BETWEEN QUIT ATTEMPT AND OTHER LIFESTYLE BEHAVIOURS
AMONG TOBACCO USERS ATTENDING A DISTRICT HOSPITAL IN GAUTENG**

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DECLARATION

I, Ntumba Monica Kapinga, 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 the Witwatersrand, Johannesburg. It has not been submitted previously for any other degree or examination at this or any other University.

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15.10.2025

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And to my extended family Aunty Tina, Aunty Suzanne, Mireille, Gracia, Tonton Serge, Edna, Alka, Davidlor, and Brian, merci beaucoup for your unwavering support and love.

DEDICATION

I dedicate this research report to all clinicians who are taking care of tobacco users.

NOMENCLATURE

All definitions are taken from WHO's smoking and tobacco policy document¹.

- **Current Tobacco user:** someone aged 15 years and over who currently use any smoked tobacco product. "Current" means either daily or non-daily (occasional) use. Any tobacco products, including smoking, sucking, chewing, or snuffing.
- **Tobacco product:** Products entirely or partly made of leaf tobacco as raw material, which is manufactured for use in smoking, sucking, chewing, or snuffing.
- **Smokers:** Persons who smoke any tobacco product, either daily or occasionally - cigarette smoking, cigar-smoking, pipe-smoking, shishas, or hookah smoking
- **Smokeless tobacco:** A type of tobacco that is not smoked or burned. It may be chewed, inhaled by nose, or mouth by dry or moist snuff called snus.

Acronyms:

- CVD: cardiovascular disease
- DYDH: Dr Yusuf Dadoo Hospital
- F&V: Fruit and vegetables
- GATS: Global Adults Tobacco Survey
- HSI: Heaviness of Smoking Index
- HND: Higher nicotine dependence
- OPD: Outpatient Department
- SA: South Africa
- SLT: Smokeless Tobacco
- WHO: World Health Organization

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A manuscript submitted according to the style guide and requirements of the Tobacco Induced Disease (TID) Journal.

IMPORTANT NOTE: The original title of the research protocol submitted in 2020 was *"Quit attempt and other lifestyle behaviours among tobacco users attending Dr Yusuf Dadoo Hospital, Gauteng, South Africa."* For the final report, we revised the title by incorporating the phrase *"association between"* and replace Dr Yusuf Dadoo Hospital by District Hospital to enhance clarity and better reflect the contextual focus of the study. This modification was made without altering the study's scope, objectives, or methodology.

TITLE: ASSOCIATIONS BETWEEN QUIT ATTEMPT AND OTHER LIFESTYLE BEHAVIOURS AMONG TOBACCO USERS ATTENDING A DISTRICT HOSPITAL IN GAUTENG.

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ABSTRACT

Background: The cessation of tobacco use is associated with better health outcomes. Such a lifestyle choice may facilitate the uptake of other healthy lifestyles. In this study, we examined whether engaging in tobacco use cessation increases the likelihood of engaging in other healthy lifestyle behaviours.

Methods: In this cross-sectional study, consecutive tobacco users attending the Outpatient Department of Dr Yusuf Dadoo District Hospital, were administered a questionnaire that collected data on sociodemographic, and clinical/health status, tobacco use, nicotine dependence, alcohol consumption, fruit/vegetable intake, physical activity and lifetime and 12-month quit attempts. Analysis included descriptive statistics and logistic regressions.

Results: A total of 406 respondents completed the questionnaires with six discarded due to insufficient data. A quarter of respondents (n=104) reported making a quit attempt in the last 12 months while 54.5% had done in a lifetime. About 17.7 % (n=47) of smokers were classified as high nicotine dependent (HND) and 17.3 % reported harmful alcohol use. Only 37.6% reported adequate physical activity and 45.2% daily fruit/vegetable intake.

In univariate analyses, among smokers, only daily fruits/vegetables intake and having a respiratory problem were significantly associated with making a quit attempt ($p<0.001$ and $p<0.011$ respectively). Among all tobacco users, tertiary education and adequate physical activity were negatively associated with HND ($p<0.002$ and $p<0.001$, respectively).

In multivariate regression, none of the lifestyle behaviours predicted quit attempt. Only reporting a good health status and being unemployed were significantly associated with making a quit attempt in the 12 months (AOR=3.0;95%CI:1.5-5.99; $p=0.002$, AOR=3.11;95%CI:1.1.28-7.6; $p=0.013$ respectively).

Conclusions: Most tobacco users did not make a quit attempt in the last 12months, highlighting a need to scale up the implementation of brief advice and motivational counselling within the clinical setting. Except for unemployment status and perceptions of being healthy, making a quit attempt appears not to be associated with uptake of other healthy lifestyle behaviours. Larger and better designed studies are therefore needed to explore this relationship. Nonetheless, the study findings may find suitable expression in policies aimed at facilitating quit attempts among tobacco users.

Key words: 12-month quit attempt, lifetime quit attempt, tobacco users, nicotine dependence, lifestyle behaviours, fruits and vegetable intake, physical activity, alcohol intake.

INTRODUCTION

The tobacco epidemic continues to be one of the most significant public health challenge worldwide, and South Africa is no exception^{1,2}. According to the 2021 Global Adult Tobacco Survey (GATS), 29.4% of South Africans aged over 15 use tobacco products, including smoking tobacco, smokeless tobacco, or heated tobacco². While there has been a downward trend in tobacco consumption reported worldwide, low- and middle-income countries continue to bear the heaviest burden^{1,3,4}. In 2021, tobacco ranked as the eighth highest health risk responsible for premature deaths and disability combined in South Africa⁵. Despite various efforts by governments and the World Health Organization to curb this dangerous trend, tobacco use remains a pressing public health issue^{1,5,6}.

Tobacco use and other unhealthy lifestyle behaviours are common in South Africa^{7,8}. Data from the South African Demographic and Health Survey (SADHS 2016) highlight some concerning trends⁸ - 37% of men and 8% of women are tobacco users; 68% of women are overweight, with 41% obese; 31% of men are overweight, with 11% obese; 61% of men and 26% of women consume alcoholic beverages; and of those who consume alcohol, 28% of males and 5% of females engage in risky alcohol consumption⁸. Furthermore, the SADHS (2016) found that only 25% of households reported consuming at least one portion of fruit or vegetables (F&V) daily⁸.

The '3-4-50' concept highlights the link between three key unhealthy behaviours namely: tobacco use, inadequate physical activity and poor diet⁹. These constitute major risk factors for four major chronic diseases (cardiovascular diseases, cancers, type 2 diabetes, and respiratory conditions) and ultimately account for over 50% of premature deaths worldwide^{9,10}. These lifestyle behaviours significantly impact public health, leading to preventable diseases, increased healthcare costs, and higher mortality rates^{1,11}. Evidence from multiple studies suggest that unhealthy lifestyle behaviours tend to cluster together, increasing the overall risk of negative health outcomes⁹⁻¹¹. Simply put, individuals often, and at the same time, engage in multiple unhealthy behaviours, such as tobacco use, physical inactivity, unhealthy diet, excessive alcohol use, or illicit drug use⁹⁻¹¹. A Canadian study reported that smoking cessation is challenging when multiple unhealthy lifestyle behaviours co-exist, as the odds of dependence on nicotine increases by 23% with each additional unhealthy behaviour¹². Additionally, the impact of these unhealthy behaviours contribute to socioeconomic inequalities^{12,13}.

A 2022 scoping review identified a rising trend in smokeless tobacco (SLT) use among a much younger population¹⁴. It also found that youth who use SLT are more likely to engage in multiple unhealthy behaviours, such as smoking cigarettes and consuming alcohol concurrently.¹⁴⁻¹⁶ This study also found that novel smokeless tobacco (SLT) products are popular among young males who engage in physical

activity^{14,15}. This trend was confirmed by the Centres for Disease Control and Prevention (CDC) in the USA who reported that novel forms of SLT along with the influence of friends and family, were identified as pivotal elements influencing the use of SLT products among the youth¹⁵.

It is well established that all forms of tobacco products are harmful, with no safe level of exposure¹. Therefore, promoting a quit attempt is a desirable clinical and public health priority^{1,6,11}. It requires a conscious resistance to the urge to use any form of tobacco product, usually supported by intrinsic motivation, pharmacotherapy, and mindfulness training^{10,11,17}. It has been shown that brief motivational interviews (BMI) by healthcare providers increases the chances of a successful quit attempt by 30%, while quitting rates are increased by 87% with intensive counselling sessions, follow-ups and pharmacotherapy¹⁸. Although, most tobacco users express the desire to quit, many are unsuccessful, as the chances of quitting also decrease with higher nicotine dependence (HND) and the presence of concurrent risky lifestyle behaviours^{9,11,12}.

Literature suggests that the likelihood of attempting to quit tobacco use is associated with being female, older, higher formal education, exposure to smoke-free environments, lower level of nicotine dependence, awareness of the dangers of tobacco and concern about their health^{11,18,19}. However, a recent South African study, while supporting most of the findings above, found that the odds of planning a quit attempt was lower with higher socioeconomic status, possibly because of the greater elasticity in affordability among this group with increases in the price of tobacco.¹¹ In addition, multiple studies have shown that past or present alcohol use disorder is negatively associated with making a quit attempt and have greater chance of relapse²⁰. Also, smokers with higher nicotine dependence are less likely to attempt to quit¹¹ and weight gain has been identified as both a barrier to quitting and a cause of relapse with many reporting an average weight gain post cessation of 7kg²¹. This was reiterated by a recent systematic review in 2019 which identified a link between hookah smoking and obesity²².

A large number of adult patients visiting the outpatient department (OPD) at a district hospital seek care for the treatment of non-communicable diseases (NCD's) related to lifestyle²³. Healthy lifestyle changes, including tobacco use cessation, are therefore paramount for this population. The South African literature is, however, limited on the relationship between quit attempts and behavioural lifestyles, particularly, whether a quit attempt is associated with other healthy lifestyle behaviours among ambulatory hospital patients, and the extent to which nicotine dependence modulates this. Furthermore, there is no clear evidence on whether tobacco cessation counselling should be instituted simultaneously with other healthy lifestyle behaviours including sufficient fruit and vegetable consumption, regular physical activity and little or no alcohol intake^{10,11,21}. The only available study on this topic in South Africa, a community-based study published in 2020, found that smokers whose fruit and vegetable intake was frequent were more likely to attempt quitting, while those who reported risky

alcohol use, were less likely to do so¹¹. Based on these findings, we hypothesized that individuals who adopt one or more healthy lifestyle habits are more likely to try to quit. Understanding the relationship between health behaviours and quitting behaviours could provide valuable insights for improving future cessation treatment strategies and the adoption of multiple healthy lifestyles within the ambulatory NCD patient population.

Therefore, this study examined the associations between quit attempts, nicotine dependence, and lifestyle behaviours among tobacco users who presented at a district Hospital in Gauteng. Specifically, the study sought to: (i) describe patterns of tobacco use, including the average number of cigarettes smoked and snuff dips per day, duration of tobacco use, and levels of nicotine dependence; (ii) assess the proportion of tobacco users engaging in lifestyle behaviours such as regular fruit and vegetable consumption, physical activity, and non-harmful alcohol intake; (iii) determine the proportion of respondents who had ever attempted to quit or made a quit attempt in the past 12 months; and (iv) examine associations between sociodemographic characteristics, tobacco use patterns (including level of nicotine dependence), lifestyle behaviours, and quit attempts.

METHODS

Study design

Descriptive, analytical cross-sectional study.

Study setting

This study took place at the outpatient department (OPD) of Dr Yusuf Dadoo Hospital (DYDH), a district-level healthcare facility situated in the West Rand District of Gauteng Province. The hospital has a capacity of 245 beds and lies in the Mogale City sub-district. The hospital delivers both outpatient and inpatient medical services covering 2 CHC 's and 39 clinics. The OPD operates weekdays, Monday to Friday, from 8:00 a.m. to 4:00 p.m. As of 2020, the hospital served an estimated catchment population of 435,511¹⁸.

Sample size and sampling strategy

The study population comprised all current tobacco users who presented to the OPD at DYDH during consultation hours, Monday to Friday, excluding patients who presented with emergencies. According to the district health information system, there were 26,632 adult patient visits to the OPD of DYDH in 2019. Most of these visits were for the monthly management of patients with chronic health conditions, estimated at approximately 2,220 per month for the year. In addition, a previous study in the same setting, by Bokoro et al., reported a tobacco use prevalence of 20.0% in 2020¹⁸. The required sample size for the study was calculated to be 336 respondents, using a 5% margin of error and a 95% confidence interval. To compensate for potential non-responses and incomplete data, the sample size was increased by 10%, resulting in a final target of 400 respondents. Prior to the main study, a pilot was

carried out in October 2022 involving 40 patients at the outpatient department of Carletonville Hospital—another facility within the West Rand Health District. This pilot, approved by the University of the Witwatersrand Human Research Ethics Committee, aimed to evaluate the practicality of the study design and identify any operational challenges. Respondents from the pilot phase were not included in the main study

Selection of respondents

Consecutive tobacco users were invited to take part in the research study. During the research, the principal investigator worked in the OPD at DYDH. Posters in English about the research study were displayed in the OPD with permission from the hospital management. A trained research assistant informed patients about the ongoing study after the morning health promotion talks. Those who consented to participate were assured that they would not lose their position in the queue, as they would be returned to their original position or the next position in the front of the queue once they completed their participation. The other patients were also informed about this procedure to gain their cooperation. The study included tobacco users who were 18 years of age or older who voluntarily signed a written consent form. Critically ill patients, emergencies, those who presented outside of normal working hours (07h30 – 16h00) and on weekends, and patients who could only speak languages other than English, Setswana, Afrikaans, Sotho, and Zulu (mostly foreign nationals) were excluded from the research study.

Data collection

On each working day, all patients visiting the OPD were screened for tobacco use as part of the staff nurse's routine screening and vital signs triaging system in a triage room. Prior to the study, The principal investigator trained the research assistant to consistently apply inclusion and exclusion criteria and to collect data in accordance with study protocols and ethical standards. Fluent in English and multiple local languages (Setswana, Afrikaans, Sotho, and Zulu), the assistant notified all patients about the ongoing study and invited them to participate. Non-tobacco users were thanked for their interest and directed to their usual care path.

The researcher and the trained research assistant provided consecutive current tobacco users with a respondent information leaflet while they were waiting in the queue to see the doctor. Those willing to participate signed a written consent, while those who were unwilling were thanked and re-directed to continue with their care. The number of those who declined to participate was not recorded. The enrolment of consecutive consenting patients continued until the sample size was reached. All screened patients received a sticker on their files afterwards, to avoid multiple recruitment.

Data collection was conducted between February 2023 and July 2023 in the outpatient department of DYDH. A researcher-administered questionnaire, written in English, was used to collect the data. Each

questionnaire had a code to ensure anonymity. The data collection tool was developed using previously validated and reliable questionnaires addressing tobacco use, nicotine dependence, and quit attempts from the Global Adult Tobacco Survey (GATS), as well as lifestyle factors included in the South African Social Attitudes Survey (SASAS). Additionally, the Alcohol Use Disorders Identification Test–Consumption (AUDIT-C) was employed as a validated instrument for screening alcohol use disorder^{7,8,24,25}

Measures

- **12-months Quit attempt:** was defined among tobacco users who attempted to quit were those who answered "yes" to the question, "During the past 12 months, have you tried to stop tobacco use?"^{26,27}
- **Lifetime quit attempt** was defined by any answer indicating 'once,' 'twice,' or 'three times or more' as opposed to 'never' in response to the question, "Have you ever attempted to quit tobacco use?"¹¹
- **Nicotine dependence:** To determine the nicotine dependence levels among smokers, the Heaviness of Smoking Index (HSI) was used, which has been validated as an effective measure of nicotine dependence²⁸. The HSI is derived from two questions: the number of cigarettes smoked per day (CPD) and the time to first cigarette (TTFC) smoking in the morning²⁸.
- **Lifestyle behaviours:** Lifestyle behaviours included dietary consumption of fruits and vegetables, physical activity, and consumption of alcohol. Dietary consumption of fruits and vegetables was measured as proposed in the South African Social Attitudes Survey (SASAS) of 2014⁸; by asking respondents how often they consumed fruits and/or vegetables per day or week⁸.
- **Physical activity** was measured using the Global Physical Activity Questionnaire (GPAQ), a tool developed by the WHO to monitor physical activity levels across different countries^{9,25}. The GPAQ gathers data on physical activity across three domains: vigorous and moderate activity at work, transport-related activity, and vigorous and moderate activity during leisure time. Additionally, it records information on sedentary behaviour, specifically the duration of time spent sitting²⁵. To assess alcohol consumption, the Alcohol Use Disorders Identification Test-Concise (AUDIT-C) tool was utilized. This is a brief but effective screening tool for identifying individuals who engage in risky drinking or may have an active alcohol use disorder²⁹. The AUDIT-C comprises the first three questions from the full Alcohol Use Disorders Identification Test (AUDIT). Harmful drinking refers to a pattern or quantity of alcohol consumption that increases the likelihood of adverse health outcomes and is recognized by the WHO as a distinct disorder²⁹. According to standard guidelines, alcohol intake within the recommended limits is defined as less than 14 units per week for women and less than 21 units per week for men²⁹. The AUDIT-C includes the following three questions: Q1: How often

do you consume a drink containing alcohol? Q2: On a typical drinking day, how many units of alcohol do you consume? Q3: In the past year, how often have you consumed six or more units (for females) or eight or more units (for males) in a single session?²⁹.

Covariates

- **Tobacco use: Current tobacco users** were defined as individuals who responded "daily" or "less than daily" to the question, "Do you currently use any tobacco products on a daily basis, less than daily, or not at all?"²⁶ For tobacco use patterns, the GATS questionnaire was used to collect data on tobacco use patterns²⁴. The GATS questionnaire is an internationally valid and reliable tool used to obtain information on tobacco use and quit attempts for both smokers and SLT users²⁴.
- **Sociodemographic characteristics:** The sociodemographic data collected included age, gender (male and female), marital status (single, married, other: divorced/widowed/separated), employment status (pensioner, employed: professional/artisan/self-employed, unemployed/student), educational level (no formal education, primary school, secondary school, tertiary education), and ethnicity (Black, White, Coloured, Indian).
- **General health status and clinical conditions:** Study respondents were also asked to evaluate how they perceived their general health status, choosing from options such as good, average, poor, or I don't know^{8,11}. Regarding clinical conditions, patients were asked to specify the reason for their clinical visit and, if they had any chronic diseases, to indicate the duration of these conditions in years.

Analysis

A statistician provided support with data management and analysis. The data on the completed questionnaire were entered into REDCap and later analysed using STATA 18. Descriptive statistics, including frequencies and percentages for the categorical variable, as well as means and standard deviations for the continuous variables, were calculated. Measures of central tendency and cross tabulation were also performed. The outcome of analyses included the distribution of the sample in terms of age, sex, marital status, employment status, education level, ethnicity, self-reported health status, clinical diagnoses.

The mean number of cigarettes smoked per day, the average number of snuff dips per day, and the duration of smoking and/or snuff use were calculated and reported along with their standard deviations. Smokers were categorised into nicotine dependence levels based on their scores from the HSI questions²⁸. Using the HSI, the number of cigarettes smoked per day was scored as follows: "0" = 1-10 CPD; "1" = 11-20 CPD; "2" = 21-30 CPD; and "3" > 30 CPD. The time to the first cigarette from waking up in the morning was scored as: "3" for ≤ 5 minutes; "2" for 6 to 30 minutes; "1" for 31 to 60 minutes; and "0" for more than 60 minutes. The maximum total score for these two components was 6

points. Nicotine dependence levels were categorised as: 0-2 points for low nicotine dependence; 3-4 points for moderate nicotine dependence; and 5-6 points for high nicotine dependence.

To determine the proportion of respondents who have ever made a quit attempt or attempted to quit in the last 12 months, descriptive statistics were calculated in terms of frequencies and percentages. The outcome measured was the proportion or percentage of respondents who made a quit attempt in the past 12 months. Same determination was made for lifetime quit attempt.

To determine the proportions of tobacco users engaged in each lifestyle behaviour (healthy diet, physical activity, and non-harmful alcohol intake), descriptive statistics were calculated in terms of frequency and percentage. The outcome measure was the proportion or percentage of respondents engaged in a healthy or unhealthy diet, in regular exercise, and in harmful alcohol use. Adequate fruit and vegetable (F&V) intake was defined as consuming two servings of fruit and three servings of vegetables per day³⁰.

Study respondent were considered adequately physically active if they engaged in at least 150 minutes of moderate-intensity exercise or 75 minutes of vigorous-intensity activity per week²⁵. Risky alcohol consumption was identified using an alcohol screening tool, where a score of 8 or higher indicated harmful drinking behaviour. The screening included questions such as: "How often do you drink alcohol?" with response options ranging from "Never" (score 0) to "Four or more times per week" (score 4); "On a typical drinking day, how many alcoholic drinks do you consume?" with answers from "1-2" (score 0) to "10 or more" (score 4); and "In the past year, how frequently have you consumed six or more units (for women) or eight or more units (for men) on one occasion?" with options from "Never" (score 0) to "Daily or almost daily" (score 4).

To analyse the associations between Respondent's' demographic and clinical profiles, levels of nicotine dependence, health-related behaviours, and attempts to quit smoking, appropriate statistical tests were applied: Chi-square tests, T-tests, or ANOVA were used for testing categorical and numerical variables, as appropriate. A statistically significant relationship was determined to exist at a p-value < 0.05.

ETHICAL CONSIDERATIONS

Ethical approval was granted by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg, South Africa (clearance number: M201173), and permission was obtained from the Chief Executive Officer of DYDH. Written informed consent was obtained from all respondents. Participation was voluntary, and respondents could withdraw from the study at any time without consequence. Anonymity and confidentiality were maintained by coding responses and excluding identifying information. Data were locked daily into cabinets accessible only to the research

team then stored securely in password-protected electronic files on REDCap. Respondents who consented received a brief motivational interview and a pamphlet from the Cancer Association of South Africa (CANSA) with guidance on smoking cessation.³¹

RESULTS

A total of 406 respondents completed the questionnaires with six of these discarded due to insufficient data. Data from the remaining 400 respondents were therefore entered into final analysis.

Respondent characteristics

Table 1 and Figure 1 summarise the baseline sociodemographic data, self-reported health status, and clinical conditions of the respondents. Most respondents were Black (65%), male (51.2%), single (46.5%), employed (43%), and had secondary education (71.2%). The median age of the respondents was 47.2 years. Less than half of the respondents (45.2%), described their general health status as good. The most common reason for a clinical encounter was a cardiovascular disease (CVD) (49%) - Figure 1. The overall mean duration of respondents having their health condition was 6.9 years.

Table 1: Respondent's Sociodemographic characteristics and health status

Variable	Categories	n(%)	Percentage
Gender	Male	205	51.25
	Female	195	48.75
Marital status	Single	186	46.5
	Married	151	37.75
	Others (Divorced/Widowed/Separated)	64	15.75
Employment	Pensioner	98	24.5
	Employed (Professional + Artisan+ Self)	172	43.0
	Unemployed+ Student	130	32.50
Educational attainment	No formal education	9	2.25
	Primary school education	25	6.25
	Secondary education	185	71.25
	Tertiary	81	20.25
Ethnicity	Blacks	260	65.0
	White	126	31.5
	Coloured	8	2.0
	Indians	6	1.5
Health status	Good	181	45.25
	Average	142	35.5
	Poor	68	17.0
	Don't know	9	2.25

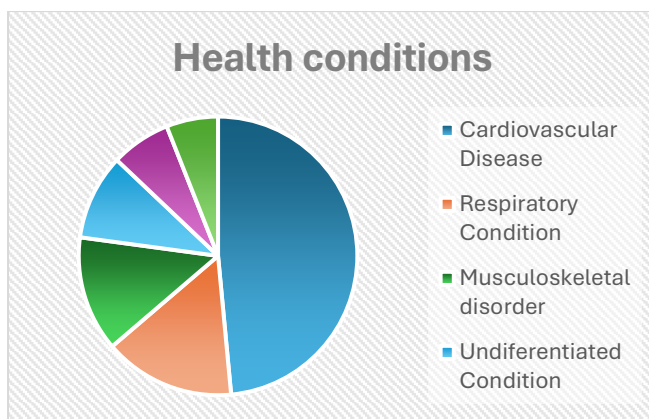


Figure 1: Health conditions

Tobacco use patterns

About 80.5% (n=322) were cigarette smokers and 19.5% (n=78) were SLT users. Most of the cigarette users smoked daily (91.9%), preferred the manufactured (non-menthol) type of cigarette (63%). The mean number of packs per year of smoking was 14.5.

Most cigarette smokers had low nicotine dependence (LND) (60.9%), while 21.25% had moderate dependence, and 17.7% high nicotine dependence (HND).

Among SLT users, the majority (71.7%, n = 56) used snuff daily. The median duration of snuff use was 10 years (IQR 3-20 years). On average, SLT users used three snuff dips per day (Tables 2 and 3).

Table 2 Distribution of tobacco products

Products	Count	Percentage
Cigarette only	268	67
Snuff only	78	19.5
Hookah pipe only	27	6.75
E-cigarette only	2	0.5
Cigarette + others	19	4.75
E-cigarette + others	6	1.5

Table 3: Smokers and smokeless use pattern

Variable	Categories	Frequency	Percentage
Cigarettes users' group profile (n=287)			
Frequent use of cigarette	Daily	264	91.9
	Less than daily	22	7.67
	No response	1	0.35
Type of cigarette smoked	Manufactured (menthol only)	58	20.21
	Manufactured (non-menthol)	181	63.07
	Manufactured (either)	43	14.98
	Others	12	1.18
Number of cigarettes smoked per day	Median (IQR)	10 (5-15)	
Length of smoking in years	Median (IQR)	20(10-35)	

Mean pack year	Mean	14.5	
Nicotine dependence level based on the heaviness of smoking index	Low	175	60.98
	Moderate	61	21.25
	High	51	17.77
Smokeless tobacco (snuff) user profile (n=78)			
Frequent use of smokeless tobacco (snuff)	Daily	56	71.79
	Less than daily	22	28.21
Length of snuff use in years	Median (IQR)	10 (3 to 20) years	
Number of snuff dips per day	Median (IQR)	3 (1 to 4) times	

In the univariate analysis, smokers who were Black, had tertiary education, and reported adequate physical activity were less likely to have HND (OR = 0.2, 95% CI: 0.1-0.39, $p = 0.001$; OR = 0.23, 95% CI: 0.08-0.69, $p = 0.002$; and OR = 0.17, 95% CI: 0.07-0.39, $p = 0.001$, respectively). In contrast, married smokers and those with a mean pack-year of smoking higher than 14.5 were significantly associated with HND, with $p = 0.001$ for both, as detailed in Tables 5 to 7.

Lifestyle behaviours

Table 4: Lifestyle behaviours: Fruits vegetables intake, physical activities and alcohol use

Item	Responses	n(%)	Percentage
Intake of fruits and vegetables			
Fruits and Vegetable intake	Less than a portion daily	219	54.75
	One portion daily	181	45.25
	Met WHO	3	0.75%
Physical activity			
Overall physical involvement	No	65	16.25
	Yes	332	83.0
	Not specified	3	0.75
Meet WHO guidelines	No	207	62.35
	Yes	125	37.65
Workday length	Mean	8 hours	
Time spent sitting or reclining (lying)	Median (IQR)	3 (2 to 5) hours	
Alcohol intake and heaviness (n=271)			
Do you take drinks containing alcohol?	No	129	32.25
	Yes	271	67.75
Alcohol use	Harmful	47	17.34
	Not harmful	224	82.66

Only three respondents (0.75%) met the WHO guidelines for adequate consumption of F&V — of a minimum of five servings of F&V daily. More than half of the respondents (55%) consumed less than one serving of F&V daily. Compared to others, respondents with a tertiary education were more likely to eat at least one serving of F&V each day with (OR = 2.04, 95% CI: 1.19-3.47, $p = 0.009$).

Regarding physical activity, most respondents (83%) reported engaging in either vigorous or moderate physical activity. Of these, only 37,6% met the WHO guidelines for total 150 minutes of weekly physical activity. On the average, participants worked for eight hours a day, with half spending three hours sitting or reclining. In the univariate analysis, females, pensioners, and those with a mean pack year of smoking higher than 14.5 were negatively associated with engaging in adequate physical activity ($p = 0.001$, 0.001 , and 0.002 , respectively). Surprisingly, participants who described their general health as good were less likely to engage in adequate physical activity (OR = 0.22, 95% CI: 0.11-0.46, $p = 0.001$). Tertiary education, being black, and non-pensioner were all significantly associated with engaging in adequate levels of physical activity ($p = 0.02$ and $p = 0.028$, $p = 0.001$, and $p = 0.006$), as shown in Table 7.

The overall prevalence of alcohol use among the study respondents was 67.7% ($n = 271$), with 70% of Blacks, 55% of males and 45% of females reporting alcohol use. Harmful drinking was reported by 17.3% of participants. Being Black and unemployed were significantly associated with harmful alcohol drinking ($p = 0.03$ and $p = 0.01$, respectively). Harmful drinking was negatively associated with being a female and married ($p = 0.00$ and $p = 0.03$, respectively) as shown in Table7.

Quit attempts

In the past year, 25% of respondents had attempted to quit tobacco, while 54.5% reported having tried to quit at some point in their lives. Among various lifestyle behaviours, consuming at least one serving of fruits and vegetables daily was the only factor significantly linked to a quit attempt in the previous 12 months (OR = 2.77; 40%, 95% CI: 1.63–4.69; $p = 0.001$). Smokers diagnosed with cardiovascular disease were less likely to attempt quitting (OR = 0.59; 24%, 95% CI: 0.35–0.99; $p = 0.044$). Across all tobacco users, those who rated their general health as good and those with a respiratory illness were more inclined to try quitting (OR = 1.94, 95% CI: 1.09–3.44, $p = 0.024$; and OR = 1.07, 95% CI: 1.18–3.62, $p = 0.001$, respectively). Marital status showed a significant association, with individuals who were married or in other non-single arrangements being more likely to have made a quit attempt (OR = 1.62, 95% CI: 1.05–2.50, $p = 0.028$; and OR = 2.69, 95% CI: 1.46–4.96, $p = 0.001$, respectively), as detailed in Tables 5 and 6.

Table 5: Quit attempts: 12 months and lifetime

Variable	Categori es	Cigarette smokers n(%)	Smokel ess tobacco n(%)	Other products n (%)	Total n(%)
Ever tried to quit	No Yes	103(35.89) 184(64.11)	50(64.1 28(35.9)	29(82.86) 6(17.14)	182(45.5) 218(54.5)

During the past 12 months, have you tried to stop using tobacco?	No Yes	203(70.73) 84(29.27)	65(83.33) 13(16.67)	31(88.57) 4(11.43)	299(74.75) 101(25.25)
How many times have you tried in the past 12 months?	Once 2-10 Not specified	53(63.1) 30(35.71) 1(1.19)	7(53.85) 6(46.15) 0	2(50.0) 2(50.0) 0	62(61.39) 38(37.62) 1(0.99)

Multivariate regression analysis revealed that individuals who reported good overall health, unemployed were more likely to quit smoking within the past year (AOR = 3.0, 95% CI: 1.5–5.99, $p = 0.002$; and AOR = 3.11, 95% CI: 1.28–7.6, $p = 0.013$, respectively). In relation to lifetime quit attempts, non-pensioners regardless of employment status were significantly more likely to have attempted to quit tobacco use AOR = 2.96, 95% CI: 1.23–6.23, $p = 0.014$; and AOR = 2.96, 95% CI: 1.32–6.65, $p = 0.008$, respectively). Individuals living with HIV were six times more likely (AOR = 6.25, 95% CI: 1.93–20.2, $p = 0.002$). Unlike Black and females who were less likely to quit (AOR = 0.34, 95% CI: 1.20–1.58, $p = 0.001$; and AOR = 0.62, 95% CI: 0.39–0.98, $p = 0.04$, respectively), as outlined in Table 8.

Table 6: Factors associated with the quit attempt for cigarette and smokeless tobacco (snuff) smokers

Variable	Cigarette smokers			Smokeless tobacco (snuff)			Overall			Overall		
	Quit attempt	Univariate logistic regression		12 month Quit attempt	Univariate logistic regression		Annual Quit attempt	Univariate logistic regression		Lifetime quit attempt	Univariate logistic regression	
	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Age (mean, sd)	48 (15.2)	0.99(0.98-1.01)	0.827	57.5 (11.6)	1.1 (0.99-1.11)	0.087	48.3(14.6)	1.0(0.99-1.02)	0.358	49.3(14.2)	1.01(1.01-1.03)	0.003
Gender												
Male	53(28.19)	1		2(25.0)	1		56(27.32)	1		121(59.02)	1	
Female	31(31.31)	1.16(0.68 – 1.97)	0.581	11(15.71)	0.56(0.09-3.14)	0.509	45(23.08)	0.8(0.51-1.26)	0.330	97(49.74)	0.69(0.46-1.02)	0.063
Employment												
Pensioner	18(23.68)	1		4(18.18)			22(22.45)	1		53(54.08)	1	
Employed	34(27.42)	1.22(0.63-2.35)	0.559	4(13.79)			40(23.26)	1.05(0.58-1.89)	0.880	91(52.91)	0.95(0.58-1.57)	0.852
Unemployed	32(36.78)	1.87(0.94-3.72)	0.072	5(18.52)			39(30.0)	1.48(0.81-2.71)	0.204	74(56.92)	1.12(0.66-1.91)	0.669
Race												
Other	33(24.44)	1		0			33(23.57)	1		98(70.0)	1	
Blacks	51(33.55)	1.56(0.93-2.61)	0.092	13(17.11)			68(26.15)	1.15(0.72-1.85)	0.571	120(46.15)	0.37(0.24-0.57)	<0.001
Marital status												
Single	36(29.03)	1		5(16.67)	1		45(24.19)	1		86(46.24)	1	
Married	31(26.96)	0.9(0.51 – 1.59)	0.721	3(8.57)	0.47(0.11-2.15)	0.33	34(22.52)	0.91(0.55-1.51)	0.718	88(58.28)	1.62(1.05-2.50)	0.028
Other	17(35.42)	1.34(0.67-2.71)	0.417	5(38.46)	3.13(0.72-13.64)	0.13	22(34.92)	1.68(0.91-3.11)	0.099	44(69.84)	2.69(1.46-4.96)	0.001
Education level												
Primary	38(30.89)	1		9(17.31)	1		47(26.26)	1		103(57.54)	1	
Secondary	29(26.61)	0.81(0.45-1.43)	0.472	3(15.79)	0.89(0.22-3.73)	0.88	35(25.0)	0.94(0.56-1.55)	0.799	77(55.0)	0.90(0.56-1.41)	0.65
Tertiary	17(30.91)	1.01(0.51-1.99)	0.998	1(14.29)	0.79(0.09-7.45)	0.84	19(23.46)	0.86(0.47-1.59)	0.631	38(46.91)	0.65(0.38-1.11)	0.112

CVD	No Yes	47(35.07) 37(24.18)	1 0.59(0.35-0.99)	0.04 4	7(23.33) 6(12.5)	1 0.47(0.14-1.56)	0.2 18	47(24.74) 54(25.71)	1 1.05(0.67-1.66)	0.822	105(55.26) 113(53.81)	1 0.94(0.63-1.39)	0.77 1
Daily fruit and vegetable consumption	No Yes	30(19.61) 54(40.3)	1 2.77(1.63-4.69)	<0.0 01	5(11.61) 8(22.86)	1 2.25(0.66-7.63)	0.1 93	50(22.83) 51(28.18)	1 1.33(0.84-2.1)	0.221	121(55.25) 97(53.59)	1 0.94(0.63-1.39)	0.74 0
Health status	Poor Moderate Good	36(27.07) 25(26.32) 23(38.98)	1 0.96(0.53-1.75) 1.72(0.9-3.29)	0.89 9 0.10 0	6(20.69) 2(5.88) 5(33.33)	1 0.24(0.04-1.29) 1.92(0.47-7.77)	0.0 97 0.3 62	43(23.76) 29(20.42) 29(37.66)	1 0.82(0.48-1.40) 1.94(1.09-3.44)	0.475 0.024	102(56.35) 70(49.3) 46(59.74)	1 0.75(0.48-1.17) 1.14(0.67-1.97)	0.20 7 0.61 5
Physical activity	Not physically active Active (not adequate) Active (adequate)	15(26.79) 44(31.88) 25(26.88)	1 1.28(0.64 - 2.55) 1.1(0.48-2.12)	0.48 5 0.99 0	2(22.22) 7(14.0) 4(21.05)	1 0.57(0.1-3.32) 0.93(0.14-6.37)	0.5 32 0.9 44	17(25.0) 55(26.77) 29(23.2)	1 1.09(0.59-2.03) 0.91(0.46-1.81)	0.798 0.779	40(58.82) 113(54.59) 65(52.0)	1 0.84(0.48-1.47) 0.76(0.42-1.37)	0.54 2 0.36 4
Alcohol use	Not harmful Harmful	40(22.99) 14(37.5)	1 2.01(0.97-4.18)	0.06 1				40(31.01) 61(22.51)	1 0.65(0.41-1.03)	0.068	75(58.14) 143(52.77)	1 0.81(0.53-1.23)	0.31 4
Nicotine dependence	Low Moderate High	51(29.14) 21(34.43) 12(23.53)	1 1.28(0.69-2.37) 0.75(0.36-1.54)	0.44 1 0.43 2									
Pack year		15.6(16)	1.01(1.00-1.03)	0.10 6									
Respiratory	No Yes	76(22.75) 25(37.88)	1 2.1(1.2-3.6)	0.01 1				76(22.75) 25(37.88)	1 1.07(1.18-3.62)	0.001	181(54.19) 37(56.06)	1 1.08(0.63-1.84)	0.78 1

Table 7: Lifestyle behaviour: Fruit and vegetable, risky alcohol use, physical activity, Nicotine dependence univariate analysis

Variable	Daily fruit and vegetable consumption			Harmful alcohol use			Adequate Physical activity			High Nicotine Dependence		
	Proportion	Univariate logistic regression		Proportion	Univariate logistic regression		Proportion	Univariate logistic regression		Proportion	Univariate logistic regression	
	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value	n (%)	OR (95%CI)	p-value
Age (mean, sd)	46.4(14.9)	0.99(0.98-1.01)	0.365	38.8(1.)	0.97(0.95-0.99)	0.012	40.9(13.14)	0.9(0.9-0.97)	<0.001	52.8(16.2)	1.02(1.0-1.03)	0.001
Gender												
Male	94(4.85)	1		35(22.73)	1		79(38.54)	1		32(16.24)	1	
Female	87(44.62)	0.95(0.64-1.41)	0.804	12(9.52)	0.36(0.18-0.72)	0.004	46(23.59)	0.49(0.31-0.76)	0.001	19(15.2)	0.95(0.59-1.52)	0.836
Marital status												
Single	81(43.55)	1		32(22.38)	1		71(38.17)	1		12(7.69)	1	
Married	75(49.67)	1.28(0.83-1.97)	0.263	12(11.65)	0.46(0.22-0.94)	0.033	46(30.46)	0.71(0.45-1.12)	0.140	31(26.72)	4.37(2.1-8.98)	<0.001
Other	25(39.68)	0.85(0.48-1.53)	0.592	3(8.82)	0.33(0.10-1.17)	0.087	8(12.7)	0.23(0.11-0.52)	<0.001	8(16.0)	2.29(0.88-5.96)	0.091
Employment												
Pensioner	40(40.82)	1		4(7.55)	1		8(8.16)	1		22(28.95)	1	
Employed	78(45.35)	1.2(0.73-1.99)	0.471	19(13.87)	1.97(0.64-6.09)	0.238	88(51.16)	11.8(5.4-25.8)	<0.001	15(10.49)	0.29(0.14-0.59)	0.001
Unemployed	63(48.46)	1.36(0.80-2.32)	0.251	24(26.67)	4.45(1.45-13.7)	0.009	29(22.31)	3.2(1.4-7.4)	0.006	14(13.59)	0.39(0.18-0.82)	0.013
Race												
Other	62(44.29)	1		8(9.2)	1		34(24.29)	1		38(27.54)	1	
Blacks	119(45.77)	1.06(0.7-1.61)	0.776	39(20.21)	2.5(1.11-5.60)	0.026	91(35.0)	1.67(1.06-2.67)	0.028	13(7.07)	0.2(0.1-0.39)	<0.001
Education level												
Primary	68(37.99)	1		21(19.44)	1		49(27.37)	1		25(19.69)	1	
Secondary	68(48.57)	1.54(0.98-2.41)	0.058	17(16.04)	0.79(0.39-1.60)	0.515	42(30.0)	1.14(0.69-1.85)	0.606	22(18.18)	0.91(0.48-1.71)	0.322
Tertiary	45(55.56)	2.04(1.19-3.47)	0.009	9(13.64)	0.65(0.28-1.53)	0.327	34(41.98)	1.92(1.11-3.32)	0.02	4(5.41))	0.23(0.08-0.69)	0.002
CVD												
No	94(49.47)	1		18(13.53)	1		63(33.16)	1		26(16.88)	1	
Yes	87(41.43)	0.72(0.49-1.07)	0.107	29(19.73)	1.57(0.83-2.98)	0.168	62(29.52)	0.84(0.56-1.28)	0.434	25(14.88)	0.86(0.47-1.56)	0.633

Daily fruit and vegetable consumption No Yes				24(16.44) 23(17.16)	1 1.05(0.56-1.97)	0.871	67(30.59) 58(32.04)	1 1.07(0.79-1.64)	0.755	24(13.33) 27(19.01)	1 1.52(0.84-2.78))	0.168
Health status Poor Moderate Good	78(43.09) 66(46.48) 37(48.05)	1 1.15(0.74-1.78) 1.22(0.72-2.08)	0.544 0.464	23(16.79) 12(12.5) 12(2.53)	1 0.71(0.33-1.51) 1.69(0.77-3.75)	0.365 0.191	73(40.33) 42(29.58) 10(12.99)	1 0.62(0.39-0.99) 0.22(0.11-0.46)	0.046 <0.001	20(13.16) 18(16.67) 13(20.97)	1 1.32(0.66-2.63)) 1.75(0.81-3.79)	0.431 0.155
Physical activity Not physically active Active (not adequate) Active (adequate)	31(45.59) 92(44.44) 58(46.40)	1 0.95(0.55-1.66) 1.03(0.57-1.87)	0.869 0.914	7(16.28) 21(15.91) 19(18.1)	1 0.97(0.38-2.48) 1.13(0.44-2.94)	0.954 0.792				21(35.59) 21(13.38) 9(8.49)	1 0.28(0.13-0.56) 0.17(0.07-0.39)	0.001 <0.001
Alcohol use Not harmful Harmful							86(36.91) 19(40.430)	1 1.16(0.61-2.21)	0.65	35(17.24) 7(15.91)	1 0.9(0.37-2.2)	0.831
Pack year							9.3(10.1)	0.97(0.95-0.99)	0.002	28.7(21.2)	1.06(1.04-1.08)	<0.001

Table 8: 12 months and lifetime quit attempts: multiple stepwise regression analysis

Variables	Categories	12 months quit attempts			lifetime quit attempt		
		OR	95%CI	P-value	OR	95%CI	P-value
Age		1.02	1.00-1.06	0.056	1.02	1.0-1.05	0.07
Gender	Male	1			1		
	Female	0.68	0.41-1.13	0.138	0.62	0.39-0.98	0.04
Marital status	Single	1			1		
	Married	1.26	0.63-2.48	0.513	1.65	0.90-3.02	0.108
	Other	2.02	0.87-4.70	0.102	2.07	0.92-4.69	0.078
Education	Primary	1			1		
	Secondary	1.43	0.78-2.60	0.246	1.04	0.61-1.78	0.865
	Tertiary	1.09	0.53-2.23	0.816	0.79	0.41-1.50	0.462
Hypertension	No	1			1		
	Yes	0.83	0.36-1.91	0.668	1.15	0.56-3.37	0.697
Diabetes	No	1			1		
	Yes	0.91	0.41-1.91	0.668	0.72	0.37-1.42	0.346
VTE	No	1			1		
	Yes	0.42	0.13-1.39	0.155	0.54	0.22-1.32	0.177
Harmful alcohol use	No	1			1		
	Yes	1.3	0.45-3.72	0.627	0.69	0.24-1.99	0.497
Health status	Poor	1			1		
	Moderate	1.03	0.57-1.88	0.911	0.84	0.5-1.42	0.522
	Good	3.0	1.5-5.99	0.002	1.46	0.76-2.8	0.251
Daily fruit and vegetable consumption	No	1			1		
	Yes	1.43	0.82-2.50	0.207	1.08	0.65-1.82	0.761
Physical activity	Not physically active	1			1		
	Active (not adequate)	1.19	0.58-2.45	0.635	0.95	0.50-1.8	0.881
	Active (adequate)	1.28	0.54-3.0	0.573	1.46	0.45-1.98	0.884
Ethnicity	Other	1			1		
	Black	1.36	0.74-2.50	0.98	0.34	0.20-0.58	<0.001
Employment status	Pensioners	1			1		
	Employed	2.16	0.87-5.39	0.099	2.76	1.23-6.23	0.014
	Unemployed	3.11	1.28-7.6	0.013	2.96	1.32-6.65	0.008
Mental health problem	No	1			1		
	Yes	1.03	0.87-5.39	0.099	0.54	0.21-1.45	0.223
Respiratory condition	No	1			1		
	Yes	1.94	0.77-4.91	0.966	1.16	0.46-2.92	0.745
Retroviral disease	No	1			1		
	Yes	3.89	1.56-4.91	0.162	6.25	1.93-20.2	0.002
CVD	No	1			1		
	Yes	0.84	0.33-9.72	0.724	0.50	0.21-1.16	0.107
Musculoskeletal disease	No	1					
	Yes	0.67	0.30-1.50	0.327	0.46	0.22-0.95	0.037

DISCUSSION

The aim of this study was to determine the association between tobacco users making quit attempts and engaging in other healthy lifestyle behaviour. The study found a low quit rate with poor uptake of healthy lifestyle behaviours among tobacco users. The findings reveal that most tobacco users were cigarette smokers (80.5%), with the majority reporting low nicotine dependence (60.9%). While 25% had attempted to quit in the past 12 months and 54.5% at least once in their lifetime, engagement in other healthy behaviours was minimal, with only 0.7% consuming five or more servings of fruits and vegetables daily, 36.6% achieving adequate physical activity, and 32.3% abstaining from alcohol. Furthermore, being unemployed, eating at least one portion of F&V daily, having a respiratory problem, living with HIV, and perceiving their general health as good, were all associated with making a quit attempt in the past 12 months among smokers. In contrast, smokers with CVD and respondents who self-identified as female or Black individuals were less likely to attempt quitting.

Only a quarter of tobacco users attempted to quit in the past year, a worrying finding in a population with high chronic disease burden as nearly half reporting CVD. This is much lower than previously reported in other studies conducted in South Africa – SASAS data in 2017 (60%)²⁷, in DYDH in 2019 (74%)¹⁸, the GATS South Africa in 2021 (40.5%)², and the United States CDC in 2022 (53%)³². The low quit attempt rate of 25% observed in this study may partly be explained by the impact of the COVID-19 pandemic, particularly the temporary ban on cigarette sales in South Africa during 2020. Restrictions during the pandemic also limited patient–clinician interactions and reduced brief cessation advice, a key driver of quit attempts³³. While the ban initially forced some smokers to reduce or temporarily stop smoking, evidence shows that many relapsed once the ban was lifted^{34,35}. This disruption may have created a pattern of intermittent cessation followed by relapse, undermining sustained quit attempts. Additionally, the pandemic imposed heightened psychosocial stress, including anxiety, isolation, and economic uncertainty, which are known barriers to quitting smoking^{34,35}. Consequently, when data were collected in 2023, the residual effects of these factors likely contributed to the observed low quit attempt rate in the past 12 months^{34,35}. Notwithstanding the above, this trend was not observed in the USA, where the CDC reported that 53.3% of adult smokers made a quit attempt in 2022, compared with the pre COVID-19 rate of 55.1% in 2018³².

Although most respondents smoked cigarettes, 19.5% used smokeless tobacco (SLT), primarily Black females³⁶. Evidence suggests that SLT users are less likely to make quit attempts, which is consistent with our findings; only 13% of SLT users reported a quit attempt. Continued SLT use despite 79.9% of users in South Africa reporting being aware of the adverse health risks (GATS survey;2021)² may be a pointer to the nicotine addiction that may come with SLT use, and hence the few users that reported making a quit attempt highlighting nicotine dependence as a likely barrier. These findings underscore the urgent need to prioritize SLT users for cessation interventions alongside cigarette smokers^{14,15}.

That Respondents with CVDs were less likely to make quit attempts is a clinical concern since smoking doubles the risk of incident stroke and quadruples the risk of incident heart disease^{1,37}. A systematic review and meta-analysis examining smoking after a diagnosis of heart failure found that 16% of patients continued to smoke even after their diagnosis. The authors emphasised the need for tobacco cessation treatments both before and after the diagnosis of heart failure³⁷. On the other hand, respondents who reported having a respiratory condition, living with HIV, and those who perceiving their health status as good were more likely to have made a quit attempt, may be due to respondents' knowledge of a direct link between smoking and respiratory diseases³⁸ and the exposure to health education programs in priority health programs such as the HIV program³⁸. In addition, those who perceived their health to be good may be more aware of the need to preserve the status quo and therefore be motivated to limit their health risks by quitting smoking. To this end, it is clinically imperative that healthcare workers take advantage of the clinical visits to assist their patients with chronic diseases of lifestyle, to reflect on their health status and build on this to motivate them to engage in healthier lifestyle behaviours.

An increase of one year in age was associated with a 1% higher probability of a lifetime quit attempt among all tobacco users, possibly because chronic health conditions tend to be more common with advancing age^{23,39}. Older tobacco users may therefore be more aware of their health vulnerabilities and risks, motivating more quit attempts. For the same reason, and to achieve greater benefits, healthcare practitioners may target older adults more actively for health promotion and counselling interventions, including tobacco cessation support. However, this finding contrasts with a longitudinal study in South Africa, which reported higher quitting rates among younger individuals²⁷, and the ITC 4-Country Survey (2002–2014), which found older tobacco users were less likely to attempt quitting⁴⁰.

Black South Africans were less likely to attempt quitting smoking than other ethnic groups, consistent with previous reports from the US⁴¹. This pattern may reflect significant socio-economic disparities within South Africa, where Black South Africans predominantly belong to lower socio-economic classes and experience higher psychosocial distress, contributing to unhealthy coping mechanisms, including continued cigarette smoking¹¹. These findings highlight the importance of strategies that address social determinants of health, targeting this population for tailored tobacco cessation interventions.

Tobacco dependence is known to influence both quit attempts and success. Most respondents (60.9%) had low nicotine dependence, aligning with a prior South African study showing that individuals with low nicotine dependence were more likely to intend to quit⁴². Smokers with low nicotine dependence are generally more amenable to non-pharmacological interventions such as counselling and behavioural therapy^{2,42}. Clinicians, particularly in primary care, should therefore be trained in tobacco dependence treatments, including brief advice and motivational counselling, which are effective in promoting quit

attempts and cessation³³. Yet, many clinicians lack confidence in delivering these interventions¹⁸ and would benefit from specialised training integrated into health professions education and continuous professional development⁴³.

Respondents who were Black, had tertiary education, or engaged in physical activity were less likely to have high nicotine dependence, consistent with previous South African studies¹⁸. Additionally, non-Black respondents smoked more than Black respondents and those with tertiary education, aligning with findings from the Society for Research into Nicotine and Tobacco, which suggest that tertiary education significantly reduces tobacco use in low- and middle-income countries⁴⁴. Tobacco use correlates with multiple socioeconomic factors and is unequally distributed across population groups, creating disparities that have important public health policy implications⁴⁴.

Most respondents did not meet WHO standards for fruit and vegetable (F&V) intake, physical activity, or alcohol consumption. The only lifestyle behaviour associated with quit attempts among smokers was consuming at least one serving of F&V per day, consistent with a 2020 community study in South Africa¹¹. However, only 0.7% of respondents met the recommended five servings of F&V per day, similar to recent household data (0.6%)³⁰. These findings suggest that consumption of F&V remains low in South Africa, and adopting one healthy lifestyle behaviour does not necessarily promote simultaneous uptake of others. Smokers making quit attempts may not be leveraging this motivation to reduce other NCD risks, such as improving diet or reducing alcohol intake³⁰.

Tobacco and alcohol use are prevalent and often concurrent in South Africa^{18,45}. Approximately 9.6% of the population reported both behaviours, with 20.3% engaging in harmful drinking²⁰. Black and unemployed respondents were more likely to consume alcohol excessively, whereas married individuals and females were less likely to engage in harmful drinking. These patterns may reflect socioeconomic disparities, as unemployed Black South Africans may lack alternative coping mechanisms for stress, anxiety, and depression, potentially promoting continued smoking and acting as a barrier to quit attempts. Moreover, smokers with alcohol use disorders often experience higher nicotine dependence and difficulties quitting⁴⁶. A study in England found that smokers attempting to quit were more likely to reduce alcohol consumption, reinforcing recommendations that tobacco users should consider stopping or substantially reducing alcohol intake before or during a quit attempt^{23,46}.

Individuals with tertiary education, Black respondents, non-pensioners, and those engaging in harmful drinking were more physically active. A 2023 meta-analysis found that physical activity interventions are effective in the short term, helping reduce cravings and withdrawal symptoms in highly nicotine-dependent individuals^{10,47}. However, these interventions did not significantly impact long-term cessation. Other studies indicate that physically active smokers tend to consume more F&V, have lower nicotine dependence, and are more likely to successfully quit⁴⁸. Although not directly established in this

study, evidence supports integrating physical activity into tobacco cessation and relapse prevention strategies^{23,48}

In conclusion, most tobacco users did not make a quit attempt in the last 12 months, and engagement in healthy lifestyle behaviours was low. While most smokers had low nicotine dependence, 18% had high dependence, highlighting the need for both counselling and pharmacotherapy in public and private healthcare. Making a quit attempt and simultaneously adopting other healthy lifestyle behaviours appears to be a complex behavioural endeavour and will require Future studies should ensure larger sample sizes for key subgroups to improve statistical power to understand how best to do this, taking cognisance of the influence of socioeconomic characteristics, nicotine dependence levels, other concurrent health risks and tobacco users' perceptions of their own health status. These findings have the potential to improve outcomes of chronic diseases care, considering that tobacco use (in particular smoking) is a traversal risk factor among most NCDs. To enhance high level of uptake among primary health care practitioners in the NHI, tobacco cessation treatments need to be considered as a defined medical intervention package with prescribed minimum benefit.

STUDY STRENGTHS AND LIMITATIONS

As far as the authors could ascertain, this is the first South African study to investigate the association between making quit attempts and concurrent engagement in other healthy lifestyle practices among tobacco users in a clinical setting. This research provides valuable insight about this associations as well as the potential mediating role of nicotine dependence. However, as a cross-sectional study, it could not infer causation. Additionally, the reliance on self-reported data for key variables introduces the risk of information and reporting biases, which may have affected the outcome estimates. Self-reporting methods are also susceptible to social desirability and information biases, potentially leading to errors in estimates, particularly for lifestyle variables such as diet, alcohol use, and physical activity. The study was conducted at a single site using consecutive sampling, which may limit generalisability to other populations or settings. Additionally, some subgroup analyses—particularly for smokeless tobacco users (n=78)—may have been underpowered, reducing the ability to detect statistically significant associations within these smaller groups. This limitation should be considered when interpreting subgroup results. However, despite these limitations, the findings are useful for understanding the intricacies of the associations between quit attempts and lifestyle behaviours, as well as the role of nicotine dependence, among smokers in a hospital setting in South Africa. Moreover, the findings have potential to inform policy and clinical interventions aimed at health promotion, smoking cessation, and supporting quit attempts within the healthcare system.

CONCLUSION AND RECOMMENDATIONS

With only 25% of respondents attempting to quit in the past year and nearly 18% presenting high nicotine dependence, there is an urgent need for stronger cessation support in South Africa. Pharmacotherapy should be made routinely available in the public sector and included in the upcoming National Health Insurance coverage. At the same time, cessation support should be integrated with strategies that address unhealthy diet, alcohol misuse, and physical inactivity, given their strong overlap with tobacco use. Prioritising these interventions within the framework of the National Health Insurance is essential to reducing preventable morbidity and mortality from tobacco-related diseases in South Africa.

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SUPPLEMENTARY MATERIAL

Supplementary material submitted with the manuscript will be available at *Tobacco induced disease* online.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHORS' CONTRIBUTIONS

N.M., E.E., and O.B. were involved in the research conceptualization and design, development of the proposal, data analysis, and drafting and approval of the final draft of the manuscript. N.M. was responsible for the data collection.

DISCLAIMER

The perspectives and opinions presented in this article are solely those of the authors and do not represent the official stance of any institutions with which they are affiliated.

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Appendix 1: TOBACCO RESEARCH QUESTIONNAIRE

Questionnaire

Respondents Code : (000 – 400)

Instructions

Thank you for agreeing to participate in this study. It should not take longer than 20 minutes to complete this questionnaire. Your responses are confidential and will not be traceable to you.

Note: In this study, tobacco use includes any of the following: smoking, snuff use, chewing tobacco, and waterpipe (hookah).

Regarding the type of tobacco product use:

*For smokers ONLY, please complete Sections QUESTION 9-13

*For snuff users ONLY, please complete Sections QUESTION 14-17

*For tobacco users who smoke and use snuff products, please complete all the question: 9-17

SECTION A. RESPONDENT'S SOCIODEMOGRAPHIC CHARACTERISTIC

1.

Your age at your last birthday is	years
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Choose one most appropriate option in Question 2-Question 6

2.

Gender	Male
	Female

3. **Marital Status:**

Single	
Married	
Divorced	
Widowed	
Separated	

4. **Occupation:**

Pensioner	
Professional	
Student	
Self-employed	
Unemployed	
Artisan	

5. **Educational attainment:**

Started but did not complete high school	
Completed Matric	

No Schooling	
Post matric diploma	
University degree	
Primary school education	

6. Racial ethnicity:

African	
White	
Coloured	
Indian	
Others	
I don't know	

SECTION B. CLINICAL INFORMATION

7. What health problem(s) made you come to the hospital today? (List as many as you are aware) and how long ago have you had this/these health condition (s)?

Condition	Duration since diagnosed (years)

SECTION C. TOBACCO USE INFORMATION

8. Which of the following tobacco product(s) do you use? (you may choose more than one)

Cigarette	
Snuff	
Hookah /Waterpipe	
Chew tobacco leaves	
Others (Please specify) e.g., e-cigarette, "Biddi", Toombak, etc	

- For **cigarettes smokers**, fill question **9 to 13 only**.
- For **snuff** (smokeless tobacco) users, please fill question **14 to 17 only**.
- For those **who use both cigarettes and snuff**, fill all question **9 to 17**

Cigarette use

9. Do you currently smoke tobacco daily, less than daily, or not at all?

Daily	
Less than daily	
Not at all	
Do not know	

10. Types of cigarettes used.

Manufactured cigarettes (Pick applicable one)	- Only Menthol [] - Only Non menthol [] - Either []
Hand-rolled cigarettes	
Pipes full of tobacco	
Cigars	
Others (Please specify)	

11.

How long have you been smoking cigarettes?	(years)
--	---------

Cigarette smoking nicotine dependence information.

12.

How many cigarettes do you smoke per day?	
---	--

13. How soon after you wake up do you usually have your first smoke? Would you say within 5 minutes, 6 to 30 minutes, 31 to 60 minutes, or more than 60 minutes? (Only pick the time that best describes your behaviour)

Within 5 minutes	
6 to 30 minutes	
31 to 60 minutes	
More than 60 minutes	

Smokeless tobacco use

14. Do you currently use smokeless tobacco daily, less than daily, or not at all? (snuff, water-pipe, Bididi, Toombak)

Daily	
Less than daily	
Not at all	
Do not know	

Types of snuff used.

Industrially manufactured snuff (Ntsu, Taxi, etc)	
Home-made traditional snuff	
Others. Specify	

15. How long have you been using snuff?

Years

Smokeless tobacco nicotine dependence information

16. How many snuff dips do you take per day?

Times

17. How soon after you wake up do you usually have your first smoke? Would you say within 5 minutes, 6 to 30 minutes, 31 to 60 minutes, or more than 60 minutes? (Only pick the time that best describes your behaviour)

Within 5 minutes	
6 to 30 minutes	
31 to 60 minutes	
More than 60 minutes	

SECTION D. QUIT ATTEMPT

18. Have you ever tried to quit tobacco use? If yes, complete question 20 and 21
If no, go to question 22.

YES	
NO	

19. During the past 12 months, have you tried to stop using tobacco?

YES	
NO	

20. How many times have you tried in the past 12 months?

Times

SECTION F. HEALTH STATUS

Which of the following would you say best describe your health in general?

Excellent	
Good	
Average	
Poor	
Don't know	

SECTION G. LIFESTYLE BEHAVIOURS

G.1: INTAKE OF FRUITS AND VEGETABLES

1. Please tell me how often you eat fruits, excluding drinking juice.

Three times or more a day	
Twice a day	
Once a day	
Less than once a day but at least 4 times a week	
Less than 4 times a week but at least once a week.	
Less than once a week	
Never	
Do not know	

2. Please tell me how often you eat vegetables or salad, excluding potatoes.
(Including FROZEN VEGETABLES)

Three times or more a day	
Twice a day	
Once a day	
Less than once a day but at least 4 times a week	
Less than 4 times a week but at least once a week	
Less than once a week	
Never	
Do not know	

G.2 PHYSICAL ACTIVITY

Next, I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.

Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores, harvesting food/crops, fishing or hunting for food, seeking employment.

In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart beat, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate.

	Questions	Response
Question 1	Does your work involve vigorous activities , (like heavy lifting, digging, or heavy construction) for at least 10 minutes at a time? vigorous-intensity activity that causes large increases in breathing or heart rate	- Yes - No - If no, go to Question 4
Question 2	In your usual week, on how many days do you do vigorous intensity activities as part of your work?	Number of days:
Question3	On a usual day on which you do vigorous activities, how much time do you spend doing such work?	Hours Minutes
Question 4	Does your work involve moderate-intensity activities that causes small increases in breathing or heart rate such as brisk walking (like brisk walking or carrying light loads) for at least 10 minutes at a time?	- Yes - No
Question 5	In a usual week , how many days do you do moderate-intensity activities as part of your work?	Number of days
Question 6	On a usual day on which you do moderate intensity activities, how much time do you spend doing such work?	Hours: Minutes:
Question 7	How long is your usual workday?	

Sitting / Resting Activity: Over the **past 7 days**, how much time did you spend sitting or lying down on **a usual day (excluding sleeping)**? This may include time sitting at a desk, sitting with friends, reading, traveling in car, bus, train, reading, playing cards, or sitting down to watch television **during working hours and leisure or spare time**.

Question 8	Over the past 7 days , how much time did you spend sitting or reclining (lying) on a usual day (excluding sleeping) ?	Hours: Minutes:
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G.3: ALCOHOL INTAKE

Do you take drinks containing alcohol such as beer, wine, ciders, spirits, or sorghum beer?

2.PROBE: Even one drink?

YES	
NO	

IF NO, thank you for your participation, you have successfully completed all questions.

If YES, complete questions 26 to 28.

1. How often have you had a drink containing alcohol in the last year? (Consider a drink to be a can or bottle of beer or cider, a glass of wine, or one cocktail shot of hard liquor (such as scotch, gin, whisky, vodka) or other drinks containing alcohol) Please choose the most appropriate answer.

Never	
Monthly or less	
Two to four times a month.	
Two to three times per week	
Four or more times a week	

2. How many drinks did you have on a typical day when you were drinking in the past year?

Never	
1 or 2	
3 or 4	
5 or 6	
7-9	
≥10	

3. How often in the last year have you had 6 or more drinks on one occasion?

Never	
< monthly	
Monthly	
Weekly	
Daily or almost daily	

THANK YOU FOR YOUR TIME AND RESPONSES.

APPENDIX 2: CONSENT FORM

I have been requested to participate in this research by

I understand that i will have to answer question related to my use of tobacco products, my diet and physical activity, including my use of drinks containing alcohol.

I accept that there is no compensation involved and that my participation is voluntary.

I understand that I will not be penalized if I refuse to participate or decide to pull out of this research study.

You may Contact Dr NM Kapinga at 0119516000 for any query at any time.

You may contact the Wits Human Research Committee at 0117171252 for any query on your right as a research respondent.

If you agree to participate, a signed copy of this document with the information sheet, including the research summary, will be given to you.

All information, including the summary and the consent form, has been described to me through this information sheet.

I,, hereby give consent to participate in the condition as mentioned above for the research study.

Patient:

Witness 1:

Witness2:

APPENDIX 3: ETHICAL CLEARANCE



R14/49 Dr Ntumba Monica Kapinga

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M201173

NAME: Dr Ntumba Monica Kapinga
(Principal Investigator)
DEPARTMENT: Family Medicine
Dr Yusuf Dadoo Hospital, West Rand District

PROJECT TITLE: Quit attempt and other lifestyle behaviours among tobacco users attending Dr. Yusuf Dadoo hospital, Gauteng, South Africa

DATE CONSIDERED: 27/11/2020

DECISION: Approved unconditionally

CONDITIONS:

SUPERVISOR: Dr E.E Wenegieme and Prof O.B Omole

APPROVED BY: 
Dr CB Penny, Chairperson, HREC (Medical)

DATE OF APPROVAL: 08/03/2021

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the Third Floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. 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 resubmit the application to the Committee. **I agree to submit a yearly progress report.** The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in **November** and will therefore be due in the month of **November** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

APPENDIX 4: PERMISSION TO CONDUCT RESEARCH

	DR. YUSUF DADOO HOSPITAL Office of the CEO Enquiries: Dr. R. Pheto ☎: (011) 951 – 6228/6161 ✉: Rodney.Pheto@gauteng.gov.za
Date: 20 th February 2023	
 Dr. N.M Kapinga Family Medicine Registrar ☎: 082 742 2661 ✉: monikapinga@yahoo.com	
<u>RE: PERMISSION TO CONDUCT RESEARCH STUDY AT DR. YUSUF DADOO HOSPITAL</u>	
Title: "Quit attempt and other lifestyle behaviors among among tobacco users attending Dr. Yusuf Dadoo Hospital"	
Permission is hereby given to Family Medicine Department in the West Rand District to conduct research study on the above-mentioned topic.	
You are therefore expected to adhere and comply with the ethics of research as stipulated in the research policy.	
Regards 	
Dr. Rodney Pheto Chief Executive Officer Dr. Yusuf Dadoo Hospital 011 951 6228/6161 Date: 20/02/2023	
Dr. YUSUF DADOO HOSPITAL PRIVAATSAK/PRIVATE BAG X2006 2023 -02- 20  KRUGERSDORP 1740 CHIEF EXECUTIVE OFFICER	

APPENDIX 5: RESEARCH PROPOSAL

RESEARCH PROTOCOL

QUIT ATTEMPT AND OTHER LIFESTYLE BEHAVIOURS AMONG TOBACCO USERS ATTENDING DR YUSUF DADOO HOSPITAL, GAUTENG, SOUTH AFRICA

**Research protocol submitted to the Faculty of Health Science, University of the Witwatersrand,
in partial fulfilment of the requirements for MMed - Family Medicine**

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Johannesburg 2020

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ANNEXURE 7	Error! Bookmark not defined.

Definition of terms

All definitions are taken from WHO's smoking and tobacco policy document.

- **Tobacco user:** Someone who uses any tobacco products, including smoking, sucking, chewing, or snuffing.
- **Tobacco product:** Products entirely or partly made of the leaf tobacco as raw material, which is manufactured for use in smoking, sucking, chewing, or snuffing.
- **Smokers:** Persons who smoke any tobacco product, either daily or occasionally - cigarette smoking, cigar-smoking, pipe-smoking, shishas, or hookah smoking
- **Smokeless tobacco:** A type of tobacco that is not smoked or burned. It may be chewed, inhaled by nose or mouth by dry snuff or moist snuff called snus.
- **A quit attempt** is defined as an attempt to stop tobacco use, which lasted one day or >24 hr.
- **"Intention to quit"** is the willingness to quit within the next months.

Acronyms:

- DYDH: Dr Yusuf Dadoo Hospital
- GATS: Global Adults Tobacco Survey
- HSI: Heaviness of Smoking Index
- HND: Higher nicotine dependence
- OPD: Outpatient Department
- SLT: Smokeless Tobacco
- WHO: World Health Organization

Introduction

Tobacco is the only legal drug that kills many of its users when used exactly as intended by the manufacturers. Tobacco use remains the primary risk factor leading to reduced life expectancy and early death worldwide, with approximatively eight million deaths each year^{1,2}. Tobacco smoking is deadly, even in non-smokers, causing around 1.2 million deaths due to second-hand smoke exposure^{1,2}.

The WHO considers the use of tobacco products (smoking and smokeless) to be harmful. Furthermore, the high prevalence of tobacco dependence and the low rate of quitting are associated with increased risk of death from non-communicable diseases, such as COPD, heart disease, stroke, and cancer in older adults^{2,3}.

Despite the intention to quit, many tobacco users fail as the odds of a successful attempt drops with higher nicotine dependence (HND) and concurrent risky lifestyle behaviour³.

Other unhealthy lifestyles, such as physical inactivity and poor diet, have become growing health problems associated with obesity. Worldwide, overweight and obesity have become a global pandemic, with an increased risk of mortality related to non-communicable diseases (NCD) such as diabetes, cardiovascular disease, and cancer^{4,5}. Data from the South African Demographic and Health Survey (SADHS 2016) are alarming; 68% of women were found to be overweight, with 41% being obese, and 31 % of men overweight, with 11% being obese⁶. Tobacco use, obesity, and harmful alcohol use pose serious public health hazards, resulting in overwhelming cases of preventable diseases, increased medical expenditure, and deaths^{3,7,8}. While tobacco smoking represents 4.0% of the total disability-adjusted life years (DALYs), obesity and alcohol use represents 2.9% and 7.0% of total DALYs each; both ranking in the top five risk factors and burden of disease in South Africa⁹.

Lifestyle behaviours have a direct impact on the health of individuals and the general population. A healthy lifestyle behaviour includes a low glycaemic diet with high consumption of fruit and vegetables, increased physical activity with moderate to vigorous exercise, and moderate to no alcohol consumption¹⁰. For the ultimate fitness, lifestyle behaviour should combine intensive dietary change with physical activity⁵.

Multiple evidence suggest that unhealthy lifestyle behaviours tend to cluster around each other, increasing the negative health outcome^{8,11}. Thus, individuals have a common tendency to engage in multiple unhealthy behaviours, such as tobacco smoking, physical inactivity, unhealthy diet, excessive alcohol use or use of illicit drugs, and unsafe sexual practice, at the same time^{8,11,12}. Besides the health component, multiple unhealthy lifestyle behaviours may be associated with socioeconomic inequalities, especially as these tend to be common among the lower socioeconomic class^{8,13}. A Canadian study reported that smoking cessation intervention could be particularly challenging in the context of co-existing unhealthy lifestyle behaviours, as the odds of becoming dependent on nicotine increase by 23% with every unhealthy behaviour⁸.

The World Health Organization (WHO) supervised the development of the world's first global health treaty, the Framework Convention on Tobacco Control (WHO FCTC), adopted by the United Nations (UN) and ratified by 179 countries, including South Africa. Despite strategies encouraged by MPOWER, with the bans on direct or indirect advertisement of tobacco products, the increase of retail prices, and warning signs on the packaging, tobacco products still attract millions of people every year¹⁴. The use of tobacco by individuals introduces nicotine into their bodies, which is highly addictive and promotes dependence. Other constituents of tobacco products are toxic and carcinogenic and are responsible for diseases^{2,15}.

Tobacco dependence is considered a disease that should be diagnosed and treated as any other chronic condition¹⁶. The term tobacco/nicotine addiction or nicotine dependence is now referred to as tobacco use disorder, according to the DSM-5 manual¹⁷. For this reason, healthcare providers must intervene by initiating tobacco cessation interventions^{18–20}. Much research has pointed out the potential of healthcare providers of any group in promoting tobacco use cessation¹. Evidence has demonstrated that smoking cessation at any given age offers substantial health benefits compared to those who carry on smoking^{20,21,18}. Consequently, those who stop using tobacco products are likely to stop or even reverse the disease progression with an immediate result, such as lowering blood pressure within 20 minutes and lowering carbon monoxide in blood within 12 hours^{2,18,22}.

An intention to quit smoking represents a healthy lifestyle modification and is a strong predictor of a quit attempt²³. The basis for intention to quit is the respondent's responses to "Do you plan to quit smoking in the next six months or the next 12 months." The definition of quit attempt is an attempt to stop smoking that lasts one day or 24 hours. It requires a conscious resistance to the urges to use any form of tobacco product, usually through motivation, often pharmacotherapy, and mindfulness training. Any health system has to incorporate into its coverage a program to help tobacco users quit²². Therefore, promoting a quit attempt at tobacco use is a desirable clinical and public health imperative. Brief motivational interviews (BMI) from health providers increase the chances of a successful quit attempt by 30%, while quitting is increased by 87% with intensive counselling sessions and follow up²².

The proportion of tobacco users intending to quit smoking in a year ranged between 60% and 72.3% in the USA in 2017²⁴. In a South African study, this estimate was 42%, signifying that 58% were not interested in quitting, although 82% had attempted quitting in the previous year¹⁷. Female gender, older age, higher education level, living or working where smoking is prohibited, low nicotine dependence, beliefs that tobacco products are harmful, and health concerns increase the likelihood of a quit attempt^{20,25}. However, while supporting the other findings above, a recent South African study found that higher socioeconomic status decreased the likelihood of planning or making a quit attempt.³ Multiple studies have shown that those with past or present alcohol use disorder have a decreased likelihood of making a quit attempt or a higher chance of relapse^{21,26}.

While smokers with higher nicotine dependence are less likely to attempt to quit,³ studies consider weight gain as a barrier to quitting smoking²⁷. However, a recent systematic review in 2019 revealed an association between hookah pipe smoking and obesity²⁸.

Problem statement

Quitting tobacco use is challenging for most users and is dependent on several factors, including the stage of intrinsic motivation, level of nicotine dependence, and sociodemographic context. The result is that many tobacco users will need several quit attempts before succeeding¹². Furthermore, motivational interviews that promote quit attempt are more likely to be successful among tobacco users with prior quit attempts⁸. While unhealthy behaviours tend to cluster around one another, the converse is also true^{3,12}, and quit attempts are therefore more likely to succeed among tobacco users who are engaged in one form of healthy lifestyle behaviours or the other than those who are not¹⁵.

A significant proportion of patients attending the OPD in a district hospital do so for the management of non-communicable diseases of lifestyle origin. Healthy lifestyle changes, including tobacco use cessation, are therefore paramount in this population. However, literature is sparse on whether tobacco use quit attempt promotes simultaneous uptake of other healthy lifestyles among ambulatory hospital patients and the extent to which nicotine dependence affects this? This is important for tobacco control in South Africa and other developing countries, considering that tobacco use in this population is at epidemic proportions and that tobacco users attending the hospital for care may already have one or more other health risks. The only available study in South Africa is a recent community-based study, which found that quit attempts were more likely among smokers who engaged in frequent fruit and vegetable intake and less likely among those who reported problematic alcohol use³. We hypothesize that those who are engaged in healthy lifestyle behaviours may be the ones attempting to quit.

Rationale

In the population of patients attending a hospital OPD, promoting quit attempt is a clinical imperative. However, lifestyle behaviours tend to cluster around one another, and it is important to implement lifestyle changes targeting other unhealthy lifestyle behaviours. Knowing the relationship between quit attempt and other healthy lifestyle among these tobacco users is therefore crucial for understanding how to develop strategies that may promote the simultaneous uptake of multiple healthy lifestyles in this population.

Aim

To explore the relationship between quit attempt, nicotine dependence and lifestyle behaviours among tobacco users who present at the outpatient department (OPD) of Dr. Yusuf Dadoo Hospital (DYDH), Gauteng Province, South Africa.

Objectives

1. To describe the tobacco use patterns, including the mean cigarette smoked and snuff dips per day, duration of smoking or/and snuff use, and nicotine dependence levels.
2. To determine the proportions of tobacco users engaged in each lifestyle, regular fruit and vegetable intake, physical activity, and non-harmful alcohol intake.
3. To determine the proportion of respondents who have ever or attempted to quit in the last 12 months.
4. To test for associations between sociodemographic characteristics, tobacco use patterns, including level of nicotine dependence, lifestyle behaviours, and quit attempt.

METHODOLOGY

Study design:

This study will be a quantitative cross-sectional study with a descriptive and analytic component.

Study site:

The study will be conducted at the Outpatient department of DYDH, a district hospital in the West Rand District of Mogale City, Gauteng. DYDH has 245 beds and offers essential ambulatory and in-hospital healthcare services. In the OPD, patients are seen daily from Monday to Friday from 8 a.m. to 4 p.m. The hospital catchment population was estimated at *435 511 in 2020*.

Study population:

The population under study will be all tobacco users who present to the OPD at DYDH during consultation times from Monday to Friday, except for emergency patients. According to the district health information system (2019), there were about 26 632 patient-visits at the OPD of DYDH in 2019. Most of these visits were for monthly management of chronic patients of an estimated 2220 patients per month in the year.

Sample size and sampling

The DYDH OPD attended to an average of 2220 patients per month in 2019. In addition, a previous study in the same setting, by Bokoro et al. (2020), found a tobacco use prevalence of 20.0%. With the help of a statistician, and assuming a margin of error of 5% and a confidence level of 95%, the estimated sample size was 336. To account for non-response and missing data, this sample was increased by 10%, resulting in a final sample size of 400.

During the study, the researcher will work in the OPD at DYDH. Posters in English, Sotho, and Afrikaans about the research will be placed in the OPD department with hospital management authorisation. A trained research assistant will notify patients of the ongoing study once the morning's health promotion talks are completed. Those who wish to participate will be advised that they will not lose their positions in the queue, as they will be returned as soon as they finished to their positions on the queue. Other patients would also be advised to this effect.

All patients visiting the OPD will undergo screening for tobacco use as part of the staff nurse's routine screening and triaging system in a "triage" room. A trained research assistant proficient in English and other local languages (Setswana, Afrikaans, Sotho, and Zulu) will notify all patients of the ongoing study and invite all to participate. Non-tobacco users will be directed to their usual care path after being thanked for their interest. The researcher and the trained research assistant will give consecutive current tobacco users a respondent information leaflet and invite them to participate in the study while waiting in the queue to see the doctor on duty. Those willing to participate will sign a written consent afterward. Those unwilling will receive a verbal thank you and be re-directed to continue with their care accordingly. The enrolling of consecutive consenting patients will continue until the sample size is achieved. All screened patients will have a sticker on their files to avoid multiple recruitment.

Inclusion criteria

- All tobacco users age ≥ 18 years
- Must sign a written consent.

Exclusion criteria

- Critically ill patients and emergencies
- Patients who present outside of normal working hours (07h30 – 16h00) and weekends
- Patients who speak languages other than English, Setswana, Afrikaans, Sotho, and Zulu

Measuring tool or instrument

A researcher-administered questionnaire, written in English only, will be used to collect data. A trained research assistant with proficiency in other languages will help respondents unable to communicate in English. Each questionnaire will receive a code to ensure anonymity. The questionnaire, developed with inputs from relevant literature on tobacco use, nicotine dependence, quit attempt, and lifestyle behaviours, will have four sections:

- The first section will include respondents' sociodemographic characteristics, such as gender, age, employment category, ethnicity, socioeconomic status, etc.
- The second section will focus on respondents' smoking patterns and will have input from the Global Adult Tobacco Survey (GATS) questionnaire²⁹. The GATS questionnaire is an internationally valid and reliable tool used to obtain information on tobacco use and quit

attempts. Assessment of harmful alcohol use will be done via the short version of the Audit-C questionnaire tool using three questions.

- The third section will collect nicotine dependence information using the Heaviness of Smoking Index (HSI) tool, which has been validated as a good measure of nicotine dependence³⁰.
- The fourth section will collect information on respondents' engagement in lifestyle behaviours - physical activity, alcohol use, dietary intake of fruits and vegetables. These behaviours will be as measured in the South African Social and Attitudes survey (SASAS) of 2016⁶.

Data collection

Data collection will commence only after obtaining ethics clearance from the Human Research and Ethics committee of the University of the Witwatersrand and permission from the DYDH hospital management.

After recruitment and consenting processes, the researcher or research assistant, as appropriate, will administer the questionnaires to respondents in a separate room adjacent to the OPD waiting area to ensure confidentiality. Upon completing the questionnaire, respondents will be thanked and return to their position or the next most appropriate position in the queue. The completion of the questionnaire will last no more than 20 minutes. Once completed, the researcher will collect all questionnaires daily and keep the data safe in a secured electronic file.

Data analysis

A statistician will assist with data analysis. Data from the completed questionnaires will be entered into STATA for analysis.

Descriptive statistics will summarise respondents' sociodemographic and clinical characteristics, the types, and patterns of tobacco use. The proportions of respondents within a gender category, their marital status, educational attainment, racial ethnicity, clinical diagnosis, and tobacco use type will be determined and reported with their confidence intervals. The mean age, cigarette smoked per day, snuff use per day, smoking duration, or/and snuff use will be determined and reported with their standard deviations. The proportions of tobacco users who engage in each lifestyle behaviour, those who have planned and/or made a quit attempt, will be summarised as percentages with confidence intervals.

Smokers will be categorised into nicotine dependence levels using their scores on the Heaviness of Smoking Index questions. The HSI, developed from the Fagerstrom questionnaire, has been found reliable and valid for nicotine dependence measures. It is made of two questions: the number of cigarettes smoked per day (CPD) and the time to first cigarette (TTFC) smoking in the morning. The number of cigarettes smoked per day, will be scored, "0" = 1-10 cigarettes; "1" = 11-20 cigarettes; "2" = 21-30 cigarettes and "3" > 30 cigarettes per day. The time to first cigarette from waking up in the morning will be scored, "3" for ≤ 5 minutes; "2" for 6 to 30 minutes; "1" for 31 to 60 minutes, and "0" for more than 60 minutes. The maximum total score of the two components is 6 points. Nicotine

dependence levels are categorised as: 0-2: low nicotine dependence; 3-4: moderate nicotine dependence; 5-6: high nicotine dependence.

Lifestyle behaviours will be assessed as follows:

- For the diet, respondents will be asked about the number of times they eat fruit and/or vegetables per day/per week.
- For physical activity, we will use the benchmark of the WHO physical exercise: the **Global Physical Activity Questionnaire (GPAQ)**. The Global Physical Activity Questionnaire was developed by WHO for physical activity surveillance in countries. It collects information on physical activity participation in three settings (or domains) as well as sedentary behaviour. GPAQ: vigorous and moderate activity at work, transport activity, vigorous and moderate activity during leisure time, as well as sitting. METs (Metabolic Equivalents) are commonly used to express the intensity of physical activities and are also used for the analysis of GPAQ data.
- **WHO Recommendations on physical activity for health.**

For the calculation of a categorical indicator, the total time spent in physical activity during a typical week and the intensity of the physical activity are considered.

Throughout a week, including activity for work, during transport and leisure time, adults should do at least

- 150 minutes of moderate-intensity physical activity OR
- 75 minutes of vigorous-intensity physical activity OR
- An equivalent combination of moderate- and vigorous-intensity physical activity achieving at least 600 MET-minutes.

For the purpose of this study, The MET minutes will not be calculated.

- For alcohol intake, The Alcohol Use Disorders Identification Test-Concise (AUDIT-C) questionnaire is a brief alcohol screen that reliably identifies patients who are hazardous drinkers or who may have active alcohol use disorders. The AUDIT-C contains the first three questions of the full Alcohol Use Disorders Identification Test (AUDIT) Instrument. Respondents who score ≥ 8 will be classified as reporting harmful alcohol use. Less than 14 units of alcohol per week for women; 21 units of alcohol per week for men is considered standard. Question 1: How often do you have a drink containing alcohol? Answer: Never (score 0), Monthly or less (score 1), 2–4 times per month (score 2), 2–3 times per week (score 3), 4+ times per week (score 4). Question 2: How many units of alcohol do you drink on a typical day when you are drinking? Answer: 1–2 (score 0), 3–4 (score 1), 5–6 (score 2), 7–9 (score 3), 10+ (score 4). Question 3: How often have you had 6 or more units if female, or 8 or more if male, on a single occasion in the last year? Answer: Never (score 0), Less than monthly (score 1), Monthly (score 2), Weekly (score 3), Daily or almost daily (score 4).

Chi-square test, t-test, or ANOVA will be used to perform group comparisons between respondents who have made a quit attempt and those who have not, regarding sociodemographic, tobacco use pattern (including nicotine dependence), presenting clinical problems, and lifestyle behaviours.

Significant associations will be entered into a stepwise logistic regression analysis to determine the factors independently associated with planning/or making a quit attempt. Statistical significance will be set at $p < 0.05$.

Objectives	Statistical tests	Outcome measures
To describe the tobacco use patterns, including the mean cigarette smoked and snuff dips per day, duration of smoking or/and snuff use, and nicotine dependence levels.	- Descriptive statistics frequency and percentages, including mean and standard deviation for continuous variable. - Proportion and percentage for categorical variable - Central tendency measure - Cross tabulation	- Representativeness of the sample in terms of age, gender, marital status, Clinical diagnosis characteristic of tobacco users - The mean cigarette/ snuff used per day, the duration of smoking, or/and snuff use will be determined with their standard deviations. - The proportion of respondents who smoke and those using SLT - The percentage of tobacco users with HND
- To determine the proportions of tobacco users engaged in each lifestyle in a healthy diet, physical activity, and non-harmful alcohol intake. - To determine the proportion of respondents who ever made a quit attempt or attempted to quit in the last 12 months	- Descriptive statistics in terms of frequency and percentage - Descriptive statistics in terms of frequency and percentage	- The proportion/ percentages of respondents who are engaged in regular exercise, healthy or unhealthy diet and harmful alcohol use. - The proportion / percentages of respondents who quit attempt in the past 12 months.

To explore the relationship between respondents' sociodemographic and clinical characteristics, nicotine dependence, lifestyle behaviours, and quit attempts.	Chi-square test, T-tests, and ANOVA test for categorical and numerical variable testing	To determine there is a statistically significant relationship using p value < 0.05 and C.I of 95%
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Ethical considerations

We will obtain authorisation from the various committees before commencing the research:

- The Human Research Ethics Committee (HREC) of the University of Witwatersrand.
- The provincial research council.
- Permission will be sought, and approval obtained from the West Rand Health District Director before commencing the study.
- Permission from the CEO of Dr. Yusuf Dadoo Hospital prior to commencing the study.
- Patient consent, once the above approvals are in hand. The confidentiality of all information will be assured by electronic data capturing and coding, which will be kept solely by the researcher.
- The study results will be submitted in a report to the District manager and facility manager of the hospital.
- The study findings may be published in peer-reviewed scientific journals.
- Raw data and study materials will be stored for five years under a lock and key, and shredded thereafter.

Pilot study:

Carletonville Hospital, a district hospital in the West Rand district, located in Merafong City, Gauteng, will be the pilot study setting with 40 respondents; this translates to a 10% sample size.

Limitations:

- The study's self-report methods may result in social desirability and information biases, and errors in estimates.
- The cross-sectional design negates any causal relationship among variables.
- As this will be a single centre that employs consecutive sampling methods, generalisation of study findings to other settings may be limited.

TIMEFRAME

	July 2020	Aug 2020	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	March 2021	April 2021	May 2021	June 2021
Literature review												
Preparing protocol												
Protocol assessment												
Ethics application												
Provincial application												
Collecting data												

BUDGET

Item	Cost per item and number needed	Estimate
Printed research questionnaire in English	300 pages @ R2 each	R600.00
Pens	15 x R10	R150.00
Cardboard	20 x R65	R1300
Traveling to Carletonville Hospital, a round trip per day for five days	5x R250	R1250

Research assistant	R70 per hour For 10 hours per week for 12 weeks	R8400.00
Statistician	Available @ WITS	-
Editing and proofreading	50 pages @ R65 per page	R3250
Printing of protocols/Research Report		R3000
Total		R17,950.00

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APPENDIX 6: PROOFREADING CERTIFICATE



103 Kieser Street
Rietondale
Pretoria
Gauteng
0084
South Africa

21 February 2025

To Whom It May Concern,

RE: Language Editing of Manuscript to be Submitted

This letter serves as confirmation that the manuscript titled below, has undergone professional language editing. The following items were reviewed and corrected: spelling, grammar, punctuation, sentence structure, and phrasing of the document.

Title: THE ASSOCIATION BETWEEN QUIT ATTEMPT AND OTHER LIFESTYLE BEHAVIOURS AMONG TOBACCO USERS ATTENDING DR YUSUF DADOO HOSPITAL, GAUTENG PROVINCE, SOUTH AFRICA

Author: Monica Kapinga

A copy of the thesis with markup can be made available upon request. Should you require further information, kindly contact me on AbedaDawood7@gmail.com.

Yours Sincerely,

Abeda Dawood
Academic Editor

Appendix 7: Turnitin report

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PRIMARY SOURCES			
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11	Sanni Yaya, Bishwajit Ghose. "Fruit and vegetable consumption among adults in	<1%	



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Submission title: 2040892 Final MMed report Kapinga Faculty submission.docx
File name: 2040892_Final_MMed_report_Kapinga_Faculty_submission.docx
File size: 100.21K
Page count: 14
Word count: 6,971
Character count: 38,407
Submission date: 15-Apr-2025 03:04PM (UTC+0200)
Submission ID: 2646852924

ASSOCIATION BETWEEN QUIT ATTEMPT AND OTHER LIFESTYLE BEHAVIOURS AMONG TOBACCO USERS ATTENDING DR PUMF DADOO HOSPITAL, GAUTENG, SOUTH AFRICA

INTRODUCTION

The tobacco epidemic continues to be one of the most significant public health challenges worldwide, and South Africa is no exception^{1,2}. According to the 2021 Global Adult Tobacco Survey (GATS), 28.4% of South Africans aged over 15 use tobacco products, including smoking tobacco, smokeless tobacco, or heated tobacco³. While there has been a downward trend in tobacco consumption reported worldwide, low and middle-income countries continue to face the heaviest burden^{4,5}. In 2022, tobacco ranked as the eighth highest health risk responsible for premature deaths and disability combined in South Africa⁶. Despite various efforts by governments and the World Health Organization to curb this dangerous trend, tobacco use remains a pressing public health issue^{7,8}.

Tobacco use and other unhealthy lifestyle behaviours are common in South Africa⁹. Data from the South African Demographic and Health Survey (SADHS 2016) highlight some concerning trends - 37% of men and 8% of women are tobacco users, 68% of women are overweight, with 47% obese, 31% of men are overweight, with 11% obese, 67% of men and 26% of women consume alcoholic beverages, and of those who consume alcohol, 28% of males and 3% of females engage in risky alcohol consumption¹⁰. Furthermore, the SADHS (2016) found that only 26% of households reported consuming at least one portion of fruit or vegetable (F&V)-daily¹¹.

The 'D-400' concept highlights the link between three key unhealthy behaviours tobacco use, inadequate physical activity and poor diet. These constitute major risk factors for four major chronic diseases (cardiovascular diseases, cancer, type 2 diabetes, and respiratory conditions) and ultimately account for over 80% of premature deaths worldwide¹². These lifestyle behaviours significantly impact public health, leading to preventable diseases, increased healthcare costs, and higher mortality rates¹³.

Evidence from multiple studies suggest that unhealthy lifestyle behaviours tend to cluster together, increasing the overall risk of negative health outcomes^{14,15}. Simply put, individuals often, and at the same time, engage in multiple unhealthy behaviours, such as tobacco use, physical inactivity, unhealthy diet, excessive alcohol use, or drug use. A Canadian study reported that smoking cessation is challenging when multiple unhealthy lifestyle behaviours co-exist, as the odds of dependence on nicotine increased by 20% with each additional unhealthy behaviour¹⁶. Additionally, the impact of these unhealthy behaviours contributes to socioeconomic inequalities^{17,18}.

A scoping review published in 2022 highlighted a new trend showing that smokeless tobacco (SLT) users are also more likely to partake in multiple unhealthy behaviours, such as smoking cigarettes and consuming alcohol simultaneously¹⁹. It also found that most smokeless tobacco (SLT) products are popular among young males who engage in physical activity^{20,21}. This trend was confirmed by the Centre for Disease Control and Prevention (CDC) in the USA who reported that recent focus of SLT along with the influence of friends and family, were identified as pivotal elements influencing the use of SLT products among the youth²².

APPENDIX 8: CANSA PAMPHLETS HOW TO QUIT SMOKING

Allen Carr's **Easyway**[®] To Stop Smoking

Call the [National Council Against Smoking](#) (NCAS) QUIT Line: 011 720 3145 or email: quit@iafrica.com – download the NCAS Quit Guideline PDF: [English](#) | [Afrikaans](#) | [Zulu](#) (with permission by NCAS)



- [10 useful tips to help you quit smoking](#)
- [SA Tobacco Smoking Cessation Clinical Practice Guideline](#) (for practising clinicians)
- [Survey Reveals Desperation to Quit – NICORETTE®](#)
- [Quit Smoking – Stories of Hope](#)
- [A Cautionary Tale...](#) – smoking devastates family...

Published: 27 March 2018 | Last Updated: 30 May 2023

Categories: [No-Tobacco Campaign](#)

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The responsibility rests with patients to contact CANSA for assistance. [Read more...](#)

[Home » No-Tobacco Campaign](#)

How to QUIT Smoking

If you are a smoker, giving up smoking is *the best present you can give yourself and your loved ones.*

There are proven techniques you can try to help you join the increasing numbers of smokers who are quitting for good.

[Need more reasons to quit?](#)

Time to Quit

CANSA encourages smokers or those who have started using any tobacco product to get support to quit. *Counselling and medication can more than double the chance of a smoker to succeed when attempting to quit.*



CANSA's [free online eKickButt programme](#) helps with quitting – smoking – through a series of emails, surveys and downloads, and guides and mentors you, as you quit smoking, and non-smoking becomes a lifelong habit, not merely the time interval between two cigarettes.

This programme supplies a series of handy tools – tried and tested – to help you quit for good. [Sign up for free...](#)

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QUIT SMOKING

Your best chance of success is to **STOP** smoking **COMPLETELY**

The National Council Against Smoking (NCAS) advises the following with regards to quitting:

- **Quit Date:** set a date at least a week in advance to get ready
- **Get Support:** Family, friends, colleagues
- **Identify danger** and find solutions
- **Plan your survival kit:** what are the substitutes for your cigarettes
- **Start saving** your cigarette money and give yourself a treat



CHALLENGE	WINNING STRATEGY
After a meal or 1st cigarette in morning	Wait 10-15 minutes after a meal before you smoke. Increase the time by 5 minutes every day so that by Quit Day you do not smoke until at least 30 minutes after a meal. Similarly, extend the time to the first cigarette of the day.
Cigarette with a drink or coffee	Avoid alcohol for the first few weeks after quitting. Switch from coffee to tea or another beverage you do not associate with cigarettes.
Cigarette when socialising with other smokers	Stay away from smokers as much as possible for the first 10 days after quitting. Out of sight, out of mind. Socialize more with non-smokers.
When I'm alone or bored	Find other things to do. Phone a friend. Go to the cinema. Do a crossword puzzle or a Sudoku. Start a hobby.
When I'm upset or stressed	Get active – go for a walk, do some stretching. Exercise is a good way to beat stress. Practice deep breathing. Tell yourself "Relax. Stay calm."

ekickbutt.org.za

Counselling and medication can more than double the chance that a smoker who tries to quit will succeed.

CANSA's eKick Butt programme is a unique online smoking cessation programme. Through a series of emails, surveys and downloads, we will guide you and mentor you as you quit smoking.



31MAY:WORLDNOTOBACCODAY #NoTobacco

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Take a deep breath, for health's sake!

TOP 10 TIPS ON How to Stop SMOKING

Allen Carr's
Easyway

Set your date and time to stop - you're going to quit smoking naturally so carry on smoking as usual until then...

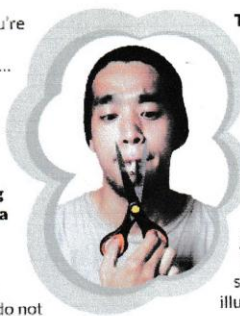
Look forward - You're going to enjoy being a non-smoker right from the moment you put out your last cigarette.

Have a final cigarette; you're going to give up smoking easily so make a solemn vow

Be cool about withdrawal; the physical withdrawal is very slight and passes quickly. Non-smokers do not suffer it. You're a non-smoker and so you'll soon be free of it forever.

Socialise as normal; you won't be craving a cigarette so there's no need to avoid smokers - Do not try to avoid smoking situations or opt out of life. Go out and enjoy social occasions right from the start and do not envy smokers. If you're offered a cigarette, just say: "No thanks - I don't smoke", rather than start a long conversation about how long it has been since you stopped.

Think about it; don't try to "not to think" about smoking - it doesn't work. Don't say "I want a cigarette but I can't have one" but instead: "Isn't it marvellous: I don't need to smoke anymore and I don't want to smoke anymore."



There's no such thing as 'just one' cigarette after you quit smoking

- Never be fooled into thinking you can have the odd cigarette just to be sociable or just to get over a difficult moment. If you do, you'll find yourself back in the trap in no time at all.

Avoid Substitutes: patches, gums, nasal sprays and e-cigs just keep the addiction alive -

They all make it more difficult to stop because they perpetuate the illusion that you're making a sacrifice.

Ditch your cigarettes; you are already a non-smoker the moment you put out your final cigarette - Do not keep cigarettes on you or anywhere else in case of an emergency. If you do, it means you're doubting your decision. You are already a non-smoker the moment you put out your final cigarette.

Enjoy your freedom; live a smoke-free life and be on your guard not to fall back into the trap. Why not? "Because I didn't like being a smoker - that's why I decided to become a non-smoker". That way those moments can become pleasurable as you congratulate yourself that you're free and that way you can enjoy remaining a non-smoker for the rest of your life.



Research • Educate • Support
TOLL FREE 0800 22 66 22
www.cansa.org.za

Source: www.allencarr.com/free-information/stop-smoking/top-tips-on-how-to-stop-smoking-using-allen-carrs-easyway/



072 197 9305
071 867 3530
ENGLISH
AFRIKAANS
SITHO
SINDI
SANSI

#NoTobacco #WorldNoTobaccoDay 31 May #BreatheLife

Other Support Resources:

[Allen Carr's Easyway to Stop Smoking Programme](#) is a CANSA Smart Choice. [View helpful tips here...](#)

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APPENDIX 9: POSTER INVITATION TO PARTICIPATE INTO THE STUDY

 **ARE YOU A Tobacco User? We Want to Hear From You!**

Take part in a short research survey at Dr Yusuf Dadoo Hospital.

Help us understand the link between quit attempts and daily lifestyle habits.

✓ Who can join?

- . Adults 18+
- . Current tobacco users(cigarettes, snuff, hookah, etc.)

 **Duration:** 10–15 minutes

 **All info is confidential. Ethics approved from WITS UNIVERSITY.**
Contact: DR KAPINGA : 0827422661

monik