

**HEALTH CARE PROVIDERS KNOWLEDGE, ATTITUDE AND  
PRACTICE OF SMOKING CESSATION INTERVENTIONS IN PUBLIC  
HEALTH FACILITIES IN KIAMBU COUNTY, KENYA**

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## **LIST OF ABBREVIATIONS**

CHD	Coronary Heart Disease
CI	Confidence Interval
CO	Clinical Officer
COHO	Community Oral Health Officer
COPD	Chronic Obstructive Pulmonary Disease
FCTC	Framework Convention On Tobacco Control
GHPSS	Global Health Professional Students Survey
HCP	Health Care Providers
IARC	International Agency For Research On Cancer
KAP	Knowledge, Attitude And Practices
KNBS	Kenya National Bureau Of Statistics
LR	Likelihood Ratio
MO	Medical Officer
MOH	Ministry Of Health
MOMS	Ministry Of Medical Services
MOPHS	Ministry Of Public Health And Sanitation
NACADA	National Campaign Against Drug Use And Abuse
NRT	Nicotine Replacement Therapy
OR	Odds Ratio
SD	Standard Deviation
SPSS	Statistical Package For The Social Sciences
UK	United Kingdom Of Great Britain
US	United States Of America
WHO	World Health Organization

## **DEFINITION OF OPERATIONAL TERMS**

### **Behavioral interventions**

Behavioral interventions refer to verbal information/ instructions that are given in order to modify health related behaviors (Mottillo, Fillion, Belisle et al., 2009). This study focused on behavioral interventions related to smoking cessation.

### **Health care provider**

This refers to a person who provides any form of health care service (McGraw-Hill Concise Dictionary of Modern Medicine, 2002). In this study the term refers to medical doctors/officers, nurses, dentists, community oral health officers and clinical officers.

### **Knowledge**

In this study, this refers to the health care providers' knowledge on smoking cessation interventions.

### **Intervention**

An intervention is any measure designed to improve health, alter the course of a disease or change the conditions which have a negative impact on the well-being of the patient, family or community (Jonas, 2005). This study focused on interventions aimed at assisting patients quit smoking.

### **Practice**

This refers to a usual or customary action (Collins English Dictionary, 2000). This study focused on the practice of 5A's (Ask, Advise, Assess, Assist and Arrange follow up) smoking cessation strategy by health care providers.

**Smoking cessation**

This refers to discontinuation of smoking or inhalation of tobacco products. It is also referred to as quitting smoking or cessation in the document.

**Smoking cessation interventions**

Smoking cessation interventions in this study included behavioral and pharmacological interventions such as brief advice and administration of pharmaceuticals that contribute to overcoming of tobacco dependence in individuals and in the population as a whole (International Agency for Research on Cancer, 2008; Raw,Anderson,Batra et al., 2002). Smoking cessation interventions are also referred to as cessation interventions in the document.

## **ABSTRACT**

### **Background**

Healthcare providers can play a major role in promoting smoking cessation by providing either behavioral and/or pharmacological smoking cessation interventions to their patients. Such smoking cessation interventions have been shown to be effective in increasing the quit rate in patients who smoke. The knowledge and attitudes of healthcare providers towards provision of smoking cessation interventions can however determine if smoking patients receive these interventions.

### **Objective**

The aim of this study was to determine healthcare providers' level of knowledge, attitude and practice of smoking cessation interventions.

### **Methodology**

This was a cross-sectional study carried out among healthcare providers working in public health facilities in Kiambu County. Four hundred participants were selected to participate in the study from five health professional groups: nurses, medical officers, dentists, clinical officers and community oral health officers. A two-stage stratified sampling technique was employed to select participants. Selection of health facilities formed the first stage while selection of health care providers formed the second stage. Self administered questionnaires were then distributed to the selected participants. Descriptive statistics was used to report frequency distribution of study variables. Chi-square tests and odds ratio were used to assess socio-demographic differences in the knowledge, attitude and practice of health care providers.

### **Results**

A total of 338 participants completed the questionnaire. Half of the participants attained an average knowledge score, 41% of the participants attained poor knowledge scores, while 8%

attained good knowledge scores. Most of the respondents (89%) had not received formal training on smoking cessation interventions. Majority of the participants (85%) had a positive attitude towards provision of smoking cessation interventions however, non-smokers had significantly more positive attitudes towards provision of smoking cessation interventions than current smokers. Overall, less than half of the health care providers reported that they always provided smoking cessation interventions to their patients. More health care providers reported that they always asked (35%) and advised (44%) smokers to quit as compared to those that always assessed willingness to quit (16%), assisted patients set a quit date (10%) or arranged follow up of patients after quitting (12%). Insufficient training, lack of smoking cessation treatment guidelines and insufficient knowledge were rated by most health care providers as important barriers to the provision of smoking cessation interventions.

### **Conclusion**

Health care providers have inadequate knowledge on smoking cessation interventions. Most health care providers surveyed had a positive attitude towards provision of smoking cessation interventions. There was sub-optimal self reported practice of smoking cessation interventions by the health care providers surveyed.

### **Recommendation**

There is need to improve health care providers' knowledge, confidence and practice levels on smoking cessation interventions through development and implementation of a pre-service and in-service standard curriculum for training healthcare providers on smoking cessation interventions. National guidelines for screening, documentation and treatment of tobacco dependence also need to be developed and implemented.

## **CHAPTER 1 INTRODUCTION**

### **1.1 Background**

Tobacco use may be defined as any habitual use of the tobacco plant leaf and its products (Al-Ibrahim & Gross, 1990). The predominant use of tobacco is by smoke inhalation of cigarettes, pipes, cigars and water pipes. Other forms of tobacco include smokeless tobacco which refers to a variety of tobacco products that are sniffed, sucked or chewed (Al-Ibrahim & Gross, 1990).

Tobacco use remains one of the leading causes of preventable illness, disability, and premature death in the world. It currently kills nearly 6 million people each year worldwide (World Health Organization, 2011). Mathematical modeling done on the basis of current smoking patterns shows that the global number of annual deaths due to smoking will rise to around 10 million by 2030. If current trends continue, there will be approximately 1 billion deaths due to smoking in the twenty-first century, of which over 70% will be in low- and middle-income countries (Jha, 2009). Approximately one in two of all long-term smokers worldwide are killed by their addiction and, the average smoker loses at least two decades of life expectancy compared with a non-smoker (Jha, 2009).

Global tobacco use levels remain high with nearly half of all men and up to 1 in every 10 women worldwide using tobacco products (American Lung Association, 2011). There are more than one billion smokers in the world and up to 80% of these current smokers live in low or middle-income countries (American Lung Association, 2011). The prevalence of tobacco use is expected to keep growing in low-income countries due to steady population growth coupled with tobacco industry targeting (WHO, 2008b).

According to a situation assessment of drug and substance abuse in Kenya by the National Campaign Against Drug Use and Abuse (NACADA), tobacco is one of the most abused substances in Kenya (NACADA, 2007). The national prevalence of tobacco use in Kenya is currently at 19% for males and 2% for females as per the results of the Kenya Demographic Health Survey 2008/2009. The national prevalence of cigarette smoking among males aged 15-49 is at 18 % with Central province leading with a prevalence of 30.4%, followed by Eastern province with 26% and Coast province at 22.6% (KNBS & ICF Macro, 2010). There has also been a gradual rise in the number of adolescents who use tobacco products in Kenya as revealed in the Kenya Global Youth Tobacco Survey done in 2007. The prevalence of tobacco use was 18% which was a 43% increase in overall tobacco use among adolescents when compared with a similar global youth tobacco survey in 2001 (Ministry of Public Health and sanitation, 2010; Warren et al., 2009). At least 3% of all male deaths in Kenya in 2004 were attributable to tobacco use (Ericksen, Mackay, & Ross, 2012).

Unless measures are taken to control the levels of smoking, tobacco will continue to contribute to increasing levels of morbidity and mortality. Smoking cessation is therefore recognized as the most practical way of avoiding a substantial proportion of all the resultant tobacco related disease and deaths (Jha, 2009).

## **1.2 Tobacco control measures**

The rising global levels of morbidity and mortality resulting from tobacco use led to development of a Framework Convention on Tobacco Control (FCTC) by the World Health Organization (WHO, 2008b). The WHO FCTC is a multilateral treaty with more than 170 parties. It presents a blueprint for countries to reduce both the supply of and the demand for tobacco (WHO, 2008a). The Kenyan government having signed and ratified the WHO FCTC on 25th June 2004, is bound to the provisions of the WHO FCTC (Ministry of Public Health and sanitation, 2010).

One of the evidence based tobacco control measure identified by the WHO as being effective in reducing tobacco use is by offering help to smokers to quit tobacco use (WHO, 2008b). Article 14 of the WHO FCTC recognizes the need for parties to take effective measures to promote cessation of tobacco use and provide adequate treatment for tobacco dependence. It also identifies health care systems as playing a central role in the promotion of tobacco cessation and provision of tobacco dependence treatment (WHO, 2010).

The Kenyan tobacco control Act that was enacted in 2007 introduced key tobacco control measures including control of the production, manufacture, sale, labeling, advertising, promotion and sponsorship of tobacco products (WHO, 2012). To assist in implementation of the tobacco control Act, the Kenyan Ministry of public health and sanitation developed the National tobacco control action plan for 2010-2015. This action plan outlines the public health policy on tobacco control in Kenya. It aims at reducing the prevalence of tobacco use by preventing people from starting to use tobacco and through reduction in the number of people using tobacco by helping users to quit (Ministry of Public Health and sanitation, 2010).



### **1.3 Role of health care providers in tobacco control**

Health care providers have a key role to play in tobacco control by working through the health care system to motivate and advice smokers to quit (Saddichha et al., 2010). Various effective smoking cessation interventions that can be utilized by health care providers in the provision of smoking cessation care are available. These range from behavioral cessation interventions (such as brief advice and counseling) to pharmacological interventions (Fiore et al., 2008).

There is evidence that advice from health professionals is effective in increasing cessation, primarily through helping motivate a smoker to make a quit attempt (Abdullah et al., 2006; Fiore et al., 2008). According to the WHO, “Integration of smoking cessation interventions into routine health visits provides health care providers with opportunities to remind tobacco users that tobacco harms their health and that of others around them while, repeated cessation education at every health visit reinforces the need to stop using tobacco” (WHO, 2008b).

Health visits and hospitalization therefore present an ideal opportunity for health care providers to provide cessation interventions to patients. It is therefore important to ensure that health care providers in Kenya are involved in the provision of smoking cessation interventions. This would improve on the chances of quitting among smoking patients and consequently reduce smoking related mortality and morbidity.

### **1.4 Statement of the research problem**

Given the health consequences of smoking and the availability of various effective smoking cessation interventions, provision of smoking cessation services deserves a prominent place in every health facility (Braun et al., 2004). However, despite effective interventions being

available to help patients quit smoking, studies show that health care providers are failing to provide these interventions. In a cross-sectional study, carried out to determine the extent to which participants were screened for and advised against tobacco use during consultations in South Africa, only 63 (12.9%) of the 500 participants reported having been screened for tobacco use during their current visit. Out of 134 smoking participants, only 16 reported being advised about the cessation of tobacco use (Omole, Ngobale, & Ayo-yusuf, 2010).

An assessment on the implementation of effective tobacco control policies in Kenya revealed that although attempts had been made to implement tobacco dependence treatment in the public health care system, smoking cessation services in public health facilities in Kenya were few, unsystematic and lacking in standardization. The potential for primary health care providers to offer brief advice to smokers in Kenya was also found to be notably underused (WHO, 2012).

As health care providers require adequate knowledge and positive attitudes on smoking cessation interventions to support their practice of these interventions, the lack of training on smoking cessation could be hindering the practice of smoking cessation interventions by health care providers (Passey, Este, & Sanson-fisher, 2012). In a study among various health professional students in Kenya, only 27.7% of the nursing students and 26.0% of the medicine students reported that they had received formal training in smoking cessation approaches during their training (Warren et al., 2009). Health care providers in public health facilities in Kenya may therefore be missing out on opportunities to provide smoking cessation interventions to their patients as a result of negative attitudes and inadequate knowledge on

smoking cessation interventions. This warrants an assessment of the health care providers' knowledge, attitude and practices on smoking cessation interventions.

### **Research Gap**

In order to be able to increase health care providers' engagement in disease prevention and control through provision of smoking cessation interventions to patients, it is important to establish health care providers' level of knowledge, attitude and practice of smoking cessation interventions. However, this information was lacking.

The Kenyan global health professional students' survey investigated the prevalence of cigarette smoking, knowledge and attitudes about tobacco use among medical, dental and nursing university students (Warren et al., 2009) while, a study by Komu et al., (2009) investigated the knowledge, attitudes and practices of cigarette smoking and oral health risks among health care professional students at the University of Nairobi. While these studies were useful in explaining tobacco use prevalence and smoking cessation practices among health care students, they may not be reflective of the situation among health care providers in public health facilities. Information was therefore scanty on the current levels of knowledge, attitude and practice of smoking cessation interventions among health care providers in public health facilities. This study therefore sought to fill this research gap.

### **1.5 Justification of the study**

This study provides information on the knowledge, attitude and practices of health care providers on smoking cessation interventions in public health facilities in Kiambu. This information is important in informing tobacco control policy and programs in Kenya and can assist in identifying effective measures needed to promote tobacco cessation. It can also be

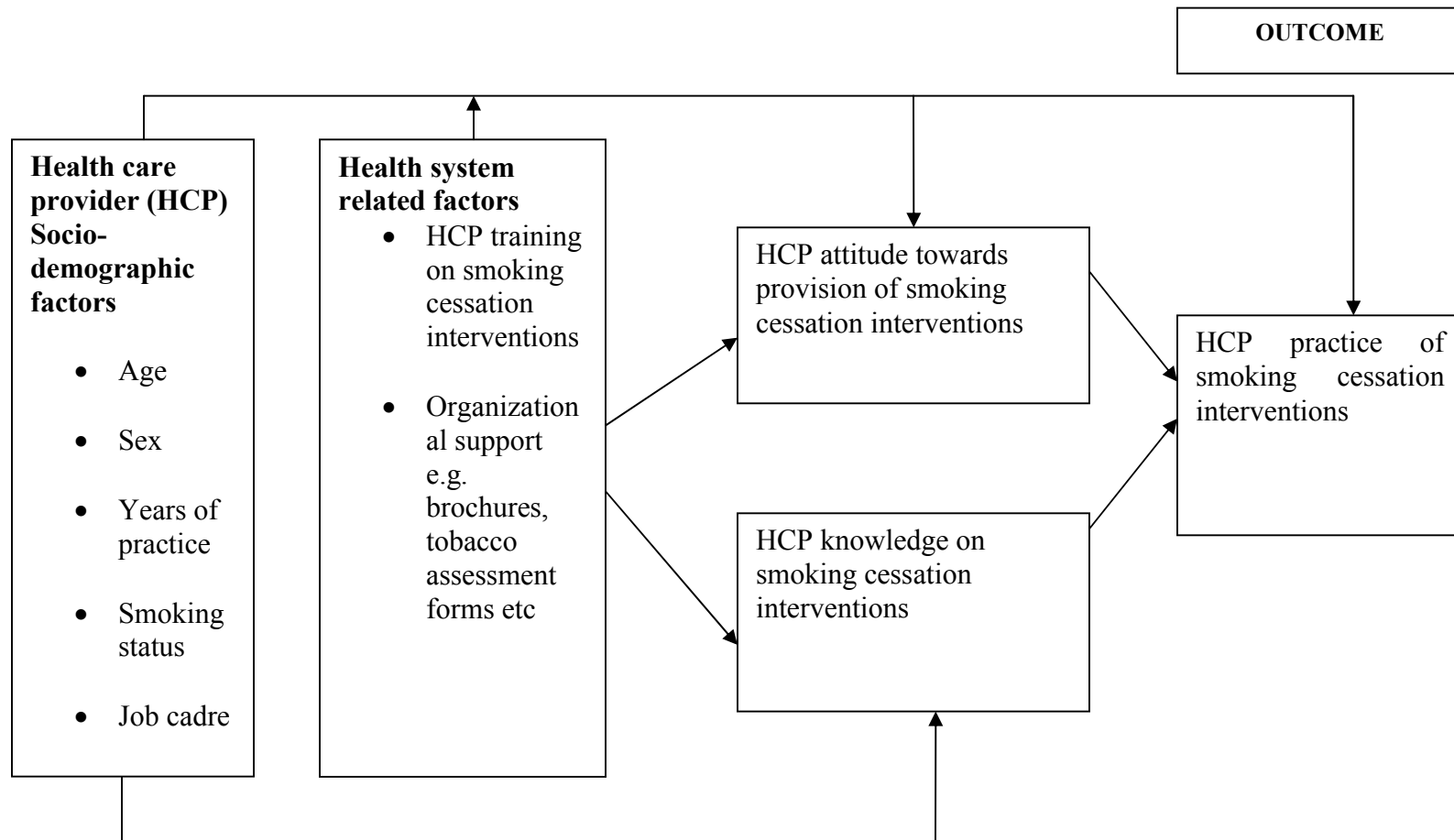
utilized in the design of effective tobacco intervention programs targeting health care providers. Results of the study will also assist in assessing the training needs of health care providers' on smoking cessation interventions.

### **1.6 Conceptual Framework**

Figure 1 illustrates the link between various demographic and health system factors with the health care providers' knowledge, attitude and practice of smoking cessation interventions. Demographic factors such as age, sex, years of practice and the smoking status of health care providers influence the health care providers level of knowledge, attitude and practice of smoking cessation interventions (Abdullah et al., 2006). Health system factors such as the training of health care providers on smoking cessation and availability of organizational support factors can also influence health care providers knowledge, attitude and practice of smoking cessation interventions (Carson et al., 2012).

The health care providers' knowledge on various aspects of smoking cessation in turn affects the level of provision of these smoking cessation interventions. The attitude of health care providers towards various aspects of tobacco dependence treatment such as their role in providing smoking cessation interventions also determines the level of involvement of health care providers in the provision of smoking cessation interventions (Meredith, Yano, Hickey, & Sherman, 2005; Passey, Este, & Sanson-fisher, 2012).

**Figure 1: Conceptual framework**



## **1.7 Objectives**

### **1.7.1 Broad objective**

To determine the knowledge, attitude and practices of health care providers' on smoking cessation interventions in public health facilities in Kiambu.

### **1.7.2 Specific objectives**

1. To determine the health care providers level of knowledge on smoking cessation interventions.
2. To determine the health care providers attitude towards provision of smoking cessation interventions to patients.
3. To establish the level of practice of various smoking cessation interventions by health care providers in public health facilities in Kiambu County.
4. To identify barriers to provision of smoking cessation interventions by health care providers.
5. To determine the association between health care providers' practice of smoking cessation interventions with their knowledge and attitude towards provision of smoking cessation.

## **1.8 Statement of hypotheses**

1. There is no association between health care providers' level of knowledge on smoking cessation interventions and their practice of smoking cessation interventions.
2. There is no association between health care providers' attitude towards provision of smoking cessation interventions and their practice of smoking cessation interventions.

## **1.9 Research questions**

1. What is the level of knowledge on smoking cessation interventions among health care providers in public health facilities in Kiambu, Kenya?
2. What is the attitude of health care providers towards provision of smoking cessation interventions in public health facilities in Kiambu?
3. What is the level of practice of smoking cessation interventions by health care providers in public health facilities in Kiambu?
4. What is the proportion of health care providers that has received training on smoking cessation interventions in public health facilities in Kiambu?
5. Which barriers influence provision of smoking cessation interventions by health care providers in public health facilities in Kiambu?

## **CHAPTER 2 LITERATURE REVIEW**

### **2.1 Introduction**

This chapter presents a review on the effects of smoking, benefits of smoking cessation, available smoking cessation interventions, effectiveness of smoking cessation interventions and factors that affect the provision of smoking cessation interventions by health care providers.

### **2.2 Effects of tobacco use**

Tobacco smoke contains more than 4000 chemicals, including more than 250 carcinogens and toxins such as polonium 210, benzene and arsenic (World Health Organization and International Union against Tuberculosis and Lung Disease, 2011). These carcinogens and toxins have been shown to be harmful to health and give rise to cell transformations, mutations, or other genetic damages that cause cancers among other diseases (WHO and International Union against Tuberculosis and Lung Disease, 2011). A meta-analysis of observational studies on cigarette smoking and cancer from 1961 to 2003 found that there was sufficient evidence to infer a causal relationship between smoking and cancers of the lung, oral cavity, larynx, pharynx, esophagus, nasal sinuses, post-nasal space, pancreas, bladder, kidney, liver, cervix, lower urinary tract and stomach (Gandini et al., 2008). There was also a causal relationship between smoking and development of acute myeloid leukemia. Lung, laryngeal and pharyngeal cancers presented the highest relative risks for current smokers, followed by upper digestive tract and oral cancers.

Smoking has also been shown to increase the risks of suffering from coronary artery disease (CAD), acute myocardial infarctions, stroke, aortic aneurysm and peripheral vascular disease (Bullen, 2008). A study on the role of smoking on cardiovascular mortality revealed that more than 1 in 10 deaths worldwide from cardiovascular disease in 2000 were attributable to smoking



(Ezzati, Henley, Thun & Lopez, 2005). In a prospective cohort study of 121,700 female nurses in the United States (US), the relative risk of coronary artery disease among current smokers was found to be 4.23 times that of participants who never smoked with the risk being highest among smokers who started smoking before the age of 15 years (Kawachi et al., 1997). Even light smokers (those smoking as little as 3–5 grams of tobacco per day) were shown to carry a significantly increased risk of developing a myocardial infarction as compared to non-smokers in a prospective cohort study of 12,000 subjects who were followed up for approximately 22 years (Prescott et al., 2002).

Tobacco use also exerts inflammatory effects on the respiratory system that can lead to development of chronic obstructive pulmonary disease (COPD), chronic bronchitis and emphysema (Behr & Nowak, 2002). A cross sectional study carried out to determine the prevalence of chronic obstructive pulmonary disease (COPD) and its relationship with tobacco smoking in India identified smoking as a major risk factor for COPD. The odds of COPD varied from about 2 to 3.5 for different types of smoking as compared to non-smokers (Jindal et al., 2005). A cross-sectional household survey in England also found a dose dependent relationship between severity of lung function impairment and current cigarette smoking with greater impairment being associated with higher smoking prevalence (Shahab et al., 2006).

Maternal smoking has also been shown to be causally associated with several pregnancy related complications. In a systematic review of studies on smoking during pregnancy and associated pregnancy outcomes by Cnattingius (2004), smoking during pregnancy was found to be causally associated with fetal growth restrictions, stillbirths, preterm births and placental abruption. Maternal smoking was also associated with increased risks of spontaneous abortions, ectopic pregnancies and placental abruption (the premature separation of the placenta from the uterine

wall). A case- control study by Bouyer et al, (2003) found a dose dependent association between maternal smoking and ectopic pregnancies while Haglund & Cnattingius (1990) observed a dose-response relationship between smoking and sudden infant death syndrome. Smoking up to nine cigarettes per day was found to double the risk of sudden infant death syndrome while smoking 10 cigarettes or more per day nearly tripled the risk.

Apart from effects on the fetus, other non-smokers also suffer the health consequences of tobacco through involuntary exposure to cigarette smoke. Secondhand smoke puts non-smokers at a greater risk of lung cancer, respiratory and cardiovascular diseases (Beaglehole & Benzi, 2005). A prospective cohort study of US female nurses by Kawachi et al, (1997) found that during the 10 years of follow-up, women regularly exposed to passive smoke were 1.91 times more likely to suffer from coronary artery disease as compared to women not exposed to passive smoking. Those exposed occasionally to passive smoke were 1.58 times as likely to suffer from coronary artery disease after adjustment for a broad range of other cardiovascular risk factors. Likewise, a meta-analysis by Jones et al, (2011) found that passive smoking in the family home was a major influence on the risk of lower respiratory infections in infants, with smoking by either parent or other household members significantly increasing the risk of lower respiratory infections in children.

Other health effects of smoking include impaired wound healing, reduced sense of taste or smell, lower resistance to infection, reduced physical endurance and premature skin aging. Smokers are also more likely to suffer more from peptic ulcer disease, osteoporosis, mental ill-health, and infertility as compared to non-smokers (Ali, Safwat, & Onyemelukwe, 2012). Smoking is also associated with negative social and aesthetic consequences including the undesirable smell that arises from cigarette smoke, bad breath and staining of teeth (Watt, Daly, & Kay, 2003).

### **2.3 Benefits of smoking cessation**

At any age, quitting confers substantial and immediate health benefits including reduced cardiovascular disease risk, improved lipid profiles, reduced risk of stroke and reduced risk of cancers attributable to smoking (Abdullah & Husten, 2004). Benefits of smoking cessation are immediate and within the first week of cessation, improvements can be seen in the heart rate and blood pressure. Within a year of cessation, the excess risk of coronary artery disease is half that of a continuing smoking. The risk of cancer of the oral cavity, throat, esophagus and bladder are halved while the risk of cervical cancer falls to that of a non-smoker after 10 years of quitting. The risk of stroke can fall to that of a non-smoker after 2 to 5 years of quitting while 15 years after cessation, the overall risk of death is almost the same as that of those who have never smoked, especially if the smoker quits before illness develops (Ali et al., 2012; Ericksen et al., 2012).

Smoking cessation at any age has also been shown to increase life expectancy when compared to the life expectancy of those who continue to smoke. A study carried out to determine the life extension obtained from stopping smoking at various ages found that most of the excess mortality from smoking can be avoided by quitting smoking at or before the age of 35 years. The life expectancy of smokers who quit at age 35 exceeded that of continuing smokers by 6.9 to 8.5 years among males and 6.1 to 7.7 years among females (Taylor et al., 2002). However, even smokers who quit at the age of 65 were found to gain 2 years of life expectancy among men and 3.7 years among women, relative to those who continued to smoke. This study showed that smoking cessation is beneficial at any age, hence the need to emphasize smoking cessation to all smokers, irrespective of age.

Apart from the significant health benefits, smoking cessation can in the long term, lead to reduction in smoking-related health-care costs to countries (Stead, Bergson, & Lancaster, 2008). It is therefore of crucial importance that all smokers have access to a range of smoking cessation interventions and treatments that are appropriate and accessible to them. This would encourage smoking cessation and maximize the smokers chances of quitting successfully (Ministry of Public Health and sanitation, 2010).

## **2.4 Interventions for smoking cessation**

There are two main types of smoking cessation interventions that can be utilized by health care providers to assist smokers to quit namely: behavioral and pharmacological interventions (Fiore et al., 2008; WHO, 2003).

### **2.4.1 Behavioral interventions for smoking cessation**

Behavioral interventions that can be utilized by health care providers to aid smokers in quitting include brief and/or intensive cessation interventions. Brief behavioral cessation interventions refer to cessation advice and counseling delivered opportunistically by health care providers during routine consultations to smokers whether or not they are seeking help with smoking cessation (Al-dogheter, 2004). Brief behavioral interventions are aimed at motivating and supporting smoking cessation among patients (Jamal et al., 2012). Intensive behavioral cessation interventions refer to interventions offered by trained cessation specialists through individual/group counseling, cessation support groups and telephone counseling (Fiore et al., 2008; WHO, 2003).

Provision of brief behavioral interventions involves asking patients about their current smoking status, advising them to stop, offering assistance either by providing further advice, a referral to a

specialist service, or recommendation of or a prescription for pharmacotherapy and arranging follow up (Al-doghether, 2004).

One model that has been advocated internationally for use by all health care providers in the delivery of brief behavioral smoking cessation interventions is a five-step strategy commonly known as the 5A's model (Fiore et al., 2008). The strategies of the 5A's model are designed to be brief and require less than 10 minutes of direct health care provider time (Fiore et al., 2008). This model has also been advocated for use in Africa in a draft guideline for smoking prevention and cessation in Africa and the Middle East (Ali et al., 2012). The five major components of the 5A model are to:

**Ask** about smoking, record the smoking status of each patient and keep these records up to date.

**Advise** smokers of the benefits of stopping in a personalized and appropriate manner that is supportive and non-confrontational. This includes linking the advice to the patient's current illness, social and economic costs of tobacco, and/or impact on children or other household members.

**Assess** the smoker's motivation to stop or willingness to make a quit attempt.

**Assist** smokers in their attempt to quit smoking. This includes offering counseling and support by assisting the patient to set a quit day, reviewing the past quit attempts, drawing up a personalized action plan for the patient and providing information on the expected withdrawal symptoms and how to cope with such withdrawal symptoms (Ali et al., 2012). Other measures include: recommendation to use pharmaceutical aids; provision of accurate information and advice about pharmaceutical aids and referral to specialist cessation services if available.

**Arrange** follow up of the patient. For the patient willing to make a quit attempt, follow-up contacts should be arranged within the first week after the quit date. For patients not ready to make a quit attempt at the time, brief motivational interventions should be carried out and tobacco dependence and willingness to quit addressed at the next health visit. The brief motivational intervention involves helping the smoker identify the relevance of quitting, the risks of smoking, the rewards of cessation and methods of dealing with roadblocks or barriers to quitting (Ali et al., 2012; Fiore et al., 2008).

#### **2.4.2 Pharmacological interventions for smoking cessation**

Pharmacological interventions that can be used to assist smokers to quit include both nicotine based and non-nicotine based medications. First-line drugs include 5 nicotine replacement therapies (NRT) namely nicotine gum, nicotine inhaler, nicotine lozenge, nicotine nasal spray and nicotine patch and 2 non-nicotine based medications namely bupropion SR (sustained release) and varenicline (Fiore et al, 2008). Second line drugs include clonidine and nortriptyline (Tonnesen, 2009).

The aim of NRT is to temporarily replace the nicotine from cigarettes to reduce motivation to smoke, thus easing the transition from cigarette smoking to complete abstinence. NRT was found to increase the rate of long-term quitting by approximately 50% to 70% as compared to placebos in a review of nicotine replacement therapies by Stead et al., (2008).

Varenicline, is a nicotine receptor partial agonist, that helps smokers stop smoking by alleviating craving and withdrawal symptoms through the reduction of smoking satisfaction and pleasure (Cahill & Lancaster, 2011; Zwar et al., 2011). A meta-analysis carried out to assess the efficacy of varenicline found that varenicline increases the chances of successful long-term smoking

cessation by two or threefold when compared to pharmacologically unassisted quit attempts (Cahill et al., 2011).

Bupropion is an anti-depressant that reduces the urge to smoke and reduces symptoms from nicotine withdrawal in the first months, thus allowing the patient to cope with the behavioral and psychological aspects of smoking cessation (Tønnesen, 2009; Zwar et al., 2011).

## **2.5 Effectiveness of behavioral smoking cessation interventions**

Health care providers can make a difference even with a minimal (less than 3 minutes) behavioral smoking cessation intervention (Fiore et al., 2008). Even when patients are not willing to make a quit attempt at a particular time, provision of advice on smoking cessation by health care providers enhance motivation and increase the likelihood of future quit attempts (Fiore et al., 2008). In a study carried out to assess the association between abstinence from smoking and use of different smoking cessation interventions among smokers in England, smokers who used a combination of behavioral support and pharmacotherapy in their quit attempts had almost three times the odds of success than those who used neither behavioral support nor pharmacotherapy (Kotz, Brown, & West, 2014).

A meta-analysis by Stead, Bergson and Lancaster, (2008) assessing the effectiveness of advice from physicians in promoting smoking cessation found a significant increase in the rate of quitting in a review of 17 trials of brief advice versus no advice (or usual care). Patients were 1.66 times more times likely to quit with brief advice as compared to no advice. In the comparison between intensive and minimal advice in 15 trials, a significant advantage of more intensive advice was identified with patients being 1.37 times more likely to quit with intensive as opposed to minimal advice. In one of the randomized clinical trials analyzed in the meta-

analysis, a minimal (brief) contact behavioral intervention was found to be effective in increasing the smoking abstinence rates with the self-reported smoking abstinence rates at the 12 month of follow up being 1.5 times higher in the intervention group as compared to the control group (Pieterse et al., 2001). In a meta-analysis on nursing smoking cessation interventions, advice and support from nursing staff was also found to increase patients' success in quitting smoking, especially in a hospital setting. The odds of a successful quit attempt for smokers increased by 47% when advised to quit by nursing staff as compared with no advice (Rice & Stead, 2009).

Behavioral smoking cessation interventions have also been shown to increase chances of quitting among smokers who are unmotivated/ unwilling to quit at the time of their visit to a health care provider. A meta- analysis by Aveyard et al., (2012) aimed at comparing and assessing the effects of opportunistic physician advice to stop smoking found that compared to no intervention, advice to quit on medical grounds increased the long-term abstinence by 47%. Offering intensive cessation interventions for smoking cessation increased the quit rate by 2.17 times as compared to no intervention. This study provided evidence that health care providers may be more effective in promoting attempts to stop smoking by offering assistance to all smokers as opposed to offering assistance to only those who express an interest in quitting.

Provision of behavioral smoking cessation interventions by health care providers has also been found to be effective even in a developing country setting. A quasi-experimental study carried out to evaluate the effect of a smoking cessation intervention among disadvantaged pregnant women in Cape Town, South Africa, found a significant difference in reduction of smoking of 11.8% among women who had received smoking cessation interventions in the form of self-help quit materials and brief counseling by mid-wives and peer counselors when compared with women who did not receive such care (Everett-murphy et al., 2010).



Smoking cessation interventions targeted at adolescents and young adults have also been found to be effective in increasing quit attempts. A retrospective study of 5154 students from an urban school in Memphis carried out to determine the benefits of physician advice against smoking among adolescents, found that combination of screening and advice were associated with more accurate knowledge regarding tobacco related damage and healthier attitudes about smoking among the adolescents (Hum et al., 2010). Adolescents who had received advice were also more likely to plan to quit smoking in 6 months and had significantly more quit attempts than those who were neither screened nor advised.

Studies show that if all health care professionals systematically advise their patients to give up smoking, eventually more smokers will successfully stop smoking (Korte et al., 2010). In a study in the US smoking cessation interventions provided by more than one type of health professional were found to have the potential to substantially increase quitting and readiness to quit in the population. The odds of recent quitting were 2.37 times higher among patients that had been asked about smoking by two or more types of health professionals than those only asked by a single health professional (An et al. , 2008).

## **2.6 Factors influencing provision of smoking cessation interventions by health care providers**

There are various factors that can affect the provision of cessation interventions by health care providers, these include: health care providers knowledge, confidence and skills in provision of smoking cessation interventions ; attitude of health care providers towards provision of cessation interventions; health care providers socio-demographic factors including age, sex, number of years of practice and smoking status; health care providers level of training on

smoking cessation interventions and; presence/absence of organizational support factors (Freeman et al., 2012; Gunes et al., 2005).

### **2.6.1 Health care providers knowledge and confidence levels**

To be able to effectively encourage and support smoking cessation among their patients, health care providers require adequate knowledge on smoking cessation interventions and techniques. In a cross-sectional study assessing the knowledge and attitude of health care providers caring for pregnant women in Australia, one of the factors independently associated with assessing smoking status was the smoking cessation knowledge score with better smoking cessation knowledge being significantly associated with higher rates of health care provider self-reported assessment of smoking status (Passey, Este & Swanson- Fisher, 2012).

Some of the knowledge gaps that have been found to affect the health care providers level of provision of smoking cessation interventions include: knowledge of recommended behavioral and pharmacological smoking cessation interventions; knowledge of benefits and effectiveness of providing smoking cessation interventions; knowledge and skills in behavioral intervention techniques and; knowledge on assessment and management of nicotine dependence/withdrawal symptoms (Boily, Lovato, & Murphy, 2006; Everett, Odendaal, & Steyn, 2005).

Poor knowledge of the available smoking cessation interventions is a hindrance to the provision of smoking cessation interventions by health care providers. In a study among community health providers in China, only 13.7% of the sampled health care providers reported use of nicotine replacement therapies when helping smokers to quit while 55.3% had never heard of them (Klink et al., 2011). Similarly, in a study among dentists and dental students in Nigeria, one of the main barriers to providing smoking cessation counseling to patients was the lack of knowledge on

smoking cessation methods. In this study only a third (30.6 %) of the 136 respondents reported having heard about smoking cessation with only 13.3 % describing the components of smoking cessation therapy as counseling and nicotine replacement therapy (Uti & Sofola, 2011).

Adequate knowledge on the benefits and effectiveness of smoking cessation interventions can also increase the provision of smoking cessation interventions by health care providers. In a study among registered nurses in china, one of the factors identified as facilitating smoking cessation interventions with patients was recognizing that smoking cessation is the most cost-effective intervention to prevent chronic disease (Chan et al., 2007). Health care providers who are aware of the benefits of promoting smoking cessation may therefore be more ready to provide smoking cessation interventions to their patients.

The level of knowledge on smoking cessation intervention techniques may also affect the level of provision of smoking cessation interventions. Poor knowledge of intervention techniques minimizes the level and effectiveness of support offered to smoking patients. A study among physicians in China found that only 6.1% of physicians helped their patients set a target quit date while most of the physicians stated that they needed more education about offering assistance to smoking patients (Gan & Hu, 2007). Similarly, a cross sectional study among physicians in Nigeria found that only 15% of the physicians helped their patients set a quit date while a majority of the physicians (66.3%) reported that having poor knowledge of smoking cessation techniques was the greatest obstacle to implementing smoking cessation interventions (Desalu et al., 2009).

Knowledge on assessment and management of nicotine dependence and withdrawal symptoms arising from smoking cessation is also crucial in the effective support of patients willing to quit

(Ali et al., 2012). However, a number of studies have found that health care providers are ill prepared to assess their patients' level of nicotine dependence and to assist their patients in quitting. In a study among nurses in China, two thirds of the nurses stated that they had not received information about nicotine dependence and its related withdrawal symptoms during their training. Consequently, majority of these nurses seldom or never assessed level of nicotine dependence, nor helped patients develop a cessation plan (Chan et al., 2007). Similarly, in a study among physicians in Kentucky (US), one of the factors contributing to the low number of physicians that assisted patients in dealing with nicotine dependence was insufficient knowledge about how to talk to their patients about nicotine dependence (Marmorato et al., 2008).

Health care providers' level of confidence in performance of various smoking cessation interventions also determines their level of involvement in provision of smoking cessation interventions. In a cross sectional study among physicians in Indonesia, study participants who felt confident in assisting patients to quit smoking were significantly more likely to advise patients to quit smoking (Nawi et al., 2007). Similarly, in a study among dentists in the US, confidence in the effectiveness of counseling on tobacco cessation was the strongest predictor of asking about smoking with the dentists being six times more likely to ask their patients about tobacco use if they were confident in their cessation knowledge (Albert et al., 2005).

The assessment of health care providers knowledge on smoking cessation interventions is therefore a priority that can help to identify measures needed to increase health care providers confidence and ability to provide smoking cessation interventions (Passey et al., 2012).

### **2.6.2 Health care provider attitude towards provision of smoking cessation interventions**

The attitude of health care providers towards provision of smoking cessation interventions plays a major role in the practice of smoking cessation interventions by health care providers. A group randomized controlled trial study carried out to determine the relationship between primary care provider's attitudes toward smoking cessation and the corresponding smoking-cessation practices found that attitude was significantly associated with smoking-cessation counseling and referral. Primary care providers with more favorable attitudes toward smoking-cessation counseling had significantly higher rates of patients reporting that the provider referred them to a smoking cessation program (Meredith et al., 2005).

Attitude factors that can affect provision of cessation interventions include health care providers perceptions on their role in smoking cessation, perceptions on lack of effect of smoking cessation interventions, perceptions of lack of time to provide interventions, reluctance to raise the issue due to perceived patient sensitivity about smoking and perceived lack of patient acceptance of smoking cessation interventions ( Zwar et al., 2010).

Health care providers' attitude towards their role in provision of smoking cessation interventions plays an important role in their level of involvement in provision of smoking cessation interventions. In a survey among health care providers in china, 88% of the health care providers surveyed agreed/ strongly agreed that health care providers should play an active role in tobacco control (Yan et al., 2008). In contrast, in a study among dentists and dental students in Nigeria, only 2.9% of the respondents agreed that it was their professional responsibility to encourage patients to quit tobacco use (Uti & Sofola, 2011). Such negative perceptions can impact on the level of provision of smoking cessation interventions.

Health care providers attitude towards the effectiveness of cessation interventions has been found to also affect the level of provision of smoking cessation interventions to patients (Vogt, Hall, & Marteau, 2005). In a cross sectional study by Gunes et al (2005) carried out to determine attitude and self-reported practices on smoking cessation counseling among physicians at a university hospital in Turkey, physicians who considered cessation counseling as an efficient use of time and an easy way to get people to quit, more often assessed and advised their patients to stop smoking. Likewise, a cross-sectional study carried out to assess Chinese physicians smoking knowledge, attitudes and practices, found physicians to be more likely to ask about smoking status or advise smokers to quit if they held beliefs that most smokers will follow their smoking-cessation advice (Gan et al., 2007). In a national survey of US health professionals smoking cessation practices, a positive attitude about the effectiveness of advice was significantly associated with advising patients to quit (Tong et al., 2010).

Health care providers' perceptions on the effects of provision of cessation interventions on the provider and patient relationship also plays a role in the level of provision of smoking cessation interventions by health care providers. A study carried out to assess smoking cessation related attitudes and behavior among general medical practitioners in England, found that the only unique predictor of the number of patients advised to stop smoking was whether the medical practitioners thought that giving such advice would harm their relationship with the patient (Mcewen, West, & Preston, 2006). In a study among physicians in Turkey, perception that cessation counseling improved the relationship between the physician and the patient was significantly associated with advising and assisting smokers with smoking cessation (Gunes et al., 2005). Similarly, in a study among nurses in Minnesota (US), most of the nurses surveyed

strongly/somewhat disagreed that offering cessation advice would have a negative impact on their relationship with patients (McCarty et al., 2001).

Perceptions of health care providers on the availability/ unavailability of time to discuss about smoking cessation with smoking patients during routine consultations has also been found to be associated with the level of provision of smoking cessation interventions. Health care providers who perceive that providing smoking cessation advice takes time away from more important tasks may be less willing to provide smoking cessation interventions to their patients (Mcewen et al., 2006). In a cross sectional study among general medical practitioners in Germany, the most frequently reported barrier for actively engaging in smoking counseling was the lack of time during consultation (Ulbricht et al., 2006). In contrast, in a cross sectional study among nurses in New Zealand, almost three quarters of the nurses surveyed disagreed that their time was better spent helping patients with other things rather than smoking cessation. Majority of the nurses stated that if they could effectively intervene they would be happy to spend an extra five minutes with each patient who smokes (Wong et al., 2007).

Health care providers' perceptions on the acceptance of smoking cessation interventions by smoking patients could also affect their willingness to engage in provision of smoking cessation interventions. Health professionals belief that patients would resist advice was associated with being less likely to advise patients to quit in a national survey of US health professionals (Tong et al., 2010) while, in a cross-sectional study of medical personnel in Minnesota (US), respondents who believed that most patients were not receptive to smoking-cessation messages were found to be less likely to report consistent participation in smoking-cessation activities (Braun et al., 2004).

The identification of the health care providers' attitude towards cessation interventions can therefore assist in assessing the need for more effective health care provider education programs to address health care providers attitude towards provision of smoking cessation interventions (Meredith et al., 2005).

### **2.6.3 Health care providers smoking status**

Smoking by health professionals has been shown to affect the attitude and practice of health care providers on smoking cessation. An international survey of physicians from 16 countries carried out to establish the association between smoking status and provision of smoking cessation interventions, found that smoking physicians were less likely to initiate cessation interventions. In addition, significantly fewer smoking than non-smoking physicians felt that smoking was a harmful activity; more non-smokers agreed that smoking cessation was the single biggest step to improving health and more non-smoking physicians discussed smoking at every visit (Pipe, Sorensen and Reed, 2009). Similar findings were also reported in a study among primary health care providers in Egypt in which non smoker public health personnel were found to have significantly better attitudes towards smoking cessation than current smokers (Sabra, 2007).

A study on the relationship between nurses smoking behavior and cessation practices by Slater, McElwee, Fleming and McKenna, (2006) found that nurses who smoked were less motivated to provide cessation support for patients, had less positive attitudes to the value of smoking cessation and were less likely to want further training. Moreover, even though health care providers who smoke may still offer cessation interventions, they may not be seen as credible counselors if their patients know they smoke (Abdullah & Husten, 2004).



The identification of the prevalence and impact of health care providers smoking on their attitudes and practice of smoking cessation interventions is therefore essential as this information can be used to determine the specific strategies and programs that need to be developed to assist health professionals who smoke with their own cessation support, and that of their patients (Pipe et al., 2009).

#### **2.6.4 Health care provider socio-demographic characteristics**

Age, sex and the number of years of practice of health care providers have been found to be significantly associated with health care providers' knowledge, attitude and practice of smoking cessation interventions in a number of studies. In a cross sectional study among doctors in Hong Kong, being aged 30 or below and being female was significantly associated with having more favorable attitudes towards smoking cessation. Advising patients to quit was significantly associated with being above 50 years of age and having practiced for more than 30 years (Abdullah et al., 2006).

A study carried out to determine whether sex and smoking status mattered towards the smoking cessation practices of Chinese physicians found that male physicians were less likely to provide smoking cessation counseling regardless of their smoking status while non-smoking female physicians were more active in advising patients on quitting (Lam et al., 2011). These results differed with those of a study among health care providers in Portugal, where the odds of always asking about tobacco use was 2.19 times higher among male health care providers than among females. Males were also found to be 2.53 times more likely to record smoking status in clinical notes than females (Ravara et al., 2012).

In contrast, other studies have found no statistically significant differences in the rates of smoking cessation interventions by gender, age, years of practice or type and location of practice of health care providers (Chang et al., 2012; Eldein, Mansour, & Mohamed, 2013; McEwen et al., 2006)

The identification of the effect of various health care provider demographic characteristics on the provision of behavioral smoking cessation interventions is crucial as it can assist in the development of tailored smoking cessation training programs for health care providers (Lam et al, 2011).

### **2.7 Importance of building capacity of health care providers in provision of smoking cessation interventions**

Training of health professionals on smoking cessation is a crucial strategy in building capacity of health care providers in treatment of tobacco dependence (WHO, 2003). A meta-analysis carried out to determine the effectiveness of training health care professionals in the provision of smoking cessation interventions to their patients found that health care professionals who had received training were more likely to perform tasks of smoking cessation as compared to untrained professionals (Carson et al., 2012). The study found that trained health care providers were more likely to ask patients to set a quit date, make follow-up appointments, counsel smokers, provide self-help material and prescribe a quit date as compared to untrained controls.

Training needs for health care providers on smoking cessation methods however still exist in various countries. In a cross-sectional study carried out to determine the attitude and practice of nurses in the United Arab Emirates in providing tobacco cessation care to patients, 51.9% of the nurses sampled had not attended tobacco cessation training programs however, a majority

(91.1%) of the nurses were ready to take part in tobacco cessation training programs (Sreedharan, Muttappallymyalil, & Venkatramana, 2010). Similarly, in a study carried out to evaluate the knowledge and practices related to smoking cessation among physicians in Nigeria, 70.6% of the participants reported that tobacco education content in their medical school curriculum was inadequate (Desalu et al., 2009)

The WHO FCTC guidelines advocate for the incorporation of tobacco dependence and cessation education into the curriculum and continuing professional training of health care providers and health professional students (WHO, 2010). However, the Global Health Professionals Students Survey (GHPSS), carried out in 31 countries between 2005 and 2007 at 80 survey sites, indicated that less than 40% of the students sampled had received training on smoking cessation (WHO, 2008b). In the Kenyan GHPSS, only 26% and 8.3% of the medical and dental students respectively reported receiving formal training on smoking cessation approaches during their training (Warren et al., 2009). In a study among students at the College of Health science in University of Nairobi, 50.4% of the students sampled felt that their curriculum did not train them adequately in providing smoking cessation interventions (Komu et al., 2009).

Apart from training, an institutional/ organizational culture that provides policies to identify patients who smoke and support smoking cessation activities is important in influencing health care providers' practices on smoking cessation (Cohen, McGinnis, & Salsberg, 2007). Some strategies that have been found to be effective in promoting smoking cessation implementation in health facilities include: Instituting a tobacco user identification system to ensure that for every patient at every visit, tobacco-use status is asked and documented in the medical records; promoting health care providers intervention through education resources such as brochures on smoking cessation, and feedback ; dedicating staff as cessation specialists to provide treatment;

assessing the delivery of treatment in staff performance evaluation and; formulation and implementation of clinical practice guidelines on smoking cessation interventions (Quinn, 1999; U.S. Preventive Services Task Force, 2009).

## **Conclusion**

Inadequate information about smoking cessation interventions, negative attitude towards provision of smoking cessation interventions, inadequate training and lack of organizational support for routine assessment are some of the factors that impede health care providers from taking an active role in providing interventions to aid their patients in smoking cessation (WHO, 2003). Assessment of health care providers' knowledge, attitude and practice of smoking cessation interventions in Kenyan public health facilities can therefore assist in determining measures that are needed to improve the provision of smoking cessation interventions to smoking patients.

## **CHAPTER 3      METHODOLOGY**

### **3.1 Study design**

This was a descriptive cross-sectional study aimed at determining health care providers' knowledge, attitude and practice of smoking cessation interventions. The descriptive cross-sectional study design was selected as it is ideal in describing and quantifying the distribution of various socio-demographic characteristics, behavior and practices of a given group of people in a study population at one point in time (Varkevisser, Pathmanathan, & Brownlee, 2003).

### **3.2 Study area**

This study was carried out in public health facilities within Kiambu County including Kiambu District Hospital, Ruiru sub-district Hospital, Wangige health centre, Githunguri Health Centre, Karuri Health Centre, Limuru Health centre, Gichuru Dispensary, Uthiru dispensary, Miguta dispensary, Mataara dispensary, Kagwe dispensary and Gathaga Dispensary.

Kiambu County is located in Central Kenya. It borders Murang'a County to the North, Machakos County to the East, Nairobi and Kajiado County to the south, Nakuru County to the west and Nyandarua County to the North West. Kiambu County consists of 10 Districts namely Githunguri, Lari, Kikuyu, Gatundu North, Gatundu South, Kiambu East, Kiambu West, Thika East, Thika West and Ruiru (Kenya National Bureau of statistics, 2011).

The population of Kiambu County as per the 2009 census was 1,623,282 people with 34.5% of the population being aged 0-14 years, 61.9% of the population was 15-64 years of age while 3.6% of the population was aged over 65 years. Kiambu County covers a surface area of 2,543 km<sup>2</sup>. The density of people in Kiambu County per km<sup>2</sup> is 638 (Commission on revenue

allocation, 2011). Public health facilities in Kiambu County include: 4 district hospitals, 4 sub-district hospitals, 29 health centers and 51 dispensaries (MOPHS, 2012).

Kiambu County was selected for this study as being in Central Province, its part of the population with the highest prevalence of smoking in Kenya as per the 2008 Kenya demographic health survey (KNBS and ICF Macro, 2010). It was therefore of importance to determine if health care providers in Kiambu County are able and willing to provide smoking cessation interventions to their patients.

### **3.3 Study population**

The study was carried out among health care providers working in public health facilities in Kiambu County. Health care providers who participated in the study were those providing primary care and in direct contact with patients in the following 5 health professions:

- Nursing officers
- Medical doctors
- Dentists
- Clinical officers
- Community oral health officers (COHO)

### **3.4 Eligibility criteria**

#### **3.4.1 Inclusion criteria**

The inclusion criteria for participation in the study were:

- Be a medical doctor/intern, nurse, dentist/intern, clinical officer/intern or community oral health officer/intern.
- Be working in a public health facility within Kiambu County.

- Be directly involved in providing care to patients.
- Consent to participate in the study.

### 3.4.2 Exclusion criteria

The following were excluded from this study:

- Health care providers not within the five study groups.
- Medical doctors, nurses, dentists, clinical officers or Community oral health officers not directly involved in providing patient care.
- Potential participants who did not consent to the study.

## 3.5 Sampling

### 3.5.1 Sample size determination

The desired sample size was calculated using the Fisher statistical formula for determining a sample size for a cross-sectional study (Mugenda & Mugenda, 1999).

$$n = \frac{Z^2 p (1-p)}{d^2}$$

Where:

n=the required sample size

Z= critical value associated with the level of confidence. A 95% confidence level was used. This corresponds to a Z value of 1.96

d=Precision/margin of error, set at 0.05 (5% margin of error).

p= Prevalence of outcome variable (practice of smoking cessation interventions).

The prevalence rates used to calculate the sample size were derived from a study carried out among Nigerian health care providers by Desalu et al., (2009). This study was selected as it was the most comparable to the present study in terms of the socio-economic status of the study area

when compared to other KAP studies on smoking cessation interventions. The KAP item that resulted in the largest sample size was used to determine the sample size (Table 1).

**Table 1: Calculation of sample size**

<b>Practice item</b>	<b>% prevalence</b>	<b>Sample size</b>
Asked about use of tobacco	86.2	182
Gave brief advice	61.5	363
Set quit date	14.9	194

The brief advice item gave the largest sample size of 363 and was therefore selected as the study sample size. A 10 % contingency (based on pre test) was provided to compensate for non response thus increasing the number of health care providers to be sampled to 400.

### **3.5.2 Sampling procedure**

A two-stage stratified sampling procedure was used to select participants as follows:

#### **Stage 1: Selection of health facilities**

This study was conducted in 12 public health facilities in Kiambu County which were selected as follows: The 84 public health facilities were stratified by administrative levels as district hospital (level 5), sub-district hospital (level 4), health center (level 3) or dispensary (level 2). Proportional allocation based on the number of facilities in each level was used to determine the number of facilities to be sampled from each level of facility (Table 2). This was to ensure fair representation of all types of public health facilities during the selection of study participants. Health facilities from each level were then selected using simple random sampling technique.



**Table 2: Selection of health facilities to be sampled**

<b>Health Facility</b>	<b>No. of facilities</b>	<b>No. included in study</b>	<b>Facilities selected through simple random sampling</b>
District/ Level 5	4	1	Kiambu District Hospital
Sub-district/ Level 4	4	1	Ruiru District Hospital
Health- centre / Level 3	25	4	Wangige Health centre Githunguri Health centre Karuri Health centre Limuru Health centre
Dispensary/ Level 2	51	6	Gichuru dispensary Uthiru dispensary Miguta dispensary Mataara dispensary Kagwe dispensary Gathaga dispensary

**Stage 2: Selection of study participants**

The number and list of potentially eligible study participants was obtained from each of the 12 selected health facilities. The total list of potentially eligible health care providers served as the sampling frame. Health care providers were then stratified by cadre as nurses, doctors, dentists, clinical officers and community oral health officers. Proportionate allocation based on number of health care providers in each cadre was used to determine the number of health care providers to be sampled from each cadre out of the sample size of 400 (Table 2). This was to ensure fair representation of all eligible cadres of health care providers in the sample. Health care providers from each stratum were then selected using simple random sampling technique.

**Table 3: Distribution of participating health care providers by cadre**

<b>Job description</b>	<b>No. in each group</b>	<b>No. sampled</b>
Nurses	335	302
Medical officers/ interns	20	18
Dentists	3	3
Clinical Officers/ interns	77	69
Community oral health officers/ interns	9	8

### **3.6 Data collection**

#### **3.6.1 Data collection method**

Self-administered questionnaires were utilized to collect data from the participants. The questionnaire consisted mainly of close-ended questions and one open ended question. The questionnaire was in English and as all participants were assumed to understand the English language, the questionnaire was not translated.

#### **3.6.2 Questionnaire content**

The questionnaire consisted of 7 sub-sections developed to assess: a) health care providers socio-demographic characteristics (age, sex, smoking status and years of practice, job cadre); b) health care providers knowledge on smoking cessation interventions; c) health care providers attitude towards provision of smoking cessation interventions; d) health care providers current smoking cessation activities based on the five “As” model (ask, advise, assess, assist, and arrange follow-up) e) health care providers training on smoking cessation interventions and level of confidence in provision of smoking cessation interventions to patients; f) Availability of various organizational support factors in the provision of smoking cessation interventions; and g) factors perceived as barriers to the provision of smoking cessation interventions to patients

The knowledge section consisted of 20 questions that were used to evaluate the health care providers' level of knowledge on smoking cessation interventions in the following areas: (1) behavioral smoking cessation intervention methods (2) benefits of providing smoking cessation interventions (3) behavioral smoking cessation intervention techniques (4) nicotine dependence and withdrawal symptoms and (5) pharmacological smoking cessation interventions. Some of the questions were presented as statements and respondents were asked to state if these statements were true or false. Respondents were also asked to identify recommended behavioral and pharmacological interventions from a list that consisted of actual interventions and decoys.

The attitude section consisted of nine items which were used to measure the health care providers' perceptions in the following areas: (1) role of health care providers in provision of smoking cessation interventions (2) effect of smoking cessation interventions on the health care provider and patient relationship (3) acceptance of smoking cessation interventions by patients and (4) availability of time to provide smoking cessation interventions during routine consultations. The questions were presented as statements, and respondents were asked to indicate their agreement or disagreement with these statements.

The practice section was based on the 5A's strategy for provision of smoking cessation interventions (Ask, Advice, Assess, Assist & Arrange follow-up). Respondents were asked to state how frequently they performed each of the components of the 5A's model in their daily interactions with patients using a 3 point scale ('never', 'sometimes', and 'always').

The confidence section consisted of 8 items based on the 5 A's strategy for provision of smoking cessation interventions (Ask, Advice, Assess, Assist, Arrange follow-up) and respondents were

asked to rate their confidence in performing the various activities using a three point scale ( 'not at all confident', 'a little confident', and 'confident').

To assess barriers to provision of cessation interventions, respondents were provided with a list of potential barriers and asked to rate each barrier using a 3 point scale ('not a barrier', 'somewhat a barrier', 'important barrier').

### **3.6.3 Questionnaire development**

Questionnaire items were drawn from validated instruments used in prior studies to assess the knowledge, attitudes, and practice patterns of health care providers in relation to smoking cessation and these were modified to suit this study. These survey instruments included: Questionnaire on physician behavior and practice patterns related to smoking cessation by the Association of American Medical Colleges in collaboration with the center for Health Workforce Studies, School of Public Health, Albany University (Cohen et al., 2007); the Smoking Knowledge, Attitudes and Practices (S-KAP) Instrument by Delucchi et al (2009) ; and questionnaire on knowledge, attitude and practice on smoking cessation counseling for nurses and social workers by Johnston et al (2005).

Some questionnaire items were formulated with reference to the clinical practice guidelines on treatment of tobacco use and dependence by the U.S. Department of Health and Human Services (Fiore et al., 2008) ; the standards for training in smoking cessation treatments by the UK national health services and health development Agency (Bennett et al., 2003) and the consensus draft guideline for smoking prevention and cessation in the Africa and Middle East Region by Ali et al (2012). Reference was also made to studies identified during literature review (Abdullah et al., 2006; Albert et al., 2005; Conroy et al., 2005; Gunes et al., 2005; Klink et al.,

2011; Passey, Este, & Sanson-fisher, 2012; Saito et al., 2010; Tong et al., 2010; Uti & Sofola, 2011).

#### **3.6.4 Measurement of Knowledge, attitude, confidence and practice variables**

Knowledge, confidence, attitude and practice scores were constructed for each respondent based on responses given in the questionnaire. Knowledge scores were derived as the sum of the correct responses to the 20 knowledge based questions with one point being assigned for each correct response and zero for each incorrect/ “don’t know” response (Abdullah et al., 2006). The highest possible score was 20 and respondents scoring 15 and above were categorized as having good knowledge; those scoring between 10 and 14 marks as having average knowledge and those scoring 9 and below marks as having poor knowledge.

Attitude scores were derived from the 9 attitude based questions. A two point scale (agree/disagree) was employed to score the health care providers’ attitude towards smoking cessation. A score of one was given for responses agreeing with positively worded items or those disagreeing with negatively worded items while a score of zero was given for responses disagreeing with positively worded items and agreeing with negatively worded items (Vogt et al., 2005). Respondents who obtained a total score of six or above were categorized as having positive attitudes and those obtaining a total score of five and below as having negative attitudes.

Practice scores were derived from the 10 practice based questionnaire items. A three point scale was used to score the health care providers practice of smoking cessation interventions. Two points were awarded for ‘always’, one point for ‘sometimes’ and zero points for ‘never’. Possible scores ranged from 0 to 20. Scores of 10 and above were classified as ‘above average’ practice of smoking cessation interventions while scores of 9 and below as ‘below average’ practice of smoking cessation interventions (Sadowski, Ruffieux & Cornuz, 2009).

Confidence scores were derived from eight confidence based questionnaire items. Zero points were awarded for “not confident”, one point for ‘a little confident’ and two points for ‘confident’. Possible scores ranged from 0 to 16. Respondents scoring 10 and above were categorized as having “higher confidence” and those scoring 9 and below as having “lower confidence” (Table 4).

**Table 4: Classification of knowledge, attitude, confidence and practice variables**

<b>Variable</b>	<b>Classification</b>
<b>Knowledge</b>	
0-9	Poor knowledge
10-14	Average knowledge
15-20	Good knowledge
<b>Attitude</b>	
0-5	Negative attitude
6-9	Positive attitude
<b>Practice</b>	
0-9	Below average practice
10-20	Above average practice
<b>Confidence</b>	
0-9	Lower confidence
10-16	Higher confidence

### **3.6.5 Variables**

#### **Dependent/ outcome variable**

1. Level of practice of smoking cessation interventions by health care providers

#### **Independent/ predictor variables**

1. Level of knowledge on smoking cessation interventions
2. Attitude of health care providers towards provision of smoking cessation interventions
3. Level of confidence in provision of smoking cessation interventions
4. Age of health care provider in years
5. Sex of health care provider
6. Number of years of practice of the health care provider
7. Training status of health care provider on smoking cessation interventions
8. Smoking status of health care providers
9. Organizational support factors availability: tobacco assessment forms, brochures, posters and cessation specialists
10. Job cadre

### **3.6.6 Reliability**

The reliability of the questionnaire was evaluated by pre-testing the questionnaire and by carrying out internal consistency measurements.

#### **3.6.6.1 Pre-testing**

Pre-testing of the questionnaires was undertaken at Kihara sub-district hospital one week prior to the commencement of the actual data collection. Kihara sub- district hospital was one of the health facilities in Kiambu County not selected to participate in the actual study. Out of the ten randomly selected participants, five nurses, one dentist, two clinical officers and one medical

officer completed the questionnaire. Respondents were then interviewed individually regarding the clarity and appropriateness of items in the questionnaire, as well as the length of the questionnaire. Revisions included the additions of ‘don’t know’ columns in the knowledge based questions and re-wording of some questionnaire items to improve on the clarity of the questions.

### 3.6.6.2 Internal consistency

To check for internal consistency of the questionnaire items, Cronbach’s alpha coefficients were calculated for the entire instrument and for each KAP scale. The overall Cronbach’s alpha for the study questionnaire was 0.8 (95% CI: 0.76 – 0.82). Cronbach alpha scores for the various KAP items are summarized in table 5. A score of 0.7 and above was considered acceptable.

**Table 5: Cronbach alpha KAP scores**

<b>KAP scale item</b>	<b>Cronbach’s alpha (95% CI)</b>
Practice	0.85 ( 0.83 -0.89)
Confidence	0.87 (0.84 – 0.89)
Knowledge	0.7 (0.68 – 0.71)
Attitude	0.7 ( 0.63 – 0.71)

### 3.6.6 Data Collection procedures

Self administered questionnaires were distributed to participants at their respective health facilities. Potentially eligible study participants were identified through the various facility in charges/ human resource departments in the selected health facilities after an explanation of the purpose of the survey and the eligibility criteria. In order to increase the likelihood of participation, distribution strategies were tailored to suit the needs of each health facility setting, with multiple visits being made to each health facility. Selected participants were approached for recruitment by the principal investigator at their respective departments after clearance from the



various health facilities in charges. In some departments, the head of departments acted as key contacts for the study and were responsible for distributing questionnaires to the selected participants in their department. The questionnaires were collected from the participants at their workstations at a time arranged with them or were left with the heads of each department. The data collection occurred between May and June 2013.

### **3.7 Minimization of errors and bias**

- A standard set of questionnaires was utilized to minimize variation in data collected.
- Questionnaires were pre-tested in order to ensure the clarity and comprehensiveness of the questions and appropriate amendments made before finalization.
- Random selection of health facilities and participants was done to ensure that health facilities and health care providers had equal chance of being selected.
- Review of questionnaires was carried out at the end of each data collection day to minimize errors in data collected

### **3.8 Ethical considerations**

- Approval to carry out the study was obtained from the Kenyatta Hospital and University of Nairobi Ethics and Research Review Committee before commencement of the study.
- All information obtained from the study participants was treated with confidentiality and used only for the intended purposes. All questionnaires were identified by serial numbers and names of participants were not included.
- Filled questionnaires were stored in a secure location only accessible to the investigator to ensure that data collected was secure.

- Informed written consent was obtained from the participants before filling of the questionnaire. Participants were given an opportunity to ask questions before signing the consent form. Participants also had the option to decline to participate in the study.
- Further approval for research was obtained from the various District Medical Officers of Health and health facility in-charges.

### **3.9 Data processing**

Data was proof-read and counterchecked for missing information, duplicate responses and inconsistencies before being entered into an excel spread sheet in the computer. Cleaning of the data was carried out and any missing data coded.

### **3.10 Data analysis**

Analysis was undertaken using the SPSS version 17.0 computer program. Descriptive statistics were used to report frequency distribution of various study variables and presented as tables and bar graphs. Means and standard deviations were calculated for continuous variables while percentages and frequencies were generated for categorical variables.

Pearson's chi square tests, Fisher's exact test and odds ratios (OR) were used to evaluate the associations between the knowledge, confidence, attitude and practice of health care providers with various socio-demographic variables. Binary logistic regression analysis was carried out to determine the factors associated with above average self reported practice of smoking cessation interventions. Variables entered into the model included: knowledge level, confidence level, attitude, sex, training status, age, years of practice, smoking status, job cadre and organizational support factors. Statistical significance was accepted at p values of equal to or less than 0.05. The open ended question was analyzed manually and summarized according to emerging themes.

### **3.11 Limitations of the study**

- This study relied on self reports of health care providers to assess the health care providers smoking cessation knowledge, attitude and practices. Some level of under/over reporting may therefore have affected the results of the study. The assurance of confidentiality may however have limited such bias.
- This study focused on health care providers working in public health facilities in Kiambu County and cannot be generalized to all health care providers in the country.

## **CHAPTER 4: RESULTS**

A total of 400 potentially eligible health care providers were approached to participate in the study. Questionnaires were returned by 359 of the selected participants, yielding a response rate of 89.8%. The most frequently verbally cited reason for lack of participation by non-respondents was lack of time to complete the questionnaire. Of the questionnaires that were returned, 21 were grossly incomplete and were excluded from the analysis leaving 338 validly completed questionnaires.

### **4.1 Socio- demographic characteristics of respondents**

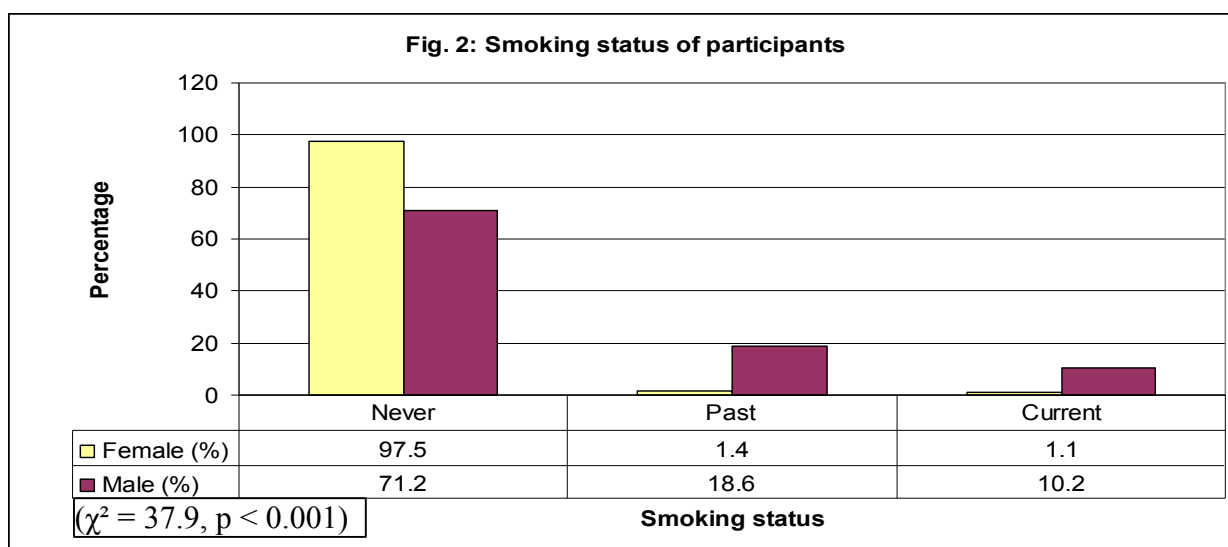
Of the 338 respondents, 59 (17.5%) were males, while 279 (82.5%) were females, giving a male to female ratio of 1: 5. The respondents' age ranged from 21 to 60 years (mean = 35; SD = 9 years). Most respondents (72.7%) were between 21 to 40 years of age. The mean number of years of practice was 11 years (SD = 9). Majority of the respondents (40 %) had been in practice for 5 years or below, 19 % had been in practice for 6 to 10 years while 18% had been in practice for 20 or more years. Seventy four percent of the surveyed health care providers were nurses followed by clinical officers at 18% (Table 6).

**Table 6: Socio-Demographic characteristics of respondents**

<b>Socio-demographic characteristics</b>	<b>Female n (%)</b>	<b>Male n (%)</b>	<b>Total n (%)</b>
<b>Age (years)</b>			
21-30	97 (34.8)	36 (61.0)	133 (39.3)
31-40	98 (35.1)	15 (25.4)	113 (33.4)
41-50	61 (21.9)	6 (10.2)	67 (19.8)
51-60	23 (8.2)	2 (3.4)	25 (7.4)
<b>Practice years</b>			
0-5	97 (34.8)	39 (66.1)	136 (40.2)
6-10	56 (20.1)	9 (15.3)	65 (19.2)
11-15	40 (14.3)	3 (5.1)	43 (12.7)
16-20	30 (10.8)	3 (5.1)	33 (9.8)
Over 20	56 (20.1)	5 (8.5)	61 (18)
<b>Job description</b>			
Nurse	230 (82.4)	21 (35.6)	251 (74.3)
Medical officer/ intern	11 (3.9)	6 (10.2)	17 (5.0)
Clinical officer/ intern	34 (12.2)	27 (45.8)	61 (18.0)
Dentists	1 (0.4)	1 (1.7)	2 (0.6)
Community oral health officer/ intern	3 (1.1)	4 (6.8)	7 (2.1)

#### 4.1.1 Smoking status of respondents

Ninety three percent (n=314) of the respondents reported that they had never smoked, 4.4 % (n=15) stated that they were former smokers while 2.7% (n=9) stated that they were current smokers. There was a higher prevalence of smoking among males (10.2 %) as compared to females (1.1%) (Fig.2). Chi square test analysis revealed a statistically significant relationship between smoking status and sex ( $\chi^2 = 37.9$ ,  $p < 0.001$ ).



**Figure 2: Smoking status of participants**

#### **4.2 Knowledge on smoking cessation interventions**

Knowledge scores ranged from 2 to 19 (Mean = 10.6; SD= 2.7; n = 338). Forty one percent (139) of the respondents attained a poor knowledge score (0 to 9 marks), 51% (171) attained an average knowledge score (10- 14 marks), while 8% (28) attained a good knowledge score (15 to 20 marks).

##### **4.2.1. Knowledge on behavioral smoking cessation intervention methods**

Seventy three percent of the respondents correctly identified the 5A's model as a recommended behavioral intervention while 66.3% of respondents correctly identified advice from a health care provider as a recommended behavioral intervention for smoking cessation. Only 22% of respondents correctly stated that hypnosis was not a recommended behavioral intervention.

##### **4.2.2 Knowledge on benefits of providing smoking cessation interventions**

Most of the respondents were aware of the benefits of providing smoking cessation interventions with 83% of the respondents correctly stating that cessation advice by a healthcare provider

increases the patient's chances of quitting while 78% of the respondents correctly stated that most smokers will not successfully quit smoking without assistance.

#### **4.2.3 Knowledge on behavioral intervention techniques**

Slightly less than half (45%) of the study participants were unaware of the need to help a smoking patient set up a quit date while 85.8% were aware of the need to set up a follow up appointment to assess the patients' progress on quitting smoking.

#### **4.2.4 Knowledge on nicotine dependence and withdrawal symptoms**

Fifty nine percent of the respondents correctly stated that smoking was a chronic disorder associated with relapse while 49% of the respondents correctly stated that weight loss was not a common withdrawal symptom. Only 23 % of the respondents correctly stated that most withdrawal symptoms disappear within four weeks of quitting while nearly half of the respondents incorrectly stated that patients who smoked within 30 minutes of waking up were less dependent on nicotine than patients who had their first cigarette much later in the day.

#### **4.2.5 Knowledge on smoking cessation medications**

More than half of the respondents did not correctly identify various smoking cessation medications. Nicotine gum was correctly identified by 41% of the respondents while nicotine patch was correctly identified by 35% of the respondents. Only 18% and 11.5% of the respondents correctly identified nicotine lozenges and bupropion respectively as smoking cessation medications while only 17% of the respondents correctly stated that nicotine syrup and carbamezapine were not smoking cessation medications (Table 7).

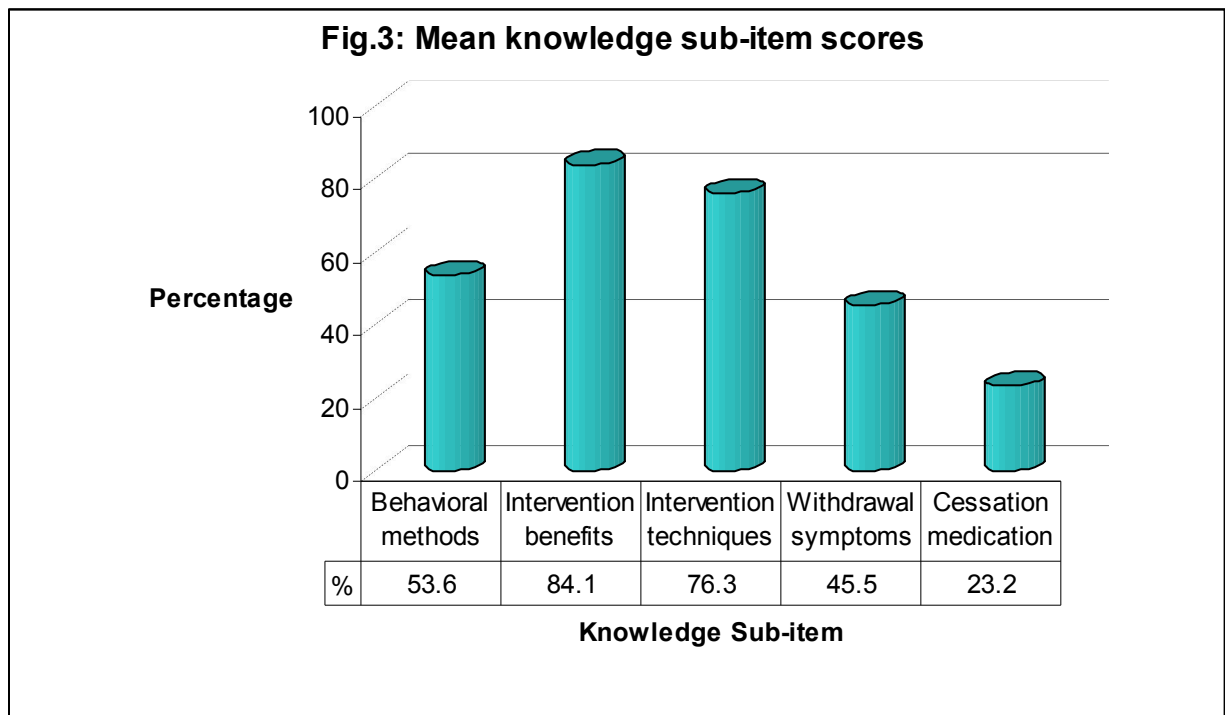
**Table 7: Health care providers' knowledge on smoking cessation interventions**

<b>Knowledge item (Tabulation of Correct Responses)</b>	<b>n (%)</b>
<b>(n = 338)</b>	
<b>Knowledge of recommended behavioral cessation interventions</b>	
Answered correctly that advice from a health care provider is recommended	224 (66.3)
Answered correctly that Hypnosis <u>is not a recommended behavioral intervention</u>	74 (21.9)
Answered correctly that 5A's method is recommended	245 (72.5)
<b>Knowledge on benefits of providing cessation interventions</b>	
Answered correctly that cessation advice increases the patients chances of quitting	281 (83.4)
Answered correctly that <u>it is false</u> that most smokers will successfully quit without assistance	263 (77.8)
Answered correctly that <u>it is false</u> that there is no need of advising elderly patients who smoke to quit as damage from smoking is already present and cannot be reversed.	308 (91.1)
<b>Knowledge on behavioral intervention techniques</b>	
Answered correctly that <u>it is false</u> that only patients with smoking related disease should be asked about their smoking status	299 (88.5)
Answered correctly that <u>it is false</u> that advice should never be linked to the patient's illness.	255 (75.4)
Answered correctly that counseling patients includes helping patient set up quit date.	187 (55.3)
Answered correctly that follow up appointments should be made within 1 <sup>st</sup> week of quitting	290 (85.8)
<b>Knowledge on nicotine dependence and withdrawal symptoms</b>	
Answered correctly that <u>it is false</u> that patients who smoke within 30 minutes of waking up are less dependent on nicotine than those who smoke much later in the day	173 (51.2)
Answered correctly that smoking is a chronic disorder associated with relapse	198 (58.6)
Answered correctly that <u>it is false</u> that a common withdrawal symptom is weight loss.	166 (49.1)
Answered correctly that most withdrawal symptoms disappear within 4 weeks of quitting.	79 (23.4)
<b>Knowledge of recommended cessation medications</b>	
Answered correctly that nicotine gum is recommended	140 (41.4)
Answered correctly that nicotine patches are recommended	117 (34.6)
Answered correctly that nicotine syrup is <u>not a recommended cessation medication</u>	56 (16.6)
Answered correctly that nicotine lozenges are recommended	61 (18.0)
Answered correctly that bupropion tablets are recommended	39 (11.5)
Answered correctly that carbamezapine tablets are <u>not recommended</u>	58 (17.2)



#### 4.2.6 Mean knowledge sub-item scores

The highest mean percentage scores for the five knowledge sub-items were obtained in questions assessing knowledge on benefits of provision of smoking cessation interventions (84%), followed by knowledge on behavioral intervention techniques (76%). The lowest mean scores were attained for questions assessing knowledge on smoking cessation medications (23%) (Figure 3).



**Figure 3: Mean knowledge scores**

#### 4.2.3 Relationship between knowledge level and socio-demographic characteristics

Chi square analysis was carried out to determine the association between various socio-demographic characteristics and the respondents' level of knowledge on smoking cessation interventions. Statistically significant associations were identified between level of knowledge

and: sex ( $p < 0.001$ ); number of years of practice ( $p = 0.017$ ); smoking status ( $p = 0.018$ ) and training on smoking cessation ( $p = 0.004$ ) (Table 8).

**Table 8: Relationship between knowledge level and social demographic characteristics**

Characteristics	Level of knowledge			Fishers exact test Statistic	p value
	Poor n (%)	Average n (%)	Good n (%)		
<b>Sex</b>					
Female	127 (45.5)	138 (49.5)	14 (5.0)	24.72	0.000*
Male	12 (20.3)	33 (55.9)	14 (23.7)		
<b>Practice yrs</b>					
0-5	42(30.2)	80 (46.8)	14 (50.0)	17.529	0.025*
6-10	24 (17.3)	35 (20.5)	6 (21.4)		
11-15	25 (18.0)	17 (9.9)	1 (3.6)		
16-20	15 (10.8)	15 (8.8)	3 (10.7)		
Over 20	33 (23.7)	24 (14.0)	4 (14.3)		
<b>Age (years)</b>					
21-30	42 (31.6)	77 (57.9)	14 (10.5)	11.70	0.061
31-40	48 (42.5)	58 (51.3)	7 (6.2)		
41-50	35 (52.2)	27 (40.3)	5 (7.5)		
51-60	14 (56.0)	9 (36.0)	2 (8.0)		
<b>Smoking</b>					
Never	134 (42.7)	159 (50.6)	21 (6.7)	13.185	0.006*
past	3 (20.0)	8 (53.3)	4 (26.7)		
current	2 (22.2)	4 (44.4)	3 (33.3)		
<b>Training</b>					
Yes	6 (16.7)	26 (72.2)	4 (11.1)	10.870	0.004*
No	133 (44.0)	145 (48.0)	24 (7.9)		

\* Statistically significant variables at 95% level of significance`

### 4.3 Training received on smoking cessation interventions

Most of the respondents (89 %;  $n = 302$ ) stated that they had not received any formal training on smoking cessation interventions. Only 11 % ( $n = 38$ ) of the respondents stated that they had received training on smoking cessation interventions. Most of those with training had received

the training while in college for their certificate/diploma/degree programs (64%; n=24), while the rest had received training in seminars (25%; n=9) and via E-learning (11%; n=4).

Ninety six percent of the respondents were willing to receive training on smoking cessation interventions and guidelines. All respondents who stated that they had prior training on smoking cessation (n= 36), also indicated that they were willing to receive further training while 97% of those with no prior training indicated their willingness to receive training. There were no associations between training and other socio- demographic characteristics of the respondents.

#### **4.4 Attitude of health care providers to provision of smoking cessation interventions**

The attitude scores ranged from 1 to 9 (mean = 7; SD = 1; n=338). Most respondents (85.2%; n= 288) attained positive attitude scores (6 to 9) while 14.8 % of the respondents' (n= 50) attained negative attitude scores (0 to 5).

Most of the respondents had a positive attitude towards their role in provision of smoking cessation interventions. 97% of the respondents agreed that it was part of the health care providers' responsibility to assist and motivate their patients to stop smoking. Most of the respondents (95%) also disagreed that there was no need to advise patients to quit as patients already knew they should quit. Most respondents also displayed a positive attitude towards the effect of smoking cessation interventions on the health care provider and patient relationship, with 80.2% agreeing that provision of smoking cessation advice or counseling improves the health care provider's relationship with the patient. Only 9 % of the respondents perceived that it was uncomfortable to counsel patients on smoking cessation.

Study participants however had less positive attitudes towards the availability of time to advice smoking patients with nearly half of the respondents (43%) agreeing that they did not have sufficient time to advice all smoking patients to quit while 60 % of the respondents agreed that the patients other health problems took precedence to smoking cessation advice. Towards the acceptance of interventions by patients, a third of the respondents perceived that patients were not receptive to smoking cessation advice while, 22% of the respondents perceived that quitting smoking was an individual choice (Table 9).

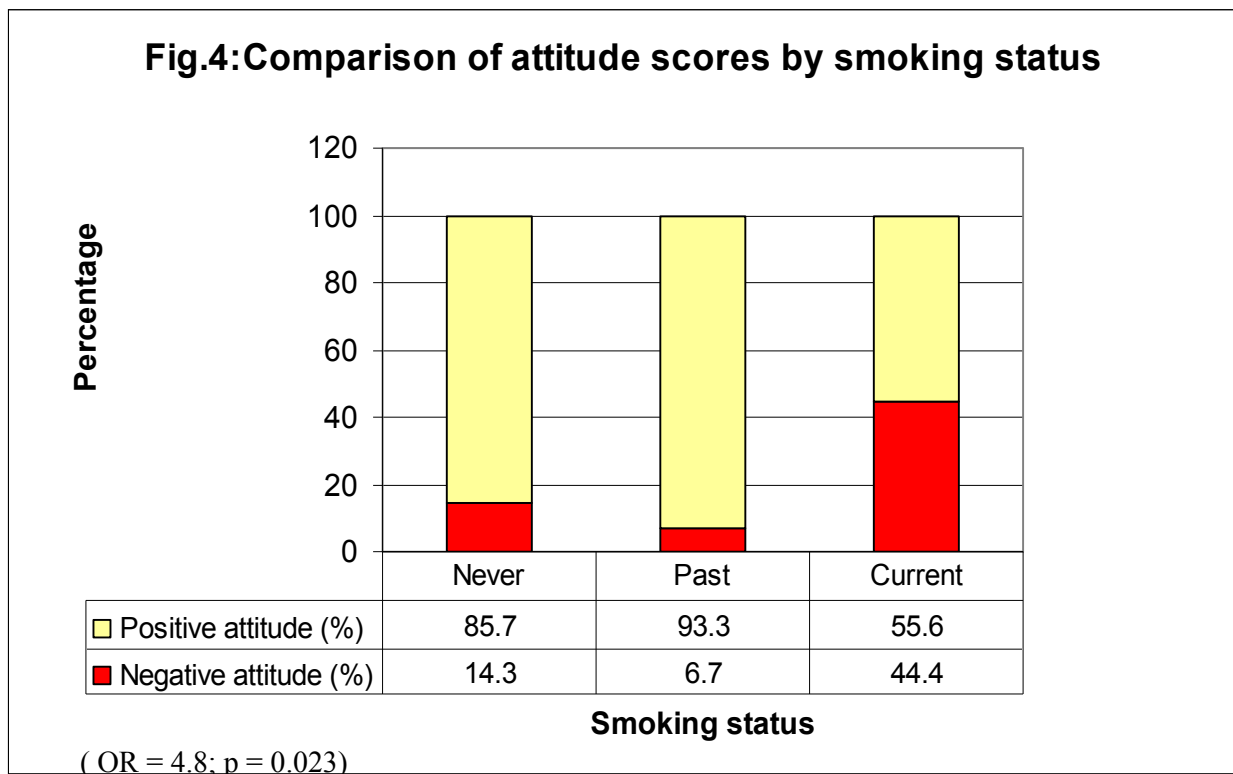
**Table 9: Healthcare providers' attitude towards provision of cessation interventions**

<b>Attitude Statements (n=338)</b>	<b>Agree n (%)</b>	<b>Disagree n (%)</b>
<b>Attitude towards role of HCP in provision of interventions</b>		
It's my responsibility as a HCP to assist patients stop smoking	328 (97.0)	10 (3.0)
It's my responsibility as a HCP to motivate patients to quit	327 (96.7)	11 (3.3)
Its not worth discussing benefits of cessation with patients as patients already know they should stop smoking *	16 (4.7)	322 (95.3)
<b>Effect of interventions on HCP and patient relationship</b>		
Cessation advice improves the HCP and patient relationship	268 (80.2)	70 (19.8)
It is uncomfortable to counsel smoking patients to quit *	31 (9.2)	307 (90.8)
<b>Attitude towards time factor and competing priorities</b>		
I do not have sufficient time to advice all patients to quit *	144 (42.6)	194 (57.4)
My patient's other health problems take precedence *	202 (59.8)	136 (40.2)
<b>Attitude towards acceptance of interventions by patients</b>		
Patients are not willing to receive advice on smoking cessation *	115 (34.0)	223 (66.0)
Quitting smoking is an individual choice , its not up to the health care provider to advice patients to quit *	75 (22.2)	263 (77.8)

\* Negatively worded statements

#### 4.4.1 Relationship between attitude and socio-demographic characteristics

A statistically significant relationship was identified between attitude towards provision of smoking cessation interventions and the smoking status of respondents (Figure 4). Respondents who had never smoked were 4.8 times more likely to have positive attitudes towards provision of smoking cessation interventions as compared to smokers (OR=4.8; 95% CI: 1.2- 18.5; p = 0.023). Other associations between attitude and socio-demographic characteristics were not statistically significant.



**Figure 4: Comparison of attitude scores by smoking status**

#### **4.5 Practice of smoking cessation interventions by health care providers**

The practice scores ranged from 0 to 20 (mean = 9.6; SD= 4.2; n= 338). Fifty four percent (n= 183) of the respondents obtained below average practice scores (0 to 9) while, 45.9% (n= 155) attained above average practice scores (10 to 20).

In the 'ask' component, slightly more than a third of the respondents (35%) stated that they always inquired about the patients smoking status, 29% always inquired about the number of cigarettes smoked daily while 39% of the respondents stated that they always recorded the patient's smoking status. More than half of the respondents (62%) stated that they at times asked patients about their smoking status (Table 10).

Less than half of the respondents (43.5 %) stated that they always advised smoking patients to quit while only 29% of the respondents stated that they routinely discussed risks and benefits of quitting with patients. Only 16% of the respondents stated that they always assessed if patients were willing to quit smoking.

In the 'assist' component of the 5A's, only 6.5% of respondents stated that they always discussed the use of nicotine replacement therapy with smoking patients while a tenth of the respondents stated that they always assisted the patient set up a quit date. Twelve percent of the respondents also stated that they always set up a date to review the progress of their smoking patients.

The least performed activities under the 5A model were the "assist" and 'arrange follow up' components. More than half of the respondents stated that they never discussed the use of smoking cessation medications (65%), assisted patients set up a quit date (54%) or set up a follow up appointment to assess the patients' progress on quitting smoking (57%).

**Table 10: Health care providers practice of smoking cessation interventions**

<b>Behavioral cessation intervention</b>	<b>Never</b>	<b>Sometimes</b>	<b>Always</b>
(n = 338	<b>n (%)</b>	<b>n (%)</b>	<b>n (%)</b>
<b>Ask</b>			
Ask smoking status	12 (3.6)	208 (61.5)	118 (34.9)
Ask number of cigarettes smoked	59 (17.5)	181 (53.6)	98 (29.0)
Record smoking status	66 (19.5)	142 (42.0)	130 (38.5)
<b>Advise</b>			
Advise smoking patients to quit	10 (3.0)	181 (53.6)	147 (43.5)
Discuss smoking risks and cessation benefits	16 (4.7)	223 (66.0)	99 (29.3)
<b>Assess</b>			
Assess willingness to quit	105 (31.1)	178 (52.7)	55 (16.3)
<b>Assist</b>			
Discuss about previous quit attempts	102 (30.2)	192 (56.8)	44 (13.0)
Discuss use of NRT	218 (64.5)	98 (29.0)	22 (6.5)
Assist patients set up a quit date	181 (53.6)	122 (36.1)	35 (10.4)
<b>Arrange follow up</b>			
Set follow up appointment	194 (57.4)	103 (30.5)	41 (12.1)

#### 4.5.1 Relationship between practice levels and socio-demographic characteristics

Statistically significant associations were identified between practice of smoking cessation interventions with the sex and training status of respondents. Respondents who stated that they had received training on smoking cessation interventions were 4.1 times more likely to have above average practice scores as compared to those without training (OR = 4.1; 95% CI: 1.9 – 8.9;  $p < 0.001$ ) while males were 2.7 times more likely to have above average practice scores as compared to females (OR = 2.7; 95% CI: 1.5 - 4.9;  $p = 0.001$ ) (Table 11).

**Table 11: Relationship between practice and socio-demographic characteristics**

<b>Socio-demographic characteristics</b>	<b><u>Level of Practice</u></b>		<b>OR (95% CI)</b>	<b>p value</b>
	<b>Below average n (%)</b>	<b>Above average n (%)</b>		
<b>Sex</b>				
Female	163 (58.4)	116 (41.6)	1	0.001*
Male	20 (33.9)	39 (66.1)	2.7 (1.5-4.9)	
<b>Practice years</b>				
0-5	66(48.5)	70(51.5)	1.336 (0.7 – 2.5)	0.350
6-10	36(55.4)	29(44.6)	1.014 (0.5 – 2.0)	0.968
11-15	28(65.1)	15(34.9)	0.675 (0.3 – 1.5)	0.338
16-20	19(57.6)	14(42.4)	0.928 (0.4 – 2.2)	0.864
Over 20	34(55.7)	27(44.3)	1	
<b>Age</b>				
21-30	67 (50.4)	66 (49.6)	1.5 (0.6- 3.5)	0.379
31-40	64 (56.6)	49 (43.4)	1.1 (0.5- 2.8)	0.759
41-50	37 (55.2)	30 (44.8)	1.2 (0.5- 3.1)	0.681
51-60	15 (60.0)	10 40.0)	1	
<b>Smoking</b>				
Never	171 (54.5)	143 (45.5)	1.0 (0.3 – 4.0)	0.948
Past	7 (46.7)	8 (53.3)	1.4 (0.3- 7.5)	0.674
current	5 (55.6)	4 (44.4)	1	
<b>Training</b>				
No	174 (57.6)	128 (42.4)	1	
Yes	9 (25.0)	27 (75.0)	4.1 (1.9 – 8.9)	0.000*

**4.5.2 Comparison of mean knowledge, attitude and practice scores by job cadre**

There were statistically significant differences in the mean knowledge ( $p < 0.001$ ) and practice ( $p, 0.001$ ) scores among the different job cadres. Clinical officers had the highest mean scores followed by doctors while dentists had the least mean scores. In the knowledge items, doctors had the highest mean scores followed by clinical officers. Community health officers had the lowest mean knowledge scores (Table 12).



**Table 12: Comparison of mean KAP scores by job cadre**

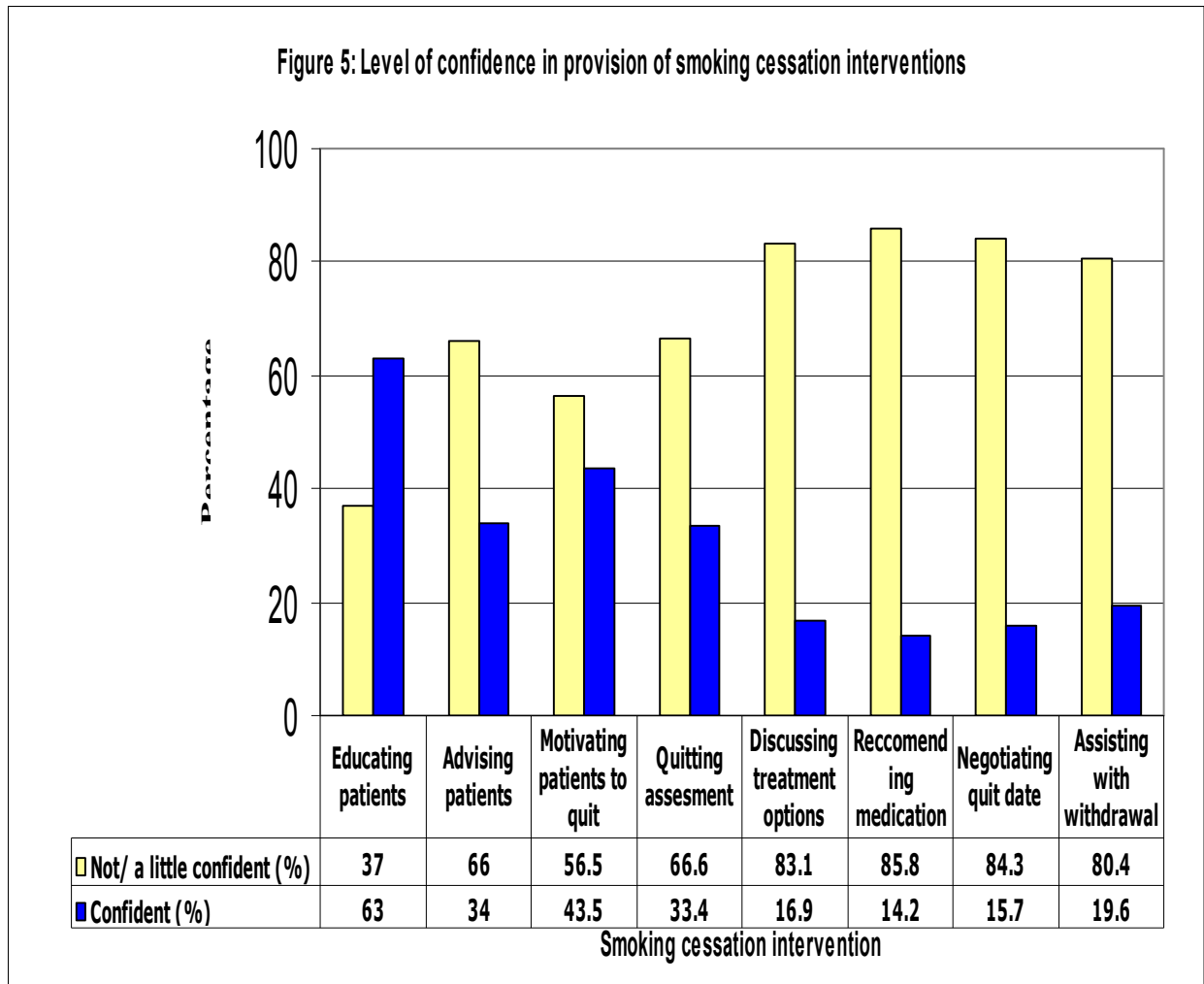
KAP item	Job cadre	N	Mean	Std. Deviation	F	p value
Attitude score	Nurse	251	6.91	1.427	1.962	0.100
	Doctor	17	6.94	1.391		
	Clinical officers	61	7.46	1.259		
	Dentists	2	7.50	2.121		
	Community oral health officers	7	7.00	1.633		
Practice scores	Nurse	251	8.86	4.042	6.466	<0.001
	Doctor	17	11.29	5.059		
	Clinical officers	61	11.49	3.901		
	Dentists	2	6.50	3.536		
	Community oral health officers	7	10.86	4.451		
Knowledge score	Nurse	251	9.96	2.495	10.296	<0.001
	Doctor	17	13.59	2.895		
	Clinical officers	61	11.36	2.829		
	Dentists	2	10.50	3.536		
	Community oral health officers	7	9.71	3.684		

#### 4.6 Confidence in provision of smoking cessation interventions

Confidence scores ranged from 0 to 16 (mean = 8.7; SD =3.8; n =338). Fifty nine percent (n = 200) of the respondents attained lower confidence scores (9 and below), while 41% (n = 138) attained higher confidence scores (10 and above).

More than half of the respondents (62.7%) reported being confident in educating patients on smoking risks. However, less than half of the study participants expressed confidence in performing all other smoking cessation interventions with only 14 % of respondents expressing

confidence in their ability to recommend smoking cessation medications to smoking patients (Figure 5). A higher percentage of health care providers reported being confident in advising (34%) and motivating (44%) patients to quit as compared to the percentage of health care providers who were confident in discussing treatment options (17%), negotiating quit dates (16%) or assisting patients cope with withdrawal symptoms (19%).



**Figure 5: Health care providers’ confidence in provision of cessation interventions**

#### 4.6.2. Relationship between level of confidence and social demographic characteristics

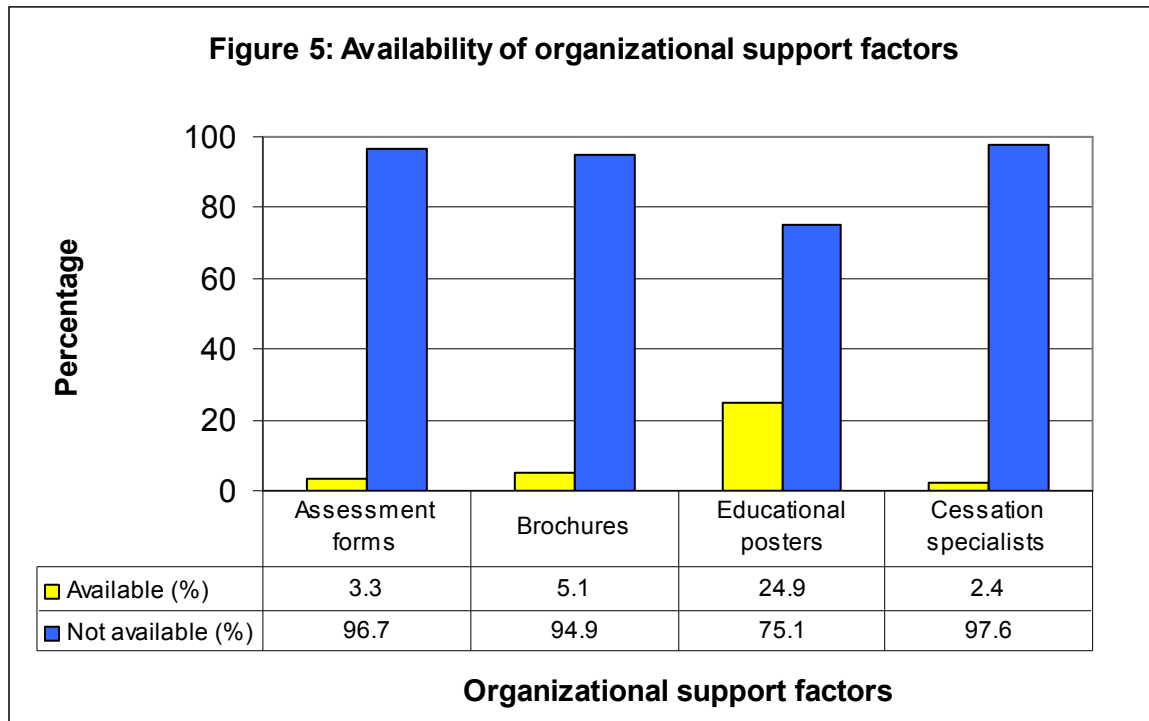
Statistically significant associations were identified between level of confidence with the sex and training. Respondents who had received training on smoking cessation interventions were 5.2 times more likely to have higher confidence scores as compared to those without training (OR = 5.2 95% CI: 2.3 – 11.4;  $p < 0.001$ ) while males were 3.5 times more likely to have higher confidence scores as compared to females (OR = 3.5; 95% CI: 1.9 – 6.4;  $p = 0.001$ ) (Table 13).

**Table 13: Relationship between level of confidence and social demographic characteristics**

Characteristic (n = 338)	Level of confidence		OR (95% CI)	P value
	Lower n (%)	Higher n (%)		
<b>Sex</b>				
Female	180 (64.5)	128 (35.5)		
Male	20 (22.0)	39 (66.1)	3.5 (1.9 -6.4)	0.001*
<b>Practice years</b>				
0-5	52 (38.2)	84 (61.8)	1.7 (0.9-3.1)	0.099
6-10	33 (50.8)	32 (49.2)	1.0 (0.5-2.0)	0.995
11-15	28 (65.1)	15 (34.9)	0.6 (0.2-1.2)	0.149
16-20	20 (60.6)	13 (39.4)	0.7 (0.3-1.6)	0.364
over 20	31 (50.8)	30 (49.2)	1	
<b>Age</b>				
21-30	67 (50.4)	66 (49.6)	2.1 (0.8- 5.3)	0.110
31-40	69 (61.1)	44 (38.9)	1.4 (0.5- 3.4)	0.518
41-50	47 (70.1)	20 (29.9)	0.9 (0.3- 2.4)	0.842
51-60	17 (68.0)	8 (32.0)	1	
<b>Smoking</b>				
Never	192 (61.1)	122 (38.9)	0.5 (0.1-2.0)	0.320
Past	4 (26.7)	11 (73.3)	2.2 (0.4- 12.6)	0.375
Current	4 (44.4)	5 (55.6)	1	
<b>Training</b>				
Yes	9 (25.0)	27 (75.0)	5.2(2.3 – 11.4)	0.000*
No	191 (63.2)	111 (36.8)	1	

#### 4.7 Organizational support in provision of smoking cessation interventions

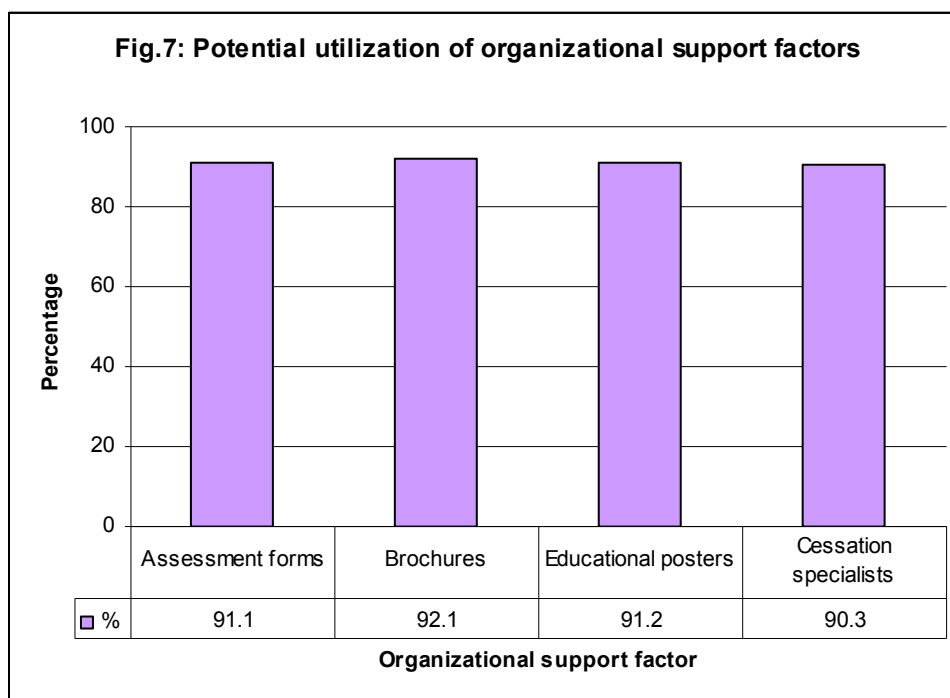
Twenty five percent of the respondents indicated that there were posters to aid in educating patients on harms of smoking in their health facilities. However, over 90% of the study participants reported lack of brochures, trained tobacco cessation specialists and tobacco assessment forms (Figure 6).



**Figure 6: Availability of organizational support factors**

##### 4.7.1 Utilization of organizational support factors

More than 90% of the study participants reported that they would utilize tobacco assessment forms, brochures, posters and smoking cessation specialists in assisting patients stop smoking if these organizational support factors were made available in their health facilities (Figure 7).



**Figure 7: Potential utilization of organizational support factors**

#### **4.8 Barriers to provision of smoking cessation intervention**

Insufficient training was perceived by the highest proportion of respondents (75%) as an important barrier to provision of smoking cessation interventions. Other health system factors perceived as important barriers by more than half of the respondents included: lack of guidelines (72%) and lack of smoking cessation specialists (69%).

Insufficient knowledge was identified as an important barrier by 67 % of respondents. However, less than a third of the respondents perceived lack of time (29%) and patients’ other health problems (30%) as important barriers to provision of smoking cessation interventions. Among the patient related barriers, only 27% of the respondents reported that lack of patients’ interest in receiving cessation advice was an important barrier while 35% of the respondents perceived lack of patients’ compliance with smoking cessation advice as an important barrier (Table 14).

**Table 14: Barriers to provision of cessation interventions**

<b>Barrier (n = 338)</b>	<b>Health care providers perceptions</b>		
	<b>Not a barrier n (%)</b>	<b>Somewhat a barrier n (%)</b>	<b>Important barrier n (%)</b>
<b>Health system related</b>			
Insufficient training	18 (5.3)	68 (20.1)	252 (74.6)
Lack of guidelines	24 (7.1)	72 (21.3)	242 (71.6)
No referral cessation specialists	32 (9.5)	72 (21.3)	234 (69.2)
Lack of education materials	35 (10.4)	107 (31.7)	196 (58.0)
<b>Health care provider related</b>			
Insufficient knowledge	25 (7.4)	86 (25.4)	227 (67.2)
More immediate health issues	101 (29.9)	135 (39.9)	102 (30.2)
Lack of time	71 (21.1)	170 (50.3)	97 (28.6)
<b>Patient related</b>			
Patients not interested	103 (30.5)	144 (42.6)	91 (26.9)
Patients don't comply	68 (20.2)	151 (44.8)	118 (35.0)

**4.8.1 Suggestions on improvement of provision of smoking cessation interventions**

Health care providers were asked for suggestions on ways to improve the provision of smoking cessation interventions to patients (Table 15). Among the 172 study participants that provided suggestions, most (70%) stated that there was a need to increase the knowledge of health care providers on smoking cessation through capacity building while 13% stated that there was need to increase community awareness on smoking cessation through health education and community outreach programs as not all smokers visit health facilities. Other suggestions included: provision of patient education material in health facilities (8.7%); introduction of smoking cessation specialist clinics (3.5%); introduction of support groups/ group counseling

sessions for smoking patients (2.9%); increased media involvement in educating on smoking cessation (2.9%); availing smoking cessation medications in public health facilities (1.2%) and illegalization of smoking (1.2%).

**Table 15: Suggestions on improvement of provision of smoking cessation interventions**

<b>Suggestion (n=172)</b>	<b>n (%)*</b>
Capacity building	120 (70)
Provision of brochures/posters in health facilities	15 (8.7)
Development of smoking cessation guidelines	5 (2.9)
Introduction of smoking cessation referral clinics	6 (3.5)
Education of school going children to minimize uptake of smoking habit	1 (0.5)
Introduction of support groups/ group counseling sessions	5 (2.9)
Availing smoking cessation medications in health facilities	2 (1.2)
Improve community awareness through health education and community outreach programs	23 (13.4)
Increase media involvement in educating on smoking cessation	5 (2.9)
Bann smoking	2 (1.2)

\* Some respondents gave multiple suggestions

## **4.9 Hypotheses Tests**

### **4.9.1 Relationship between level of knowledge and level of practice**

The null hypothesis stated that there is no association between the level of knowledge on smoking cessation interventions and the practice of smoking cessation interventions by health care providers. The analysis of the relationship between level of knowledge and practice using Pearson's chi square analysis revealed a statistically significant relationship between the knowledge scores and practice scores ( $p < 0.001$ ) and this null hypothesis was therefore rejected (Table 16).

**Table 16: Relationship between knowledge and practice**

<b>Knowledge level</b>	<b><u>Practice level (n = 338)</u></b>		<b>Total n (%)</b>	<b>Chi sq</b>	<b>p value</b>
	<b>Below average n (%)</b>	<b>Above average n (%)</b>			
<b>Poor</b>	94 (67.6)	45 (32.4)	139 (41.1)		
<b>Average</b>	80 (46.8)	91 (53.2)	171 (50.6)	19.37	0.000
<b>Good</b>	9 (32.1)	19 (67.9)	28 (8.3)		
<b>Total</b>	183 (54.1)	155 (45.9)	338 (100)		

**4.9.2 Relationship between health care providers' attitude and level of practice**

The null hypothesis stated that there is no association between the health care providers' attitude towards provision of smoking cessation interventions and the practice of smoking cessation interventions by health care providers. The analysis of the relationship between the attitude levels and practice levels using Pearson's chi square analysis (Table 17) revealed a statistically significant relationship between the attitude scores and practice scores ( $p = 0.006$ ) and this null hypothesis was therefore rejected.

**Table 17: Relationship between attitude and level of practice**

<b>Attitude</b>	<b><u>Practice level</u></b>		<b>Total n (%)</b>	<b>Chi square</b>	<b>P value</b>
	<b>Below average n (%)</b>	<b>Above average n (%)</b>			
<b>Negative</b>	36 (72)	14 (28)	50 (14.8)		
<b>Positive</b>	147 (51)	141 (49)	288 (85.2)	7.537	0.006
<b>Total</b>	183 (54.1)	155 (45.9)	338 (100)		



#### **4.10 Predictive factors for better smoking cessation intervention practice scores**

Binary logistic regression analysis was used to identify factors associated with above average practice scores. Statistically significant predictors of having above average practice scores after controlling for job cadre, age and years of practice were: higher knowledge levels, positive attitude, higher confidence levels, being male, having received training on smoking cessation interventions and availability of posters.

Respondents with good knowledge scores were 2.9 times more likely to have above average practice scores as compared to those with poor knowledge scores (OR= 2.9; 95% CI: 1.1- 8.1 p= 0.033) while those with average knowledge scores were 1.8 times more likely to have above average practice scores as compared to those with poor knowledge scores (OR= 1.8; 95% CI: 1.1-3.0; p= 0.030). Health care providers with positive attitude were 2.2 times more likely to have above average practice scores as compared to respondents with negative attitude (OR=2.2; 95% CI: 1.1-4.7; p = 0.035) .

Among the socio-demographic factors, males were 2.4 times more likely to have above average practice scores as compared to females (OR=2.4 95% CI: 1.1 - 5.4; p=0.029) while respondents who stated that they had received training on smoking cessation interventions were 3.4 times more likely to have above average practice scores as compared to those who stated that they had not received training (OR=3.6; 95% CI: 1.4 -7.9; p=0.004).

Respondents who stated that organizational support factors (posters) were available in their health facilities were 2.1 times more likely to have above average practice scores as compared to those who lacked posters in their health facilities (OR=2.1; 95% CI: 1.1 – 3.9; p = 0.017) (Table 18).

**Table 18: Predictor factors for above average practice scores**

<b>Predictor variable</b>	<b>Classification</b>	<b>Odds ratio (95% C.I.)</b>	<b>p value</b>
<b>Knowledge level</b>	Poor <sup>^</sup>		
	Average	1.8 (1.1-3.0)	0.030*
	Good	2.9 (1.1-8.1)	0.033*
<b>Attitude levels</b>	Positive	2.2 (1.1-4.7)	0.035*
	Negative <sup>^</sup>		
<b>Practice years</b>	0-5	1.0 (0.2-5.4)	0.963
	6-10	0.8 (0.2-3.5)	0.740
	11-15	0.8 (0.2-3.5)	0.770
	16-20	0.6 (0.2-1.7)	0.340
	over 20 <sup>^</sup>		
<b>Sex</b>	Female <sup>^</sup>		
	Male	2.4 (1.1-5.4)	0.029*
<b>Smoking status</b>	Current <sup>^</sup>		
	Never	2.2 (0.4-12.4)	0.373
	Past	0.8 (0.1-6.8)	0.877
<b>Training Status</b>	No <sup>^</sup>		
	Yes	3.6 (1.4-7.9)	0.004*
<b>Organizational support</b>	No <sup>^</sup>		
	Yes	2.1 (1.1-3.9)	0.017*
<b>Age (years)</b>	21-30 <sup>^</sup>		
	31-40	0.9 (0.5-2.0)	0.981
	41-50	1.1 (0.3-3.7)	0.840
	51-60	0.5 (0.9-2.7)	0.418
<b>Job cadre</b>	Nurse <sup>^</sup>		
	Medical officer	0.8 (0.2-2.7)	0.675
	Clinical officer	1.6 (0.7-3.4)	0.227
	Dentist	0.0	0.999
	Community oral health	0.6 (0.1-4.5)	0.590

<sup>^</sup>: Reference category

\* Statistically significant variables

## **CHAPTER 5: DISCUSSION**

### **5.1 Introduction**

The aim of this study was to determine the knowledge, attitude and practices of health care providers on smoking cessation interventions. In general, half of the health care providers had an average level of knowledge on smoking cessation interventions while two fifths attained below average knowledge scores; most of the health care providers had a positive attitude towards the provision of smoking cessation interventions; while more than half of the respondents did not routinely provide smoking cessation interventions to their patients. There were statistically significant relationships between the health care providers' knowledge and attitude towards provision of smoking cessation interventions with the level of practice of smoking cessation interventions.

### **5.2 Knowledge and confidence in provision of smoking cessation interventions**

Even though most of the health care providers in this study were aware of the benefits of providing smoking cessation interventions, inadequate knowledge of the various smoking cessation interventions and techniques required in counseling patients could be hindering the provision of such interventions to patients. This is exemplified by the fact that a third of the health care providers in this study were not aware that smoking cessation advice is a recommended cessation intervention while 45% of the health care providers were unaware of the need to assist smokers set up a quit date. This was consistent with findings in a cross sectional study among nurses in Australia in which nurses surveyed perceived they lacked skills required to deliver cessation interventions. While 61% of the nurses in that study felt that they had enough knowledge on how to ask a patient about smoking status, only 21.2% felt that they had enough knowledge to discuss about smoking cessation with patients (Nagle et al., 1999).

The lowest scores among the knowledge based questionnaire items were obtained in items assessing knowledge on nicotine dependence symptoms, nicotine withdrawal symptoms and smoking cessation medications. Almost half of the respondents failed to correctly identify smoking within the first half hour of waking as a nicotine dependence symptom, indicating that health care providers may not have sufficient skills to determine a smokers' level of nicotine dependence. The assessment of the level of nicotine dependence helps to predict whether a smoker is likely to experience nicotine withdrawal symptoms on quitting smoking. This assists the health care provider to select the most appropriate level of non-pharmacological and/or pharmacological support that will be needed (Ali et al., 2012). These findings were in contrast to those in a cross sectional study among healthcare providers in Australia in which all the respondents identified smoking within the first half hour of waking as a nicotine dependence symptom (Pilkington, Carter, Cameron, & Thompson, 2009). Educating health care providers on simple tests for nicotine dependence, such as the Fagerstrom nicotine dependence test, would help to increase the knowledge and confidence of healthcare providers in utilizing such skills to assist smokers quit successfully (Pilkington et al., 2009).

Two fifths of the respondents were unaware of the chronic and addictive nature of cigarettes. As smoking cessation is a process associated with relapse, repeated attempts to quit smoking are a common and accepted pathway to abstinence and, smokers require ongoing rather than acute care (Ali et al., 2012; Fiore et al., 2008). It is important that health care providers be aware that quitting smoking is a process and not a one off event (Cleland et al., 2005). This would ensure that they keep motivating their patients to keep trying even after relapse.

The lack of awareness by more than half of the respondents of medications used to assist smokers cope with smoking cessation withdrawal symptoms limits the ability of health care

providers to effectively discuss such treatment options with smokers. Similar findings were observed in a study among community health care providers in China in which, 55.3% of those surveyed had never heard of nicotine replacement therapy (Klink et al., 2011).

Apart from educating patients on smoking risks, more than half of the healthcare providers reported little or no confidence in providing all other smoking cessation interventions within the 5A's model. The low level of confidence in recommending cessation medications and in assisting patients with nicotine withdrawal symptoms was consistent with the low scores obtained in questionnaire items assessing knowledge on smoking cessation medications and withdrawal symptoms.

Consistent with other studies (Abdullah et al., 2006; Suchanek, Prokhorov, & Corelli, 2006), there was a significant relationship between having received training on smoking cessation interventions and the level of knowledge and confidence in provision of smoking cessation interventions. Trained health care providers had higher level of knowledge and confidence. Training of health care providers on smoking cessation would therefore be of immense importance in increasing the health care providers smoking cessation intervention knowledge and confidence in delivery of smoking cessation interventions.

### **5.3 Attitude towards provision of smoking cessation interventions**

Most of the health care providers surveyed had a positive attitude towards their role in provision of smoking cessation interventions. This is comparable to a study among health care providers in china that found that 88% of the health care providers surveyed agreed/ strongly agreed that health care providers should play an active role in tobacco control (Yan et al., 2008).

Majority of the health care providers surveyed also had a positive attitude towards the effect of cessation advice on the health care provider and patient relationship. Similar findings were observed in a study assessing nurses attitude towards provision of smoking cessation interventions in Minnesota, US (McCarty et al., 2001). Given that health care providers' perceptions on the effect of provision of cessation interventions on the provider and patient relationship has been found to play a role in the level of provision of smoking cessation interventions (Mcewen et al., 2006), it is encouraging that most health care providers surveyed perceived that provision of smoking cessation interventions would improve the health care provider and patient relationship.

However, a third of the health care providers in this study perceived that patients were unwilling to receive advice on smoking cessation. Health care providers belief that patients would resist smoking cessation advice was found to be associated with being less likely to advise patients to quit in a national survey of US health professionals (Tong et al., 2010). It is therefore important that such concerns be addressed in order to increase the health care providers' level of provision of smoking cessation interventions.

Two fifths of the health care providers also perceived that they did not have sufficient time to provide advice to all patients who smoke, while three fifths agreed that patients other health problems took precedence to provision of smoking cessation counseling. In contrast, in a cross sectional study among nurses in New Zealand, almost three quarters of the nurses surveyed disagreed that their time was better spent helping patients with other things rather than smoking cessation (Wong et al., 2007). This signifies the need to sensitize health care providers that even brief/minimal interventions lasting less than 3 minutes increase overall tobacco abstinence rates when compared to no intervention. Every tobacco user should therefore be offered at least a

minimal intervention (Fiore et al., 2008). Concerns about time constraints and competing health priorities need to be addressed by training health care providers to deliver smoking cessation interventions as effectively and efficiently as possible within the available consultation time (Hall & Marteau, 2007).

#### **5.4 Practice of smoking cessation interventions**

The first step in the provision of smoking cessation interventions is the identification and documentation of a patient's smoking status. Various smoking cessation guidelines recommend that health care providers establish and record the smoking status of every adult patient (Ali et al., 2012; Fiore et al., 2008; Vardavas, Symvoulakis, & Lionis, 2013). However, only a third of the respondents in this study stated that they always asked patients about their smoking status. A large number of smoking patients in public health facilities may therefore remain unidentified. Nearly two thirds of respondents in this study did not routinely document their patients smoking status. These findings, as in other studies (Eldein, Mansour, & Mohamed, 2013; Ravara et al., 2012), demonstrate that establishment of patients' smoking status presents a weak link in the provision of smoking cessation interventions by health care providers. The identification of a patient's smoking status is crucial as it determines whether a smoker receives all the other smoking cessation interventions (Raw et al., 1998; Fiore et al., 2008 ). Health care providers' failure to routinely establish and document the patients smoking status therefore contributes to missed opportunities in the provision of smoking cessation interventions in public health facilities in Kenya.

Even when smoking patients are identified some may still not receive any advice to quit as suggested by the large proportion of health care providers (53%) who stated that they did not routinely advise smoking patients to quit. This is comparable to a study among health care

providers in China that found that despite knowing the smoking status of patients, only 1 in 3 doctors advised all smoking patients to quit (Abdullah et al., 2006).

There was sub-optimal self reported practice of all the smoking cessation interventions within the 5A's model. However, more health care providers performed the 'ask' and 'advise' components as compared to the 'assist' and "arrange follow up" components. This indicates that apart from occasionally screening for smoking and offering advice to quit, most health care providers do not go further to assist patients quit smoking. Smoking patients are therefore not receiving adequate support from health care providers to assist them quit successfully. Consistent findings to these have been found in other studies (Bodner et al., 2012; Eldein et al., 2013; Everett et al., 2005; Sarna et al., 2009). In a KAP study among doctors in Egypt, the most practiced intervention within the 5A's guidelines was the 'Ask' component while the least practiced were the 'Assist' and 'Arrange follow up' components (Eldein et al., 2013). Similarly, a study carried out in South Africa to assess doctors' attitudes and practices regarding smoking cessation during pregnancy found that though some doctors made initial enquiries about smoking status and explained the risks, they did little to monitor and review the patients' quitting progress throughout the pregnancy (Everett et al., 2005).

Health care providers' lack of adequate knowledge, skills and confidence in provision of cessation interventions may assist to account for the sub-optimal practice of smoking cessation interventions as, higher knowledge and confidence levels were found to significantly increase the odds of having better practice scores. Lack of knowledge on smoking cessation medications by more than half of the study participants may therefore partially account for the high number of healthcare providers (65%) that never discussed the use of pharmacological aids with patients. This is comparable to a study among health care providers in China in which, only 13.7% of the



health care providers reported that they had ever used nicotine replacement medications when helping smokers to quit while 55.3% had never heard of them (Klink et al., 2011). Lack of inclusion of smoking cessation medications in the essential drug list in public health facilities may also partially assist to explain the failure of health care providers to discuss such treatment options with smoking patients.

### **5.5 Barriers to provision of smoking cessation interventions**

Most of the respondents perceived insufficient training and inadequate knowledge as important barriers to the provision of smoking cessation interventions. This view was supported by the fact that majority of the health care providers surveyed had not received formal training on smoking cessation interventions. These findings were consistent with those of a study carried out among doctors in Nigeria in which majority of the doctors surveyed (66.3%) reported that poor knowledge of smoking cessation interventions was the greatest obstacle to implementing smoking cessation interventions (Desalu et al., 2009).

Training of health care providers on smoking cessation has been found to improve the level of knowledge, confidence and performance of smoking cessation interventions by health care providers (Carson et al., 2012). It is therefore encouraging that almost all the respondents were willing to receive training on smoking cessation interventions. Of note is that all the respondents who stated that they had some prior training in smoking cessation also expressed their willingness to receive training, indicating that the prior training may have been insufficient.

Lack of smoking cessation treatment guidelines was also perceived by majority of the health care providers as an important barrier to the provision of smoking cessation interventions. In an assessment of the implementation of tobacco control policies in Kenya by the WHO, provision of smoking cessation services in Kenyan public health facilities was found to be unsystematic

and lacking in standardization (WHO, 2012). The presence of national guidelines on treatment of tobacco dependence is therefore crucial in promoting and standardizing the provision of smoking cessation care to patients.

Lack of organizational support factors such as patient educational materials and smoking cessation specialists for referral was also perceived by more than half of the health care providers as important barriers to the provision of smoking cessation interventions. More than 90% of the health care providers surveyed stated that their health facilities lacked protocols for documenting smoking cessation counseling, patient brochures and smoking cessation specialists. Similarly, in a study among nurses in Australia, majority of the nurses perceived that organizational factors such as availability of cessation specialists, availability of smoking history forms and supervisor support, would make them more likely to provide smoking cessation support (Nagle et al., 1999).

Provision of these organizational support factors may improve on the health care providers' participation in smoking cessation activities. The presence of a smoking cessation specialist based within a health facility can facilitate the referral of smoking patients for more intensive support, provide an accessible and flexible service for health care providers who desire to quit smoking, promote implementation of smoking cessation guidelines and help in training of other staff (Lewis & Stern, 2012) . Other strategies that have been found to be effective in promoting smoking cessation implementation in health facilities include: Instituting a tobacco user identification system ; promoting health care providers intervention through education resources such as brochures on smoking cessation and assessing the delivery of treatment in staff performance evaluation (Quinn, 1999; U.S. Preventive Services Task Force, 2009).

Most of the health care providers did not perceive patient related factors such as patients' low receptiveness to smoking cessation interventions and failure to comply with information given as important barriers to provision of smoking cessation interventions. This is in contrast to findings in a number of other studies (Abdullah et al., 2006; Cohen et al., 2007; Lam et al., 2011). In a study among doctors in Hong Kong, lack of patient motivation was rated as an important barrier by 82.8% of the doctors (Abdullah et al., 2006) while in a study among physicians in the U.S., lack of patient motivation was rated by 63% of the physicians as the most important barrier to provision of smoking cessation care (Cohen et al., 2007).

### **5.6 Factors associated with practice of smoking cessation interventions**

Factors identified to be positively associated with smoking cessation practices of health care providers included knowledge level, attitude, sex, training and organizational support. Similar to findings in other studies (Abdullah et al., 2006; Albert et al., 2005; Passey et al., 2012), higher knowledge scores were associated with better practice of smoking cessation interventions. A more positive attitude towards the provision of smoking cessation interventions was also significantly associated with better practice scores. This was similar to findings in other studies (Abdullah et al., 2006; Meredith et al., 2005).

Among the socio-demographic factors, age and number of years of practice were not found to be significantly associated with the practice of smoking cessation interventions in this study. This is in contrast to findings in other studies that have found significant differences in the smoking cessation practices based on age or number of years of practice (Abdullah et al., 2006; Gan et al., 2007; Ulbricht et al., 2006). There was however, a significant relationship between sex and the practice level with males having significantly higher practice scores than females. This was consistent with the findings of a study among Portuguese health professionals that found that the

odds of asking about smoking and recording the smoking status was significantly higher among male health care providers than females (Ravara et al., 2012). In contrast, in a study carried out to assess whether sex mattered towards the smoking cessation practices of health care providers in China, females were found to be more likely to provide smoking cessation interventions as compared to males (Lam et al., 2011).

Among the organizational support factors, the presence of anti-smoking posters in health facilities was found to be significantly associated with better practice scores. However there was no relationship between practice of smoking cessation interventions and other organizational support factors such as tobacco assessment forms and smoking cessation specialists as majority (95%) of the health care providers indicated that these support factors were missing in their health facilities. Supporting health care providers in provision of smoking cessation interventions could therefore increase their level of provision of smoking cessation interventions.

### **5.7 Prevalence of tobacco use among health care providers**

Although there was a low prevalence of smoking among the respondents (2.7%), comparison of the smoking prevalence between males and females revealed a higher prevalence of smoking among males (10.2%) as compared to females (1.1%) and this difference was statistically significant. This is consistent with the national prevalence of tobacco use that is higher among males (19%) as compared to females (2%) (KNBS & ICF Macro, 2010).

The smoking prevalence obtained in this study may however not be indicative of the smoking prevalence among all health care providers in Kiambu County as not all health professions were included in this study. A large proportion of the respondents sampled were nurses, which is a predominantly female profession and, given the lower national prevalence of smoking among females, smokers in professions that may have a higher male representation, that were not

included in the study (such as pharmacy, physiotherapy, occupational therapy and radiology ) , may have been missed out.

Health care providers smoking status was not found to be significantly associated with the level of practice of smoking cessation interventions. This is in contrast to findings in previous studies that have demonstrated a relationship between health care providers smoking status and the level of practice of smoking cessation interventions (Pipe et al., 2009; Yan et al., 2008). There were however, significant differences in the attitude scores of respondents on the basis of smoking status. Health care providers who were non- smokers had significantly more positive attitudes towards provision of smoking cessation interventions as compared to current smokers and these findings were consistent with previous studies ( Ravara et al., 2011; Sabra, 2007).

## **5.8 Conclusion**

Less than a tenth of the health care providers attained good knowledge scores while half of the health care providers surveyed had an average level of knowledge on smoking cessation interventions. Although more than half of the study participants had little or no confidence in provision of various smoking cessation interventions, more health care providers reported being confident in advising patients on smoking cessation as compared to those that reported being confident in assisting patients quit smoking. There was a significant relationship between having received training on smoking cessation interventions with the health care providers' level of knowledge and confidence in provision of smoking cessation interventions.

Most of the health care providers had a positive attitude towards provision of smoking cessation interventions. However, two thirds of the health care providers perceived that the patients other health problems took priority to provision of smoking cessation interventions. There was a

significant relationship between health care providers' attitude toward provision of smoking cessation interventions and the smoking status of the health care provider.

Slightly more than half of the health care providers surveyed attained below average practice scores. There was sub-optimal performance of all the smoking cessation interventions under the 5A's model, however, more health care providers reported that they asked and advised patients to quit as compared to those that assessed willingness to quit, assisted patients to quit or arranged follow up. There was a significant relationship between the level of practice of smoking cessation interventions with the knowledge and attitude of health care providers towards provision of smoking cessation interventions. Other factors that were significantly associated with the level of practice of smoking cessation interventions included sex, training on smoking cessation interventions, presence of organizational support (posters) and level of confidence.

## **5.9 Recommendations**

1. To address training needs for health care providers on smoking cessation intervention methods and techniques, as well as nicotine dependence and withdrawal symptoms, the Ministry of health in conjunction with County health management teams should develop and implement both a pre-service and in-service standard curriculum for training healthcare providers on smoking cessation interventions.
2. National guidelines for screening, documentation and treatment of tobacco dependence need to be developed, implemented and monitored by the Ministry of health and County health management teams.

3. The County health management team should provide health facilities with information, educational and communication (IEC) materials such as posters and brochures to aid in the delivery of smoking cessation interventions to patients.
4. County and Sub-County health management teams should develop and implement monitoring tools for support supervision of health staff in delivery of smoking cessation interventions

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## **7. APPENDICES**

### **APPENDIX I: CONSENT FORM**

I am Dr. Judy Gichuki, a postgraduate student pursuing a Master's degree in Public Health at the University of Nairobi, School of Public Health. I am conducting a research study on "the knowledge, attitude and practices of healthcare providers on smoking cessation interventions in public health facilities in Kiambu" and would kindly like to request you to take part in this study. The approval to carry out this study has been given by the Kenyatta National Hospital / University of Nairobi Ethics and Research Committee.

#### **Purpose of the Study & Procedure**

The purpose of this study is to determine the knowledge, attitude and practices of healthcare providers on smoking cessation interventions.

If you agree to participate in this study, you will be required to answer questions in a questionnaire comprising of several close ended questions

#### **Perceived benefits**

You will not benefit personally from the study. However, the results obtained from this study will provide information that may assist in improving the provision of smoking cessation interventions to patients.

#### **Risks**

There are no anticipated risks for participating in the study.

#### **Costs and payments:**

This study is strictly voluntary and no monetary compensation will be given.

#### **Confidentiality:**

All the information that you provide will be strictly confidential. Your names will not appear anywhere on the data collection form. Only identification numbers will be used on the forms.

#### **Withdrawal privilege:**

If you decide to withdraw from the study then you are free to do so at any time without penalty or prejudice.

#### **Contacts**

In case you have any questions or issues regarding the study during or after the study, then you are free to contact me through P. O Box 28201-00200, Nairobi. Mobile No: 0722607430 or

The Secretary, Kenyatta National Hospital/University of Nairobi Ethics and Research Committee, P.O Box 20723 - 00202, Nairobi, Tel. No. Tel: (254) 020 726300 EXT 44102, 44355

**Voluntary consent:**

I certify that I have read and understood all of this consent explanation and questions pertaining to the research have been answered to my satisfaction. My signature below means I freely agree to participate in this study.

**Signature of participant .....**      **Date.....**

**Investigators statement:**

I certify that I have explained to the above individual the nature and purpose of this study, potential benefits and possible risks associated with participation in this study. I have answered any questions that have been raised. I have also explained the above to the participant on the date on this consent from.

**Investigator.....**      **Date:.....**

## APPENDIX II: QUESTIONNAIRE

### SECTION 1: DEMOGRAPHIC INFORMATION

Q. No.....

Gender (Please Tick One)      Female .....    Male.....

Age .....

What is your job description? (Please tick one)

A) Nurse .....

B) Medical Officer.....

C) Medical Officer Intern.....

D) Clinical Officer.....

E) Clinical Officer Intern.....

F) Dentist.....

G) Community Oral Health Officer.....

H) Community Oral Health Intern.....

F) Other..... (Specify).....

Number of years of practice.....

Smoking status

Are you? (Please tick one)

A) A never smoker.....

B) An ex-smoker.....

C) A current smoker.....

## SECTION 2: KNOWLEDGE

Which of the following methods are recommended for use by healthcare providers to provide smoking cessation care to patients? (Kindly tick YES for those that are recommended and NO for those not recommended)

NO.	BEHAVIORAL INTERVENTION	YES	NO	DON'T KNOW
1	Advice from a healthcare provider on smoking cessation			
2	Hypnosis			
3	5A's method of assessment of tobacco use			

Please indicate if the following statements are true or false

NO	STATEMENT	TRUE	I DON'T KNOW	FALSE
4	Patients should only be asked about their smoking history if they have a smoking related disease/illness.			
5	Most smokers will successfully quit smoking on their own without assistance.			
6	Patients who have their first cigarette within half an hour of waking are likely to be less dependent on nicotine than patients who have it much later in the day.			
7	Smoking cessation advice given by a health professional to a patient increases the patient's chances of quitting.			
8	When advising patients to stop smoking, the advice should never be linked to the patient's current health/illness.			
9	Counseling patients on smoking cessation includes assisting the patient to set a quit date			

10	A common withdrawal symptom that occurs after quitting smoking is weight loss			
11	Most of the withdrawal symptoms from smoking cessation disappear within 4 weeks of abstinence.			
12	Follow-up appointments should be made for the patients who are willing to stop smoking within the first week after quitting.			
13	There is no need of advising elderly patients who smoke(those above 60 years) to quit as the damage from smoking is already present and cannot be reversed			
14	Smoking is a chronic disorder associated with relapse			

15. Which of the following medications are recommended for the treatment of tobacco dependence in smoking patients? (Kindly tick YES for those that are recommended and NO for those not recommended)

	<b>MEDICATION</b>	<b>YES</b>	<b>NO</b>	<b>DON'T KNOW</b>
a)	Nicotine gum			
b)	Nicotine patch			
c)	Nicotine syrup			
e)	Nicotine lozenges			
f)	Bupropion tablets			
g)	Carbamezapine tablets			

## SECTION 2: ATTITUDES

This section addresses your perceptions on the role of healthcare providers in smoking cessation. Please indicate if you agree or disagree with the following statements (Kindly tick the appropriate answer).

	<b>Statement</b>	<b>AGREE</b>	<b>DISAGREE</b>
16	It is my responsibility to assist patients to stop smoking		
17	It's not worth discussing benefits of smoking cessation with patients as patients already know they should quit.		
18	It is my responsibility to motivate patients to stop smoking		
19	My patients' acute health problems take precedence over smoking cessation counseling/advice		
20	Patients are not receptive to receiving smoking cessation assistance from healthcare providers		
21	Smoking Cessation counseling improves my relationship with patients		
22	Quitting smoking is an individual choice. It's not up to me to advise a patient to quit smoking		
23	I do not have sufficient time to provide advice and counseling to all my patients who smoke during routine consultations		
25	It is uncomfortable to counsel my smoking patients on quitting smoking		

### SECTION 3: PRACTICES

This section addresses the range of activities performed by healthcare providers to encourage patients to quit smoking. In your daily interactions with patients, how often do you perform the following procedures? (Kindly tick the appropriate answer)

NO	PROCEDURE	NEVER	SOMETIMES	ALWAYS
26	Ask about the patients smoking status			
27	Ask about the number of cigarettes smoked per day			
28	Record the patients smoking history in the medical records			
29	Advice a smoking patient on the need to quit			
30	Discuss the risks of smoking and benefits of quitting smoking with patients			
31	Ask about the previous quit attempts of smoking patients			
32	Assess if patients who smoke are willing to quit at that particular time			
33	Discuss the use of pharmacological aids such as nicotine replacement therapy with patients			
34	Assist the smoking patient to set up a target quit date			
35	Set up a follow up appointment to review the progress of patients on quitting smoking			

#### SECTION 4: TRAINING AND CONFIDENCE

This section addresses your past training in smoking cessation and your confidence in performing various smoking cessation interventions.

36. Have you received any formal training in smoking cessation methods and approaches to use with your patients? (Please tick one)

A) Yes ..... B) No.....

If yes, when a) during my undergraduate/ diploma/ certificate training

b) During my post graduate / Higher- diploma training

c) In a seminar/conference/in-service training

d) Through E-Learning (via the internet)

e) Other .....

Please rate your confidence in performing the following to help your patients quit smoking (Kindly tick the appropriate answer).

NO	Statement	Not at all confident	A little confident	Confident
37	Educating patients on the general health risks of smoking			
38	Advising smokers on how to quit smoking			
39	Assessing the willingness of the patient to quit smoking			
40	Discussing various smoking cessation treatment options with patients			
41	Recommending appropriate smoking cessation medications for the patient			
42	Motivating patients to consider quitting			
43	Negotiating a target quit date for the patient to stop smoking			
44	Helping recent quitters learn how to cope with withdrawal symptoms			



45. Do you wish to receive training on smoking cessation methods, available interventions and guidelines on tobacco control? *(Please tick one)*

A) Yes

B) No

**SECTION 5: ORGANIZATIONAL SUPPORT FACTORS**

This section addresses the resources that are available to aid you in helping patients to quit smoking. Which of the following resources are available in your facility to assist you in providing smoking cessation care to your patients? (Kindly tick the appropriate answer).

Do you or would you use them if they became available? (Kindly tick the appropriate answer).

	<b>Organizational factor</b>	<b>Availability</b>		<b>Use if available?</b>	
		<b>Available</b>	<b>Not available</b>	<b>Yes</b>	<b>No</b>
46	Tobacco user identification charts(special forms for assessment and recording tobacco history				
47	Brochures/ pamphlets on smoking cessation for distribution to patients.				
48	Anti- smoking posters in the treatment/waiting rooms				
49	Smoking cessation specialist referral clinics				

**SECTION 6: BARRIERS**

This section addresses barriers that you may face in helping patients quit smoking. How would you rate the following as barriers that hinder you from helping patients to stop smoking? (Kindly tick the appropriate answer).

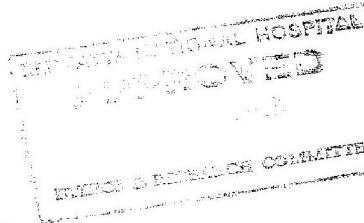
		<b>Not a barrier</b>	<b>Somewhat a barrier</b>	<b>Important barrier</b>
50	Patients are not interested in receiving smoking cessation information			
51	Patients do not comply to information given on smoking cessation			
52	Lack of time/ time with patients is limited			
53	Patients have more immediate health problems to be addressed			
54	Lack of smoking cessation specialists to refer patients to for further assistance			
55	Lack of patient education material ( brochures/pamphlets)			
56	Insufficient training on smoking cessation interventions			
57	Lack of awareness of smoking cessation guidelines			
58	Insufficient knowledge on smoking cessation interventions			

Thank you for participating in this study. Please place the completed questionnaire in the enclosed envelope and seal it.

## APPENDIX III: ETHICAL APPROVAL LETTER



UNIVERSITY OF NAIROBI  
COLLEGE OF HEALTH SCIENCES  
P O BOX 19676 Code 00202  
Telegrams: varsity  
(254-020) 2726300 Ext 44355  
Ref: KNH-ERC/A/82



KNH/UON-ERC  
Email: [uonknh\\_erc@uonbi.ac.ke](mailto:uonknh_erc@uonbi.ac.ke)  
Website: [www.uonbi.ac.ke](http://www.uonbi.ac.ke)  
Link: [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN)



KENYATTA NATIONAL HOSPITAL  
P O BOX 20723 Code 00202  
Tel: 726300-9  
Fax: 725272  
Telegrams: MEDSUP, Nairobi  
15<sup>th</sup> April 2013

Gichuki Judy Watiri  
School of Public Health  
College of Health Sciences  
University of Nairobi

Dear Judy

**Research proposal: Knowledge, Attitude and Practices of Healthcare Providers on Behavioural Interventions for smoking cessation in public health facilities in Kiambu County, Kenya (P672/12/2012)**

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and **approved** your above revised proposal. The approval periods are 15<sup>th</sup> April 2013 to 14<sup>th</sup> April 2014.

This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- Submission of an *executive summary* report within 90 days upon completion of the study. This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website [www.uonbi.ac.ke/activities/KNHUoN](http://www.uonbi.ac.ke/activities/KNHUoN)

*Protect to Discover*

Yours sincerely



**PROF. M. L. CHINDIA**  
**SECRETARY, KNH/UON-ERC**

c.c. Prof. A.N. Guantai, Chairperson, KNH/UoN-ERC  
The Deputy Director CS, KNH  
The Principal, College of Health Sciences, UoN  
The Director, School of Public Health, UoN  
The HOD, Records, KNH  
Supervisors: Rose Opiyo, Prof. Elizabeth Ngugi

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