Research Report

Psychosocial factors associated with tobacco use among a population of medical students in Pretoria.

by

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DECLARATION

I declare that the dissertation, which I hereby submit for the degree Master of Medicine in Public Health Medicine to the University of Pretoria is my own work and that I have never before submitted it to any other tertiary institution for any degree or diploma.

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DEDICATION

To my grandfather:
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And

my beloved mother:
Mumbeja Anne Sylvia Senkubuge;

"*Sáciame Señor con lo mejor del cielo.*"

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LIST OF ACRONYMS

CDC	Centres for Disease Control and Prevention
CI	Confidence Interval
CHD	Coronary heart disease
DOH	Department of Health
WHO FCTC	Framework Convention on Tobacco Control
GYTS	Global Youth Tobacco Survey
GHPSS	Global Health Professions Student Survey
HIV	Human Immunodeficiency Virus
ICD-10	International Classification of Diseases 10
MDG	Millennium Development Goal
NRT	Nicotine Replacement Therapy
OR	Odds ratio
SHS exposure	Second-hand tobacco smoke
SOC	Sense of Coherence
SD	Standard deviation
TFI	Tobacco Free Initiative
TobReg	Tobacco Product Regulation
WHO	World Health Organization

ABSTRACT

Context: Tobacco use among medical students is of public health concern, given their role as future role models for healthy lifestyles. This study sought to determine the prevalence and determinants of tobacco use and nicotine dependence in medical students in Pretoria. In particular, this study explored the role of sense of coherence – a measure of stress-coping ability – on tobacco use patterns among medical students. Furthermore, we examined the students' knowledge of smoking cessation approaches, their perceptions with regard to the availability and adequacy of tobacco control curricula, and their perception of their role as "role models" for their patients.

Methods: This cross-sectional analytical study, involving undergraduate medical students in their 2nd and 6th year of study at the universities of Pretoria and Limpopo (MEDUNSA), was conducted during August and September 2008. Consenting participants completed a self-administered questionnaire (N=722). Information obtained included: demographic characteristics of respondents, alcohol use, past and current use of various tobacco products, perception of availability and adequacy of training in tobacco control (TC), support for various TC legislation and perception of the role of doctors in smoking cessation. A six-item Antonovsky's sense of coherence scale (SOC) was also included to measure respondents' ability to cope with stress. Nicotine dependence was measured using the diagnostic and statistical manual of mental disorders, fourth edition (DSM-IV). Data analysis included chi-square statistics, t-test and multiple logistic regression analysis. Level of significance was set at $p<0.05$.

Results: Prevalence of cigarette smoking in medical students was 17.3%. Cigarette smoking was significantly higher among the 6th (21.5%) than among the 2nd year (14.1%) students and was also significantly higher among males (20.4%) than among females (14.4%). In a bivariate analysis, problem drinkers were more likely to be smokers (37.5%) as compared to non-problem drinkers (13%).

Compared to non-smokes, smokers were more likely to have a lower SOC [Mean(sd); 26.8 (8.8) vs 28.8 (7.4); p=0.019] and were less likely to attach importance to being seen as a role model by patients. Only 21.9% felt their training curriculum contained TC issues and of these a little over half felt the TC content was inadequate. After controlling for potential confounders, the factors that were independently associated with the current smoking status were, having lower support for TC legislation (OR=0.49; 95% CI= (0.41-0.59) and attaching less importance to being seen as a role model by patients (0.62; 0.41-0.91). Other factors associated with cigarette use included: being a 6th year student (OR=2.17; 95% CI; 1.32-3.58), having a drinking problem (2.17; 1.28-3.68), reporting exposure to others smoking at home (3.29; 1.91-5.66) and having received previous formal training in cessation (0.55; 0.32-0.95). Younger age (0.86; 0.77-0.97), lower SOC (0.94; 0.90-0.99), and lower level of support for TC legislation (0.56; 0.40-0.79) were independently associated with nicotine dependence.

Conclusions: This study's findings suggest that tobacco use is prevalent among medical students and tobacco use is strongly associated with alcohol abuse. In addition to offering tobacco cessation services to these students, these findings highlight the need to institute a curriculum on tobacco control that includes not only teaching cessation counselling skills to medical students, but that also encourages them to become advocates for TC legislation and to recognise themselves as important role models in the society.

Author keywords: Tobacco use, nicotine dependence, psychosocial factors, medical students, sense of coherence, training, curriculum, smoking cessation.

CHAPTER 1:

INTRODUCTION AND LITERATURE REVIEW

1.1 INTRODUCTION

- Background

Tobacco use is a leading cause of death in South Africa.[1] A study by Groenewald et al[1] found that smoking caused between 41,632 and 46,656 deaths in South Africa, accounting for 8.0 - 9.0% of deaths and 3.7 - 4.3% of disability adjusted life years (DALYs) in the year 2000. Smoking ranked third highest in terms of mortality after unsafe sex/sexually transmitted disease and high blood pressure.[1]

Medical professionals have a role to play in smoking cessation and as role models; however, their own use of tobacco may influence their efforts and ability when intervening in their patients' tobacco use.

Limited information is available on the prevalence of tobacco use and dependence among undergraduate university students, particularly in South Africa. Only reports from a few studies on tobacco use in medical undergraduate students conducted over a decade ago are available.[2-5] There is indeed little or no knowledge on the current prevalence of tobacco use and on factors associated with tobacco use and dependence among undergraduate medical students in South Africa since the introduction of comprehensive tobacco control (TC) legislation in 2001. Furthermore, there is no information on the availability and quality of tobacco control curricula in the medical curriculum. This study therefore sought to address this gap in knowledge.

1.2 LITERATURE REVIEW

The World Health Organization's (WHO) most recent report on the global tobacco epidemic attributes 5.4 million deaths a year to tobacco use.[6] This figure is

expected to rise to more than 8 million deaths a year by 2030.[6] The 20th century saw 100 million deaths due to tobacco.[6] With current smoking patterns, about 500 million people alive today will eventually be killed by tobacco use.[7] More than half of these are now children and teenagers.[6,7]

Until recently tobacco use mainly affected rich countries, but it is now rapidly shifting to the developing world.[7] By 2020, seven out of every 10 people killed by smoking will be in low- and middle-income nations.[7,8] By 2030, more than 80% of tobacco deaths will be in developing countries.[8] Although tobacco consumption rates in sub-Sahara Africa are lower on average than in other regions of the world, smoking prevalence rates are increasing in many countries.[9]

A systematic review conducted by Furber et al[10] recently concluded that tobacco smoking was an independent risk factor for HIV infection.[10] Considering that South Africa already has a high prevalence (11%)[11] of HIV infection, tobacco control should be considered an important public health priority. Strategies to promote smoking cessation in particular should be a priority. The World Bank projects that if adult consumption was to decrease by 50% by the year 2030, approximately 180 million tobacco-related deaths could be avoided.[7]

A study by Gorin and Heck[12] found that receiving advice from any health care professional about tobacco usage produced increases in quit rates.[12] Quitting indeed confers substantial and immediate health benefits including reduced cardiovascular disease risk, reduced risk of stroke and risk of smoking-attributable cancers.[6] In contrast to many other middle-income and lower-income countries where the tobacco epidemic may still be growing, in South Africa significant strides have been made in reducing tobacco use.[13] Between 1993 and 2000 fewer people smoked, and fewer cigarettes were being smoked .[14] Studies show that in South Africa prevalence rates for adult daily cigarette smoking have decreased.[14] A recent study suggested that the adult (15+ years) population daily smoking rates fell by a fifth, decreasing from 30.2% in 1995 to 24.1% in 2004.[14] An estimated 2.5

million smokers stopped smoking during this period.[14] This in time will translate into fewer deaths from diseases caused by tobacco use.[14,15]

The overall downward trend of the South African tobacco use prevalence, though, masks the fact that in certain sections of the population smoking rates remain alarmingly high. Age, gender, 'race', cultural and economic status affect smoking prevalence rates.[14]

Van Walbeek's study on trends in smoking prevalence in South Africa indicated that approximately 51.4% of South African males smoked in 1993, decreasing to about 43.8% in 2000.[14] According to van Walbeek, smoking prevalence among females was only 12.9% in 1993 but, unlike male smoking prevalence, the females did not experience a statistically significant downward trend. Between 1993 and 2000 the "prevalence gap" between males and females indeed decreased from about 38% to 32%. This narrowing of the "gender prevalence gap" is consistent with international experience.[14]

In the year 2000 the Coloured population had the highest smoking prevalence (49%), followed by Whites and Indians (37% and 28%). Smoking prevalence among the Black population was much lower at about 22.7%. With the possible exception of Indians, van Walbeek noted that smoking prevalence among all the racial groups has not decreased significantly in more recent years.[14]

The 2002 Global Youth Tobacco Survey (GYTS) estimates the past-month smoking prevalence rate among South African high school learners 12-19 years to be 18.5% and for use of other non-cigarette tobacco products (mainly snuff) to be 14.5%.[16] However, little is known about the prevalence of tobacco use among school-going young adults, e.g. those in the universities.

Currently, only limited information is available on the current prevalence of tobacco use among South African medical undergraduate students or on their attitude with

regard to tobacco use. Yet, this is a population that has access to and direct influence on the county's health care system and can and should play a role in tobacco control. WHO, the Centers for Disease Control and Prevention (CDC), and the Canadian Public Health Association (CPHA) are focusing on two strategies to enhance the role of health professionals in tobacco control; the first focuses on health professionals serving as role models for healthy behaviour to the public, being the most personal face of the public health infrastructure in many countries; the second is the critical role health professionals can play in reducing the tobacco use of their patients through patient counselling.[17] To support the implementation of these strategies, WHO, CDC, and CPHA developed the Global Health Professions Student Survey (GHPSS). The GHPSS monitors health professions students' tobacco use, attitudes, and training received to counsel patients in cessation techniques. The GHPSS is a school-based survey of 3rd (preclinical and starting clinical) students attending dental, medical, nursing, or pharmacy schools.[17]

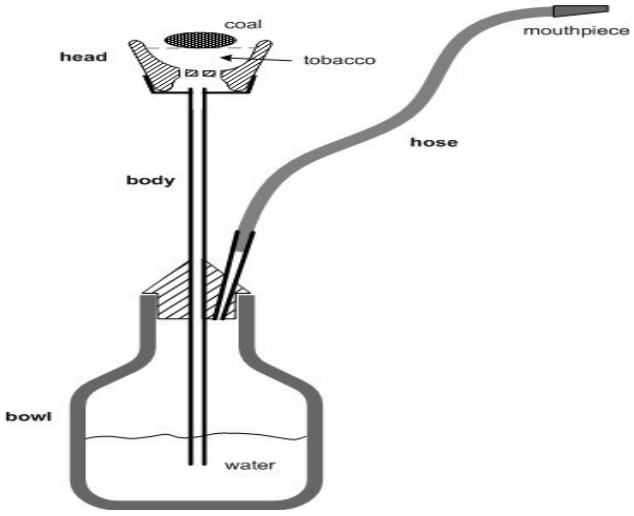
Results from the countries that surveyed medical students as at 2005 showed varying cigarette smoking rates ranging from as high as 43.3% among Albanian medical students to as low as 2.8% among Ugandan medical students.[17] However, in all countries, over half of student health professionals who were current smokers desired to quit. This suggests a significant unmet need for cessation assistance among health professionals at the beginning of their careers.[18] Findings further showed that most students in all the countries believed health professionals should advise patients about smoking cessation (range: 95.0% among Albanian medical students to over 98.8% among medical students in Uganda).[18] The percentage of students who received formal training in tobacco cessation counselling ranged from 5.2% among medical students in Argentina-Buenos Aires to 32.6% among medical students in the Republic of Serbia (Belgrade).[18] More than 90% of students in every survey except medical students in Croatia (71.7%) thought health profession students should receive cessation counselling training as part of their normal curriculum. These data show a significant unmet need for training health

professionals in patient counselling for tobacco cessation.[18] A recent publication by Warren et al[19] that conducted the GHPSS among 3rd students attending dental, medical, nursing and pharmacy schools in 80 countries between 2005 and 2007 showed similar results. In all four disciplines over 20% of the students currently smoked cigarettes and males were significantly more likely than female students to currently smoke cigarettes in 51 of the 77 sites.[19] Further, over 80% of students believed that health professionals have a role in giving advise and that they should get specific training in tobacco cessation but in 73 of 80 sites less than 40 % of students reported to have ever received training in their medical curriculum on smoking cessation.[19] Training acquired professionally should include amongst others courses on counselling on tobacco cessation techniques, details of the harmful health effects of tobacco use and exposure to second-hand smoke. [20] A study by Vrazic et al[21] conducted among 3rd year medical students in Croatia reported a 50.4% exposure to second-hand smoke (SHS) at home.[21] The harmful effects of SHS were already reported on in 1975 where the study found that: Some substances are found in greater concentration in undiluted side stream smoke, including nicotine (x 2.7), carbon monoxide (x 2.5), ammonia (x 73) and some carcinogens, for example, benzo-e pyrene (x 3.4).[22] This would therefore suggest harm and dangerous health effects. Indeed there is current consensus on SHS exposure's adverse health effects.[23,24,25] Of further concern are the findings that having a family member that smoked was a significant risk factor for both smoking and snuff use.[26,27,28] Hedman et al[26] in their study also found that having a family member other than parents, e.g. a sibling or stepparent, that smoked was also a strong risk factor for smoking.[26] The above findings indeed indicate the influence that exposure to smoking at home has on smokers.

Little is known about use of tobacco products other than cigarettes by medical students in South Africa. A study by Warren et al[19] among health professional students around the world found that in 8 of the 80 sites sampled, more than 20% of students reported to have been currently using tobacco products other than manufactured cigarettes compared to less than 5% in 33 of the 80 sites.[19] Hubbly

bubbly and snuff are two products among others that are currently used in South Africa. Snuff is a smokeless tobacco product which is traditionally used by older black women in South Africa and about 80% is inhaled via the nasal passage.[29] The prevalence among these women of snuff use was 13.2% in 1998 compared to a 5.3% prevalence of smoking among women.[29] In South African adolescents the prevalence of snuff use in 2002 was reported to be 14.5%.[30] Hubbly bubbly on the other hand which is also known as “shisha”, “hookah”, “narghile” and “goza” has long been used for tobacco consumption in the middle east. Hubbly bubbly is a tobacco product inhaled through a water pipe by the smoker (Figure 1). It was a habit of older males who used to smoke hubbly bubbly in street side cafes while visiting friends and playing games.[31] Current evidence shows that hubbly bubbly use has grown in popularity and is used now by trendy youth, university students and even school-going children.[31] A study conducted in Syria showed that hubbly bubbly smokers started in their 20s and had started using hubbly bubbly to share ’a pleasure among friends’.[32] Further, they tended to perceive smoking hubbly bubbly as less harmful than smoking cigarettes. Some also cited using hubbly bubbly as a substitute for drinking alcohol.[32]

Figure 1: Water-pipe



Tobacco use and alcohol use have long been associated with each other. Smokers are 1.3 times as likely to consume alcohol as are nonsmokers.[33] A study by Jackson et al[34] found that alcohol and tobacco use exhibit monotonic increases

over adolescence and young adulthood and that initiation of smoking was a function of prior drinking. A longitudinal study conducted by Newbury-Birch et al[35] on a cohort of medical students who were surveyed in the second and fifth year of their undergraduate studies and one year after working as pre-registration house officers (PRHOs, the equivalent of a house doctor or intern) found that the mean alcohol consumption had increased significantly ($p<0.015$) over the three studied time points; from 15.2 (2nd year undergraduate) to 16.0 (5th year undergraduate) and 18.8 (PHRO) units/week respectively.[35] Further, the study found a positive relationship between alcohol and proprietary medicines, which suggested that those who drink more heavily suffered from ailments that needed over the counter medication.[35] Considering consistent findings of the association between tobacco use and alcohol consumption, it becomes pertinent to have knowledge of alcohol use among medical students.

Evidence exists of correlations between the year of study and extent of tobacco usage. A study by Underwood and Fox[36] looking at dental students in the United Kingdom found that regular tobacco use (10 and more cigarettes per day) was most highly represented amongst 4th and 5th year males, with 21% currently smoking and 15% smoking prior to becoming undergraduates. Only 4% of 1st and 3rd year males reported current regular tobacco use before entering dental school. Tobacco use amongst female undergraduates showed similar findings to their male colleagues with 13% of 4th and 5th years regularly smoking and 1% of 1st to 3rd years.[36] Underwood and Fox[36] found a highly significant association between the year of undergraduate study and regular tobacco use, with 4th and 5th year undergraduates being eight times more likely to regularly smoke tobacco than their 1st year colleagues.[36]Although Underwood and Fox's study was conducted among dental students, these students constitute part of the college population and it has been suggested that as the students progress in study, their workload and perceived stress levels may increase. Workload and responsibility also increase with progression in medical training; the perceived stress could therefore increase with progression of study years. Indeed, a study conducted by Seeramareddy et

al[37] among undergraduate medical students found that 20.9 % of them suffered from psychological morbidity (stress). Stress also increased as one progressed in the clinical years: 3rd year (15%), 4th year (18.9%) and final year (24%).[37]

A study by Nichter et al[38] found that smoking served multiple functions during times of stress for college students. Cigarette smoking served as a brief social interaction during study times when students felt isolated from their friends.[38] Cigarettes also served as a means of relieving stress, signalling non-verbally to others that the student was stressed.[38] Students also described smoking as a way to manage their own stress and also to help manage "second-hand stress" from their friends and classmates.[38] It is therefore conceivable that some students will be more dependent on smoking than others as a way to get over stressful situations. Furthermore, smoking may increase with high stress levels. However, the fact that not all medical students smoke despite being potentially exposed to the same stress levels suggests that there might be differences in response to stress. These differences in stress response could explain why there is a difference in tobacco use and/or nicotine dependence.

Nicotine dependence in medical students still remains an area that has had little investigation. Different instruments are currently available to asses nicotine dependence but two have been frequently used.[39] They are first; the instruments based on definitions in the Diagnostic and Statistical Manual of Mental Disorders, third (revised) or fourth edition (DSM-III-R or DSM-IV).[40] The other is the alternate version of the Fagerström Tolerence Questionnaire (FTQ).[41] This version was revised as the Fagerström Test for Nicotine Dependence (FTND),[42] with the adolescent version being called the modified Fagerström (mFTQ).[43] The DSM scale was used in this study as the DSM scale was shown to identify many more nicotine-dependent youths than the mFTQ.[44] Since medical students are young adults we postulated that the DSM scale would identify the dependent medical students better than the FTQ since it better identified dependent youths. A study by Kandel et al[45] showed that although adolescents smoked fewer cigarettes than

adults in the study, adolescents had a higher prevalence of nicotine dependence at the same levels of use.[45] These findings suggest that younger people are more likely to become nicotine dependent compared to an older person, this regardless of the number of cigarettes smoked. The identification of nicotine-dependent medical students is important given the consideration that our study compares two groups of students who differ in age: the 2nd year students who are generally younger in age than the 6th year students. Further, dependence may be a response to the difference in stress levels or coping levels of the medical student.

The difference in the ability of individuals to respond to stress is the central construct of the salutogenic theory. The salutogenenesis concept which is the generation and maintenance of health was introduced in 1979 by Aaron Antonovsky, who further elaborated it in 1987.[46] From the concept Antonovsky, a medical sociologist, developed a model of positive coping called ”sense of coherence” (SOC). SOC refers to the ability of an individual to respond to stressors with appropriate coping strategies, to interpret a stressor as understandable and worth overcoming, and to resist in the face of stress.[47]According to this theory, stressors are intrinsic to the human condition, but people have internal and external resources they can use when confronted with stressful situations and can therefore, maintain health in this way.[46] The SOC therefore, is the factor that prevents people in general from breaking down when faced with stressors and facilitates the movement towards health. According to Antonovsky[48], “a person’s sense of coherence (SOC) is a global orientation that expresses the extent to which the person has a pervasive, enduring but dynamic feeling of confidence enabling the person to apply general resistance resources (GRR) to cope in stressful situations”.[48] These GRRs can be found in both the immediate and the distant environment of every person and may include coping strategies, social support, religion, cultural identity, preventive health orientation and even money.[49] Therefore SOC is a dispositional orientation rather than a personality trait/type or a coping stategy.[48]

The SOC scale originally developed by Antonovsky was a questionnaire of 29 items (SOC-29) that were used to measure SOC and later a shorter version of 13 items (SOC-13) was developed.[48]The scale of a person's SOC was originally described as consisting of three dimensions, namely comprehensibility (cognitive), meaningfulness (motivational) and manageability (behavioural); SOC was therefore a multidimensional construct.[50] In other words, a person with a high SOC in the face of stress will be motivated to cope (cognitive), believe that resources to cope are available(motivational) and understand what is needed (behavioural). The construct of SOC has been consistently demonstrated to be related to health.[51] There are, though, inconsistent opinions on whether SOC is a multidimensional construct as originally described by Antonovsky or a one-dimensional construct as suggested by others. Studies[47,50] have described the reliability and internal consistency of the SOC scale as satisfactory to excellent although validation by factor analysis failed to replicate the three subscales of the multidimensional construct and have shown inconsistencies. For this reason, the current consensus is the use of only one global factor.[47,50] A recent study among South African adolescents using the original 13-item short form of the SOC questionnaire suggested SOC as a one-dimensional construct.[52] Factor analysis suggested a 6-item was equally as reliable as the original 13-item short form in the South African population studied.[52] Six item scales though different from the South African SOC-6 have been used previously in other studies.[53,54] The higher or stronger an individual's total SOC, the more adequately he or she will cope with stressors and maintain his or her health.[48] A study conducted by Eriksson and Lindström [51] found that the stronger the SOC the better the perceived health in general and that SOC is an important contributor for the development and maintenance of people's health.[51] Further, Wainwright et al[55] found in their study that, compared with participants with the weakest SOC**,** those with the strongest SOC were 28% less likely to be current smokers.[55]A psychosocial factor, such as SOC or stress-coping abilities among the medical students becomes important when considering the assumption that as students move from pre-clinical to clinical years, perceived stress levels may increase.[37]

This study sought to determine the prevalence of tobacco use and nicotine dependence in a population of undergraduate medical students of the University of Pretoria and University of Limpopo (MEDUNSA) in their pre-clinical and clinical years of study.

Further, the students' SOC, knowledge of smoking cessation approaches, attitudes towards tobacco control, and perceptions of their future role as doctors in offering tobacco cessation services was assessed. The study also assessed the students' perception of the availability and quality of tobacco control curricula in their universities.

Rationale

As one WHO publication points out, tobacco is a relevant and significant contributor to the conditions that affect the achievement of the Millennium Development Goals.[56] The WHO Framework Convention on Tobacco Control (FCTC), the first multilateral public health treaty with more than 160 parties, presents a blueprint for countries to reduce both the supply of and the demand for tobacco. South Africa is a party to the WHO FCTC, and is legally bound to implement the provisions of the treaty, which includes ensuring that health professionals are trained to treat tobacco dependence (Article 14).[6,57]

Considering that medical students who will become medical practitioners have a role to play in reducing smoking prevalence. Further, given that some of the reasons for non-intervention include having inadequate training and the practitioners' own tobacco use. It then becomes important to document current prevalence and determinants of tobacco use and evaluate the adequacy of tobacco control curricula in medical schools. This information could inform the design of appropriate curriculum interventions that may be directed towards improving student training in tobacco use cessation and prevention.

CHAPTER 2:

AIMS AND OBJECTIVES

The aim of this study was to determine the prevalence and psychosocial determinants of tobacco use and dependence in medical students in Pretoria and their perceptions with regard to the availability and quality of tobacco control curricula.

2.1 OBJECTIVES

The primary objectives of this study were:

1. To determine the prevalence of tobacco use and nicotine dependence among the 2nd and 6th year students of the medical schools of the University of Pretoria and the University of Limpopo (MEDUNSA).

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2. To assess the association between tobacco use, nicotine dependence and sense of coherence among the 2nd and 6th year students of the medical schools of the University of Pretoria and the University of Limpopo (MEDUNSA).

The secondary objectives of this study were:

1. To determine the perceptions of 2nd and 6th year medical students with regard to the availability of a tobacco control curriculum and the quality of the tobacco control curriculum, where available.

2. To determine medical students' support for tobacco control legislation and their perception of themselves as role models.

2.2 HYPOTHESES

Primary hypotheses

H_o: 1. No difference exists in the prevalence of tobacco use and nicotine dependence among the 6th year (clinical year group) and 2nd year (preclinical year group) medical students.

H_o: 2. Students' tobacco use status and nicotine dependence status is not related to their level of sense of coherence.

Exploratory hypotheses

1. Tobacco issues are not specifically addressed in the medical curriculum and when they are, students do not appreciate and also do not perceive the issues to be of considerable value.

2. Medical students do not support tobacco control legislation and do not perceive themselves as role models.

CHAPTER 3:

METHODS AND DATA COLLECTION

3.1 METHODS

3.1.1 Study design

To obtain a broad overview about the psychosocial determinants of tobacco use among medical students, the study design was a cross-sectional analytical study.

3.1.2 Study population

The study population consisted of all undergraduate medical students in their 2nd and 6th year of study at the University of Pretoria and University of Limpopo (MEDUNSA) in 2008.

The 2nd year students represented the preclinical year group (total estimated size from both universities was 430) and the 6th year students represented the clinical year group (total estimated size from both universities was 370).The total population of study therefore was estimated at 800 students from both universities. The study was conducted from August 2008 to September 2008.

3.1.3 Sample size

Assuming a 15% tobacco use prevalence and in order to have a 0.95 probability of being within 3% points of the actual proportion of those who use tobacco, it was determined that a sample of 545 participants was needed. Based on an expectation of 70% of eligible participants (N=800) responding (i.e. a sample yield of 560), it was determined that all the eligible participants be included in this study in order to provide adequate precision for the study's main

objective. Nevertheless, the study sample in general was limited by the number of 2nd and 6th year medical students enrolled in both universities.

3.1.4 Inclusion and exclusion criteria

All undergraduate medical students who were enrolled at the University of Pretoria and University of Limpopo (MEDUNSA) in their 2nd and 6th year of study in August and September 2008 were included in the study.

3.2 DATA COLLECTION PROCEDURES

Data for this study was gathered by using a self-administered structured questionnaire for use with 2nd and 6th year medical students from both universities. The survey was conducted during August and September, 2008, using a questionnaire adapted from the Global Health Professions Student Survey (GHPSS).[17] The following adaptations were made to the original questionnaire: two questions on alcohol use from the 2003 South African Demographic Health Survey (DHS)[58] were included. Questions from the CAGE questionnaire[59] were used to assess alcohol abuse. Sense of coherence (SOC) was measured using a 6-item Antonovsky's SOC scale that has recently been validated among South African adolescents (Ayo-Yusuf et al).[52] Nicotine dependence was measured using a previously validated measurement tool based on the definitions in the Diagnostic and Statistical Manual of mental Disorders, fourth edition (DSM-IV).[39,40]

Given that the clinical curricula may be different between the 2nd and 6th year students, the 2nd year students were selected to represent the pre-clinical year group and the 6th year students represented the clinical year group. Furthermore, the researcher could schedule contact time with these students when they were most likely to be together as one group, thus improving the potential for a high response rate. In order to improve clarity, the questionnaire

was pilot-tested among a group of ten volunteering 1st year and ten 5th year students. This pilot test provided the opportunity to refine the questions for clarity and local cultural adaptation of meanings.

The main study participants were met at their respective universities in lecture halls during their scheduled mandatory class meetings. This was the best time to meet the participants as they were all mandated to attend class meetings. The researcher therefore did not interfere with the complex programme of the medical students during lecture or clinical time therefore ensuring that all participants were present, this was the best time to guarantee response. The response rate was calculated as follows: the total number of students registered for the year group was used to classify students as eligible. Those who were present in the class and filled in their questionnaire voluntarily were classified as respondents. Those who walked out of the class or who do not fill in their questionnaire were classified as non-respondents. Classification of the non-respondents group was difficult since the questionnaire was anonymous. However an attempt was made to characterise non-respondents using the class register with regards to gender (the only sample characteristic obtainable from the class register that could bias smoking rate response).A second visit was made to the class groups to give the opportunity to those who may have not participated in the study (for example those who were absent due to illness) and wished to do so to participate in order to increase the response rate.

The researcher allowed the participants to settle down and proceeded to explain the questionnaire, assure the participants of anonymity and finally hand out the questionnaire. The questionnaire was self-administered. Completed questionnaires were collected by the researcher and the participants were thanked for their participation. The data was entered anonymously into the database.

3.4 MEASURES AND DEFINITIONS

Tobacco use and nicotine dependence were the dependent variables in this study. The main independent variable of interest was SOC. The age and gender variables were included as covariates in our study. Other independent variables measured were those previously identified in published literature as being significant predictors of tobacco use among adolescents and young adults (including college and medical students). These factors include among others: year of undergraduate study, alcohol use, exposure to household member smoking or any one else smoking outside of home smoking and having received advice to quit.

3.4.1 Tobacco use and dependence measures

The questionnaire contained several items to assess the prevalence of tobacco use and nicotine dependence as outcome variables of interest for this study.

Participants answered questions regarding their use of cigarettes, hubbly bubbly/waterpipe and smokeless tobacco (snuff).

For means of multivariate analysis in the current study current cigarette use was used as the main outcome variable of interest to be consistent with other studies. Tobacco products other than cigarettes (hubbly bubbly and snuff use) were not considered because with hubbly bubbly there is currently no consensus on a validated standardised means of assessing dependence while the sample of snuff users was too small to be included in multivariate analysis.

3.4.1.1 Cigarette smoking

Two questions were used to assess current cigarette smoking. These questions are explained immediately below.

a) *Past month cigarette use*

Participants were asked: “During the past 30 days (one month), on how many days did you smoke cigarettes?

The above question was scored on a 7 point scale from"0 days" (1) to "all 30 days" (7). (See questionnaire in appendix E.).

Response items were recoded to express this as the dichotomous outcome of past month-cigarette use. That is each participant was assigned to either be past-month cigarette use (coded 1) for those who scored from 2-7 on the point scale and non-cigarette smoker (coded 0) for those who scored 1 on the point scale.

b) *Cigarette products use*

Participants were asked: "How do you use or have you used any of the following tobacco products in the past? Manufactured cigarettes, hand rolled cigarettes (Zol)". Response items included:

- Everyday (1)
- some days (2)
- completely stopped (3)
- never before (4)

Responses were dichotomised into: cigarette product user ("everyday and some days")-(coded 1) and non-cigarette product user ("completely stopped and never before"), (coded 0).

For the purpose of data analysis in the current study, a dichotomous outcome variable smokers (current smokers and non-smokers) was created by combining and recoding the responses to the items of the above two questions about past month cigarette use and cigarette product use. That is each participant was assigned to either be a current smoker (1) for those who were past-month cigarette users and additionally cigarette product users ("everyday and some days"). Further, non-smoker (0) for those who were non-cigarette smokers above and additionally had been non-cigarette product users ("completely stopped and never before"). If there was a discrepancy between the responses of past month cigarette use and cigarette products use the record was excluded.

Nine other items were also used to measure cigarette smoking practice. These items are set out under points 1 to 9 below.

1) *Ever experimented with smoking*

Participants were asked:" Have you ever tried or experimented with cigarette smoking, even one or two puffs?" Responses were coded into "Yes" (1) and "No" (0).

2) *Age at which first tried a cigarette*

Participants were asked: "How old were you when you first tried a cigarette?"

3) *Smoked on university premises/property during the past year*

Participants were asked: "Have you smoked cigarettes on university premises/ property during the past year?" Responses were dichotomised into "Yes" (coded 1) and all the rest ("I have never smoked cigarettes, "No") (coded 0).

4) *Smoked in university buildings during the past year*

Participants were asked: "Have you smoked cigarettes in University buildings during the past year?" Responses wee dichotomised into "Yes" (coded 1) and all the rest ("I have never smoked cigarettes", "No"), (coded 0).

5) *Frequency of use of cigarettes*

The frequency of cigarette use was assessed by two questions namely:

a) "On the days that you smoke(d) on average, how many cigarettes, including hand rolled cigarettes, do (did) you smoke per day?

Responses were categorised as follows:

- <10 (cigarettes per day)
- >10 (cigarettes per day)

b) If you smoke (d) daily, how soon after you wake up do (did) you take your first cigarette.

Responses included:

- Within 5 minutes
- Within 30 minutes
- Between 30 and 60 minutes (1 hour)
- After 1 hour
- Stopped smoking daily more than 3 months ago
- I have never been a daily smoker

6) *Desire to quit*

Desire to quit was assessed by the question: "Do you want to stop smoking cigarettes now?" Respondents had the options of answering:

- I have never smoked cigarettes
- I do not smoke now
- Yes
- No

Analysis was limited to respondents who were identified as current cigarette users. Responses were dichotomised into "Yes" (coded 1) and "No" (coded 0). All the rest ("I have never smoked cigarettes", "I do not smoke now) were excluded.

7) *Quit attempt*

The attempt to quit was assessed by the question: "During the past year, have you ever tried to stop smoking cigarettes?" Respondents had the options of answering:

- I have never smoked cigarettes

- I did not smoke during the past year

- Yes

- No

Analysis was limited to respondents who were identified as cigarette users. Responses were dichotomised into “Yes” (coded 1) and “No” and “I did not smoke during the past year” (coded 0). “I have never smoked cigarettes”, was excluded from analysis.

8) Duration of quitting

Participants were asked: “How long ago did you stop smoking cigarettes?” Response items included:

- I have never smoked cigarettes (1)
- I have not stopped smoking cigarettes (2)
- Less than 1 month (3)
- 1-5 months (4)
- 6-11 months (5)
- 1 year (6)
- 2 years (7)
- 3 years or longer (8)

9) Advice to quit

Participants were asked:” Have you ever received help or advice to help you stop smoking cigarettes?” Respondents had the options of answering:

- I have never smoked cigarettes

- Yes

- No

Analysis was limited to respondents who were identified as cigarette users. Responses were dichotomised into “Yes” (coded 1) and “No” (coded 0). “I have never smoked cigarettes”, was excluded.

3.4.1.2 Use of tobacco products other than cigarettes

3.4.1.2 (a) Hubbly bubbly/water pipe use

Ever used

Participants were asked: “Have you ever used water pipes or hubbly bubbly?” Responses were coded into “Yes” (1) and “No” (0).

Past month hubbly bubbly use

To assess past month hubbly bubbly use participants were asked:” During the past 30 days (one month), on how many days did you use water pipes or hubbly bubbly?”

The question was scored on a 7-point scale from”0 days” (1) to “all 30 days” (7).

The item was recoded to express this as the dichotomous variable of past month hubbly bubbly use. That is each participant was assigned to either be past hubbly bubbly use (1) for those who scored from 2-7 on the point scale and non-hubbly bubbly user (0) for those who scored 1 on the point scale.

Hubbly bubbly products use

Participants were asked: “How do you use or have you used any of the following tobacco products in the past, hubbly bubbly? Response items included:

- every day (1)
- some days (2)
- completely stopped (3)
- never before (4)

Responses were dichotomised into: hubbly bubbly product user ("everyday and some days"), (coded 1) and non-hubbly bubbly product user ("completely stopped and never before"), (coded 0).

For the purpose of data analysis in the current study, a dichotomous variable – hubbly bubbly user (current hubbly bubbly user and non-hubbly bubbly user) – was created by combining and recoding the responses to the items of the above two questions about past month hubbly bubbly use and hubbly bubbly product use. That is each participant was assigned either to being a current hubbly bubbly user (coded 1) for those who were past-month hubbly bubbly users and also hubbly bubbly product users ("every day and some days"). Further, non-hubbly bubbly user (coded 0) for those who were non-hubbly bubbly users above and also non-hubbly bubbly product user ("completely stopped and never before"). If there was a discrepancy between the responses of past month hubbly bubbly use and hubbly bubbly products use the record was excluded.

3.4.1.2 (b) Smokeless tobacco use (Snuff)

Ever use

Participants were asked:" Have you ever used snuff?" Responses were coded into "Yes" (1) and "No" (0).

Past month snuff use

To assess smokeless tobacco use participants were asked: "During the past 30 days (one month), on how many days did you use snuff?" The question was scored on a 7 point scale from"0 days" (1) to "all 30 days" (7).

The item was recoded to be expressed as the dichotomous outcome of past month snuff use. That is each participant was assigned to either be a past-month snuff user (1) for those who scored from 2-7 on the point scale and non-snuff user (0) for those who scored 1 on the 7-point scale.

Snuff products use

Participants were asked: "How do you use or have you used any of the following tobacco products in the past? Nasal snuff, oral snuff" Response items included:

- everyday (1)
- some days(2)
- completely stopped (3)
- never before (4)

Responses were dichotomised into: snuff product user ("everyday and some days"), (coded 1) and non-snuff product user ("completely stopped and never before"), (coded 0).

For the purpose of data analysis in the current study, a dichotomous outcome variable snuff users (current snuff users and non-snuff users) was created by combining and recoding the responses to the items of the above two questions about past month snuff use and snuff product use. That is each participant was assigned to either be a current snuff user(coded 1) for those who were past-month snuff users and also snuff product users ("every day and some days"). Further, non-snuff users (coded 0) for those who were non-snuff users above and also non-snuff product user ("completely stopped and never before"). If there was a discrepancy between the responses of past month snuff use and snuff products use the record was excluded.

Frequency of snuff use

Participants were asked "On the days that you use(d) snuff, how many times per day do (did) you use snuff?"

Snuff brand

Participants were asked: "Which brand of snuff have you tried or do you currently use mostly?"

The responses included:

- Traditional/homemade-mix

- Ntsu

- Taxi

- Singleton menthol

- One of the new brands in tea bag-like packs (snus)

- Never tried/not currently using snuff

- Other brands

Desire to quit

Desire to quit was assessed by the question: "Do you want to stop using snuff now?" Respondents had the options of answering:

- I have never used snuff

- I do not use snuff now

- Yes

- No

Analysis was limited to respondents who were identified as snuff users. Responses were dichotomised into "Yes" (coded 1) and all the rest ("I have never used snuff", "I do not use snuff now", "No"), (coded 0)

3.4.1.3 Nicotine dependence

A 14-item DSM-IV scale was used[40] to assess nicotine dependence. This asked for symptoms ever experienced with the use of any tobacco product in order to assess the 7 dependence DSM criteria. The criteria are: tolerance, withdrawal, Impaired control, unsuccessful attempts to quit, great deal of time spent using, neglect of important activities, and use despite problems.[40] The response options were dichotomised as Yes (1) and No (0), then grouped into the 7 DSM criteria (see questionnaire appendix E). In our current study the Cronbach alpha for the 14 item DSM-IV scale was assessed.

Analysis was limited to respondents who were identified as tobacco users. All the items grouped into the 7 DSM criteria were combined to create a total DSM score of 7. To assess nicotine dependence results were dichotomised to nicotine dependence; i.e. dependent if DSM score >=3 (coded1) and not nicotine dependent if DSM score was 0-2 (coded 0), this is the standard cuff used based on clinical criteria. [40]

An extra question on desire – which is not part of the 14-item DSM-IV scale – was included in our study. The question asked: "Was there ever a time when you often had such a strong desire to smoke or use tobacco that you couldn't keep yourself from using tobacco, or found it difficult to think of anything else?" Analysis was limited to respondents who were identified as smokers. Responses were dichotomised into "Yes" (coded 1) and "No" (coded 0).

3.4.2 Second-hand smoke exposure (SHS)

To assess second hand smoke exposure at home participants were asked: "During the past 7 days, on how many days have people smoked where you live, in your presence?" The question was scored on a 5-point scale from "0 days" (1) to "all 7 days" (5). The item was recoded to express this as a dichotomous outcome of no exposure to household member smoking (0) and exposure to household member smoking (1).

Further, participants were asked about second-hand smoke exposure elsewhere by the question: "During the past 7 days, on how many days have people smoked in your presence, in places other than where you live?" The question was also scored on a 5-point scale from "0 days" (1) to "all 7 days" (5) and was recoded to a dichotomous outcome of no exposure elsewhere (0) and exposure elsewhere (1).

3.4.3 Sense of coherence

The respondents' sense of coherence was measured by a 6-item questionnaire adapted from Antonovsky's original SOC-13 questionnaire. Antonovsky's assumption was that the three components of the SOC are only theoretically

distinguishable but have to be understood as one factor.[48] The 6-item scale (SOC-6) was previously used and validated by Ayo-Yusuf et al[52] in a recent study among a population of South African youths in the Limpopo province, the mean SOC of this study was 26.3 and Cronbach alpha = 0.63.[52] In our study, as with the previous South African study, the respondents were scored on a 7-point Likert-scale using the six items. The total score obtainable from the six items ranged from 6 to 42, the higher the score obtained the stronger the individual's SOC was.

The six questions of SOC-6 were as follows:

- How often do you have the feeling that you are in an unfamiliar situation and don't know what to do?
- How often do you have very mixed -up feelings and ideas?
- How often does it happen that you have feelings inside you that you would rather not feel?
- In general, how often do you have the feeling that you're being treated unfairly?
- How often do you have feelings that you're not sure you can keep under control?
- How often do you have feelings that there's little meaning in the things you do in your daily life?

For the purpose of this study, the internal consistency of the 6-item scale was assessed by measuring the Cronbach alpha which is a proxy measure of a scale's reliability. The reliability of SOC-6 was assessed as it had not been used before in this population. .

3.4.4 Other independent measures

Socio-demographic factors

All Participants provided information about their gender, age and ethnic group. Gender was classified into male (0) and female (1), while age was assessed as a continuous variable.

Respondents self-identified as being Black, White, Indian/Asian or Coloured, according to the definitions of Statistics South Africa, 2001.[60]

Few respondents were in the categories of Indian/Asian and Coloured. Thus, for the purpose of data analysis in the current study, a three category race variable (Black, White, other) was created by combining the responses of the Indian/Asian and Coloured group as "other".

Alcohol use

The questionnaire contained items to assess the level of alcohol use. The questionnaire included questions that were used to measure problem drinking using the CAGE scale, which has been previously validated[59]. In our current study the Cronbach alpha for the CAGE was assessed.

The four items with response options of "Yes" (coded 1) or "No" (coded 0) in the CAGE scale were:

- 'Have you ever felt that you should cut down on your drinking?'
- 'Have people annoyed you by criticising your drinking?'
- 'Have you ever felt bad or guilty about your drinking?'
- 'Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hang over?'

Respondents were then categorized as either a non-drinker, alcohol drinker without problem drinking (score 0 or 1 on CAGE scale) and problem-drinker (score 2 or greater).

Importance of role model

The question: "How important is it for you as a health professional to be seen as a 'role model' by your patients?" was asked of respondents. Responses were ranked and analysed as:

- Not at all important (1)
- A little important (2)
- Somewhat important (3)
- Very important (4)

Knowledge of smoking cessation approaches

The knowledge of smoking cessation approaches was assessed by using nine items from the GHPSS questionnaire.[17] The questions assessed whether the participants had acquired knowledge on smoking cessation approaches during their medical school training. The questions had response options of "Yes" (1) and "No" (0). The questions assessed:

- Knowledge of the reasons why people smoke
- Presence of tobacco control curriculum
- Knowledge of the dangers of smoking
- Learning regarding the importance of recording patient's tobacco use
- Formal training in cessation approaches
- Knowledge of social problems associated with smoking
- Knowledge on provision of educational material to patients who desired to quit smoking.
- Knowledge of NRT (Nicotine Replacement Therapy)
- Knowledge of using antidepressants in tobacco cessation (such as Bupropion or Zyban)

Support for legislation

A scale was formed from responses to questions about whether respondents supported the banning of smoking or not. Response options were "Yes" (1) or "No" (0). The participants responded to the following questions:

- Do you support ban on tobacco sales to adolescents?
- Do you support complete ban of advertising of tobacco products?
- Do you support complete ban in restaurants?
- Do you support complete ban in discos/bars/pubs?
- Do you support ban in all enclosed public places?

Principal component analysis was performed and a 5-item scale was derived. The 5-item scale's internal consistency or reliability was assessed using Cronbach alpha. For the purpose of the current analysis the scale was used as a one-dimensional construct to represent a composite score of level of support for tobacco control legislation.

Additionally two other questions were asked pertaining specifically to the university policies on smoking namely:

"Does your university have an official policy banning smoking in university buildings and residences?" Here the answers were ranked as:

- Yes, for university buildings only (1)
- Yes ,for residences only (2)
- Yes, for both school buildings and residences (3)
- No, official policy (4)

Further: "Is your university's official smoking ban for university buildings and residences enforced?" The responses were:

- Yes, policy is enforced (1)
- No, Policy is not enforced (2)

- School has no official policy (3)

3.4 DATA ANALYSIS

The completed questionnaire data was entered using Epi-Info and all data was entered twice (double data verification). Data was exported using Start Transfer and data analysis was done using the statistical package Stata Version 9. Following cleaning, variables were recoded in accordance with the definitions given above. The main outcome measures were current smoking and nicotine dependence. Descriptive statistical analysis was used to compute frequency distributions and sample characteristics. As part of the primary analysis, cross-tabulations were conducted. Group differences were tested by means of chi-square analysed (for categorical variables) and independent t-tests (for continuous variables). The variables that were significantly associated at a 90% significance level in bivariate analysis were entered into a multiple logistic regression model using a stepwise backward elimination procedure. Two separate multiple logistic regression models were constructed to determine the independent association of psychosocial variables such as SOC, attitude to tobacco use cessation and tobacco control legislation with smoking status and nicotine dependence. Effect estimates presented as odds ratios (ORs) were derived. To assess the adequacy of the fitted logistic regression models, we used standard diagnostic procedures such as the pseudo R^2, the Hosmer-Lemeshow goodness-of-fit test, the area under the curve of the Receiver Operating Curve plot (ROC) – adequacy was set at greater than 75% – and the model chi-square test. For the Hosmer-Lemeshow goodness-of fit test the following were used for decision: H_0: There is not enough reason to doubt the adequacy of the estimated model. H_1: There is enough reason to doubt the adequacy of the estimated model. The decision rule was made as follows: reject H_0 if $P < \alpha$ and fail to reject H_0 if $P >= \alpha$. The statistical significance was defined at $p < 0.05$ or at the 95% confidence interval.

Data analysis for this study did not include stratification by university. Certainly, especially for the curricular questions the researcher recognises that universities may differ in their implementation of curricula. Further, the researcher also recognises that in terms of predictors and prevalence of tobacco use different universities would represent different cultures and contexts. The stratification therefore or accounting for university analysis would appear important. This analysis though in the current context of the universities which are still largely racially segregated thus non-overlap of sensitive factors especially race has the danger of stigmatisation. The stratification and analysis therefore for the purpose of this study was limited to combined data from both universities.

3.5 ETHICAL CONSIDERATIONS

The questionnaire survey was anonymous and information was kept confidential. Permission was obtained to conduct the study from the respective deans of the faculties of health sciences of both universities. Further, informed consent was obtained from the participants and ethics approval was granted from the research ethics committee of the University of Pretoria and University of Limpopo (MEDUNSA).

CHAPTER 4:

RESULTS

4.1 SOCIODEMOGRAPHIC CHARACTERISTICS, TOBACCO USE AND NICOTINE DEPENDENCE

A total number of 722 students participated in the study, with a response rate of 90.3%.The total number of eligible students (students registered for the year group) was 800, with 722 respondents and 78 non-respondents [43 (10.1%) females and 35 (9.3%) males].

Participants' ages ranged from 17 to 50, with a mean age of 23.0 years (SD 3.97). The sample was almost equally divided between males (47.1%) and females (52.9%). The 2nd year group accounted for 57.1% of the sample and the majority (55.1%) of the participants were Black Africans. The prevalence of cigarette smoking was 17.3% (n= 122) and 62.5% (n= 75) of smokers met the diagnostic criteria for nicotine dependence. The Cronbach alpha for the 14-item DSM-IV scale in our study was 0.91. The Cronbach alpha for the CAGE scale was 0.75 with 18.7% of participants being categorised as problem-drinkers. The distribution of the main outcome variables and socio-demographic characteristics of the study sample is shown in Table 1.

4.1.1 Pattern of cigarette smoking

Of respondents, 52.9% (n= 382) reported to have ever experimented with cigarettes while the age of when participants first tried to smoke cigarettes ranged from 7 to 24 with a mean age of 15.23 years (SD = 3.11).

The quantity of cigarettes smoked (including hand-rolled cigarettes) per day ranged from 1 to 20 cigarettes with a mean of 3.92 (SD = 3.40). Furthermore, 32% (n= 39) of the smokers reported to be regular cigarette smokers; i.e. smoked cigarettes for more than 20 days during the past 30 days (one month). Of those who smoked between 1-9 days, 38.6% (n= 27) were nicotine dependent, while of those who

smoked between 10-19 days, 90.9% (n= 10) were nicotine dependent and of those who smoked >20 cigarettes, 97.4% (n= 38) were nicotine dependent.

Table 1: Main outcomes and socio- demographic characteristics of study participants

Variables (N)		n	Percentage (%)
Dependent/outcome variables			
Current cigarette smoking (707)	No	585	82.7
	Yes	122	17.3
Nicotine dependence (120)	No	45	37.5
	Yes	75	62.5
Socio-demographic variables			
University (722)	Limpopo (MEDUNSA)	362	50.1
	Pretoria	360	49.9
Gender (722)	Male	340	47.1
	Female	382	52.9
Age (722)	Range: 17 to 50 years old Mean=23 years, SD= 3.97		
Year Group (722)	2nd	412	57.1
	6th	310	42.9
Ethnicity/Race (722)	Black	398	55.1
	White	258	35.7
	Other	66	9.1
Problem drinker (710)	No	577	81.3
	Yes	133	18.7

Of the past-month smokers 82.8% (n= 101) reported to have smoked cigarettes on the university premises, but only 34.4% (n= 42) reported to have smoked cigarettes

in the university buildings. Cigarette smoking patterns are as shown in Table 2.

Table 2: Patterns of cigarette smoking

Variable (N)		n	Percentage (%)
Ever experimented with cigarette smoking (722)	No	340	47.1
	Yes	382	52.9
Past month cigarette smoking (122)	1- 9 days	72	59.0
	10 – 19 days	11	9.0
	> 20 days	39	32.0
Daily smokers report of time from waking up to first cigarette (36)	Within 5 minutes	3	8.3
	Within 30 minutes	8	22.2
	Between 30 and 60 minutes (1 hour)	3	8.3
	After 1 hour	22	61.1
Smoking of cigarettes on university premises/property in past year (122)	No	21	17.2
	Yes	101	82.8
Smoking of cigarettes in university buildings in past year (122)	No	80	65.6
	Yes	42	34.4
Want to quit cigarettes now (121)	No	97	80.2
	Yes	24	19.8
Quit attempt in past year (120)	No	84	70.0
	Yes	36	30.0
Duration of stopping smoking (31)	Less than 1 month	15	48.4
	1-5 months	4	12.9
	>= 6 months	12	38.7
Ever received advise to quit (122)	No	95	77.9
	Yes	27	22.1

4.1.2 Use of tobacco products other than cigarettes

Of the respondents 43.5% (n= 314) reported to have ever used hubbly bubbly/water pipes. A total of 18.6% (n= 133) of respondents reported use of hubbly bubbly/water pipes at least once in the past month as compared to 3.1% (n= 22) of respondents who reported snuff use in the past month. The frequency of snuff use per day ranged from 1 to 5 times with a mean of 2.05 (SD= 1.25). Of the snuff users, 27.3 % (n= 6) of them also reported smoking cigarettes. Only 11 of the smokeless tobacco users answered the question on nicotine dependence, nonetheless, of these 36.4% (n= 4) of them were categorised as nicotine dependent. The patterns of use of tobacco products other than cigarettes, hubbly bubbly/water pipes and snuff use are shown in Table 3.

Table 3: Use of tobacco products other than cigarettes

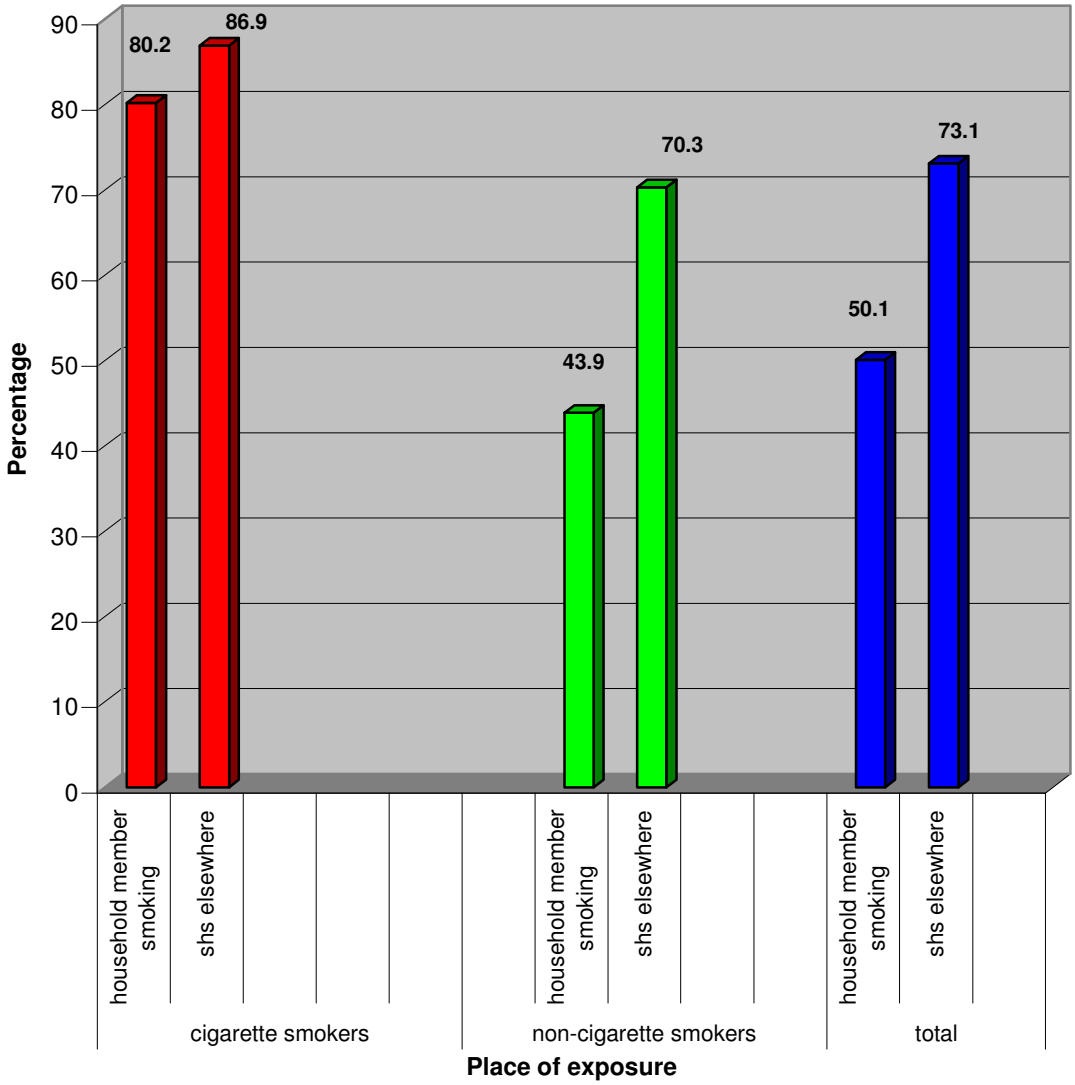
Variable (N)		n	Percentage
Ever use of Hubbly bubbly (722)	No	408	56.5
	Yes	314	43.5
Past month Hubbly bubbly (133)	1- 9 days	114	85.7
	10 – 19 days	12	9.0
	> 20 days	7	5.3
Ever snuff (720)	No	607	84.3
	Yes	113	15.7
Past month snuff use (712)	1- 9 days	22	3.1
	>= 10 days	0	0.0

4.1.3 Second-hand smoke exposure (SHS)

Exposure to household member smoking among participants was found to be 50.1% (n= 354), while that of exposure to second-hand smoke elsewhere was found to be 73.1% (n= 517). Cigarette smokers (n = 121) were more likely to report exposure to a household member smoking 80.2% (n= 97),(p= <0.001) and to SHS

exposure elsewhere 86.9% (n= 106),(p= <0.001). P-values were derived using the Pearson Chi-square statistic (Figure 2).

Figure 2: Second-hand smoke exposure (SHS)



4.2 SENSE OF COHERENCE AND PERCEPTION OF BEING A ROLE MODEL

4.2.1 Sense of Coherence (SOC) scale-item responses

Sense of coherence was measured using a 6-item 7-point likert-type scale (see questionnaire appendix E). The combined overall SOC score ranged from 6 to 42

with a mean of 28.53 (SD= 7.66). The internal consistency of the 6-item scale as measured by the Cronbach alpha – a proxy measure of a scale's reliability – was 0.88. The six items of sense of coherence are shown in Table 4.

Table 4: Sense of coherence six items (N= 722)

Variable	Mean (SD)*	Median (IQ range#)
Feeling of being in unfamiliar situation and not knowing what to do.	4.83 (1.52)	5.0 (4.0-6.0)
Having mixed-up feelings and ideas.	4.62 (1.62)	5.0 (4.0-6.0)
Having feelings inside that one would rather not feel.	4.42 (1.65)	5.0 (3.0-6.0)
Feeling that one is being treated unfairly.	4.63 (1.64)	5.0 (3.8-6.0)
Having feelings that one is not sure that one can keep under control.	4.96 (1.59)	5.0 (4.0-6.0)
Having feelings that there's little meaning in the things one does in one's daily life.	5.08 (1.66)	5.0 (4.0-6.0)
Overall SOC		
SOC	Range: 6 to 42 Mean = 28.53, SD = 7.66	30.0 (23.0-35.0)

Range 1(Very often)* – 7*(Never)*

IQ range – inter-quartile range *(25 – 75)*

4.2.2 Perception of being a role model

The majority of the participants agreed that health professionals serve as role models for their patients and the public (78.9% (n= 570)). However, when asked how important it was for them as health professionals to be seen as a role model by their patients only 70.8% (n= 511) thought it was very important (Table 5).

Table 5: Perception of being a role model (N=722)

Variable		n	Percentage (%)
Do health professionals serve as role models for their patients and the public?	No	152	21.1
	Yes	570	78.9
How important is it for you as a health professional to be seen as a role model by your patients	Not at all important	5	0.7
	A little important	20	2.8
	Somewhat important	186	25.8
	Very important	511	70.8

4.3 KNOWLEDGE AND SUPPORT FOR TOBACCO CONTROL LEGISLATION

4.3.1 Level of support for legislation

Principal component analysis was performed from responses to questions about whether respondents supported the banning of smoking or not. A 5-item scale was derived. The 5-item scale derived was considered to have good internal consistency or reliability with a Cronbach alpha score of 0.74. For the purpose of the current analysis the scale was used as a one-dimensional construct to represent a composite score of level of support for tobacco control legislation, with score ranging from 0-5.

Of the 5 items the highest level of support expressed by the respondents was for legislation banning tobacco sales to adolescents and the least support was for any legislation that will ban smoking in pubs/bars (Table 6).

4.3.2 Knowledge of official University tobacco control policy

Just under half of the respondents reported that smoking was banned in both their residences and the university campus buildings and 44.5 % (n= 320) said that the

policy was not enforced. About one fifth claimed that there was no official policy to this effect (Table 7).

Table 6: Support for legislation (N=722)

Variable		n	Percentage (%)
Support ban on tobacco sales to adolescents (<18 years old)	No	30	4.2
	Yes	692	95.8
Support complete ban of advertising of tobacco products	No	101	14.0
	Yes	621	86.0
Support complete ban in restaurants	No	157	21.7
	Yes	565	78.3
Support complete ban in discos/bars/pubs	No	290	40.2
	Yes	431	59.8
Support complete ban in all enclosed public places	No	203	28.1
	Yes	519	71.9

Table 7: Knowledge of official university policy banning smoking (N=720)

Variable		n	Percentage
Is there an official policy banning smoking in university buildings only?	No	517	71.8
	Yes	203	28.2
Is there an official policy banning smoking in university buildings and residences?	No	386	53.6
	Yes	334	46.4
Is there an official policy banning smoking in university buildings and residences?	No	574	79.7
	Yes	146	20.3
Policy banning smoking in university buildings and residences *not* enforced.	No	400	55.6
	Yes	320	44.5

4.4 PERCEPTION OF ADEQUACY OF CURRICULUM AND KNOWLEDGE OF SMOKING CESSATION

4.4.1. Perceptions with regards to the availability and quality of tobacco control curricula

Only 21.9% (n= 158) of the participants indicated the presence of a tobacco control curriculum for their university institution. Of the latter 88.6% (n= 140) were 2nd years and 11.4% (n= 18) 6th year students. Only 38.9% (n= 7) of 6th years rated their curriculum as fairly to very adequate compared to 48.6% (n= 58) of 2nd years (Table 8).

Table 8: Availability and rating of quality of tobacco control curriculum

Variable (N)		2nd year % (n)	6th year % (n)
Availability of curriculum on tobacco control (721)	No	66.0 (272)	94.2 (291)
	Yes	34.0 (140)	5.8 (18)
	P-value	<0.001	<0.001
Rating of quality of tobacco control curriculum (158)	Very inadequate	11.4 (16)	16.7 (3)
	Inadequate	40.0 (56)	44.4 (8)
	Fairly adequate	40.7 (57)	27.8 (5)
	Very adequate	7.9 (1)	11.1 (2)
	P-value	<0.001	<0.001

All P- values derived using Pearson Chi-Square statistic

4.4.2 Knowledge of cessation approaches

Of the 6th year students, 98.4% (n= 304) indicated that they had been taught about the dangers of smoking compared to 84.5% (n= 348) of 2nd years. Almost all the 6th years 97.1% (n= 301) indicated that they had learnt the importance of always recording the patient's tobacco use status compared to 77.4% (n= 319) of 2nd year students. Of the 6th years, only 14.9% (n= 46) reported to have never heard of

using antidepressants in tobacco cessation programmes compared to 75.5% (n= 311) of 2nd years (Table 9).

Table 9: Knowledge of smoking cessation approaches during medical school training (N=722)

Variable		2nd year % (n)	6th year % (n)
Have you been taught in any of your classes about the dangers of smoking?	No	15.5 (64)	1.6 (5)
	Yes	84.5 (348)	98.4 (304)
	P-value	<0.001	<0.001
Have you discussed in any of your classes the reasons why people smoke?	No	35.4 (146)	51.3 (159)
	Yes	64.6 (266)	48.7 (151)
	P-value	<0.001	<0.001
Have you learnt that it is important to always record tobacco use history as pat of all patients' general medical history?	No	22.6 (93)	2.9 (9)
	Yes	77.4 (319)	97.1 (301)
	P-value	<0.001	<0.001
Have you ever received any formal training in smoking cessation approaches to use with patients?	No	58.0 (239)	76.8 (238)
	Yes	42.0 (173)	23.2 (72)
	P-value	<0.001	<0.001
Have you been taught in any of your classes about the social problems associated with smoking?	No	36.2 (149)	65.5 (203)
	Yes	63.8 (263)	34.5 (107)
	P-value	<0.001	<0.001
Have you learnt the importance of providing educational materials to support cessation to patients who want to quit smoking?	No	39.8 (164)	55.2 (171)
	Yes	60.2 (248)	44.8 (139)
	P-value	<0.001	<0.001
Have you ever heard of using NRT in tobacco cessation programmes?	No	20.1 (83)	1.9 (6)
	Yes	79.9 (329)	98.1 (304)
	P-value	<0.001	<0.001

Have you ever heard of using antidepressants in tobacco cessation programmes?	No	75.5 (311)	14.9 (46)
	Yes	24.5 (101)	85.1 (263)
	P-value	<0.001	<0.001

All P- values derived using Pearson Chi-Square statistic

4.5 BIVARIATE ANALYSIS

Of the 2nd year group, 14.1% were cigarette smokers while 21.5 % of the 6th year group were smokers. The distributions of all tobacco use patterns by socio-demographic characteristics are as shown in Table 10.

Table 10: Tobacco use patterns and nicotine dependence by socio-demographic characteristics

	Variable (n)	Currently Smoking % (n/N)	Smokeless tobacco user % (n/N)	Nicotine dependent % (n/N)
Year group	2nd	14.1 (57/405)	5.2 (21/407)	63.2 (36/57)
	6th	21.5 (65/302)	2.0 (6/302)	61.9 (39/63)
	P-value	0.010	0.029	0.887
Race	Black	14.1 (54/384)	5.7 (22/388)	50.9 (27/53)
	White	21.8 (56/257)	2.0 (5/255)	72.7 (40/55)
	Others*	18.2 (12/66)	0.0 (0/66)	66.7 (8/12)
	P-value	0.039	0.013	0.062
Gender	Male	20.4 (68/333)	4.5 (15/332)	58.8 (40/68)
	Female	14.4 (54/374)	3.2 (12/377)	67.3 (35/52)
	P-value	0.036	0.354	0.341
Problem drinker	No	13.0 (74/571)	3.1 (18/573)	54.8 (40/73)
	Yes	37.5 (48/128)	6.3 (8/128)	74.5 (35/47)
	P-value	<0.0001	0.092	0.030
Formal training in smoking cessation	No	20.4 (95/466)	3.4 (16/466)	67.0 (63/94)
	Yes	11.2 (27/241)	4.6 (11/241)	46.2 (12/26)
	P-value	0.002	0.450	0.052

Exposed to others smoking at home	No	6.8 (24/352)	2.0 (7/351)	45.8 (11/24)
	Yes	27.4 (97/354)	5.6 (20/357)	66.3 (63/95)
	P-value	<0.0001	0.012	0.064
SHS**elsewhere	No	8.4 (16/190)	3.2 (6/190)	37.5 (6/16)
	Yes	20.5 (106/517)	4.0 (21/519)	66.3 (69/104)
	P-value	<0.0001	0.584	0.027

*Others = *Indian and coloured*
**SHS = *Second-hand smoke*
All P- values derived using Pearson Chi-Square statistic

Sense of coherence (SOC) was significantly higher among non-smokers than among smokers (28.8 vs 26.8; p<0.01). The participants who were nicotine dependent were significantly younger than those who were not nicotine dependent (22.6 vs 23.9 ; p=0.025). (Table 11)

Table 11: Factors associated with SOC, being a role model and level of support for legislation

	Variable(n)	**SOC**	**Perceived importance as role model (1-4)**	**Level of support of legislation (0-5)**
		Mean (SD)	**Mean (SD)**	**Mean (SD)**
Gender (N= 720)	Male (339)	28.8 (7.9)	3.7 (0.6)	3.8 (1.5)
	Female (381)	28.3 (7.4)	3.6 (0.6)	4.1 (1.3)
	P- value	0.426	0.646	0.005
Smokers (N= 706)	No (584)	28.8 (7.4)	3.7 (0.5)	4.2 (1.2)
	Yes (122)	26.8 (8.8)	3.4 (0.7)	2.5 (1.4)
	P- value	0.019	<0.001	<0.001
Problem drinker (N= 710)	No (577)	29.1 (7.4)	3.7 (0.5)	4.0 (1.3)
	Yes (133)	25.4 (7.9)	3.5 (0.6)	3.3 (1.4)
	P- value	<0.001	0.002	<0.001
Nicotine dependence (N= 120)	No (45)	28.1 (7.6)	3.5 (0.6)	3.0 (1.4)
	Yes (75)	26.0 (9.5)	3.3 (0.7)	2.2 (1.2)
	P- value	0.046	0.610	0.022

Desire to quit among smokers (N= 121)	No (97)	26.8 (9.0)	3.4 (0.6)	2.5 (1.4)
	Yes (24)	26.4 (7.8)	3.3 (0.7)	2.7 (1.2)
	P- value	0.139	0.743	0.252
Past quit attempt among smokers (N= 120)	No (84)	26.7 (8.8)	3.3 (0.6)	2.4 (1.3)
	Yes (36)	27.1 (9.2)	3.4 (0.7)	2.9 (1.4)
	P-value	0.917	0.503	0.364
Formal training in smoking cessation(N= 722)	No(477)	27.7 (7.7)	3.7 (0.6)	3.9 (1.4)
	Yes(245)	30.2 (7.4)	3.6 (0.6)	3.9 (1.3)
	P-value	0.277	0.009	0.119
Year Group(N= 720)	2nd (410)	30.0 (7.7)	3.7 (0.6)	3.8 (1.4)
	6th (310)	26.5 (7.2)	3.7 (0.6)	4.0 (1.4)
	P-value	0.259	0.438	0.528

All P- values derived using Independent samples t-test

4.5 MULTIVARIATE ANALYSIS

Two separate models were constructed. In the first model to predict cigarette smoking, the variables that were significant at 10% (α) level in a bivariate analysis were entered into multivariate analysis (see table 10 and 11). Only those variables that were significant at 0.05 were retained in the final model.

4.5.1 Factors associated with cigarette smoking

The following were significantly associated with higher odds of being a cigarette smoker: being in a higher/clinical year group, having a lower level of perception as a role model, lower level of support of legislation, not reporting previous formal training on cessation, being a problem drinker, and reporting second-hand smoke exposure at home (Table 12). The adequacy of the above fitted model was assessed. The pseudo R^2 was 0.30 and the P-value of the Hosmer-Lemeshow

goodness-of fit test was 0.43. Therefore we could not reject the null hypothesis of not enough reason to doubt the adequacy of the estimated model. Further, the area under the ROC curve was 85.79% (See Appendix A.).

Table 12: Final logistic regression model of factors associated with cigarette smoking

Variable		Odds ratio(95% CI)	p-value
Year group			0.002
	Second Year	1 (referent)	
	Sixth Year	2.17 (1.32-3.58)	
Problem drinker			0.004
	No	1 (referent)	
	Yes	2.17 (1.28-3.68)	
Household member smoking			<0.001
	No	1 (referent)	
	Yes	3.29 (1.91-5.66)	
Formal training in smoking cessation			0.033
	No	1 (referent)	
	Yes	0.55 (0.317-0.95)	
Beliefs as role model (continuous variable)			0.016
	Per unit increase Range(1-4)	0.62 (0.41-0.91)	
Support for legislation (continuous variable)			<0.001
	Per unit increase Range(0-5)	0.49 (0.41-0.59)	

Variables entered into model: *age, sex, year group, race category, SOC, household member smoking, SHS elsewhere, support legislation, rolemodel, formal training in smoking cessation, problem drinker.*

4.3.2 Factors associated with nicotine dependence

In the second model to predict nicotine dependence, the variables which were significant at 10% (α) in bivariate analysis were also entered into the multivariate analysis (see table 10 and 11). Only those variables that were significant at 0.05 were retained in the final model. In a multivariate analysis the following were significantly associated with lower odds of being diagnosed as nicotine dependent: increasing SOC, increasing level of support of legislation and increasing age (Table 13).

Table 13: Final logistic regression model of factors associated with nicotine dependence

Variable		Odds ratio(95% CI)	p-value
Support Legislation (continuous variable)			0.001
	per unit increase Range(0-5)	0.56 (0.40-0.79)	
SOC (continuous variable)			0.022
	per unit increase Range(6-42)	0.94 (0.90-0.99)	
Age (continuous variable)			0.010
	per unit increase Range(17-50)	0.86 (0.77-0.97)	

Variables entered into model: *age, sex, year group, race category, SOC, household member smoking, SHS elsewhere, support legislation, rolemodel, formal training in smoking cessation, problem drinker*

The adequacy of the above fitted model was assessed. The pseudo R^2 was 0.14 and P-value of the Hosmer-Lemeshow goodness-of fit test was 0.53. Therefore we could not reject the null hypothesis of not enough reason to doubt the adequacy of the estimated model. Further, the area under the ROC curve was 73.0% (See Appendix B.).

CHAPTER 5:

DISCUSSION

The aim of this study was to determine the prevalence and psychosocial determinants – in particular SOC – of tobacco use and nicotine dependence in medical students and the perceptions of these students with regard to the availability and quality of tobacco control curricula, in Pretoria. Results of the 722 students analysed showed that being in the senior year group was a significant predictor of current smoking. Also associated with smoking were; being a problem drinker, reporting household member smoking, reporting not having had any formal exposure to training in smoking cessation, not considering oneself as a role model and expressing lower level of support for tobacco control legislation. Students with a high sense of coherence (SOC) were less likely to be nicotine dependent. Nicotine dependence was also associated with being younger and expressing a lower level of support for tobacco legislation.

5.1 PREVALENCE OF TOBACO USE AND DEPENDENCE

5.1.1 Cigarette smoking

The data in the current study suggests an overall 17.3% prevalence of cigarette smoking among medical students. This is lower than the daily smoking prevalence of approximately 24.1%[14] reported in the adult population in South Africa in 2002,[14] and that reported recently of 23.4% in 2008.[61] Smoking prevalence in the adult population was negatively associated with educational achievement.[14] This finding suggests, therefore, that although smoking among medical students may be relatively prevalent, their higher educational status seems to be associated with a relatively lower rate of smoking. The prevalence rate observed among medical students in the current study is also lower than that obtained from the Global Youth Tobacco Survey (GYTS),[16] which estimated the past-month smoking prevalence

rate among South African high school learners 12-19 years to be 18.5%.[16] The possible explanation is that high school learners have less knowledge or understanding about the dangers of tobacco use. Medical students on the other hand may have a little more knowledge about the harmful effects of tobacco as compared to high school learners. It may also be that those high school students who were health conscious – therefore more likely to be non-smokers – were more likely to have elected to study medicine.

Considerably more 6th years (21.5%) were cigarette smokers in comparison to 2nd years (14.1%). This is consistent with the study findings of Underwood and Fox[36] that showed a highly significant association between the year of undergraduate study and regular tobacco use.[36] Smith et al[62] in their review also found that tobacco smoking rates among medical students tended to increase between the year of entry and the final year.

Significantly more males (20.4%) were smokers as compared to females (14.4%). The finding is consistent with similar other international studies.[19,35,36] Studies have also speculated on the narrowing of the prevalence gap between the male and female smokers. [13,21] In our study this was difficult to estimate as it was a cross-sectional study and the Birkholtz et al[5] study did not report percentages of smoking in the different genders. The study by Birkholtz et al[5] though reported that more males smoked than females. We therefore had no other published study that to our knowledge had investigated a student population similar to ours with which compare our findings on gender differences. Nonetheless, the study in the general population of South Africans reported a narrowing of the gender prevalence gap.[14] More research is needed that will investigate whether change in social acceptability of smoking women has any influence on the smoking prevalence and patterns of smoking among women. Further, more research is needed to investigate and monitor the gender prevalence gap among medical students.

Significantly more White medical students were smokers compared to Blacks and other races (Indian and Coloured). Our study's findings are different from those of van Walbeek's study in the adult South African population in 2000.[14] The study showed that the Coloured population had the highest smoking prevalence followed by Whites and Indians and Blacks.[14] The difference in study findings could be attributed to the fact that the Coloured and Indian population in our study was small. The trend, though, in terms of Whites and Blacks is consistent with observations from previous national surveys that reported a higher proportion of Whites being smokers compared to Blacks. This is also consistent with the findings from the most recent South African Demographic Health Survey (SADHS 2003).[58] The low smoking rates among Blacks have been attributed to the general cultural or social proscription with regards to smoking, particularly among females.[14] Nevertheless, maintaining this low level of smoking rates among the largest population group in South Africa remains an important task for tobacco control in South Africa.

Alcohol drinking was found to be a substantial part of multiple substance use in South Africa.[63] In the general population of South Africa multiple substance use is found amongst Coloured South Africans who have the highest smoking rates ,[14] and also high alcohol use rate as a result of the "dop" system.[64] The "dop" system is traced in the regime where the Coloured population was remunerated with alcohol.[64] Our study found similar results where 37.5% of problem drinkers reported to be smokers compared to 13.0% of non-problem drinkers. This finding of the association between alcohol and smoking is of public health concern, given that cancer risk is multiplicative with concurrent use of tobacco and alcohol.

5.1.2 Use of tobacco products other than cigarettes

5.1.2.1 Hubbly bubbly use

Hubbly bubbly use in medical students in South Africa has not been studied. In our current study, 43.5% of students reported to have ever used hubbly bubbly. Further, 18.6% reported current use of hubbly bubbly and of these most, were non-daily users. The prevalence of hubbly bubbly use as compared to cigarette smoking was marginally different. Warren et al's[19] study showed that when comparing cigarette smoking and the use of tobacco products other than cigarettes, there was no difference in 23 of the 80 sites. However, in Syria, Lebanon and Sri Lanka there was a higher prevalence of use of tobacco products other than cigarettes.[19] Furthermore, Hammal et al's[32] study showed that hubbly bubbly use was a social event and this is consistent with our study that showed that most use is non-daily. Our study's findings show that medical students use hubbly bubbly. This is consistent with Mazaik et al's[31] study's findings that suggested that there was a new population of hubbly bubbly users outside of the traditionally Middle Eastern male. The finding poses a concern to public health efforts for tobacco control especially when considering that hubbly bubbly users do not consider the practice harmful,[32]yet recent reviews have demonstrated significant adverse health effects.[31]

5.1.2.2 Smokeless tobacco use

Smokeless tobacco in South Africa is most commonly known as snuff. Traditionally, snuff use was most common among older black women[29].Our study's findings showed that more black male students were snuff users. Further, the 2nd year group had more snuff users than the 6th year group. This is different from the traditionally known snuff users i.e. older black females. This observation suggests a new trend i.e. young adults may now be using smokeless tobacco. Of the participants 15.7% reported ever using snuff but only 3.1% reported current use.

In South Africa snuff is considerably more affordable than other tobacco products and this cost implication may suggest why a young student tobacco user would prefer this product.

Ayo-Yusuf et al[65] found that popular South African smokeless tobacco brands had high nicotine delivery capability. For example, they had a nicotine content of 6-16mg/g, a pH of 7-10 and a percentage free based nicotine of 10-99%.[65] These factors suggested a high potential for dependence and associated health risks.[65] These findings, suggest that, smokeless tobacco may be harmful. Indeed, snuff use was recently associated with an increased risk of chronic bronchitis in a South African study.[66] The findings of the harmful effects of snuff use suggest that when considering programmes for control of tobacco use in South Africa, consideration should also be given to the prevention of smokeless tobacco use. This is important because currently the use of smokeless tobacco products such as snus from Sweden – which is a lower-nitrosamine containing smokeless tobacco product different from the South African snuff products – is being promoted as alternatives to cigarette smoking because snus is considered safer than cigarette smoking.[67] Others have expressed concern that smokeless tobacco may be used as a gateway to cigarette smoking.[68] Further, that smokeless tobacco may be associated with dual use among established smokers, such that it will only be used where smoking is not permitted, while smoking then continues on other ocassions.[68] Indeed, this study showed that about one out of four snuff users were also smokers, thus suggesting that dual use is a reality in South Africa.

5.1.3 Nicotine dependence

Data from this study indicated that as high as 62.5% of smoking medical students met the DSM IV criteria for nicotine dependence, that is, more than half of smoking medical students are nicotine dependent. More than 90% of medical students who smoked more than 10 cigarettes per day in the past month were found to be nicotine dependent. This finding confirms the known fact that nicotine has a high

dependence liability. Indeed, in a study by Woody et al[69] comparing prevalence of dependence across substances nicotine was shown to have the highest prevalence of dependence among those exposed to the substance.[69] That is a higher proportion of smokers met criteria for nicotine dependence compared to users of other drug classes.[69] The findings could also explain why in our study most smoking students (80.2%) had indicated that they had no desire to quit now and only 30.0% of them had a quit attempt in the past year. This finding is important especially when looking at designing cessation programmes and particularly highlights the possible need to support students with medication, even though smoking intensity is relatively low.

In particular, our study further found that of the students who smoked between 1 to 9 days in the past month, 38.6% of them were nicotine dependent. This finding indeed disputes the notion that nicotine dependence is only in daily smokers or those reporting frequent and heavy smoking. Consistent with our findings, recent studies have shown that nicotine dependence does occur in non-daily smokers or those reporting low levels of use.[45,70] This therefore suggests that the traditional diagnosis of addiction to cigarettes confined mainly to the number of cigarettes that one smokes per day as a dependence measure may be less valid in this population. That is, although nicotine dependent daily smokers may be diagnosed the non-daily smokers like those smoking between 1-9 days may be missed.

Non-daily smokers then perhaps have alternate explanations of what will determine whether they become dependent or not to cigarettes. The latter being independent of the number of cigarettes smoked in a day. Among medical students, one could postulate that because of the nature of the stressful curriculum that medical students go through, cigarette smoking may serve as a means of coping during stressful situations. Indeed, Nichter et al[38] reported that students described smoking as a way to manage their own stress and also to help manage “second-hand stress” from friends or classmates.[38] The cycle of smoking to relieve stress may then perhaps perpetuate addiction where the cigarette is the outlet especially

in those students who are susceptible to dependence. The dimension therefore of nicotine dependence in non-daily smokers is perhaps not in just having a daily "fix" as in other addictions but is in the maintenance of 'normality' thus the time between the one cigarette till the next one is determined by the steady state of an individual. When the state is in disarray then, that is what perhaps determines when the next smoking episode will occur. Another study by DiFranza et al[71] in adolescents postulated that nicotine dependence in smokers who are not heavy smokers could be explained as an indication of different sensitivities to nicotine exposure across individuals.[71] Although the later study was conducted among adolescents, but considering that this is a population that grows to constitute college and medical students, this explanation could therefore also be another reason for the observation noted in the current study. Another alternate explanation is that the nicotine dependence reported amongst those smoking less than 10 days per month may be the result of selective respondent under-reporting amongst those who are nicotine dependent. Therefore, medical students who are nicotine dependent may be under reporting the number of days smoking.

Nicotine dependence in our study was associated with: age, sense of coherence and whether the student supported legislation. Respondents were less likely to be nicotine dependent with increasing age. In our study the trend was that the 2nd year students were more likely to be nicotine dependent than the 6th year students. Considering that 2nd year students are younger than 6th year students, our finding is therefore consistent with that of Kandel et al[45] who reported that although adolescents smoked fewer cigarettes than adults, adolescents had a higher prevalence of nicotine dependence at the same levels of use.[45] The finding therefore suggests that, age plays a role in nicotine dependence, with younger people more likely to be dependent than older people. Further, this may also suggest earlier initiation age among the 2nd year students given earlier reports that the younger an individual is at the time regular smoking was initiated, the more likely they are to become nicotine dependent.[72] Indeed, nicotine dependence has been reported to be occurring at a younger age.[73]

Although SOC did not predict cigarette smoking, an individual with a strong sense of coherence was less likely to be nicotine dependent. This finding suggests that SOC may represent universal self efficacy,[48,49] the latter which in turn has been associated with lower rates of cigarette smoking and cessation.[55]

Those who supported legislation were less likely to be nicotine dependent. Support for legislation may suggest that one has the knowledge of the harms of smoking or values the legislative measures as a protection of tobacco harm. Even smokers may seek self-protective mechanisms that will protect their health or cause them to be dependent, and thus may see legislation as a self-control device.

5.1.4 Second-hand smoke exposure (SHS)

Second-hand smoke (SHS) refers to the exposure of people to tobacco smoke from other tobacco users. Our study found that a total of 50.6% of the respondents were exposed to SHS at home while 73.1% where exposed elsewhere. This study's finding on prevalence of SHS exposure at home is consistent with that of the study by Vrazic et al[21] conducted among 3rd year medical students in Croatia who reported a 50.4% exposure to SHS at home.[21] In this study, both cigarette smokers and non-cigarette product users reported equal exposure to SHS elsewhere but more smokers reported SHS exposure at home. Exposure to SHS or other people smoking at home was associated with smoking in our study. Our findings are consistent with those of several other studies that have reported that, having a family member who smoked was a significant risk factor for both smoking and snuff use.[26,27,28] Considering that there is overwhelming evidence reported on the serious health effects of SHS[74,75] even as far back as 1969,[76] taken together, these findings become very significant as an area for potential intervention. The findings of smoking being associated with exposure to other people smoking at home in our study are significant. The findings suggest that, if a child grows up in an environment where smoking is acceptable as a practice, this possibly "demystifies" the notion that smoking is an unacceptable practice and a harmful

substance. From the above suggestion, it is reasonable to deduce that the creation of an environment of ”normality” and “acceptability” of tobacco use at home may explain why , having a smoking family member was a major risk factor for tobacco use.[26] These findings suggest the initiation of prevention programmes targeted at families who smoke. Furthermore, 73.1% of respondents reported exposure to SHS elsewhere other than their homes. This may suggest ineffectiveness of South Africa’s partial ban on public smoking law implemented in 2001,[77] especially if SHS exposures elsewhere was in public areas. The findings further provide evidence to support the implementation of 100% smoke free environments as the only effective way to protect populations from harmful SHS. The later is envisaged in the Article 8 guidelines of the World Health Organization framework Convention on Tobacco Control (WHO FCTC),[78] which addresses protection from exposure to tobacco smoke.[78] This finding supports the introduction of 100% smoke-free law in South Africa and in particular smoke free law on University campuses including the residences on campus. The least support for legislation was given for banning smoking in bars. Advocacy will also be needed in this area as students seem to accept exposure to SHS in bars.

5.2 SENSE OF COHERENCE AND OTHER PSYCHOSOCIAL DETERMINANTS

5.2.1 Sense of coherence

This study, consistent with other studies confirms SOC as a one-dimensional construct[47,50] and provided a considerably higher reliability than in the previous study that used the same 6-item scale scale.[52] This suggests that SOC-6 was a very consistent measure of SOC in this population. The difference may be related to the different ages and educational levels of the study sample. Indeed, it is conceivable that medical students were more likely to better comprehend the questions anchored on a 7-point scale than 15 year old rural adolescents studied by Ayo-Yusuf et al.[52]

This study showed no differences in the SOC scores by gender, therefore supporting Antonovsky's contention that SOC cuts across gender.[48] Antonovsky also assumed that the strength of SOC increases with age, but begins to stabilize in the 3rd decade of life.[48] In our study, there was no significant difference between the SOC scores in the different year groups, although 6th year students were significantly older than 2nd years. This was an unexpected finding in our study as we had assumed that since SOC increases with age and since 6th years were older than 2nd years; the 6th years should have had a higher SOC score. The inability to detect the differences across age may also be due to the expected instability of SOC levels expected in a younger age group than an adult age group.[48] Another explanation of this finding may be the fact that the 2nd and 6th years are two separate cohorts of students with different psychological make up, such that the 6th year cohort of students may have had a generally lower SOC. This may also partly explain the 6th year student's higher smoking rates compared to 2nd years.

Nevertheless, as expected, SOC scores were significantly higher for students who were not problem drinkers and those who were not nicotine dependent. This could suggest that students who perceived the world in general as comprehensible, manageable and meaningful tended to be less likely to be alcoholics and significantly less likely to be nicotine dependent, even if they started smoking.

5.2.2 Perceived role model

It is known that doctors are perceived by the population to be the most trusted. This would infer that doctors are viewed by societies as role models. The concept of role modelling becomes imperative when talking about tobacco cessation practices as it is known that when a patient trusts their practitioner they are more likely and willing to take advice. It is therefore important for the doctor to be seen by the patient as a role model as this will improve compliance. The question then is; do doctors perceive themselves as role models and is it important for them to be seen as role models? Our study found that 78.9% of medical students agreed that health professionals serve as role models for their patients and the public. This is

consistent with the findings from other GHPSS studies.[18,19] There was no gender difference in the perceived importance of being seen as a role model by patients. Significantly though, medical students who were smokers and problem drinkers placed less importance on being seen as role models by their patients. This is a very significant finding and the finding poses a challenge to tobacco control advocates. Smoking medical students who do not place importance on being role models may send the incorrect message about tobacco use to the patient and public who see their doctor as a role model. The patient and public may ask the question: "if my doctor smokes why should I not smoke?" This paradox may potentially create the notion that tobacco use is okay because even doctors smoke. Smoking doctors may perhaps have doubt about the effectiveness of smoking cessation. These doctors would then perhaps not advise patients to stop smoking because they may deem tobacco as a less important issue. The doctors may also deem it unnecessary for themselves to be advocates and role models for tobacco control. The study by Everett et al[79] showed that doctors needed convincing that smoking cessation interventions can be effective.[79] This is indeed an area of concern that needs to be addressed. Tobacco control programmes should include the concept of the doctor as a role model by asking doctors to be advocates for tobacco control. Universities should also include classes or modules on the doctor as a role model for patients. This may improve and assist medical students when they formulate their identity as doctors and role models for the public and their patients with regard to tobacco control.

5.3 SUPPORT FOR TOBACCO CONTROL LEGISLATION

In this study there was a significant difference in support for legislation between the males and the females, wherein females were more supportive of tobacco legislation than males. This is though not a surprising finding considering that fewer females smoked. This finding, of support for legislation is consistent with findings in other studies.[18,19] A further explanation of the gender difference is that perhaps there may be gender differences in social responsibilities of males and females.

Problem drinkers and those who were nicotine dependent also significantly reported lower level of support for legislation. These findings suggest that nicotine dependent smokers are less likely to support legislation against smoking. This suggests that advocacy for tobacco control should lobby for support for legislation especially among smokers. Enforcing and implementing current legislation that ban smoking may also assist smokers and tobacco users to quit. Indeed, Gorin and Heck [12] showed that implementation of legislation for tobacco control assisted in increasing quit rates. Indeed, in South Africa after the implementation of the tobacco policy in 1994 the smoking prevalence declined.[14,15] This suggests that legislation assists in decreasing smoking rates and may decrease the prevalence of tobacco users.

5.4 KNOWLEDGE OF SMOKING CESSATION AND PERCEPTION OF ADEQUACY OF CURRICULUM

Only 21.9 % of medical students – 88.6% 2nd years and 11.4% 6th years – reported to have a tobacco curriculum consistent with the Framework Convention. This is an important finding considering that these same medical students would be expected to take part in tobacco cessation and advise patients on how to quit using tobacco. Considering that the 2nd year medical students have not had as much training as the 6th years, this could have influenced their rating of availability of a curriculum. The 6th years who are senior as compared to the junior 2nd years may have interpreted curriculum availability differently; this may explain the difference in rating between the two groups. The 6th years may be more pessimistic about the availability of a curriculum as compared to the junior 2nd years, hence the 6th years low rating. Further, the 2nd years may have been exposed to a different curriculum compared to the 6th years. There is a need for a qualitative study to determine which elements the 6th year and 2nd year students considered while rating their curriculum. Saloojee et al[80] postulated that “in South Africa, if 200,000 registered health professionals each helped one patient to stop smoking per month, this would produce 2.4 million ex-smokers a year.[80] It is therefore of concern when

medical practitioners who are expected to help patients to stop tobacco use have no formal training. This especially when considering that patients expect to get information, help and guidance from their doctor on health matters.[80]

Further, the available curriculum was rated and perceived as inadequate by 51.4% of the 2nd years and 61.1% of 6th years who indicated its availability. It therefore means that even the curriculum that is available is perceived by medical students as not adequate enough to equip them in cessation practice. Knowledge of cessation approaches is crucial for success in advice and helping patients and individuals to quit. More 6th years as compared to 2nd years knew the importance of recording a patients' history and also the dangers of smoking, this may perhaps be the only aspect of tobacco use that is taught in the medical school as part of disease aetiology. Therefore, with advancement of years and knowledge one's knowledge on aetiology would improve thus explaining why the 6th year students knew more than the 2nd year students. Another explanation could be that although formal teaching did not occur on these aspects medical students might have gained the information from other sources e.g. media, colleagues or even their own self-education. This therefore suggests that knowledge on tobacco control and perhaps even cessation may be available to the students even outside the medical curriculum. The argument though is that evidence-based techniques of cessation need to be included in the curriculum as these are technical in nature and one needs training in these approaches. It is known that doctors can make an important contribution to reducing tobacco use through counselling their patients to quit. Doctors therefore need to be equipped with the skills.

5.5 STRENGTHS AND LIMITATIONS OF THE STUDY

As with any type of self-report or assessment, it was anticipated that students could have shied away from being truthful about their tobacco use status or perceptions of the curriculum for fear of victimisation. However, this was hopefully limited by full assurance of anonymity and confidentiality and a focus on constructive criticism of the curriculum in order that more valid results could be

achieved. Further, respondents did not answer all questions that were posed to them in the questionnaire. Despite this limitation the overall relatively high response rate provided for valid generalisation of findings to the two medical schools but may not be generalised to all South African universities, given the known differences in provincial smoking rates and across cultures. The provincial differences may influence prevalence rates among medical students in the different regions.

The stratification and analysis for the purpose of this study was limited to combined data from both universities. Thus, data analysis for this study did not stratify by university. The implementation of curricular at the two universities may differ and may therefore influence the questions and responses on curricula. Further, in terms of predictors and prevalence of tobacco use, different universities would represent different cultures and contexts. The stratification therefore or accounting for university analysis would appear important. The universities though are currently still largely racially segregated thus have non-overlap of sensitive factors like race and stratification therefore by university has the danger of stigmatisation.

This was a cross-sectional study. For this reason caution needs to be exercised in interpreting causality. Indeed, without the information on the temporal relationship or order of events, reverse causality is possible. For instance, it may just be that those who smoke were less likely to support legislation and not that those who do not support legislation were those who started smoking. Lastly, the current study may not have measured all relevant factors for tobacco use and nicotine dependence. This may be particularly so with respect to the limited model obtained with nicotine dependence, as evidenced by the relatively low pseudo R^2.

Despite these limitations, this study had good reliability scales for CAGE, SOC and support for legislation as measured by the Cronbach alpha. The robustness of the instruments used – as all demonstrated high Cronbach alphas – means that use in other studies involving similar kinds of populations can now be rendered easier.

Further, the predictor models for smoking and nicotine dependence in this study were assessed as adequate. This study provided useful information that could inform further studies and potential interventions that could reduce tobacco use among medical students and improve involvement of health practitioners in cessation.

The methodologies used in this study may be tested in other faculties of the two Universities to determine if the smoking and nicotine dependence are more prevalent among medical students than students from other faculties.

Further, the methodologies can also be easily adapted and be used in universities in other provinces. This study has the potential to be expanded further in order to provide national data with savings on time and cost for new protocol development.

CHAPTER 6:

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

This study explored factors relating to tobacco use among a population of 2nd and 6th year medical students. The factors explored included psychological factors, social factors, demographic factors and curriculum knowledge and availability. The results show that smoking and nicotine dependence among medical students in Pretoria is associated with different factors ranging from socio-demographic characteristics to the level of exposure to training in cessation approaches.

- Smoking and nicotine dependence was prevalent among medical students in Pretoria.
- Only about one-third had attempted to quit in the past year and even fewer had ever received advice to quit or are contemplating quitting.
- Male students smoked significantly more than female students and 6th year students also significantly smoked more than 2nd year students.
- Use of hubbly bubbly among medical students was common.
- Smokers were also more likely to be problem drinkers.
- SOC was not associated with smoking but strong SOC was associated with lower odds of smokers becoming nicotine dependent.
- Even though a large majority of the respondents knew about the dangers of tobacco, tobacco control curricula were considered to be inadequate.
- Current smokers were less likely to report that they had received any training in smoking cessation.
- The majority of students believed that doctors were seen as role models by members of the society. Smokers though were less likely to consider it important for doctors to be seen as role models.

- A majority support TC legislation, but current smokers and nicotine dependent smokers exercised lower level of support for TC legislation.

The evidence in this study sheds light on aspects of tobacco usage by medical students. This knowledge may assist in the formulation of curricula and may also inform policy.

6.2 RECOMMENDATIONS

Tobacco use cessation is of paramount importance in medical students. Medical students are the custodians of health and they also serve as role models for their patients and the society. In order to assist with tobacco use cessation among medical students, the following recommendations are made; to assist smokers in quitting, improve their knowledge about the dangers of using tobacco products other than cigarettes, and to improve tobacco control curriculum.

The prevalence of tobacco use among medical students is of concern and efforts should be made to assist students to quit cigarette smoking and use of tobacco products other than cigarettes like hubbly bubbly and snuff. Students should also be given adequate information and student health clinics should mainstream smoking cessation while universities make smoking cessation among medical students in their universities a priority. Prevalence rates of tobacco use should be monitored with periodic evaluations determined by the medical schools. These evaluations will serve as a means of comparison and will also indicate and show areas of changes in trends and practices of tobacco use.

Medical students who smoke were found to be nicotine dependent, even amongst those students reporting fewer days of smoking per month, this is of concern. Qualitative and quantitative studies would be useful to further explore the issues of nicotine dependence. For example, we hypothesised that stress plays a role in latter years of study. A cohort study measuring reported stress levels in relation to

smoking and nicotine, in both qualitative and quantitative designs would be useful. A programme in medical schools may also be introduced that addresses not only smoking but all the factors that could lead to nicotine dependence.

As has been documented in literature doctors are seen as role models by society and reduction in smoking in the general population has often been preceded by reduction in smoking rates among physicians. It is therefore important that during their medical school training students be encouraged to develop a culture where they understand their role as role models to society. Medical schools need to encourage students to become role models and introduce as part of the curriculum classes that address these softer issues.

It is imperative that the medical school curriculum include tobacco control because of its importance in public health. Therefore, there is a need to strengthen medical curricula to include tobacco control. This curriculum should be designed by all stake holders including the students and academic staff and also tobacco control groups in the country. The curriculum should address knowledge issues and provide skills that students can use in order to assist patients to quit tobacco usage. South Africa as a party to the WHO FCTC has an obligation to implement the provisions of this treaty, including the training of health professionals in tobacco use cessation. The Health professions council of South Africa – registering medical practitioners – should make it mandatory for students graduating to have competencies in tobacco cessation programmes and familiarity with tobacco control.

Following a previously published approach to the introduction of a new curriculum into the health professional training,[81] the next approach to introducing a tobacco use cessation curriculum should include: developing core competencies for tobacco use cessation in the medical school curricula, identifying appropriate instructional methodologies and assessment tools suited to the content and context of tobacco use cessation, and engaging the institutional environment for tobacco

use cessation teaching at both the level of institutional culture and strategic implementation.[81] The recent introduction of the longitudinal clinical attachment programme (LCAS) for medical students at the University of Pretoria provides a unique opportunity to introduce tobacco use cessation intervention as part of community-outreach intervention by medical students. This while getting practice reinforcement during their block postings in disciplines such as pulmonology, gyneacology & obstetrics, peadiatrics and internal medicine.

Knowledge of the university tobacco policies needs to be strengthened and enhanced. The study found that most of the students claimed a lack of tobacco control policies in their universities although the policies were clearly written in the university guidelines.[82,83] This suggests that students may not have read the guidelines of the university or have no knowledge of their existence because the guidelines may not be well publicised to the students. Clearly marked signs that are visible are needed in the university premises and students should be reminded of the university tobacco policy periodically, maybe every year.

There is a need for further tobacco research among medical students. A longitudinal study may be conducted among the medical students to document predictors of smoking as the students progress along medical training. Further, to enquire about how a change in curriculum that includes tobacco control and cessation approaches affects the prevalence of tobacco use among the students. The study may also investigate how the introduction of a tobacco control curriculum changes the students' smoking habits and their support for legislation.

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APPENDICES

Appendix A

Receiver Operating Characteristic (ROC) Curve for model predicting factors associated with cigarette smoking.

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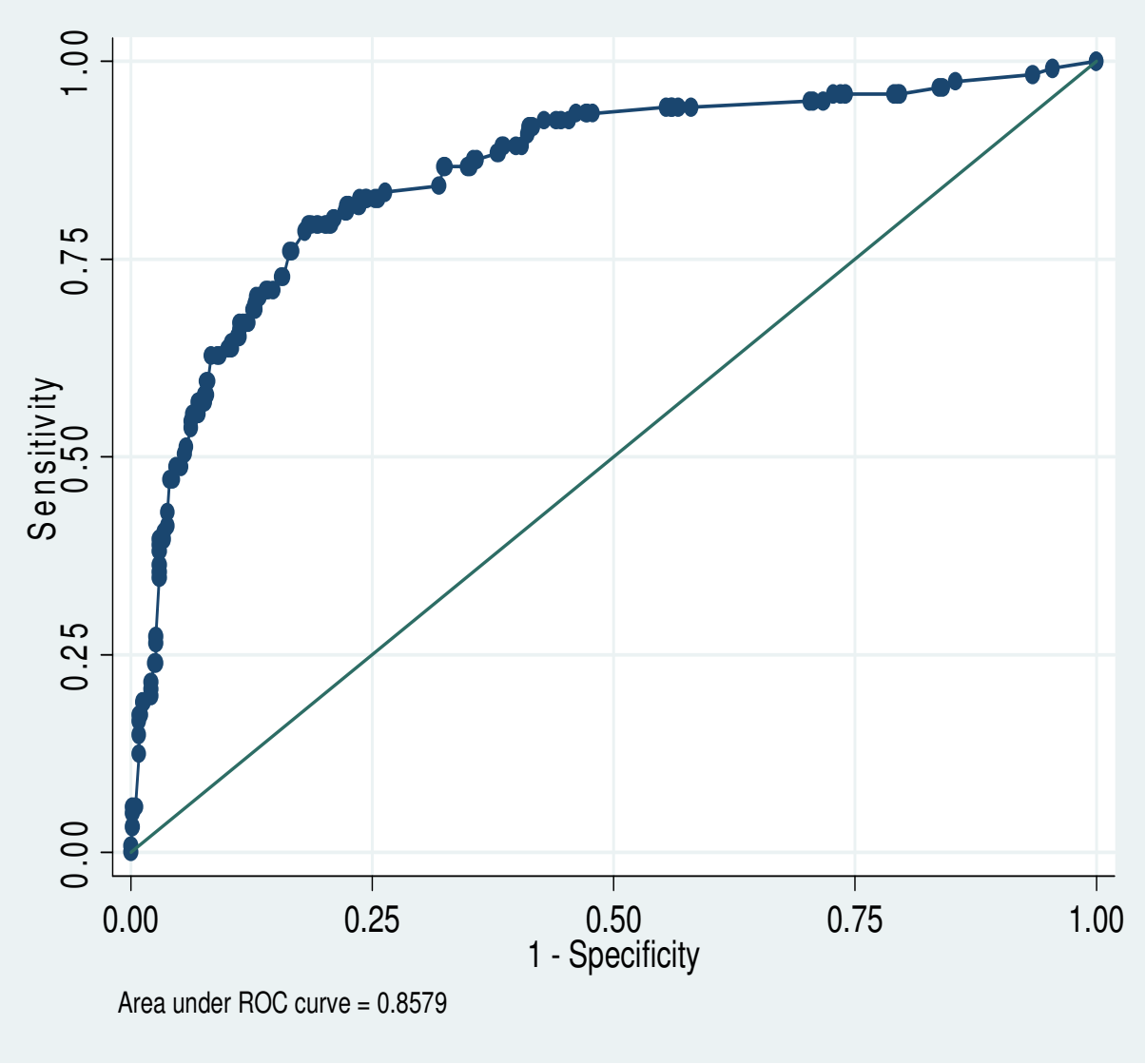
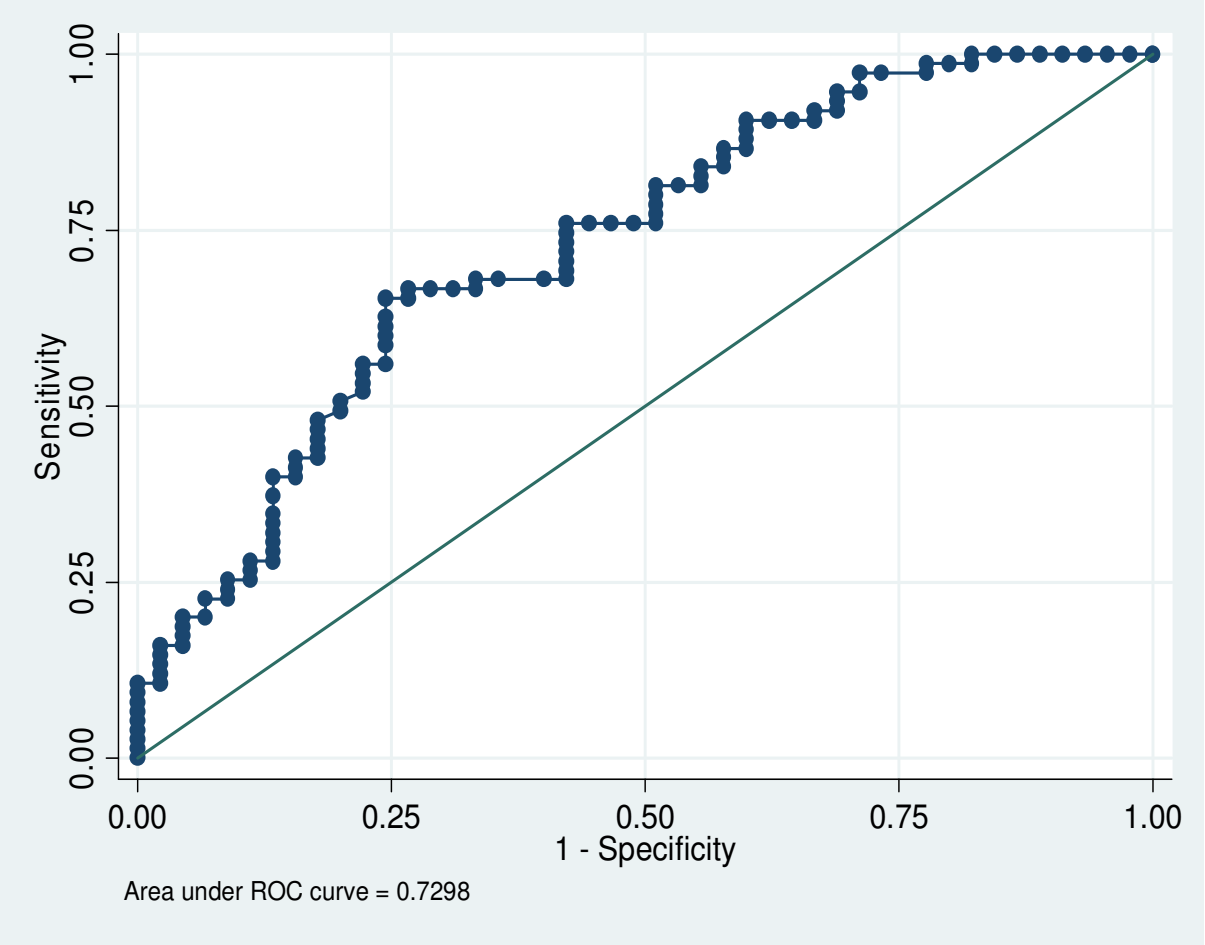


APPENDIX B

Receiver Operating Characteristic (ROC) Curve for model predicting factors associated with nicotine dependence.



Appendix C

ETHICAL APPROVAL – UNIVERSITY OF LIMPOPO (MEDUNSA)

UNIVERSITY OF LIMPOPO
Medunsa Campus

MEDUNSA RESEARCH & ETHICS COMMITTEE

CLEARANCE CERTIFICATE

P O Medunsa
Medunsa
0204
SOUTH AFRICA

Tel: 012 - 521 4000
Fax: 012 - 560 0086

MEETING: **07/2008**

PROJECT NUMBER: MREC/D/174/2008: PG.

PROJECT :

Title: Psychosocial factors associated with tobacco use among a population of medical students in Pretoria.

Researcher: Dr F Senkubuge, University of Pretoria
Supervisor: Dr O A Ayo-Yusuf / Dr G Louwagie
Department: Community Dentistry, Oral & Dental Hospital
Degree: M Med (Comm Health)

DECISION OF THE COMMITTEE:

MREC approved the project.

DATE: 11 September 2008

RESEARCH & PARTNERSHIP
2008 -09- 11
MEDUNSA CAMPUS

PROF GA OGUNBANJO
CHAIRPERSON MREC

Note:
i) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee.
ii) The budget for the research will be considered separately from the protocol.
PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

Appendix D

ETHICAL APPROVAL – UNIVERSITY OF PRETORIA

The Research Ethics Committee, Faculty Health Sciences, University of Pretoria complies with ICH-GCP guidelines and has US Federalwide Assurance.

100 1908 - 2008 UNIVERSITEIT VAN PRETORIA UNIVERSITY OF PRETORIA YUNIBESITHI YA PRETORIA
Faculty of Health Sciences Research Ethics Committee
Fakulteit van Gesondheidswetenskappe Navorsingsetiekkomitee

Date: 25/08/2008

PROTOCOL NO.	**120/2008**
PROTOCOL TITLE	Psychosocial factors associated with tobacco use among a population of medical students in Pretoria.
INVESTIGATOR	**Principle Investigator:** Dr F Senkubuge
SUPERVISOR	Dr O A Ayo-Yusuf / Dr G Louwagie
DEPARTMENT	**Dept:** Community Dentistry, Oral & Dental Hospital. **Phone:** 012-3192514 **Fax: E-Mail:** flavia.senkubuge@up.ac.za / Flavia0404@yahoo.com **Cell:** 0834024493
STUDY DEGREE	MMed (Community Health)
SPONSOR	None
MEETING DATE OF THIS STUDY	30/07/2008

This **Protocol** and **Informed Consent** and **all the attachments** have been considered by the Faculty of Health Sciences Research Ethics Committee, University of Pretoria on 30/07/2008 and found to be acceptable

*Dr A Nienaber (UNISA)	(female) BA (Hons) (Wits); LLB; LLM (UP); Dipl.Datametrics
*Prof V.O.L. Karusseit	MBChB; MFGP (SA); MMed (Chir); FCS (SA): Surgeon
*Prof M Kruger (Pret); PhD. (Leuven)	(female) MB.ChB. (Pta); MMed. Pead.
Dr N K Likibi	MB.BCh; Med.Adviser (Gauteng Dept.of Health)
*Dr T S Marcus	(female) BSc (LSE), PhD (University of Lodz, Poland)
*Mrs M C Nzeku	(female) BSc (NUL); MSc Biochem (UCL, UK)
*Snr Sr J. Phatoli Nursing-Sister	(female) BCur (Eet.A) BTec (Oncology Nursing Sience)Snr
*Dr L Schoeman	(female) BP harm, BA Hons (PSy), PhD
*Dr R Sommers	(female) MBChB; MMed (Int); MPhar.Med;
Mr Y Sikweyiya	MPH; Master Level Fellowship in Research Ethics; BSC (Health Promotion) Postgraduate Dip in Health Promotion
*Prof TJP Swart	BChD, MSc (Odont), MChD (Oral Path), PGCHE
Dr A P van Der Walt	BChD, DGA (Pret) Director: Clinical Services of the Pretoria Academic Hospital
*Prof C W van Staden	MBChB; MMed (Psych); MD; FCPsych; FTCL; UPLM; Dept of Psychiatry

Dr R Sommers; MBChB; MMed (Int); MPhar.Med.
SECRETARYof the Faculty of Health Sciences Research Ethics Committee, University of Pretoria, Pretoria Academic Hospital

Appendix E

QUESTIONAIRE

PARTICIPANT'S INFORMATION LEAFLET & INFORMED CONSENT FOR

ANONYMOUS QUESTIONNAIRE

Researcher's name: Dr Flavia Senkubuge
Student Number: 97001920
Department of Community Health
University of Pretoria

Dear Student

TITLE OF STUDY: PSYCHOSOCIAL FACTORS ASSOCIATED WITH TOBACCO USE AMONG A POPULATION OF MEDICAL STUDENTS IN PRETORIA.

I am an MMED student in Community health in the Department of Community Health University of Pretoria. You are invited to volunteer to participate in the research project on: **PSYCHOSOCIAL FACTORS ASSOCIATED WITH TOBACCO USE AMONG A POPULATION OF MEDICAL STUDENTS IN PRETORIA.**
This letter gives information to help you to decide if you want to take part in this study. Before you agree you should fully understand what is involved. If you do not understand the information or have any other questions, do not hesitate to ask. You should not agree to take part unless you are completely happy about what is expected of you.

The purpose of the study is:
To determine the prevalence and psychosocial determinants of tobacco use in medical students and their perceptions with regards to the availability and quality of tobacco control curricula, in Pretoria.

We would like you to complete a questionnaire. This may take about **25** minutes. We will collect the questionnaire from you before you leave the lecture hall. It will be kept in a safe place to ensure confidentiality. ***Please do not write your name on the questionnaire***.
We will be available to help you with the questionnaire.

The Research Ethics Committee of the University of Pretoria, Faculty of Health Sciences and Research committee of the University of Limpopo (MEDUNSA campus) granted written approval for this study.

Your participation in this study is voluntary. You can refuse to participate or stop at any time without giving any reason. Some of the questions are of a personal nature and you are not obliged to answer all questions. There will be no penalty whether you take part or not. As you do not write your name on the questionnaire, you give us the information anonymously. Once you have given the questionnaire back to us, you cannot recall your consent. We will not be able to trace your information. Therefore, you will also not be identified as a participant in any publication that comes from this study.

We sincerely appreciate your help.

Yours truly,
Dr Flavia Senkubuge

INSTRUCTIONS

- Please read each question carefully before answering it.
- Choose the answer that best describes what you believe and feel to be correct.
- Choose only one answer for each question.
- If you have to change your answer, don't worry; just erase it completely, without leaving marks.
- Remember, each question only has one answer.

Section 1:

1. How old are you?

[ ]

Years

2. What is your gender?

Female	1
Male	2

3. What is your course year at University?

Second year	1
Sixth year	2

4. In which population group would you be placed?

Black/African	1
Coloured	2
Indian/Asian	3
White	4

5. Have you ever tried or experimented with cigarette smoking, even one or two puffs?

Yes	1
No	2

6. How old were you when you first tried a cigarette?

[ ]

Years

7. During the past 30 days (one month), on how many days did you smoke cigarettes?

0 days	1
1 or 2 days	2
3 to 5 days	3
6 to 9 days	4
10 to 19 days	5
20 to 29 days	6
All 30 days	7

8. Have you smoked cigarettes *on university premises/property* during the past year?

I have never smoked cigarettes	1
Yes	2
No	3

9. Have you smoked cigarettes *in University buildings* during the past year?

I have never smoked cigarettes	1
Yes	2
No	3

10. Have you ever used snuff?

Yes	1
No	2

11. During the past 30 days (one month), on how many days did you use snuff?

0 days	1
1 or 2 days	2
3 to 5 days	3
6 to 9 days	4
10 to 19 days	5
20 to 29 days	6
All 30 days	7

12. Have you ever used water pipes or hubbly bubbly?

Yes	1
No	2

13. During the past 30 days (one month), on how many days did you use water pipes or hubbly bubbly?

0 days	1
1 or 2 days	2
3 to 5 days	3
6 to 9 days	4
10 to 19 days	5
20 to 29 days	6
All 30 days	7

14. How do you use or have you used any of the following tobacco products in the past?

		Every day	Some days	Completely stopped	Never before
a	Manufactured Cigarettes	1	2	3	4
b	Hand rolled cigarettes (Zol)	1	2	3	4
c	Hubbly bubbly	1	2	3	4
d	Nasal Snuff	1	2	3	4
e	Oral Snuff	1	2	3	4

15. On the days that you use (used) snuff, how many times per day do (did) you use snuff?

Times per day…… | | |

16. Which brand of snuff have you tried or do you currently use mostly?

		17.Tried	18.Currently using mostly
a	Traditional/home-made mix	1	1
b	Ntsu	2	2
c	Taxi	3	3
d	Singleton menthol	4	4
e	One of the new brands in tea bag-like packs (snus), specify brand name	5	5
f	Never tried / not currently using snuff	6	6
	Other brands. Specify name……..	7	7

19. On the days that you smoke(d), on average, how many cigarettes, including hand rolled cigarettes, do (did) you smoke per day?

Cigarettes per day…… | | |

20. If you smoke(d) daily, how soon after you wake up do (did) you take your first cigarette?

Within 5 minutes	1
Within 30 minutes	2
Between 30 and 60 minutes (1 hour)	3
After 1 hour	4
Stopped smoking daily more than 3 months ago	5
I have never been a daily smoker	6

21. In the **past 12 months**, **how frequently** have you had at least one alcoholic drink?

5 or more days a week	1
1-4 days per week	2
1-3 days a month	3
Less than once a month	4
I never had a drink	5

22. With regards to your drinking

		YES	NO
a	Have you ever felt that you should cut down on your drinking?	1	2
b	Have people annoyed you by criticizing your drinking?	1	2
c	Have you ever felt bad or guilty about your drinking?	1	2
d	Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?	1	2

23. During the past 7 days, on how many days have people smoked where you live, in your presence?

0 days	1
1 to 2 days	2

3 to 4 days	3
5 to 6 days	4
All 7 days	5

24. During the past 7 days, on how many days have people smoked in your presence, in places *other than* where you live?

0 days	1
1 to 2 days	2
3 to 4 days	3
5 to 6 days	4
All 7 days	5

25. Does your university have an official policy banning smoking in university buildings and residences?

Yes, for university buildings only	1
Yes, for residences only	2
Yes, for both school buildings and residences	3
No official policy	4

26. Is your university's official smoking ban for university buildings and residences enforced?

Yes, policy is enforced	1
No, policy is not enforced	2
School has no official policy	3

SECTION 2: *In general*:

27. How often do you have the feeling that you are in an unfamiliar situation and don't know what to do?

1 Very Often	2	3	4	5	6	7 Never

28. How often do you have very mixed-up feelings and ideas?

1 Very often	2	3	4	5	6	7 Never

29. How often does it happen that you have feelings inside you that you would rather not feel?

1 Very often	2	3	4	5	6	7 Never

30. In general, how often do you have the feeling that you're being treated unfairly?

1 Very often	2	3	4	5	6	7 Never

31. How often do you have the feelings that you're not sure you can keep under control?

1 Very often	2	3	4	5	6	7 Never

32. How often do you have feelings that there's little meaning in the things you do in your daily life?

1 Very often	2	3	4	5	6	7 Never

Section 3;

33. Do you support the ban on tobacco sales to adolescents (persons younger than 18 yrs old)?

Yes	1
No	2

34. Do you support the complete ban of the advertising of tobacco products?

Yes	1
No	2

35. Should smoking be COMPLETELY banned in restaurants?

Yes	1
No	2

36. Should smoking be COMPLETELY banned in discos/bars/pubs?

Yes	1
No	2

37. Should smoking in ALL enclosed public places be COMPLETELY banned?

Yes	1
No	2

38. Should health professionals get specific training on cessation techniques?

Yes	1
No	2

39. Do health professionals serve as “role models” for their patients and the public?

Yes	1
No	2

40. How important is it for you as a health professional to be seen as a ‘role model’ by your patients?

Very important	1
Somewhat important	2
Little important	3
Not all important	4

41. Should health professionals routinely advise their patients who smoke to quit smoking?

Yes	1
No	2

42. Should health professionals routinely advise their patients who use other tobacco products to quit using these products?

Yes	1
No	2

43. Do health professionals have a role in giving advice or information about smoking cessation to patients?

Yes	1
No	2

44. Are a patient's chances of quitting smoking increased if a health professional advises him or her to quit?

Yes	1
No	2

45. How soon after you awake do you smoke your first cigarette?

I have never smoked cigarettes	1
I do not currently smoke cigarettes	2
Less than 10 minutes	3
10-30 minutes	4
31-60 minutes	5
After 60 minutes	6

46. Do you want to stop smoking cigarettes now?

I have never smoked cigarettes	1
I do not smoke now	2
Yes	3
No	4

47. During the past year, have you ever tried to stop smoking cigarettes?

I have never smoked cigarettes	1
I did not smoke during the past year	2
Yes	3
No	4

48. How long ago did you stop smoking cigarettes?

I have never smoked cigarettes	1
I have not stopped smoking cigarettes	2
Less than 1 month	3
1-5 months	4
6 – 11 months	5
One year	6
2 years	7
3 years or longer	8

49. Have you ever received help or advice to help you stop smoking cigarettes?

a. I have never smoked cigarettes
b. Yes
c. No

50. Do you want to stop using snuff now?

I have never used snuff	1

I do not use snuff now	2
Yes	3
No	4

51. Are health professionals who smoke less likely to advise patients to stop smoking?

Yes	1
No	2

52. Are health professionals who use other tobacco products (chewing tobacco, snuff, hubbly bubbly, cigars or pipes) less likely to advise patients to stop smoking?

Yes	1
No	2

53. The next questions are about some problems or experiences you may have ever had because of using tobacco. If you have ever used both snuff and cigarettes, please answer (with X) for the one you have used MOST FREQUENTLY or the one used MOST OF THE TIME.

A. **Select the product for which you will be answering**. **Choose *only one* answer**.

I have never smoked cigarettes or snuff or have only smoked or snuffed once or twice.	1
Cigarettes	2
Snuff	3

	Please *answer all* the following Questions (with X)	Yes	No
B	Over time, did you find that you could smoke or use tobacco more without feeling nauseated or dizzy?		
C	Compared with when you first started smoking or using tobacco, did you need to use tobacco more in order to get the same effect?		
D	Did you ever have times when you stopped, cut down, or went without smoking or using tobacco and then experienced physical problems (for example, muscle aches, restlessness, increased appetite or weight gain, increased heart rate, nausea, or not sleeping well)?		
E	Did you ever have times when you stopped, cut down, or went without smoking or using tobacco and then experienced emotional problems (for example, feeling irritable, depressed, angry, anxious, or stressed, or having difficulty concentrating)?		
F	Did you ever have times when you smoked or used tobacco to KEEP from experiencing physical or emotional problems?		
G	Did you have times when you smoked or used tobacco even though you PROMISED yourself you wouldn't?		
H	Were there ever times when you smoked or used tobacco more frequently or for MORE DAYS IN A ROW than you intended?		
I	Were there times when you tried to stop or cut down on your smoking or tobacco use and found that you were not able to do so?		
J	Did you ever have periods of several days or more when you chain-smoked, that is, started another cigarette as soon as you had finished one, or put another snuff portion, soon as you had finished one?		
K	Did you ever have a period of a month or more when you gave up or greatly reduced important activities like sports, school, or time spent with friends and family so you could use tobacco?		
L	Did tobacco ever cause you any physical problems like coughing, difficulty breathing, or problems with your heart?		
M	Did you continue to smoke or use tobacco even though you knew that using tobacco was causing you physical problems or making them worse?		
N	Did tobacco use ever cause you any emotional problems like irritability, anxiety, difficulty concentrating, or depression?		
O	Did you continue to smoke or use tobacco even though you knew that using tobacco was causing you emotional problems or making them worse?		
p	Was there ever a time when you often had such a strong desire to smoke or use tobacco that you couldn't keep yourself from using tobacco, or found it difficult to think of anything else?		

54. During your medical school training, have you been taught in any of your classes about the dangers of smoking?

Yes	1
No	2

55. During your medical school training, have you discussed in any of your classes the reasons why people smoke?

Yes	1
No	2

56. How would you rate the quality of your tobacco control curriculum?

Very inadequate	1
inadequate	2
fairly adequate	3
very adequate	4

57. As part of your medical school training is there a curriculum on tobacco control?

Yes	1
No	2

58. During your medical school training, have you learnt that it is important to always record tobacco use history as part of all patient's general medical history?

Yes	1
No	2

59. During your medical school training, have you ever received any formal training in smoking cessation approaches to use with patients?

Yes	1
No	2

60. During your medical school training, have you been taught in any of your classes about the social problems associated with smoking?

Yes	1
No	2

61. During your medical school have you learnt that it is important to provide educational materials to support smoking cessation to patients who want to quit smoking?

Yes	1
No	2

62. Have you ever heard of using nicotine replacement therapies (NRT) in tobacco cessation programs (such as nicotine patch or gum)?

Yes	1
No	2

63. Have you ever heard of using antidepressants in tobacco cessation programs (such as bupropion or Zyban)?

Yes	1
No	2

Thank you !