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SMOKING BEHAVIOR AND TOBACCO CONTROL AMONG MEDICAL DOCTORS IN LAO PDR

**Alongkone PHENGSAVANH, MD, MSc, PhD
Vanphanom SYCHAREUN, MD, MTH, PhD
Visanou HANSANA, MD, MCTH
Sysavanh PHOMMACHNAN, MD, MA
Ketketsone PRASISOMBATH, MD, MPH
Angkham OUNAVONG, MD, MPH**

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Research team

Alongkone PHENGSAVANH, MD, MSc, PhD
Vanphanom SYCHAREUN, MD, MTH, PhD
Visanou HANSANA, MD, MCTH
Sysavanh PHOMMACHNAH, MD, MA
Ketketsone PRASISOMBATH, MD, MPH
Angkham OUNAVONG, MD, MPH

Postgraduate Studies & Research Department
University of Health Sciences
Vientianne, Lao PDR

Advisors

Assoc. Prof. Dr. Som Ock Kingsada, Rector of the University of Health Sciences
Assoc. Prof. Dr. Sing Menorath, Vice Rector of the University of Health Sciences

Editor

Menchi G. Velasco

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EXECUTIVE SUMMARY

Introduction

Smoking is a key issue in the medical profession, medical doctors play leading role in tobacco control in the society and their professions and positions are important in the development of public health policies, but some of them smoke even at work in Lao PDR. In view of the important role played by medical professionals as exemplary models of appropriate health behaviors, it was deemed necessary to conduct a study to identify the smoking prevalence of medical doctors in the country as well as assess the attitudes of physicians towards smoking and tobacco control initiatives.

Methodology

This was a cross sectional survey using a combination of quantitative and qualitative research methods. The medical doctors were interviewed to describe their knowledge, attitude, practice of tobacco smoking and tobacco control through a face-to-face-administered questionnaire. Qualitative methods through in-depth interviews, were also used to explore the attitude and opinion of medical doctors on health hazards of smoking as well as counseling for their patients to quit smoking. In-depth interviews were also used in exploring the opinion of policymakers in both the central and provincial levels on tobacco control.

Results

In total, 855 medical doctors out of 1060 were recruited into the study and completed the questionnaires. More than half, 52.9%, of the respondents are males. The majority of respondents (71.6%) were from the Central part; 18% from the Southern part and 10.4% were from the Northern part. The age of the respondents ranged from 24 years to 65 years old with a mean of 40.6 years of age.

Of the 855 surveyed, 9.3% were smokers (5% daily and 4.2% occasionally), 18.4% were ex-smokers and the prevalence of non-smokers was 72.4% which was statistically significant different by region ($p < 0.05$). The prevalence of smoking among physicians from the Southern part (14.9%) was higher than the prevalence of smoking among physicians in the Northern part (11.3%) and Central part (7.6%). A higher number of male doctors at 17.3% smoked compared to female doctors at 0.4%.

Almost all of the medical doctors had high knowledge related to the health consequences of smoking and have favorable attitudes toward anti-smoking, with smokers having more positive attitudes toward anti-smoking than non-smokers ($p < .001$). There was a positive correlation between knowledge and attitudes toward anti-smoking for all physicians including non-smokers. Determinants of smoking status in this study were age and attitudes toward anti-smoking status.

The majority of medical doctors strongly supported tobacco control measures. Physicians with positive attitudes toward anti-smoking were more likely to support tobacco control ($p = .016$). In addition, the study also supported the hypothesis that physicians who smoke have lower support for tobacco control compared to non-smokers.

With regard to serving as role models, the majority of Lao medical doctors believe that they should set good examples by leading a tobacco-free life. In addition, they have to provide health counseling regarding quitting smoking and cessation treatment; however, many of the physicians mentioned that they are not yet ready to be health educators on smoking cessation.

Recommendations

- Health professionals and policymakers should play role models for stopping smoking. They are the most appropriate people to be role models because of their position, which hopefully will lead to the enforcement of the government's smoke-free area policy throughout the entire health system in the country.
- It is essential that health professionals actively promote quit smoking campaigns for their patients, public and for themselves. A focused and sustained anti-smoking campaign in health facilities and the Ministry of Health will serve as models and may also be useful in controlling the smoking epidemic among the health professionals.
- The first step in remedying this situation is for the Ministry of Health, Medical and Nursing schools, central and provincial hospitals as well as clinics to bring their practices in line with their knowledge and enforce a total ban on smoking in all their premises.
- Setting a good example applies to the University of Health Sciences. Hence, a thorough revision of the curricula, teaching methods, conditions of admission and requirements for graduation is urgently needed in order to introduce the necessary amendments that would enable graduates to set an ethical and practical example for the rest of society.
- Courses in tobacco control treatment can be offered and even mandated within the curriculum. Tobacco control responsibility can be incorporated into orientation lectures and brochures for incoming medical students and integrated into the in-service training or during their specialization.
- Advocate for national tobacco control legislation that provides grants for programs that recruit and train doctors in smoking cessation treatment.
- Prevent all hospitals from selling tobacco, and promote a smoke-free hospital environment throughout the country.
- The smoke-free policy as well as regulations related to smoking should be officially reviewed, advocated, and health professionals should be counseled on the consequences of smoking and quitting smoking technique regularly. This is to remind the health professionals of their responsibilities as role models for a tobacco-free life.

TABLE OF CONTENTS

	Page
Acknowledgements	2
Executive summary	3
1. Background and rationale	8
2. Literature review	10
2.1. Smoking behavior among medical doctors	10
2.2. Knowledge and attitudes regarding smoking	11
2.3. Relationship between Knowledge, Attitudes and Smoking practices	12
3. Objectives	13
3.1. General objective	13
3.2. Specific objectives	13
3.3 Hypotheses	13
4. Conceptual framework of smoking behavior among medical doctors	14
5. Definitions of terms	15
6. Methodology	16
6.1. Study design	16
6.2. Duration	16
6.3. Study site	16
6.4. Study population	18
6.4.1. Selection criteria	18
6.4.2. In-depth interview	18
6.5. Sampling method	19
6.6. Sample size	19
6.6.1. For cross sectional survey	19
6.7. Study variables	20
6.7.1. Measurement variables	20
6.8. Research tools	21
6.9. Data collection	21
6.10. Data processing	22
6.11. Ethical consideration	22
6.12. Dissemination of results/outputs	23
7. Results	24
7.1. Socio-demographic characteristics of the respondents	24
7.2. Smoking pattern	26
7.3. Pattern of ex-smokers	28
7.4. Pattern of current smokers	30
7.5. Cigarette dependency and reason for smoking	31
7.6. Intention of smoking cessation	38
7.7. Knowledge of the health effects of smoking	42
7.8. Attitudes regarding anti-smoking and tobacco control	45
7.9. Smoking environment at the workplace	50
7.10. Intention to participate in the tobacco control	54
7.11. Correlation between attitudes and participation in tobacco control	57

7.12. Links between knowledge, and attitudes toward smoking	58
7.13. Factors associated with smoking	59
8. Qualitative data	62
8.1. Socio-demographic characteristics and working experiences	62
8.2. Policymakers' opinion toward smoking among health professionals	63
8.3. Health professionals as role models against smoking	63
8.4. Regulation or law related to no smoking in the health institutions or other institutions	64
8.5. Influences on health personnel's smoking practice	65
8.6. Smoke-free policy of the Ministry of Health	65
8.7. The prevailing limitation of awareness on the smoke-free zone policy	66
8.8. Integrate lessons on health consequences of smoking and counseling techniques in the training curriculum	67
8.9. Opinion on counseling about consequences of smoking and quitting smoking	68
8.10. Policy regarding quitting process and health promotion encouraging medical doctors to stop smoking in the health facilities	68
9. Discussion	70
9.1. Smoking prevalence of medical doctors	70
9.2. Knowledge and attitudes	71
9.3. Health professionals as role models in tobacco control	72
9.4. Smoke-free policy	72
9.5. Factors associated with smoking among medical doctors	73
9.6. Limitations	74
10. Conclusion	75
11. Recommendations	76
12. References	77
Appendices	81
Appendix 1: Questionnaire survey on tobacco use among medical doctors in Lao PDR	82
Appendix 2: Guidelines for in-depth interviews with policymakers	92

LIST OF TABLES

	Page
Table 1: Smoking rate in Southeast Asia by country (Mackay & Eriksen, 2002)	8
Table 2: Distribution of health facilities by region and provinces	17
Table 3: Distribution of sample size by provinces and qualification	20
Table 4: Measurement of variables	21
Table 5: Demographic characteristics of respondents by region	25
Table 6: Smoking status of medical doctors by region	27
Table 7: Smoking status of medical doctors by sex	28
Table 8: Ex-smokers by gender	29
Table 9: Ex-smokers by region	30
Table 10: Current smoking status by sex	32
Table 11: Current smoking status by region	35
Table 12: Comparisons of characteristics of smokers and ex-smokers among medical doctors	38
Table 13: Smoking cessation by gender	39
Table 14: Smoking cessation by region	40
Table 15: Knowledge of health problems related to smoking by smoking status	43
Table 16: Knowledge of health problems related to smoking by region	44
Table 17: Knowledge of health effects of smoking by smoking status	45
Table 18: Knowledge of health effects of smoking by smoking status and gender	45
Table 19: Knowledge of health problems related to smoking by region and smoking status	45
Table 20: Attitudes toward smoking and tobacco control by smoking status	46
Table 21: Attitudes toward smoking and tobacco control by region	47
Table 22: Attitudes toward smoking and tobacco control by smoking status	49
Table 23: Attitudes toward smoking and tobacco control by smoking status and gender	49
Table 24: Attitudes toward smoking and tobacco control by smoking status and region	50
Table 25: Have heard about Smoking Practice and policy at their workplace by smoking status	52
Table 25.1: Smoking Practice and policy at their workplace by smoking status	52
Table 26: Have Heard about Smoking Practice and policy at their worksite practice and smoking status by region	51
Table 26.1: Worksite Practice and smoking status by region	53
Table 27: Intention to participate in tobacco control by smoking status	54
Table 28: Intention to participate in tobacco control by region	56
Table 29: Association between Attitudes and participation in tobacco control	57
Table 30: Correlation between Knowledge and Attitudes toward smoking among smokers and non-smokers	58
Table 31: Factors associated with smoking status among male medical doctors	59
Table 32: Logistic regression of smoking among male medical doctors	60
Table 33: Socio-demographic of key informants	62

BACKGROUND AND RATIONALE

Global consumption of cigarettes smoking has been rising rapidly since manufactured cigarettes were introduced at the beginning of the 20th century. While consumption is leveling off and even decreasing in some countries, worldwide, more people are smoking, and smokers are smoking more cigarettes. The number of smokers will increase mainly due to the expansion of the world population. By 2030 there will be at least 2 billion people in the world who smoke (Mackay & Eriksen, 2002).

Tobacco use has increasingly and disturbingly affected the Southeast Asia region, where smoking disproportionately affects particularly the poor. With one of the highest smoking prevalence rates in the developing world, especially among men, it is estimated that over three quarters of Vietnamese and Cambodian men and around 44% of all men in Laos, Thailand and Malaysia smoke. This has resulted in lung cancer becoming one of the region's leading cancers in men. Tobacco-related diseases account for the top three causes of deaths in the region. For example, in Malaysia, 25% of all deaths are tobacco-related, while Cambodia has the highest rate of the tobacco-related deaths at 48.5% of all deaths recorded in 1999 (SEATCA, 2006).

Not surprisingly, with the region's population base of almost 500 million, and the total trade of US\$ 720 billion, ASEAN countries are a big market and prime target for transnational tobacco companies (TTCs) as they seek to expand their market to compensate for the declining market in the developed Western market (SEATCA, 2006).

In Lao PDR, 38% of the total population are tobacco smokers; smoking rate for the males is more than two times higher than females (41% among males and 15% among females) and the country has the highest cigarette smoking rate in Southeast Asia (see Table 1) (Mackay & Eriksen, 2002). In Lao PDR, 6,700 hectares or 0.87% of land is used to grow tobacco and the country produces 33,400 tonnes of tobacco. So far, no study has yet been done to identify who the smokers are and this include those in the health professions.

Table 1: Smoking Rate in Southeast Asia by Country (Mackay & Eriksen, 2002)

Country	Smoking rate (%)		
	Total	Male	Female
Lao PDR	38	41	15
Cambodia	37	66	8
Myanmar	32	43.5	22.3
Thailand	23.4	44.1	2.6
Malaysia	26.4	49.2	3.5
Indonesia	31.4	59	3.7
Philippines	32.4	53.8	11
Singapore	15	26.9	3.1
Brunei	27	40	14
Vietnam	27.1	50.7	3.5

Smoking is not only harmful, dangerous and suicidal to the smokers but is also harmful to others. The effects of smoking on the lungs, on the heart and circulatory system have been known for a long time. But many smokers are reluctant to “expose” their weaknesses or ignorance and to obtain the necessary help from a competent person (WHO, 2005). The subject of smoking among physicians and other health professionals has been of special interest as the evidence that cigarette smoking is a major health threat continues to mount. Thus, health care professionals represent a valuable resource for tobacco control.

Smoking also is a key important issue in the medical profession, as physicians play a leading role in tobacco control in the community and they have an important position in the development of public health policy. They are very effective in helping patients to quit smoking. In this regard, physicians are seen as the role model by the public, patients and their colleagues (Fowler, 1993).

"Tobacco continues to be a leading global killer, with nearly five million deaths a year", notes Dr Lee Jong-wook, former WHO Director General, "The health community plays a key role in the global effort to fight this epidemic. Health professionals are on the frontline (WHO, 2005). They need the skills to help people stop smoking, and they need to lead by example, and quit tobacco use themselves." Without additional efforts to implement solutions now, an estimated ten million tobacco-related deaths a year will occur by 2020, most of them in developing countries.

Studies have shown that physicians and other health-care workers can act as important figures in reducing societal smoking prevalence (Foote *et al.*, 1996; Bialous & Sarna, 2004), and can contribute to stemming the projected increase in mortality and morbidity from cigarette-related diseases (Ezzati *et al.*, 2002; Rodgers *et al.*, 2004). Given the important role that doctors have in educating their patients about good health practices, the smoking figure for physicians is disturbing. Doctors are often seen as symbols of good health practice. Moreover, they can, and should, play a crucial role in influencing the smoking habits of their patients.

To our knowledge, little data is currently available on smoking among health professionals in one particular hospital. It was necessary to investigate this information in view of the important role that the medical professions play as exemplary models of appropriate health behaviors. The purpose of this study is to identify the smoking prevalence of physicians in Lao PDR and will also address the attitudes of physicians in Lao PDR toward smoking, and their attitudes toward tobacco prevention and control efforts.

LITERATURE REVIEW

2.1. Smoking Behavior among Medical Doctors

Tomson *et al.*, (2003) had reported that the smoking prevalence among male doctors in Mahosot hospital in Vientiane, Lao PDR was 35% - 16% smoked daily and 19% occasionally. Female doctors reported to have never smoked.

The study result from Pärna *et al.* (2005) showed that current smoking prevalence was 24.9% for male Estonian physicians and 10.8% for female. The percentages of ex-smokers were 32.9% for male and 16.8% for female.

Smoking prevalence among health professionals is itself often a barrier for their involvement in tobacco control. Seven out of ten countries reported cigarette smoking prevalence greater than 20%, and in 8 out of the 16 surveys, it was over 30%. Prevalence ranged between 0.5% and 47%, the lowest found among nursing students in Uganda and the highest among pharmacy students in Albania (WHO, 2005).

Hodgetts *et al.* (2004) conducted a survey among family physicians in Bosnia and Herzegovina and the results showed that approximately 45% of those surveyed currently smoke, whereby 51% of nurses smoked, compared to 40% of physicians.

Hamadeh *et al.* (1992) reported on the results from a survey on the smoking habits of primary health care physicians in Bahrain. Male physicians had a higher proportion of ever-smokers (45.3%), smokers (26.6%), ex-smokers (18.8%) and daily smokers (18.8%). Of the smokers, 80% have considered quitting and 83.3% of them had made a serious attempt to quit.

Bener *et al.* (1993) reported on the smoking habits of physicians in two Gulf countries. In Kuwait, in 1990, among male physicians, current smokers numbered 86 (45.3%), ex-smokers were 34 (17.9%) and non-smokers were 70 (36.8%), while among the female physicians, 10 (16%) were smokers and 52 (84%) were non-smokers. In the United Arab Emirates, in 1991, among the males, current smokers were 94 (43.9%), ex-smokers were 32 (14.9%) and non-smokers were 88 (41.2%), while among the females 5 (8.2%) were smokers, 3 (4.9%) were ex-smokers and 53 (86.9%) were non-smokers.

Yaacob *et al.* reported in 1991 from a Malaysian hospital that 18% of the doctors were smokers, 13% ex-smokers and 69% had never smoked. All the smokers were male and all except one smoked only cigarettes. Three of the 32 female doctors were ex-smokers.

In 2001, Behbehani *et al.* reported that the prevalence of cigarette smoking in Kuwait was: current smokers 18.4%, previous smokers 15.8%, in Bahrain 14.6% and 14.3%. The prevalence of Shisha smoking was 12% and 6.4% for Kuwait and Bahrain. Sarkar *et al.* reported that among the doctors in Chandigarh city, in 1990, 31.6% were current smokers whereas 23.3% had stopped smoking (ex-smokers).

According to Josseran et al, the results from the survey in Paris in 2000 showed that 34% of physicians were current smokers. A higher proportion of males smoked compared to women (36.1% vs. 24.9%, $p < 0.01$), and they consumed on average more cigarettes per day (11.2 vs. 8 cigarettes/day, $p < 0.05$).

In 1994, Yaacob and Abdullah showed the results from their survey of smoking behavior among medical students in the University Sains Malaysia. They found that 9% of males were current smokers while 28% of the smokers smoked more than ten cigarettes per day and 88% began smoking before entering the medical school.

The results from the survey of Bener, et al, in the United Arab Emirates in 1992, showed that among men health professionals, 86 (43.7%) were current smokers, 24 (12.2%) were ex-smokers and 87 (44.2%) were non-smokers, while among the women health professionals, 4 (5.6%) were smokers, 1 (1.4%) was an ex-smoker and 66 (93%) were non-smokers.

Ohida et al . (2001) found the prevalence of smoking among male and female medical doctors in Fukui, Japan, in 1997 was 28% and 8% respectively, which was lower than that of adults in the general population, but higher than that of doctors in the developed countries. The prevalence of smoking among doctors was almost highest when they were 20 to 29 years old.

2.2. Knowledge and Attitudes Regarding Smoking

Hodgetts (2004) found that regarding knowledge of adverse effects of smoking, the overall results were quite positive. Bosnia family physicians agreed that smoking is harmful to the health of the smoker and to others as well. However, only 64.7% of "ever" smoking nurses and approximately 80% of the remaining health professionals agreed that neonatal death is associated with passive smoking. There were some significant differences between physicians and nurses and between ever/never smokers regarding the advisory role that health professionals have.

Smokers had more negative attitudes towards policy issues, such as "ever" smokers were generally less likely to agree with statements that would change their current freedom to smoke. Most physicians and nurses agreed, however, that tobacco sales to children and youth should be banned. With respect to the adverse effects of passive smoking, most health professionals agreed that they should advise smoking patients to avoid smoking around children (Hodgetts, 2004).

The majority of Estonian physicians were aware of the association between smoking and various diseases, with significant differences between smokers and non-smokers. Non-smoking physicians were more active in asking patients about smoking habits than those who smoked. Most Estonian physicians, especially those who smoked, failed to perceive themselves as positive role models (Parna *et al.*, 2005).

Perrin *et al* (2006) also found that Armenian physicians were asked their level of agreement with nine statements about their perceived role in interacting with patients in the context of smoking. The highest levels of agreement were with statements that health professionals should routinely advise patients who smoke to not smoke in front of children, to quit smoking if they smoke, and that they should regularly ask patients if they smoke. Physicians also had a high level of agreement with the

statement that health professionals should not smoke in front of patients and that they should be a good example to their patients. The highest level of being unsure was with the statement that the chances of a patient quitting increase when the doctor tells them to. The lowest levels of agreement were with the statements that health professionals should get training on cessation techniques and that health professionals who smoke are less likely to advise patients to stop smoking (Perrin *et al.*, 2006).

2.3. Relationship between Knowledge, Attitudes and Smoking Practices

Gunes, *et al.* (2005) found that negative attitudes of physicians about smoking cessation counseling negatively affected their practices. Of the physicians, 26.5% reported that they were always asking about their patients' smoking history and 22.6% were always advising their smoker patients to quit. Men non-smoker physicians more often practiced counseling than men smoker physicians (Gunes *et al.*, 2005). A study by Ohida *et al* (2001) also suggested that non-smoking physicians had more unfavorable views toward smoking and were more active in encouraging patients not to smoke than those physicians who smoked.

Willaing and Ladelund (2004) reported that individual smoking behavior among hospital staff was strongly associated with smoking-related knowledge, attitudes, and counseling practices.

Lian Zhang *et al* (2006) reported that gender, age, education background, revenue, section, hospital administration, level of knowledge of tobacco harmful effects, relationship between smoking and illness scale, doctors' social norm attitude were related to doctors' smoking behavior.

OBJECTIVES

3.1. General Objective

To describe the general situation of smoking behavior and tobacco control among medical doctors in Lao PDR.

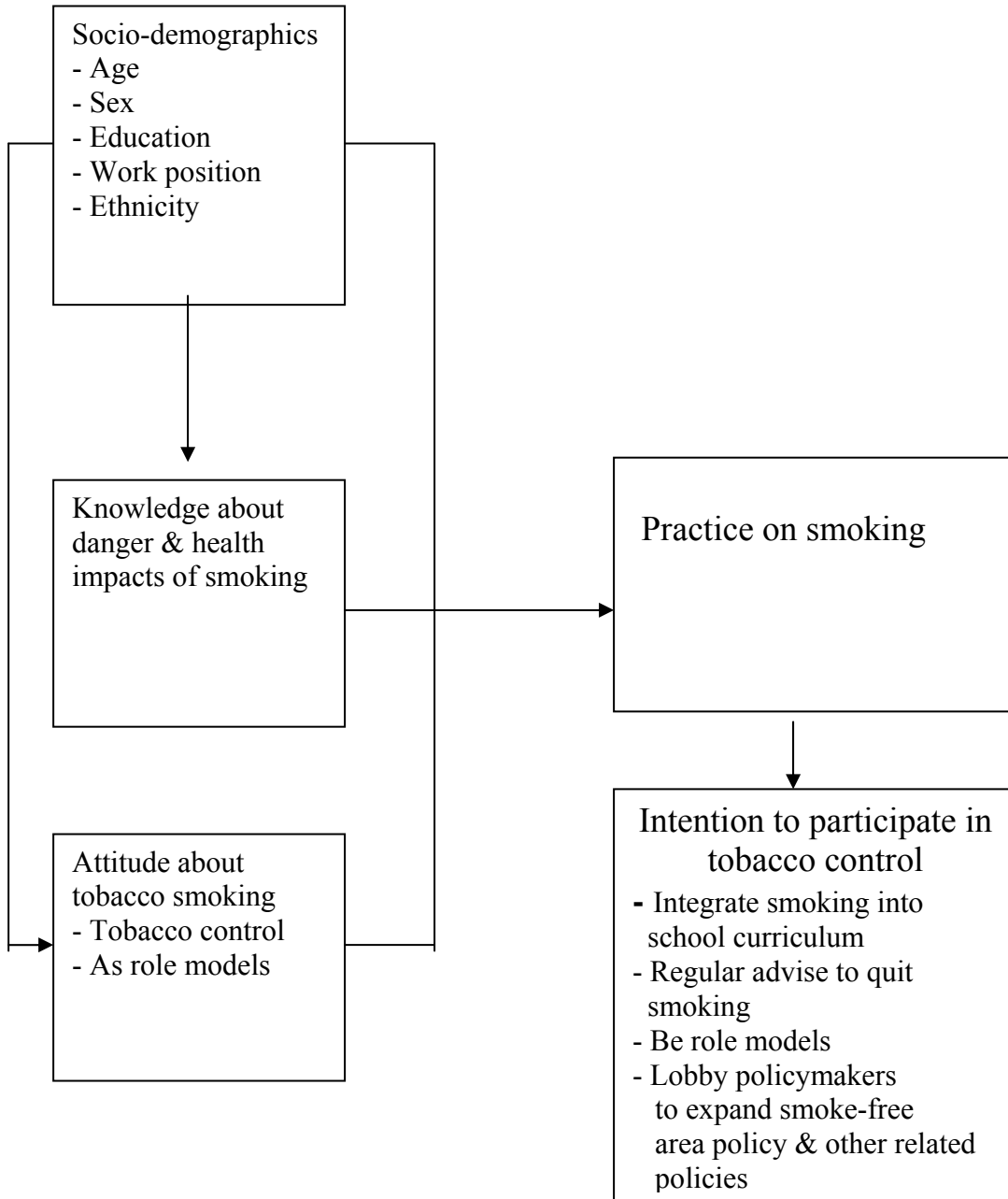
3.2. Specific Objectives

1. To determine the prevalence on tobacco smoking among medical doctors in Lao PDR
2. To assess the knowledge on tobacco smoking, and smoking behavior of medical doctors in Lao PDR
3. To evaluate the attitude of medical doctors on tobacco control in Lao PDR
4. To examine the association between knowledge, attitudes of medical doctors and tobacco control.
5. To explore the opinion and attitude of policymakers on tobacco control in Lao PDR

3.3. Hypotheses

- ❖ People with lower level of knowledge of the effects of smoking are less supportive of tobacco control
- ❖ People with negative attitudes towards smoking are less supportive of tobacco control
- ❖ Smokers have lower support for tobacco control than non-smokers

CONCEPTUAL FRAMEWORK OF SMOKING BEHAVIOR AMONG MEDICAL DOCTORS



DEFINITIONS OF TERMS

- Smoking: ≥ 1 cigarette per day
- Types of smokers: Smokers, Non-smokers, Never smokers, Ex-smokers
- Smokers were individuals who have smoked more than 100 cigarettes in their lifetime and who continued to smoke at the time of the study.
- Daily smoker: A person who is currently smoking at least 1 cigarette per day
- Occasional smoker: A person who smoked occasionally
- Never smokers: Persons who never smoked in their lifetime
- Non-smokers: Persons who never smoked their lifetime plus ex-smokers.
- Ex-smokers: People who were formerly daily smokers but currently do not smoke anymore, and respondents who stopped smoking as recently as one day prior to the survey were classified as ex-smokers (with duration of less than one month).
- Impacts of smoking consist of health impact, social impact , and environmental impact
- Tobacco control consists of bans on cigarette advertising, promotion and sponsorship, smoking-free zone in public area, health warning and cigarette tax.
- Health professionals cover medical doctors, dentists, nurses, midwives, medical technologists, pharmacists and the like.
- Medical doctors are physicians, general practitioners, specialists and those doctors who are public health officials and researchers working at the central, regional, provincial departments and hospitals and Faculty of Medical Sciences.

METHODOLOGY

6. 1. Study Design

This study employed a combination of both quantitative and qualitative methods. It was a cross-sectional survey using face-to-face-administered questionnaire to describe knowledge, attitude, practice (KAP) of tobacco smoking and tobacco control among medical doctors.

Qualitative methods especially in-depth interviews were used to explore the attitude and opinion of policy-makers in both central and provincial levels on smoking behaviors and tobacco control.

6. 2. Duration

The duration of the research was 10 months, including getting ethical approval, training data enumerators, data collection, data analysis, report writing and dissemination. The preparation phase lasted for 2 months, while the data collection lasted for 2 months. The duration of data analysis and report writing was 5 months and the remaining period (1 month) was for the dissemination of the findings.

6. 3. Study Site

Lao PDR consists of 17 provinces, and one Capital City (See Table 2). The system of formal health service provision consists of three types: 1) Services provided by hospitals - Hospital system; 2) Services provided by primary health care - PHC System; 3) Services provided by vertical programs - Vertical Programs. The hospital system comprises hospitals at the different levels. They are as follow: Central hospitals, Regional hospitals, Provincial hospitals, and District hospitals.

For Quantitative Research Method, 9 provinces and Vientiane Capital City in Lao PDR were used as the study sites. In the Northern part, Luang Prabang, Oudomxay and Xiengkhouang provinces were selected as the study sites. In the Central part, Vientiane Capital City, Vientiane province, Savannakhet and Bolikhamsay provinces were chosen. In the southern part, Champassack, Saravanne and Attapeu Provinces were selected as the target sites. These provinces were chosen based on their high population density, a high number of medical doctors and their socio-economic development. At these provinces, the health facilities such as provincial hospitals and provincial health departments were selected as the study sites. All medical doctors, including Public Health officials working at these health facilities were included in the study. The study did not include the district hospitals due to the small number of medical doctors at the district health facilities.

For Qualitative Research Methodology, 4 provinces such as Vientiane Capital, Luang Prabang, Savannakhet and Champasack provinces were selected as the study sites because they are big cities and represented key parts of the country (Central, Northern and Southern parts).

Table 2: Distribution of Health Facilities by Region and Provinces

No	Name of Provinces	Provincial Health facilities	District Health Facilities
	Northern		
1	Sayabuly	Provincial Health Department 1 Provincial Hospital	10 District Hospitals
2	Luang Prabang	Provincial Health Department 1 Regional Hospital	11 District Hospitals
3	Oudomxay	Provincial Health Department 1 Provincial Hospital	5 District Hospitals
4	Luangnamtha	Provincial Health Department 1 Provincial Hospital	5 District Hospitals
5	Bokeo	Provincial Health Department 1 Provincial Hospital	5 District Hospitals
6	Houaphanh	Provincial Health Department 1 Provincial Hospital	8 District Hospitals
7	Xiengkhouang	Provincial Health Department 1 Provincial Hospital	11 District Hospitals
8	Phongsaly	Provincial Health Department 1 Provincial Hospital	7 District Hospitals
	Central Part		
9	Vientiane Capital City	MOH Faculty of Medical Sciences Central Hospitals Teaching Hospital	9 District Hospitals
10	Vientiane Province	Provincial Health Department 1 Provincial Hospital	11 District Hospitals
11	Bolikhamxay	Provincial Health Department 1 Provincial Hospital	9 District Hospitals
12	Khammouane	Provincial Health Department 1 Provincial Hospital	9 District Hospitals
13	Savannakhet	Provincial Health Department 1 Regional Hospital	15 District Hospitals
	Southern Part		
14	Champassack	Provincial Health Department 1 Regional Hospital	10 District Hospitals
15	Saravanne	Provincial Health Department 1 Provincial Hospital	8 District Hospitals
16	Sekong	Provincial Health Department 1 Provincial Hospital	4 District Hospitals
17	Attapeu	Provincial Health Department 1 Provincial Hospital	5 District Hospitals

6. 4. Study Population

Medical doctors including physicians, general practitioners, specialists, and medical doctors who are public health officials and researchers currently working in government sectors were recruited into this study. The medical doctors were classified according to their academic qualifications i.e. from bachelor to upper degrees of medical doctors, including physicians, general practitioners, specialists, public health officials and health researchers working at the central, regional, provincial health departments and hospitals and the University of Health Sciences (the former Faculty of Medical Sciences). This group was selected because it consists of the highest proportion among health professionals and they are expected to be the role models for their patients and general population.

Questionnaires were administered face-to-face to medical doctors to collect the KAP information on smoking.

In-depth interviews, on the other hand, were conducted with the policymakers of different government sectors at central and provincial levels to seek their opinion regarding tobacco control.

6.4.1. Selection Criteria

Inclusion criteria

Medical doctors working in public health sectors in central and provincial levels were selected. including physicians, general practitioners and specialists. Medical doctors who are public health officers and researchers were also included.

6.4.2 In-depth Interview

Interviews with different categories of key informants about the policy of tobacco control among health professionals were carried out in 3 provinces such as Vientiane Capital City, Luang Prabang and Savannakhet. The total sample size was 22 and the following key informants were identified:

16 policy makers at national level

Vice Minister who is responsible for the Department of Hygiene and Prevention

Head or Deputy Head of Department of Hygiene and Prevention

Head or Deputy Head of Curative Department

Deputy Dean of Faculty of Medical Sciences

Director or Vice Director of Central hospitals (Mahosot, Sethathirath, Mittaphab, Mother and Child)

Director or Vice Director of Vientiane Capital Health Office

Director or Vice Director of National Center of Mother and Child

Director or Vice Director of National Center of Tuberculosis

Director or Vice Director of National Epidemiology Center

Luang Prabang (2 persons)

Head or Deputy Head of Health Provincial Authority

Director or Deputy Director of provincial hospital

Savannakhet (2 persons)

Head or Deputy Head of Health Provincial Authority
Director or Deputy Director of provincial hospital

Champasack (2 persons)

Head or Deputy Head of Health Provincial Authority
Director or Deputy Director of provincial hospital

6. 5. Sampling Method

Probability random sampling was used for the quantitative part; while purposive sampling was used for the qualitative research method. Two stages probability random sampling methods were applied to recruit the medical doctors from the central, and provincial levels. First, provinces were divided into three parts. In the central part, Vientiane Capital City, Vientiane province, Khammouane, Bolikhamxay and Savannakhet provinces were selected; for the Northern part, Luang Prabang, Oudomxay and Xiengkhouang provinces were chosen and for the Southern part, Champassack, Saravanne and Attapeu provinces.

A list of medical doctors for the selected provinces was prepared to identify the eligible ones at central and provincial level. They were selected by purposive sampling with probability proportional to the size in the selected health facilities of each list independently. All 3 central hospitals, and 1 military and police hospital were invited to participate; in addition, health facilities at the provincial levels also were involved.

The key informants for in-depth interviews were directors or vice directors of central and provincial hospitals, either the head or vice head of the Vientiane Capital Health office and Provincial Health Offices.

6. 6. Sample Size

6.6.1 For Cross-sectional Survey:

The population formula was used to calculate the sample size of this study. Data on the proportion of medical doctors in Vientiane Capital City who smoke daily was 18% (daily smoking prevalence).

$$n = \frac{N Z_{\frac{\alpha}{2}}^2 P(1-P)}{e^2 (N-1) + Z_{\frac{\alpha}{2}}^2 P(1-P)}$$

Assume that p=.18 and q=.82

N of the health professionals- 1,000

e- precision about 1.5%

$$n = \frac{1060(1.96)^2 0.18(1 - 0.18)}{(0.010)^2 (1060 - 1) + 1.96^2 0.16(1 - 0.18)} = 855$$

So the total sample size used was 855 medical doctors who were interviewed.

Table 3: Distribution of Sample Size by Provinces and Qualification

N	Province	No of medical doctors	Sample size
1	VTE Capital	607	561
2	Luang Prabang	55	40
3	Oudomxay	48	20
4	Xiengkhouang	44	29
5	VTE Province	39	31
6	Bolikhamsay	25	20
7	Khammouane	46	30
8	Savannakhet	64	31
9	Champassack	87	52
10	Saravanne	24	23
11	Attapeu	21	18
	Total	1060	855

6.7. Study Variables

6.7.1 Measurement Variables

The variables measured in this study were shown in the Table 4. Socio-demographic characteristics include age and sex; ethnic, religion, residency, qualification and specialists, years experiences. Knowledge about smoking included the danger and impact of smoking such as health, social and environmental impacts. The attitudes about smoking were composed of anti-smoking campaign, ban cigarette advertising, health warning, and price of cigarettes; the attitudes toward the role models and tobacco control such as the promotion of smoke-free zones and integrating issues related to tobacco into the curriculum training. In addition, the outcome variables such as tobacco use prevalence among medical doctors (duration, frequency, and previous quit attempts) and exposure to environmental tobacco smoke were included in the study. Intention to participate in tobacco control and smoking environment at the health facilities, institutions and university also were asked.

Table 4: Measurement of Variables

Socio-demographics characteristics	Independent	Face-to-face questionnaire (Nominal scale)
Knowledge about smoking	Independent	Face-to-face questionnaire (Ordinal scale)
Attitudes about smoking	Independent	Face-to-face questionnaire (Nominal scale)
Attitudes about tobacco control	Independent	Face-to-face questionnaire (Nominal scale)
Practice on tobacco smoking, behavior/cessation	Dependent	Face-to-face questionnaire (Nominal scale)

6.8. Research Tools

For the quantitative research method, a questionnaire consisted of 6 parts was used in order to assess socio-demographic characteristics; knowledge about smoking; attitude toward smoking; attitude toward tobacco control; current practice on smoking and smoking behavior /cessation.

For the qualitative research method, a structured guideline for in-depth interview was prepared and used to explore the attitude and opinion of policy-makers about the current practice on smoking and tobacco control.

6.9. Data Collection

Pretest was done where thirty sets of self-administered questionnaires were completed and validity tests were done by using Cronbach Alpha coefficient. Reliability analyses of the composite knowledge, attitudes and intention to participate in the tobacco control were carried out to determine the internal validity of the composite scales. The reliability coefficients (Alpha Cronbach) were: knowledge 0.69; attitudes 0.804 and intention to participate in the tobacco control 0.65. The purpose of pre-testing questionnaire is to test the expression, logical consequence of each question and reliability of the questions. Afterwards, the questionnaire was modified and its content and validity improved.

The research team trained the data collectors for 2 days about the purpose and objectives of the research and the details of the questionnaire form. After which the interviewers, in sets of two, practiced using the questionnaire. Ten interviewers from the University of Health Sciences (the former Faculty of Medical Sciences) and 10 interviewers from 9 provinces and one Capital City (1

from each province) (Vientiane Capital, Vientiane Province, Bolikhamsay, Luang Prabang, Oudomxay, Xiengkhouang, Savannakhet and Champasack, Saravanne and Attapeu) were trained on quantitative techniques. For the qualitative data collection, the research team from the University of Health Sciences conducted the study and transcription by the note takers was done in the field.

Data collection was carried out in 9 provinces and Vientiane Capital City as mentioned above. All data collectors in the selected provinces contacted with the Provincial Health Department and Hospitals to get official approval before data collection and 2 researchers from the University of Health Sciences joined and guided the data collection for each province.

6. 10 Data Processing

In the field, the data was checked for completeness and validity. Then, the quantitative data is entered by using EPI info and transferred to SPSS for data analysis. Frequency distributions were used to describe the data. Bivariate analyses were used to measure associations between selected variables, with statistical significance based on the chi-square (χ^2) test for independence for categorical variables and t-test for continuous variables to compare outcome between those who reported having smoked and those who never smoked. In addition, adjusted odds ratios and 95% confidence intervals were estimated using logistic regression. Two-sided tests of significance were based on the 0.05 level against a null hypothesis of no association, unless otherwise indicated. Analyses were performed using SPSS version 11.0.

Medical doctors were grouped into the following 3 categories according to their smoking habits: 1) Current Smokers, those who reported smoking during the study both occasionally and daily; 2) Ex-smokers, those who ever smoked, but had now stopped; 3) Never-smokers, those who had never tried a cigarette in their lifetime; and Non-smokers, those who had never tried a cigarette in their lifetime plus ex-smokers.

Recorded tapes were transcribed by interviewers. Expanded field notes and transcripts from in-depth interviews, and key informants' interviews were computerized in the word document format. Content analysis was used to analyze the qualitative data to get the opinion towards smoking and tobacco control. These were conducted to understand the views of the informants and the groups being studied. The procedure began with a thorough reading of a small sample of text (line by line) to extract significant statements and phrases. Significant statements include all those referring to the research questions of interest. The next step in analytic process involved identifying emergent themes or patterns across each significant statement or phrase. Themes were then clustered to develop key concepts and categories. More data from informants were gathered through reading the rest of the transcripts and incorporating each of the identical categories.

6. 11. Ethical Consideration

This research proposal was submitted to The National Ethical Committee for Health Research for the official approval. The investigators used the anonymous face-to-face administered questionnaire as a tool.

Make sure everyone understand that participation was voluntary, and anyone of all interviewees may stop participating in the interview at any time if he wished to. Consent form was prepared to get the agreement of the participants to be interviewed, and only those who agreed to participate in this study were interviewed.

Obligations of investigators regarding informed consent: (1) Exclude the possibility of unjustified deception, undue influence and intimidation; (2) Seek consent only after the prospective subject is adequately informed; (3) The investigators should assure prospective subjects that their decision to participate or not would not affect the employee - employer relationship or any other benefits to which they are entitled.

Some measures were taken in order to protect respondents' privacy. The respondents were given the option of not recording, or erasing all or parts of their audiotape interviews and the option of sharing information off the record that they considered private. In addition, the information collected should avoid violating the privacy of another people, i.e. should protect non-participants' privacy.

Some measures were also taken in order to keep confidentiality and protect respondents' identity. The data of this survey was confidentially kept at the Department of Postgraduate Studies and Research in the University of Health Sciences in Lao PDR and only the principal and co-researchers would be able to access the data.

The principal investigator from the Postgraduate Studies & Research Department at the Faculty of Medical Sciences was responsible for the data management. Only the research team can have access to the data and the data will be kept for at least 5 years after the completion of the research before it is destroyed.

6.12. Dissemination of Results / Outputs

The result of this study will be disseminated to the policy-makers and health professionals from different levels at the health facilities by organizing a small conference of health professionals.

The potential benefits or public health and policy implications of this study are being able to collect the baseline data on the prevalence of smoking among medical doctors, their attitudes toward smoking and tobacco control, where the results from this study will be used for advocacy to influence policy-makers to strengthen existing smoke-free areas policies and formulate health policy on smoking in health facilities and not only medical doctors but also among other health professionals with the aim to encourage them to be role models of smoke-free society. And also to develop intervention projects on smoking cessation among them and to implement tobacco control measures at the health facilities. Smoking cessation programs should be introduced to Lao medical doctors to reduce the number of smoking physicians and to continue the education program.

RESULTS

7.1. Socio-demographic Characteristics of the Respondents

In total, 855 participants out of 1060 were recruited into the study and completed the questionnaires. Table 5 shows the demographic characteristics of all medical doctors. Males account for 52.9%, slightly higher than half. The majority of respondents (71.6%) were from the Central part; 18% from the Southern part and 10.4% were from the Northern part. This indicated that the distribution of health professionals, in particular doctors were concentrated in the Central part of the country.

The age of respondents ranged from 24 years to 65 years old with a mean of 40.6 years of age. About two fifth of them are in the age group 41 to 50 years. It is interesting to note that the Central part had more elderly persons compared to the Northern and Southern parts with statistically significant difference by regions (12.4% versus 10% and 7.1% respectively; chi-square=22.97, $p=0.001$). The majority of them, 97% were Laoloum who lived in the low land areas. Approximately 85.1% are married.

In terms of the level of education, 67.4% were medical doctors followed by specialists (20.6%) and those with master's degrees (11.2%). Only a few of them (0.8%) completed their PhD degree from outside the country. Regarding their administrative positions, only 6.5% were directors or vice directors of provincial/district hospitals; 24.1% had some administrative positions such as the head of division of wards; while 69.4% were technical staff and did not have administrative positions. There were some significant difference in positions of health professionals by central, northern and southern part ($p<0.001$). Accordingly, 75.6% were working as technical staff and 5.3% had only administrative responsibilities and some of them (11.8%) had both administrative and technical responsibilities. With regards to dispensing of treatment, 78.1% of respondents provided treatment. The percentage of medical doctors in the Central part who provided treatment were the highest compared to those in the Southern and Northern parts (80% versus 76.6% & 67.4% respectively, $p<0.001$).

Table 5: Demographic Characteristics of Respondents by Region

	Variables	Northern		Central		Southern		Total	
		N	%	N	%	N	%	N	%
1	Sex ($\chi^2 = 1.315$, $p=.518$)								
	Male	52	58.4	318	52.0	82	53.2	452	52.9
	Female	37	41.6	294	48.0	72	46.8	403	47.1
	Total	89	100.0	612	100.0	154	100.0	855	100.0
2	Age (Mean = 40.6 ; SD = 7.887 ; Min = 24 ; Max = 65; $\chi^2 = 22.97$, $p=.001$)								
	24-30 yrs	7	7.9	96	15.7	14	9.1	117	13.7
	31-40 yrs	38	42.7	227	37.1	43	27.9	308	36.0
	41-50 yrs	33	37.1	228	37.3	86	55.8	347	40.6
	51-65 yrs	11	12.4	61	10.0	11	7.1	83	9.7
	Total	89	100.0	612	100.0	154	100.0	855	100.0
4	Ethnicity ($\chi^2=15.03$, $p=.025$)								
	Laoloum	82	92.1	595	97.2	152	98.7	829	97.0
	Laotheung	1	1.1	7	1.1	2	1.3	10	1.2
	Laosoung	5	5.6	9	1.5	0	-	14	1.6
	Others	1	1.1	1	0.2	0	-	2	0.2
	Total	89	100.0	612	100.0	154	100.0	855	100.0
5	Religion ($\chi^2=21.24$, $p<.001$)								
	Buddhism	82	92.1	600	98.0	153	99.4	835	97.7
	Christian	0	-	0	-	1	0.6	1	0.1
	Others	7	7.9	12	2.0	0	-	19	2.2
	Total	89	100.0	612	100.0	154	100.0	855	100.0
6	Marital Status ($\chi^2=9.3048$, $p=.371$)								
	Single	15	16.9	88	14.4	16	10.4	119	13.9
	Married	73	82.0	519	84.8	136	88.3	728	85.1
	Celibating	0	-	0	-	1	0.6	1	0.1
	Separated	0	-	1	0.2	0	-	1	0.1
	Divorce	0	-	2	0.3	0	-	2	0.2
	Widow	1	1.1	2	0.3	1	0.6	4	0.5
	Total	89	100.0	612	100.0	154	100.0	855	100.0
7	Education ($\chi^2=9.58$, $p=.198$)								
	1. PhD	0	-	7	1.1	0	-	7	0.8
	2. Specialist	16	18.0	135	22.1	25	16.2	176	20.6

	Variables	Northern		Central		Southern		Total	
		N	%	N	%	N	%	N	%
	3. Master	14	15.7	69	11.3	13	8.4	96	11.2
	4. Bachelor	59	66.3	401	65.5	116	75.3	576	67.4
	Total	89	100.0	612	100.0	154	100.0	855	100.0
8	Position ($\chi^2=41.89$, $p<.001$)								
	Director/Vice Director	7	7.9	27	4.4	22	14.3	56	6.5
	Head of division	33	37.1	125	20.4	48	31.2	206	24.1
	Technical staff	49	55.1	460	75.2	84	54.5	593	69.4
	Total	89	100.0	612	100.0	154	100.0	855	100.0
9	Responsibility ($\chi^2=51.17$, $p<.001$)								
	Administrative	1	1.1	32	5.2	12	7.8	45	5.3
	Technical	64	71.9	472	77.1	110	71.4	646	75.6
	Both	24	27.0	49	8.0	28	18.2	101	11.8
	Other	0	-	59	9.6	4	2.6	63	7.4
	Total	89	100.0	612	100.0	154	100.0	855	100.0
10	Providing treatment ($\chi^2=7.52$, $p=.023$)								
	1. Yes	60	67.4	490	80.1	118	76.6	668	78.1
	2. No	29	32.6	122	19.9	36	23.4	187	21.9

7.2. Smoking Pattern

Table 6 illustrates the smoking status of medical professions. Of the 855 surveyed, 9.3% were smokers (5% daily and 4.3% occasionally), 18.3% were ex-smokers and the prevalence of non-smokers was 72.4% which were statistically significant differences by regions ($p < 0.05$). The prevalence of smoking among medical doctors from Southern part (14.9%) was higher than the prevalence of smoking among medical doctors in the Northern part (11.3%) and Central part (7.6%). When data was disaggregated by gender, the number of males who smoked was much higher than females (Table 7). Only 2 female physicians (0.4%) who smoked - one smoked daily (0.2%) and the other (0.2%) occasionally; while 17% of male doctors smoked with 9.3% who smoked daily and 7.7% who smoked occasionally.

When asked to predict their smoking behavior in the future, 99.7% of the medical doctors reported that they would stop smoking and 0.2% reported that they would probably smoke, with no statistically significant difference by region. With regard to their intention to smoke in the next year, a similar pattern emerged. There was no statistically significant difference in reporting intention to smoke in the next year by region (p -value=.949). On whether they would accept cigarettes offered to them, 0.2% again reported that they will probably do so.

While data was disaggregated by gender, there was no statistically significant difference in reporting intention to smoke in the future by region (Table 7).

Table 6: Smoking Status of Medical Doctors by Region

	Smoking status	Northern		Central		Southern		Total	
		N	%	N	%	N	%	N	%
1	Best described smoking behaviour ($\chi^2=12.67$, p-value=.049)								
	Never smoked cigarettes	60	67.4	456	74.5	103	66.9	619	72.4
	Quit smoking	19	21.3	109	17.8	28	18.2	157	18.3
	Smoke occasionally	7	7.9	21	3.4	9	5.8	36	4.3
	Smoke everyday	3	3.4	26	4.2	14	9.1	43	5.0
	Total	89	100.0	612	100.0	154	100.0	855	100.0
2	Experimentation with cigarettes in the future (Fisher exact=.717, p-value=.949)								
	Definitely not	60	100.0	454	99.6	103	100.0	617	99.7
	Probably not	0	-	1	0.2	0	-	1	0.2
	Probably yes	0	-	1	0.2	0	-	1	0.2
	Total	60	100.0	456	100.0	103	100.0	619	100.0
3	Intention to smoke in the next year ($\chi^2=.717$, p-value=.949)								
	Definitely not	60	100.0	454	99.6	103	100.0	617	99.7
	Probably not	0	-	1	0.2	0	-	1	0.2
	Probably yes	0	-	1	0.2	0	-	1	0.2
	Total	60	100.0	456	100.0	103	100.0	619	100.0
4	Will accept cigarettes if offered by friends (Fisher's Exact=.717, p-value=.949)								
	Definitely not	60	100.0	454	99.6	103	100.0	617	99.7
	Probably not	0	-	1	0.2	0	-	1	0.2
	Probably yes	0	-	1	0.2	0	-	1	0.2
	Total	60	100.0	456	100.0	103	100.0	619	100.0

Table 7: Smoking Status of Medical Doctors by Sex

	Smoking status	Male		Female		Total	
		N	%	N	%	N	%
1	Smoking behaviour ($\chi^2=270.1477$, p-value=<.001)						
	Never smoked cigarettes	220	48.7	399	99.0	619	72.4
	Quit smoking	155	34.3	2	0.5	157	18.2
	Smoke occasionally	35	7.7	1	0.2	36	4.3
	Smoke everyday	42	9.3	1	0.2	43	5.0
	Total	452	100.0	403	100.0	855	100.0
2	Experimentation with cigarettes in the future ($\chi^2=3.6390$, p-value=.126)						
	Definitely not	218	99.1	399	100.0	617	99.7
	Probably not	1	0.5	0	-	1	0.2
	Probably yet	1	0.5	0	-	1	0.2
	Total	220	100.0	399	100.0	619	100.0
3	Intention to smoke in the next year ($\chi^2=3.6390$, p-value=.126)						
	Definitely not	218	99.1	399	100.0	617	99.7
	Probably not	1	0.5	0	-	1	0.2
	Probably yet	1	0.5	0	-	1	0.2
	Total	220	100.0	399	100.0	619	100.0
4	Will accept cigarettes if offered by friends ($\chi^2=3.6390$, p-value=.126)						
	Definitely not	218	99.1	399	100.0	617	99.7
	Probably not	1	0.5	0	-	1	0.2
	Probably yes	1	0.5	0	-	1	0.2
	Total	220	100.0	399	100.0	619	100.0

7.3. Pattern of Ex-smokers

Table 8 and 9 show the behavior of ex-smokers by gender and by region. Among 157 ex-smokers, 44.6% smoked occasionally and 55.4% were daily smokers. There were only 2 female ex-smokers.

The mean age for trying the first cigarette among the ex-smokers was 18.7 ± 5.64 years. The mean age of smoking initiation among ex-smokers was marginally statistically different between male physicians (18.63 ± 5.60 years) and females physicians (24.0 ± 8.48 years) ($p=0.05$). The average number of cigarettes smoked was 8.63 cigarettes per day and there was no statistically significant difference in the number of cigarettes smoking per day by gender and regions.

About one third of ex-smokers (32.5%) used to smoke rolling tobacco occasionally and 22.9% used to smoke daily and 44.6% did not answer. The average number of hand rolled cigarettes consumed

was 5.22 per day. Almost all ex-smokers (96.6%) smoked less than 16 rolling tobacco per day and about one in eight of ex-smokers (13.8%) used to smoke rolling tobacco inside the building.

Among ex-smokers, the mean age of smoking cessation was 30.44+10.13; while the mean age of smoking cessation among women is higher than those of male physicians (43.5 years of age versus 30.27 years of age, $p=.067$, data not shown).

In addition, there was no difference in the pattern of smoking among ex-smokers by region.

Table 8: Ex-smokers by Gender

	Smoking status	Male		Female		Total	
		n	%	n	%	N	%
1	Past smoking behavior ($\chi^2=.024$, p-value=1.000)						
	Occasionally	69	44.5	1	50.0	70	44.6
	Daily	86	55.5	1	50.0	87	55.4
2	Age at first trying cigarettes (Mean = 18.7, Median = 18.0, SD = 5.64, Min = 5, Max = 50, ($\chi^2=5.982$, p-value= .0213)						
	<16 years of age	44	28.4	0	0.0	44	28.0
	16-25 years of age	101	65.2	1	50.0	102	65.0
	>= 26 years of age	10	6.5	1	50.0	11	7.0
3	No. of cigarettes smoked per day (Mean = 8.63, Median = 5.0, SD = 11.834, Min = 1, Max = 80, ($\chi^2=.420$, P-value = 1.0000)						
	<16	128	82.6	2	100.0	130	82.8
	16-30	20	12.9	0	0.0	20	12.7
	>30	7	4.5	0	0.0	7	4.5
4	Ever used hand rolled cigarettes ($\chi^2=.6692$, p-value=1.000)						
	Occasionally	50	86.0	1	50.0	51	32.5
	Daily	36	14.0	0	0.0	36	22.9
	DK	69		1	50.0	70	44.6
5	No. of hand rolled cigarettes, snuff & pipes per day (Mean = 5.22, Median = 3.00, SD = 6.036, Min = 1, Max = 40, ($\chi^2=.0361$, P-value = 1.000)						
	<16	83	32.3	1	100.0	84	96.6
	16-30	1	23.2	0	0.0	1	1.1
	>30	2	44.5	0	0.0	2	2.3
6	Smoking hand rolled cigarettes in the building (($\chi^2=.1619$, p-value=1.000)						
	No	74	86.0	1	100.0	75	86.2
	Yes	12	14.0	0	0.0	12	13.8
7	Age at quitting smoking (Mean = 30.44, Median = 29.00, SD = 10.137, Min = 10, Max = 57, ($\chi^2=3.364$, P-value = 0.285)						
	<21 years of age	25	16.1	0	0.0	25	15.9
	21-30 years of age	73	47.1	2	100.0	75	47.8
	>30 years of age	57	36.8	0	0.0	57	36.3

Table 9. Ex-smokers by Region

	Smoking status	Northern		Central		Southern		Total	
		N	%	N	%	N	%	N	%
1	Past smoking behavior ($\chi^2=1.0922$, P-value=.579)								
	Occasionally	9	47.4	51	46.4	10	35.7	70	44.6
	Daily	10	52.6	59	53.6	18	64.3	87	55.4
2	Age at first trying cigarettes ($\chi^2=4.1819$, P-value = 0.331)								
	<16 years of age	4	21.0	33	30.0	7	25.0	44	28.0
	16-25 years of age	12	63.2	72	65.4	18	64.3	102	65.0
	>26 years of age	3	15.8	5	4.6	3	10.7	11	7.0
3	No of cigarettes smoked per day ($\chi^2=2.558$, P-value = 0.671)								
	<16	15	79.0	92	83.6	23	82.1	130	82.8
	16-30	4	21.0	12	10.9	4	14.3	20	12.7
	>30	0	0.0	6	5.5	1	3.6	7	4.5
4	Ever used hand rolled cigarettes ($\chi^2=1.96$, P-value=.742)								
	Occasionally	7	36.8	37	33.6	7	25	51	32.5
	Daily	4	21.1	23	20.9	9	32.1	36	22.9
	DK	8	42.1	50	45.5	12	42.9	70	44.6
5	No of hand rolled cigarettes, snuff & pipes per day (Mean, Median, SD, Min, Max, ($\chi^2=6.050$, P-value = .226)								
	<16	11	100.0	59	98.3	14	87.5	84	96.6
	16-30	0	0.0	0	0.0	1	6.25	1	1.1
	>30	0	0.0	1	1.7	1	6.25	2	2.3
6	Smoking hand rolled cigarettes in the building ($\chi^2=2.12$, P-value=.393)								
	No	10	90.9	53	88.3	12	75.0	75	86.2
	Yes	1	9.1	7	11.7	4	25.0	12	13.8
7	Age at quitting smoking (Mean 30.4, Median=29.0, SD=10.137, Min=10, Max=57, ($\chi^2=.5625$, P-value=0.982)								
	<21 years of age	18	16.4	2	10.5	5	17.9	25	15.9
	21-30 years of age	51	46.4	9	47.4	13	46.4	73	46.5
	>30 years of age	41	37.3	8	42.1	10	35.7	59	37.6

7.4. Pattern of Current Smokers

Table 10 and 11 presented the pattern of current smokers. Of the 79 current smokers, 43 (54.4%) reported that they smoked between 1 and 5 cigarettes per day, 21 (26.6%) smoked 6-10 cigarettes per day, 15 (19%) smoked 11-20 cigarettes per day. The average cigarette consumption was 7.13 ± 6.0 cigarettes (range 1-20) per day, while male physicians consumed 7.12 ± 6.07 cigarettes per day and 7.5 ± 3.53 cigarettes per day among female physicians ($p=0.664$).

The mean age of smoking initiation among the current smokers was 21.28 ± 7.109 years. The mean age of smoking initiation was not statistically different between male physicians (21.31 ± 7.191 years) and females physicians (20 ± 2.82 years) ($p= 0.534$). The majority of current smokers (62%) started smoking regularly when younger than 25 years old; followed by age group higher than 25 years (20.3%). Almost all physicians smoked at least 100 cigarettes in their lifetimes.

About 83.5% reported that they ever stopped smoking within 1 week. Concerning their readiness to stop smoking, 43% suggested that they are ready to quit now; while about 40% reported that they are not ready to quit smoking within next 6 months. The majority of current smokers (62.3%) smoked inside the buildings.

With regard to the use of hand rolled cigarettes, 36.7% of current smokers reportedly used it while 10.1% using it daily; while 26.6% used occasionally. Among smokers who used hand rolled cigarettes, approximately one fifth of them smoked inside the building. The mean consumption of hand rolled cigarettes per day was 1.40 ± 0.68 and the ways of getting cigarettes was buying them in packages (55.5%); followed by both in cigarettes and in package (23.5%). The expenses for cigarettes within 1 week ranged from 1,000 kips to 100,000 kips with the mean of 8,500 kips. 63.3% of current smokers spent less than 10,000 kips per week; while a small percentage of them (2.5%) spent money higher than 51,000 kips per week for cigarettes. The plausible explanation was that the unit cost of cigarettes in Laos is small due to the small tobacco tax (35%) compared to other countries with high tobacco tax. The price for 1 package of cigarette is 3,000 to 5,000 kips (US\$0.33 to 0.56) for the Lao brand such as “A Deng” & “Lemthong”.

7.5. Cigarette Dependency and Reason for Smoking

The current smokers are also exposed to passive smoking. About less than half of current smokers (41.8%) stayed with others who also smoke at least 4 to 7 days within 1 week. The average number of days that the smoker stayed with others who smoke within 1 week was 3.34 ± 2.58 . As to when the smoker began to smoke beginning of each new day, 43% smoked their first cigarette less than 60 minutes after they wake up. It means that they have higher cigarette dependency. 32.9% smoked their first cigarettes between 60 - 180 minutes and 24.1% did after 180 minutes.

The major reasons for smoking among medical doctors are given in Table 10. It is clear that the major reasons for the initiation of smoking were: fashionable (20.4%), social pressure (16.9%), to meet new people (12%), and to keep insects away (10.6%). When data are disaggregated by sex, men are most attracted to smoking because it is seen as fashionable (20%) and due to social pressure (17.1%) whereas women use smoking to relieve from mosquitoes (50%) and to be fashionable (50%).

Table 10: Current Smoking Status by Sex

	Items	Male (n=77)	Female (n=2)	Total (n=79)
		%	%	%
1	Age of regular smokers (Mean = 21.28, Median=19.94, SD=7.109, Min=8, Max=45, ($\chi^2=1.2563$, P-value =1.000) Male: Mean-21.31, SD-7.191, Median 19.94, Min-8, Max-45 Female: Mean-20, SD-2.828, Median 19.94, Min-18, Max-22			
	<= 15 yrs	18.2	0.0	17.7
	16-25 yrs	61.0	100.0	62.0
	> 25 yrs	20.8	0.0	20.3
2	No. of cigarettes smoked per day (Mean=7.13, Median=5.00, SD=6.005, Min=1, Max=20, $\chi^2=.8203$, P-value=1.000) Male: Mean-7.12, SD-6.07, Median 5.1, Min-1, Max-20 Female: Mean-7.5, SD-3.53, Median 7.5, Min-5, Max-10			
	1-5	54.5	50	54.4
	6-10	26	50	26.6
	11-20	19.5	0.0	19
3	Ever smoked 100 cigarettes in the lifetime ($\chi^2=.2312$, P-value=1.000)			
	No	10.4	0.0	10.4
	Yes	89.6	100.0	89.6
4	Ever stopped smoking within 1 week ($\chi^2=.4042$, P-value=1.000)			
	No	16.9	0.0	16.5
	Yes	83.1	100.0	83.5
5	Description about readiness to stop smoking (($\chi^2=2.3319$, P-value .160)			
	Not ready to quit smoking within next 6 months	40.3	50.0	40.5
	Thinking about quitting within 6 months	15.6	50.0	16.5
	Ready to quit now	44.2	0.0	43.0
6	Smoking cigarettes in the building in the last year ($\chi^2=0.126$, P-value 1.000)			
	No	37.7	50.0	38.0
	Yes	62.3	50.0	62.3
7	Ever used hand rolled cigarettes ($\chi^2=3.8243$, P-value. 262)			
	Occasionally	27.3	0.0	26.6
	Daily	9.1	50.0	10.1
	No	63.6	50.0	63.3
8	Smoked hand rolled cigarettes in the building/office/hospital ($\chi^2=.2702$, P-value=1.000)			
	No	78.6	100.0	79.3
	Yes	21.4	0.0	20.7

	Items	Male (n=77)	Female (n=2)	Total (n=79)
		%	%	%
9	No. of hand rolled cigarettes used per day (Mean=1.40, Median=1, SD=0.68, Min=1, Max=20; ($\chi^2=.377$, P-value=0.561) Male: Mean-1.42, SD=.692, Median 1.00, Min-1, Max-20 Female: Mean-1.00, SD=0.68, Median 1.0, Min-5, Max-5			
	<5	68.4	100.0	70
	6-10	21.1	0.0	20
	11-20	10.5	0.0	10
10	Getting cigarettes from (Multiple responses)			
	Buy sticks of cigarettes	13.9	0.0	13.6
	Buy in package	54.4	100.0	55.5
	Both	24.1	0.0	23.5
	Don't know	7.6	0.0	7.4
11	Expenses of buying cigarettes within 1 week ($\chi^2=1.190$, P-value .578)			
	Mean=13,150, Median=8,500.00, SD=14,644.802, Min=1,000; Max=100,000 Male: Mean-13,389.68, SD-15067.04, Median 8,000, Min-1,000; Max-100,000 Female: Mean-5000, SD-1414.214.53, Median 5,000, Min-4000, Max-6000			
	<=10,000 kips	62.3	100.0	63.3
	11,000 -30,000 kips	33.8	0.0	32.9
	31,000-50,000 kips	1.3	0.0	1.3
	>=51,000 kips	2.6	0.0	2.5
12	No. of days staying with others who smoked ($\chi^2=1.472$, p-value-.507)			
	Mean=3.34, Median=3.00, SD=2.581, Min=0, Max=7 Male: Mean-3.38, SD-6.07, Median 2.83, Min-1, Max-7 Female: Mean-2.00, SD-1.414, Median 2.0, Min-5, Max-3			
	1-3 days	57.1	100.0	58.2
	4-7 days	42.9	0.0	41.8
13	First cigarettes after waking up(Mean=161.80, Median=120.00, SD=177.179, Min=1, Max=780 ($\chi^2=6.4798$, P-value = 0.056) Male: Mean-158.21, SD-177.786, Median 105.0, Min-1, Max-780 Female: Mean-300.00, SD-84.853, Median 300.0, Min-240, Max-360			
	< 60 mins	44.2	0.0	43.0
	60 - 180 mins	33.8	0.0	32.9
	181-780 mins	22.1	100.0	24.1
14	Place of smoking more often (($\chi^2=1.472$,P_value =0.612)			
	In residence	43.6	0.0	43.0
	In office building	6.4	0.0	6.3

	Items	Male (n=77)	Female (n=2)	Total (n=79)
		%	%	%
	In hospital	1.3	0.0	1.3
	Bar (pub)	7.7	0.0	7.6
	Every where	6.4	0.0	6.3
	Outside office building	15.4	100.0	16.5
	Quiet place that have no one	3.8	0.0	3.8
	Park	5.1	0.0	5.1
	Don't know	10.3	0.0	10.1
	Total	100.0	100.0	100.0
15	Reason for starting smoking (Multiple responses)			
	Experimenting	5.0	0.0	4.9
	Fashionable	20.0	50.0	20.4
	Social pressure	17.1	0.0	16.9
	To get rid of fatigue	5.7	0.0	5.6
	To keep insects (e.g. mosquitoes) away	10.0	50.0	10.6
	To keep warm during farming in the rainy season	6.4	0.0	6.3
	Influenced by older relatives	2.1	0.0	2.1
	In sorrow & depression	2.9	0.0	2.8
	To appear more attractive	3.6	0.0	3.5
	To help with "morning sickness"	1.4	0.0	1.4
	Due to being given "free cigarettes" while in the army	2.9	0.0	2.8
	Stress	6.4	0.0	6.3
	Easier to meet new people	12.1	0.0	12.0
	To decrease craving for food (decrease appetite)	4.3	0.0	4.2

Table 11: Current Smoking Status by Region

		Northern (n=10)	Central (n=46)	Southern (n=23)	Total (n=79)
		%	%	%	%
1	Age of regular smokers (Mean = 21.28, Median=20.00, SD=7.109, Min=8, Max=45, $\chi^2=5.5465$, P-value =0.224)				
	<= 15 yrs	0.0	21.7	17.4	17.7
	16-25 yrs	70.0	54.3	73.9	62.0
	> 25 yrs	30.0	23.9	8.7	20.3
2	No of cigarettes smoked in a day (Mean=7.13, Median=5.00, SD=6.005, Min=1, Max=20, ($\chi^2=3.8196$, P-value=0.516)				
	<6	80	52.2	47.8	54.4
	6-10	10.0	30.4	26.1	26.6
	11-20	10.0	17.4	26.1	19.0
3	Ever stopped smoking within 1 week ($\chi^2=2.6874$, P-value=0.226)				
	No	20.0	10.9	26.1	16.5
	Yes	80.0	89.1	73.9	83.5
4	Ever smoked 100 cigarettes in the lifetime ($\chi^2=1.9430$, P-value=0.210)				
	No	20.0	6.5	13.0	10.1
	Yes	80.0	93.5	87.0	89.9
5	Description about readiness to stop smoking ($\chi^2=11.8300$, P-value=.023)				
	Not ready to quit smoking within the next 6 months	10.0	41.3	52.2	40.5
	Thinking about quitting within 6 months	0.0	17.4	21.7	16.5
	Ready to quit now	90.0	41.3	26.1	43.0
6	Smoking cigarettes in the building in the last year (($\chi^2=8.91108$, P-value=.008)				
	No	40.0	50.0	13.0	38.0
	Yes	60.0	50.0	87.0	62.0
7	Ever used hand rolled cigarettes ($\chi^2=5.1519$, P-value .203)				
	Occasionally	0.0	28.3	34.8	26.6
	Daily	10.0	8.7	13.0	10.1
	No	90.0	63.0	52.2	63.3
8	Smoke hand rolled cigarettes in the building/office/hospital ($\chi^2=-6.6437$, P-value=.043)				
	No	100.0	94.1	54.5	79.3
	Yes	0.0	5.9	45.5	20.7
9	No of hand rolled cigarettes smoked per day ($\chi^2=1.9339$, P-value=0.827)				
	<6	100.0	80	62.5	73.7
	6-10	0.0	20.0	25.0	21.1

		Northern (n=10)	Central (n=46)	Southern (n=23)	Total (n=79)
		%	%	%	%
	11-20	0.0	0.0	12.5	5.3
10	Getting cigarettes from (Multiple responses)				
	Buy cigarettes in sticks	30.0	11.4	11.1	13.6
	Buy in package	30.0	59.1	59.3	55.6
	Both	30.0	22.7	22.2	23.5
	Don't know	10.0	6.8	7.4	7.4
11	Expenses of buying cigarettes within 1 week ($\chi^2=4.95$, p-value .550)				
	Mean=11,651.90, Median=8,000.00, SD=14,644.802, Min=0, Max=100,000				
	<=10,000 kips	80.0	60.9	60.9	63.3
	11,000 -30,000 kips	20.0	34.8	34.8	32.9
	31,000-50,000 kips	0.0	0.0	4.3	1.3
	>=51,000 kips	0.0	4.3	0.0	2.5
13	No of days staying with others who smoked ($\chi^2=5.8362$, p-value .056)				
	Mean=3.34, Median=3.00, SD=2.581, Min=0, Max=7, P-value=0.054				
	0-3 days	80	63	39.1	58.2
	4-7 days	20	37	60.9	41.8
14	First cigarette after waking up (Mean=161.80, Median=120.00, SD=177.179, Min=1, Max=780 ($\chi^2=3.1738$, P_value = 0.514)				
	< 60 mins	20.0	45.7	47.8	43.0
	60 - 180 mins	40.0	30.4	34.8	32.9
	>180 mins	40.0	23.9	17.4	24.1
15	Place of smoking more often ($\chi^2=7.7044$, P-value =0.262)				
	In residence	50.0	34.8	56.5	43.0
	In office building	10.0	6.5	4.3	6.3
	In hospital	0.0	2.2	0.0	1.3
	Bar (pub)	20.0	6.5	4.3	7.6
	Everywhere	10.0	6.5	4.3	6.3
	Out side office	10.0	17.4	17.4	16.5
	Quiet place that have no one	0.0	4.3	4.3	3.8
	Park	0.0	8.7	0.0	5.1
	Don't know	0.0	13.1	17.8	13.3
	Total	100.0	100.0	100.0	100.0

		Northern (n=10)	Central (n=46)	Southern (n=23)	Total (n=79)
		%	%	%	%
12	Reason for starting to smoke (Multiple responses)				
	Experimenting	0.0	6.6	3.8	4.9
	Fashionable	15.4	21.1	20.8	20.4
	Social pressure	46.2	14.5	13.2	16.9
	To get rid of fatigue	0.0	9.3	1.9	5.6
	To keep insects (e.g. mosquitoes) away	7.7	10.5	11.3	10.6
	To keep warm during farming in the rainy season	0.0	7.9	5.7	6.3
	Influenced by older relatives	0.0	1.3	3.8	2.1
	In sorrow & depression	0.0	2.6	3.8	2.8
	To appear more attractive	15.4	1.3	3.8	3.5
	To help with “morning sickness”	0.0	0.0	3.8	1.4
	Due to being given “free cigarettes” while in the army	0.0	2.6	3.8	2.8
	Stress	0.0	5.3	9.4	6.3
	Easier to meet new people	7.7	15.8	7.5	12.0
	To decrease craving for food (decrease appetite)	7.7	1.3	7.5	4.2

Table 12 shows the distribution of current smokers by the age groups of the physicians. There was a significant difference in smoking patterns related to age group. Current smoking rates vary by age with medical doctors in the age group 24-30 years old having the lowest prevalence of smoking (3.8%). The highest smoking prevalence was seen among physicians aged 41-50 years (48.1%). The trend of prevalence of smoking then declined among medical doctors in the age group 51-65 years old.

Table 12: Comparisons of Characteristics of Smokers and Ex-smokers Among Medical Doctors

1	Age of physicians ($\chi^2=57.3928$, $p<.001$)	Current Smokers		Ex-smokers		Never-smokers		Total	
		n	%	N	%	n	%	N	%
	24-30 yrs	3	3.8	14	8.9	100	16.2	117	13.7
	31-40 yrs	24	30.4	37	23.6	247	39.9	308	36.0
	41-50 yrs	38	48.1	74	47.1	235	38.0	347	40.6
	51-65 yrs	14	17.7	32	20.4	37	6.0	83	9.7
	Total	79	9.2	157	18.4	619	72.4	855	100.0

7.6. Intention of Smoking Cessation

Almost all current smokers (84.8%) wanted to stop smoking and 74.7% indicated that they had made a serious attempt to quit smoking during last year (Tables 13 & 14). A high percentage of them tried to stop smoking for at least 1 year (84.7%), while 8.5% stopped smoking for 6 to 11 months; followed by 6.8% having stopped smoking for 1 to 5 months.

Regarding the methods used to quit smoking, 55.4% of them used the weaning method; while 16.9% used cold turkey; whereas 13.9% used candy and chewing gum. Among those who wanted to quit smoking, 67.1% received advice to do so, with doctors/nurses accounting for 20.3% of those giving advice; however, there was no statistically significant difference by gender.

The main reasons for trying to stop smoking in the past were to stay healthy and wanting to prevent illness (35.4%); family disapproval (20.3%); ill-health (at or before time of quitting) (15.2%). Of the current smokers, the reason for not able to quit smoking or perceived barriers to quitting was socialization (40%); don't want to quit (20%) and peer pressure (15%) and don't know how to quit (10%).

Table 13: Smoking Cessation by Gender

	Items	Male (n=77)		Female (n=2)		Total (n=79)	
		n	%	n	%	n	%
23	Want to quit smoking ($\chi^2=1.9301$, P value =0.282)						
	No	11	14.3	1	50.0	12	15.2
	Yes	66	85.7	1	50.0	67	84.8
24	Try to quit smoking within last year ($\chi^2=0.6956$., P value =1.000)						
	No	20	26.0	0	0.0	20	25.3
	Yes	57	74.0	2	100.0	59	74.7
25	How long did you stop smoking ($\chi^2=.3726$, P value =1.000)						
	1 – 5 months	4	7	0	0	4	6.8
	6 - 11 months	5	8.8	0	0	5	8.5
	1 year	48	84.2	2	100	50	84.7
	Total	57	100	2	100	59	100
26	Methods used to quit smoking ($\chi^2=.840$, P value = 0.840)						
	Eating cold turkey	11	17.5	0	0.0	11	16.9
	Drug therapy	1	1.6	0	0.0	1	1.5
	Weaning	35	55.6	1	50.0	36	55.4
	Taking candy, chewing gum	8	12.9	1	50.0	9	13.8
	Alcohol	1	1.6	0	0.0	1	1.6
	Walk away from cigarettes	2	3.1	0	0.0	2	3.1
	Don't go with people who smoke	2	3.1	0	0.0	2	3.1
	Do another activity	2	3.1	0	0.0	2	3.1
	Not specified	1	1.6	0	0.0	1	1.5
	Total	63	100.0	2	100.0	65	100.0
27.1	Received advice to quit smoking ($\chi^2=.2714$, P value =1.000)						
	No	25	32.5	1	50.0	26	32.9
	Yes	52	67.5	1	50.0	53	67.1

	Items	Male (n=77)		Female (n=2)		Total (n=79)	
		n	%	n	%	n	%
27.2	Person who gave advice to quit smoking (multiple responses)						
	Doctor/nurse	13	20.6	0	0.0	13	20.3
	Lay people	8	12.7	0	0.0	8	12.5
	Media	7	11.1	0	0.0	7	10.9
	Family	35	55.6	1	100.0	36	56.3
	Total	63	100	1	100	64	100
29	Primary reason for quitting smoking ($\chi^2=6.813$, P value = 0.449)						
	Illness (at or before time of quitting)	10	17.5	1	50.0	11	15.2
	Healthy, but wanted to prevent illness	23	40.4	0	0.0	23	35.4
	Saw illnesses developed in other smokers	2	3.9	0	0.0	2	3.8
	Family disapproval	11	20.8	0	0.0	11	20.3
	Saw health education program	3	5.2	0	0.0	3	5.1
	Not enough money to buy tobacco	1	2.6	0	0.0	1	2.5
	Disapproval of friends and co-workers	3	7.8	0	0.0	3	7.8
	Don't know/refuse to answer	4	9.1	1	50.0	5	10.1
	Total	57	100	2	100	59	100
29	Reason for not able to quit smoking						
	Don't know how to quit	2	10		0.0	2	10
	Just don't want to quit	4	20		0.0	4	20
	No advice	1	4.8		0.0	1	4.8
	Socialization	8	40.0		0.0	8	40.0
	Have bad temper	1	5.0		0.0	1	5.0
	Peer pressure	3	15		0.0	3	15
	Don't know	1	5.0		0.0	1	5.0
	Total	20	100		0	20	100.0

Table 14: Smoking Cessation by Region

	Items	Northern		Central		Southern		Total	
		n	%	n	%	n	%	n	%
23	Want to quit smoking ($\chi^2=4.0756$,P-value =.180)								
	No	0	0.0	10	21.7	2	8.7	12	15.2
	Yes	10	100.0	36	78.3	21	91.3	67	84.8
24	Tried to quit smoking within last year ($\chi^2=1.45$, P-value =0.482)								
	No	1	10.0	13	28.3	6	27.3	20	26.0
	Yes	9	90.0	33	71.7	17	72.7	59	77.0
25	How long did you stop smoking ($\chi^2=4.3695$, P-value =0.408)								
	1 – 5 months	1	11.1	3	9.1	0	0	4	6.8
	6 - 11 months	0	0	2	6.1	3	17.6	5	8.5
	1 year	8	88.9	28	84.8	14	82.4	50	84.7
	Total	9	100	33	100	17	100	59	100
26	Methods used to quit smoking ($\chi^2=4.6220$,P-value = 0.609)								
	Eating cold turkey	2	22.2	7	18.9	2	10.5	11	16.9
	Drug therapy	0	0.0	0	0.0	1	5.3	1	1.5
	Weaning	5	55.6	22	59.5	9	47.4	36	55.4
	Taking candy, chewing gum	0	0.0	3	8.1	6	31.6	9	13.8
	Alcohol	1	11.1	0	0.0	0	0.0	1	1.5
	Walk away from cigarettes	1	11.1	0	0.0	1	5.3	2	3.1
	Don't go with people who smoke	0	0.0	2	5.4	0	0.0	2	3.1
	Do another activity	0	0.0	2	5.4	0	0.0	2	3.1
	Not specified	0	0.0	1	2.7	0	0.0	1	1.5
	Total	9	100.0	37	100.0	19	100.0	65	100.0
27.1	Received advice to quit smoking ($\chi^2=3.54$ s, P-value =0.170)								
	No	1	10.0	15	32.6	10	43.5	26	32.9
	Yes	9	90.0	31	67.4	13	56.5	53	67.1
27.2	Person who gave advice to quit smoking (multiple responses)								
	Doctor/nurse	1	10.0	10	27.0	2	11.8	13	20.3
	Lay people	3	30.0	2	5.4	2	17.6	8	12.5
	Media	0	0.0	3	8.1	4	23.5	7	10.9
	Family	6	60.0	22	59.5	8	47.1	36	56.3
	Total	10	100	37	100	16	100	64	100
29	Primary reason for quitting smoking ($\chi^2=19.833$,P-value = 0.136)								
	Illness (at or before time of quitting)	1	11.1	6	18.2	4	23.5	11	18.6

	Healthy, but wanted to prevent illness	5	55.6	15	45.5	3	17.6	23	39.0
	Seeing illnesses developed in other smokers	0	0.0	2	6.1	0	0	2	3.4
	Family disapproval	3	33.3	5	15.2	3	17.6	11	18.6
	Saw health education program	0	0.0	0	0	3	17.6	3	5.1
	Not enough money to buy tobacco	0	0.0	0	0	1	5.9	1	1.7
	Disapproval of friends and co-workers	0	0.0	1	3.0	2	11.8	3	5.1
	Don't know/refuse to answer	0	0.0	4	12.1	1	5.9	5	8.5
		9	100	33	100	17	100	59	100
29	Reason for not able to quit smoking ($\chi^2=7.714$, P_value = 0.807)								
	Don't know how to quit	0	0.0	0	0	2	33.3	2	10
	Just don't want to quit	0	0.0	3	23.1	1	16.7	4	20.0
	No advice	0	0.0	1	7.7	0	0	1	5.0
	Socialization	1	100.0	5	38.5	2	33.3	8	40.0
	Have a bad temper	0	0.0	1	7.7	0	0	1	5.0
	Peer pressure	0	10.0	3	15.4	0	0	3	15.0
	Don't know	0	10.0	0	0	1	16.7	1	5.0
	Total	1	100.0	14	100	6	100	20	100.0

7.7. Knowledge of the Health Effects of Smoking

Tables 15 and 16 present the knowledge of the health effects of smoking by smoking status and by regions. All respondents were asked the true and false closed-ended questionnaire by giving score "0" for false and "1" for true. The medical doctors had favorable knowledge on the health effects of smoking in the majority items of knowledge; except for addiction to cigarettes, neonatal death and smoking, impact of maternal smoking and fatality of tobacco. All categories of smokers had low knowledge of fatality of smoking which accounted for 50.6%, 56.1% and 54.4% for smokers, ex-smokers and never-smokers, respectively. Furthermore, medical doctors also had low knowledge on the links between neonatal death and passive smoking, and smoking during pregnancy and risk of sudden death.

A greater percentage of ex-smokers and non-smokers, as high as 100%, know the harmful effects of smoking compared to smokers ($p=.007$). It is important to note that non-smokers had more knowledge on the addictive of nicotine similar to cocaine or heroine compared to former and current smokers, with statistically significant difference ($p=.003$). The other statements were not statistically significant by smoking status.

Table 15: Knowledge of Health Problems Related to Smoking by Smoking Status

No	Statement of Knowledge	Smokers	Ex-smokers	Never-smokers	Chi-square	P-value
		(n=79)	(n=157)	(n=619)		
		% Correct	% Correct	% Correct		
1	Smoking is harmful to your health	98.7	100	100	9.834	0.007
2	Nicotine in tobacco is highly addictive	96.2	90.4	95.2	5.78	0.056
3	People can get addicted to cigarette like they can get addicted to cocaine or heroine	68.4	81.5	83.8	11.411	0.003
4	Neonatal death is associated with passive smoking	69.6	72.6	70.8	.288	0.866
5	Maternal smoking during pregnancy increases the risk of sudden death	79.7	82.8	79.6	.801	0.670
6	Passive smoking increase the risk of heart disease in non-smoking adults	96.2	94.3	92.9	1.464	0.481
7	Passive smoking increase the risk of lung diseases in non-smoking adults	97.5	99.4	99.4	3.145	0.207
8	Paternal smoking increases the LRI such as pneumonia in exposed children	94.9	96.8	96.9	.884	0.643
9	Tobacco kills more people each year than illegal drugs, AIDS & car crash that causes of death	50.6	56.1	54.4	.625	0.732
10	Smoke from cigarettes is harmful to people where are repeated exposed, is not just for smokers	98.7	97.5	98.5	1.005	0.605

Notes: Never-smokers - included who never smoke and ex-smokers
Current smokers - daily and occasional smokers

With regard to knowledge of health problems related to smoking by region, there was some significant difference in knowledge of tobacco by regions. Medical doctors from the Southern part were more likely to perceive that nicotine is highly addictive compared to those from Central and Northern parts (99.4% versus 93.6% & 91% respectively; $p=.008$). The other item was “Neonatal death is associated with passive smoking” which medical doctors from the Northern part were more likely to perceive this statement compared to those from the Central and Southern parts (86.5% versus 70.1% & 65.5% respectively; $\text{chi-square}=12.841$, $p=.002$).

Similarly, there was a statistically significant difference in knowledge on passive smoking among medical doctors by region. Medical doctors from the Northern part had a higher knowledge on the effect of passive smoking on children whose parents smoke than those from the Central and Southern parts (98.9% versus 97.2% & 93.5%; $\text{Chi-square}=6.814$, $p=.033$).

Table 16: Knowledge of Health Problems Related to Smoking by Region

No	Statement of Knowledge	Northern	Central	South	Chi-square	P-value
		(N=89)	(N=612)	(N=154)		
		% Correct	% Correct	% Correct		
1	Smoking is harmful to your health	100	99.8	100	.398	0.82
2	Nicotine in tobacco is highly addictive	91	93.6	99.4	9.741	0.008
3	People can get addicted to cigarette like they can get addicted to cocaine or heroine	79.8	80.9	87.7	4.159	0.125
4	Neonatal death is associated with passive smoking	86.5	70.1	65.5	12.841	0.002
5	Maternal smoking during pregnancy increases the risk of Sudden death	85.4	78.8	83.1	3.141	0.208
6	Passive smoking increases the risk of heart disease in non-smoking adults	97.8	93.1	92.2	3.178	0.204
7	Passive smoking increases the risk of lung diseases in non-smoking adults	100	99.3	98.1	3.359	0.186
8	Paternal smoking increases the LRI such as pneumonia in exposed children	98.9	97.2	93.5	6.814	0.033
9	Tobacco kills more people each year than illegal drugs, AIDS & car crash that causes of death	60.7	52.6	57.8	2.913	0.233
10	Smoke from cigarettes is harmful not only to smokers but also to people who are repeatedly exposed to it	100	98.5	96.8	4.064	0.131

Tables 17, 18 and 19 present the mean of knowledge on the health effects of smoking by smoking status and by region. The 10 questionnaires on the topic were summed up with a higher score given to indicate high knowledge and a lower score to denote low knowledge on health effects of smoking. The sum knowledge of health effects of smoking ranged from 4 to 10. The mean for smokers was 8.5 and a mean of 8.71 was for non-smokers; however, the difference between the level of knowledge of the health effects of smoking by smokers and non-smokers was not statistically significant. In addition, there was no statistically significant difference between knowledge of the health effects of smoking by smoking status, gender and regions.

Table 17: Knowledge of Health Effects of Smoking by Smoking Status

	Mean	SD	T	P-value	95% of CI	
					Upper	Lower
Smokers*	8.50	1.261	1.443	0.149	-0.077	0.510
Non-smokers	8.71	1.405				

Notes: Non-smokers included who never smoke and plus ex-smokers
Smokers* entailed current daily and occasionally smokers

Table 18: Knowledge of Health Effects of Smoking by Smoking Status and Gender

		Mean	SD	T	P-value	95% of CI	
						Upper	Lower
Male	Smokers*	8.512	1.411	1.297	0.195	-0.107	0.525
	Non-smokers	8.721	1.269				
Female	Smokers*	8.000	1.414	0.798	0.425	-1.039	2.246
	Non-smokers	8.710	1.255				

Notes: Non-smokers - included who never smoke and ex-smokers
Smokers - current daily and occasional smokers

Table 19: Knowledge of Health Problems Related to Smoking by Region and Smoking Status

	Region	Mean	SD	T	P-value	95% of CI	
						Upper	Lower
Northern	Smokers*	8.900	1.286	.265	0.792	-0.733	0.958
	Non-smokers	9.012	1.265				
Central	Smokers*	8.665	1.272	1.686	0.092	-.0536	0.703
	Non-smokers	8.340	1.238				
Southern	Smokers*	8.652	1.747	0.356	0.722	-0.470	0.677
	Non-smokers	8.755	1.190				

Notes: Non-smokers - included who never smoke and ex-smokers
Smokers - current daily and occasional smokers

7.8. Attitudes Regarding Anti-smoking and Tobacco Control

Tables 20 and 21 illustrate the attitudes toward anti-smoking measures and tobacco control by smoking status and region. Attitudes toward smoking were assessed from answers with ordinal scale which ranged from 1 (Strongly disagree) to 4 (Strongly agree). The questions on attitudes toward smoking were focused on two parts. The first part described the ban on smoking and the other part was on how the medical doctors would be the role models of no-smoking to the public and their patients. Questions that examined the respondent's attitudes toward the banning of tobacco were

questions 1 to 7; while those that evaluated the attitudes toward smoking by emphasizing the position of medical doctors as role models were questions 8 to 15.

In the first part, there was statistically significant difference in attitudes between different categories of smokers versus non-smokers and the banning of cigarettes. For example, the non-smokers (99.2%) felt more strongly than the ex-smokers (98.1%) and current smokers (91.1%) that there should be a complete ban on tobacco products ($p < .001$). It is also interesting to reveal that the ex-smokers hold a more positive attitude toward increasing cigarette price than non-smokers and current smokers (77.7% versus 73.5% & 58.2%, Chi-square=10.551, $p = .005$).

Similarly, with regard to the statement “Health warning on cigarettes package should be in big print”, the non-smokers had more positive attitudes than former and current smokers (98.7% versus 98.1% & 93.7% respectively; chi-square=9.68, $p < .001$).

There are two important features that had significant differences between different types of smoking status and the role models of medical doctors. Compared to non-smokers and current smokers, ex-smokers, in particular, thought that medical doctors should get specific training on smoking cessation (100% versus 99.2% & 96.2% respectively; p -value=.014).

Table 20: Attitudes Toward Anti-smoking and Tobacco Control by Smoking Status

No	Statement of Attitudes	Current Smokers	Ex-smokers	Never-smokers	Chi-square	P-value
		(N=79)	(N=157)	(N=619)		
		% Positive Attitude	% Positive Attitude	% Positive Attitude		
1	Tobacco sales to children & adolescents should be <u>banned</u>	96.2	99.4	98.5	3.572	0.186
2	There should be a <u>total ban</u> of the advertising of tobacco products	91.1	98.1	99.2	26.387	0.000
3	Health warnings on cigarette packages should be in big prints	93.7	98.1	98.7	9.68	0.012
4	Sport sponsorship by tobacco industry should be banned	59.5	61.1	66.4	2.586	0.274
5	Smoking in all enclosed public places should be banned	97.5	99.4	97.3	2.453	0.283
6	Smoking should be banned at the Hospitals/Health Care Centre and all Medical Institutions	97.5	99.4	99.0	1.961	0.311
7	The price of tobacco should be increased sharply	58.2	77.7	73.5	10.551	0.005
8	Health professionals (HPs) should serve as role models for their patients and the public	100	99.4	99.2	.668	1.000

9	Patient's chances of quitting smoking are increased if a HP advises him/her to quit.	94.9	98.7	98.2	4.386	0.142
10	HP should routinely ask about their patients smoking habits.	96.2	98.1	98.5	16.1059	0.043
11	HP should routinely advise their smoking patients to quit smoking	98.7	98.7	98.7	13.7149	0.118
12	HP who smoke are less likely to advise people to stop smoking	69.6	79.0	74.6	2.5888	0.274
13	HP should routinely advise patients/people who smoke to avoid smoking around children	100	100	99.4	1.532	0.721
14	Health professionals should get specific training on cessation techniques	96.2	100	99.2	8.572	0.028
15	HP should speak to community groups about smoking	98.7	98.7	99.0	0.1495	0.620

Notes: Positive attitudes - included Strongly agree and Agree
Negative attitudes - referred to Strongly disagree and Disagree
HP - health professional

In relation to region, the medical doctors from the Northern part hold more positive attitudes toward statements such as “Tobacco sales to children & adolescents should be banned (p=.021)”; “Sport sponsorship by tobacco industry should be banned (p=.001)” and “Health Professionals who smoke are less likely to advise people to stop smoking (p=.001)” compared to those from the Central and Southern parts (Table 21).

Table 21: Attitudes Toward Smoking and Tobacco Control by Region

No	Statement of Attitudes	Northern	Central	Southern	Chi-square	P-value
		(N=89)	(N=612)	(N=154)		
		% Positive Attitude	% Positive Attitude	% Positive Attitude		
1	Tobacco sales to children & adolescents should be banned	100	98.9	96.1	7.758	0.029
2	There should be a <u>total ban</u> on the advertising of tobacco products	98.9	97.9	99.4	1.782	0.630
3	Health warnings on cigarette packages should be in big prints	96.6	98.4	98.1	1.282	0.426

4	Sports sponsorship by tobacco industry should be banned	78.7	61.1	71.4	14.103	0.001
5	Smoking in all enclosed public places should be banned	97.8	97.4	98.7	.936	0.757
6	Smoking should be banned at the Hospitals/Health Care Centre and all Medical Institutions	100	98.9	98.7	1.085	0.753
7	The price of tobacco should be increased sharply	71.9	73.2	72.1	.125	0.940
8	HP should serve as role models for their patients and the public	100	99.2	99.4	.752	1.000
9	Patient's chances of quitting smoking are increased if a HP advises him/her to quit.	100	97.7	98.1	2.088	0.448
10	HP should routinely ask about their patients' smoking habits.	100	98.0	98.1	1.776	0.531
11	HP should routinely advise their smoking patients to quit smoking	100	98.4	99.4	2.239	0.615
12	HP who smoke are less likely to advise people to stop smoking	78.7	77.5	63.0	14.435	0.001
13	HP should routinely advise patients/people who smoke to avoid smoking around children	100	99.3	100	1.596	0.735
14	Health professionals should get specific training on cessation techniques	97.8	99	100	3.119	0.73
15	HP should speak to community groups about smoking	98.9	98.9	99.4	0.294	1.000

Tables 22 and 23 present the attitudes toward smoking by smoking status. All attitudinal questionnaires were summed up with higher score given to mean positive attitudes toward smoking and lower score to indicate negative attitudes. The score of sum of attitudinal questionnaires ranged from 15 to 33. The study revealed that non-smokers had higher scores than smokers when all the attitudinal questionnaires which was statistically significantly different in attitudes toward smoking were summed up (p-value <.000). However, when disaggregating by gender, there was statistically significant difference in attitudes between smokers and non-smokers only in males (p-value <.000). Smokers (mean of 31.63) hold more negative attitudes toward anti-smoking compared to non-smokers (mean of 32.403).

Table 22: Attitudes Toward Smoking and Tobacco Control by Smoking Status

	Mean	SD	T	P-value	95% of CI	
					Upper	Lower
Non-smokers	32.403	1.446	4.486	0.000	0.431	1.101
Smokers	31.637	1.528				

Notes: Non-smokers - included who never smoke and ex-smokers
 Smokers - current daily and occasional smokers

Table 23: Attitudes Toward Smoking and Tobacco Control by Smoking Status and Gender

		Mean	SD	T	P-value	95% of CI	
						Upper	Lower
Male	Smoker	31.628	1.512	4.716	0.000	0.486	1.182
	Non smoker	32.462	1.401				
Female	Smoker	32.000	2.828	0.330	0.812	-1.730	2.428
	Non-smokers	32.349	1.48				

Notes: Non-smokers - included who never smoke and ex-smokers
 Current smokers - daily and occasional smokers

It is interesting to note that the non-smokers from 3 different regions hold higher scores for attitudes toward smoking when the scores are summed up together than those who are smokers which were statistically significantly different (Table 24).

Table 24: Attitudes Toward Smoking and Tobacco Control by Smoking Status and Regions

	Region	Mean	SD	T	P-value	95% of CI	
						Upper	Lower
Northern	Smokers	31.700	0.823	4.287	0.000	0.805	2.199
	Non-smokers	32.202	1.066				
Central	Smokers	31.872	1.361	1.966	0.050	0.0005	0.877
	Non-smokers	32.311	1.479				
Southern	Smokers	31.130	1.961	3.599	0.000	0.536	1.843
	Non-smokers	32.320	1.360				

Notes: Non-smokers - included who never smoke and ex-smokers
Smokers - current daily and occasional smokers

7.9. Smoking Environment at the Workplace

Table 25 presents the smoking practice and policy at their workplace by smoking status and by region. Approximately 80.8% of 855 medical doctors regardless of their smoking status had heard about smoking policy in their workplace and there was no significant difference between smoking statuses. Slightly higher than one third (34.7%) reported that there was no smoking policy at their workplace; in addition, 57.3% of them pointed out that smoking are not allowed at all premises. It means that there were some smoking policies in place but medical doctors were not aware of them. It is interesting to note that 8% indicated that there were smoking rooms in their workplace (Table 25.1).

With regard to the enforcement of smoke-free policy, 34.6% said that there was no smoke-free policy enforced; while 35.7% and 29.7% revealed that such policy was always and sometimes enforced in their workplace respectively. 98% of them reported that there was a prohibition on the sale of tobacco in their hospitals/workplace. The findings also found that 79.2% of physicians reported that tobacco is prohibited for sale in nearby hospitals/ offices. When asked about the details of the smoking policy for indoor public or common areas, 45.3% of them mentioned that smoking is allowed in some public places.

In light of receiving training on smoking cessation techniques, a small percentage of medical doctors who had received formal training provided tobacco cessation counselling to patients during different occasions. 16.7% of them reported they received training while working; followed by from conference (12.7%) and during studying (9.5%). Interestingly, current smokers were more likely to receive training on smoking cessation approaches during specialization than ex-smokers and non-smokers (11.6% versus 8.3% & 4.% respectively, $p=.034$).

About 76.9% of medical doctors providing treatment reported that they ever helped patients with counselling. 52.8% and 53.7% of them ever advised people to quit smoking during 30 days and on the health effects of smoking respectively. Non-smokers were more likely to give advice on smoking cessation and the health effects of smoking than ex-smokers and current smokers ($p=.001$ & $p=0.004$). There was an association between providing health education on smoking cessation and health effects of smoking and smoking status. Two third of them (74.4%) are not prepared to be

health educators on smoking cessation, so they need some training. A small percentage of physicians (21.3%) ever participated in the campaign or conference related to tobacco control.

In terms of region, there were some statistically significant differences in the enforcement of smoke-free policy (p-value <.000); prohibited selling tobacco nearby hospital (p-value=.029); smoking policy for indoor public or common areas (p-value <.000); receiving formal training on smoking cessation approaches during specialization (p-value= .010) and during conference (p-value=0.032); ever received training on providing health education on smoking cessation (p-value= .028); ever helped patients to quit smoking with self-medication (p-value= .001), with counselling (p-value <.000), with nicotine gum & patch (p-value < .001).

Table 25: Have Heard about Smoking Practice and Policy at their Workplace by Smoking Status

No	Variables	Current smokers (n=79)	Ex-smokers (n=157)	Never smokers (n=619)	Total (N=855)	Chi-square	P-value
		%	%	%	%		
1	Heard about smoking policy	83.5	82.2	80.1	80.8	0.752	0.687

Table 25.1: Smoking Practice and Policy at their Workplace by Smoking Status

No	Variables	Current smokers (n=66)	Ex-smokers (n=129)	Never smokers (n=496)	Total (n=691)	Chi-square	P-value
2	Smoke-free policy in place					7.888	0.096
	No smoking policy	28.8	31.8	36.3	34.7		
	Have smoking room	12.1	12.4	6.3	8.0		
	No smoking allowed at all the premises	59.1	55.8	57.5	57.3		
3	Smoke-free policy enforced					11.447	0.075
	Yes, always	39.2	35.7	35.2	35.7		
	Yes, sometimes	30.4	33.8	28.6	29.7		
	No/DK	30.4	30.6	36.2	34.6		
4	Prohibit selling tobacco in the hospital/office	97.5	97.5	98.2	98.0	0.514	0.647
5	Prohibit selling tobacco nearby hospital	78.5	80.9	78.5	79.2	0.347	0.841
6	Smoking policy for indoor public or common areas					3.472	0.748
	Not allowed in any public or common area	25.6	27.6	24.7	25.3		
	Allowed in some public or common area	46.5	41.0	46.2	45.3		
	Allowed in all public or common area	0	1.90	0.80	0.9		
	No official policy	27.9	29.5	28.4	28.5		
7	Received formal training on smoking cessation approaches						
7.1	during studying	7.6	10.8	9.4	9.5	0.452	0.798
7.2	during working	15.9	20.5	16.3	16.7	1.971	0.373
7.3	during specialization	11.6	8.3	4.1	5.3	8.174	0.017
7.4	from conference	11.6	12.2	13.0	12.7	0.120	0.942

8	Ever received training on providing HE on smoking cessation	9.3	12.2	8.8	9.5	1.639	0.441
	For those who provided treatment	(n=26)	(n=118)	(n=524)	(n=668)		
9	Ever helped patients to quit smoking with						
9.1	Traditional method	11.5	4.2	6.9	6.6	2.163	0.339
9.2	Self-medication	53.8	36.4	39.9	39.8	2.698	0.260
9.3	Counselling	76.9	76.3	76.1	76.2	.009	0.996
9.4	Nicotine gum & patch	23.1	35.6	38.2	37.1	2.561	0.278
10	Ever advised people to quit smoking during 30 days	26.9	50.0	54.8	52.8	8.174	0.017
11	Ever advised on the health effects of smoking during 30 days	30.8	49.2	56.9	53.7	7.516	0.023
12	How well are you prepared to be health educator on smoking cessation					2.236	0.692
	Well prepared	11.5	9.3	8.6	8.8		
	Prepared something	23.1	19.5	15.8	16.8		
	Not prepared	65.4	71.2	75.6	74.4		
13	Ever participated in the campaign or conference related to tobacco control	23.1	21.2	21.2	21.3	0.054	0.974

Table 26: Have Heard about Smoking Practice and Policy at their Worksite Practice and Smoking Status by Region

No	Variables	Northern (n=89)	Central (n=612)	Southern (n=154)	Total (N=855)	Chi square	P-value
		%	%	%	%		
1	Heard about smoking policy	86.5	81	76.6	80.8	3.633	0.163

Table 26.1: Worksite Practice and Smoking Status by Region

No	Variables	Northern (n=77)	Central (n=496)	Southern (n=118)	Total (N=691)	Chi square	P-value
2	Smoke free policy in place					5.195	0.268
	No smoking policy	37.7	32.7	41.5	34.7		
	Have smoking room	10.4	7.5	8.5	8.0		
	No smoking allowed at all on the premises	51.9	59.9	50	57.3		
3	Smoking free policy enforced					35.571	0.000
	Yes, always	31.5	40.2	20.1	35.7		
	Yes, sometimes	25.8	28.8	35.7	29.7		
	No/Don't know	42.7	31.0	44.1	34.6		
4	Prohibit selling tobacco in the hospital/office	100.0	97.4	99.4	98.0	4.453	0.108
5	Prohibit selling tobacco nearby hospital	76.4	77.6	87.0	79.2	7.058	0.029
6	Smoking policy for indoor public or common areas					40.99	0.000
	Not allowed in any public or common area	13.5	25.5	31.2	25.3		
	Allowed in some public or common area	32.6	49.0	37.7	45.3		
	Allowed in all public or common area	1.10	0.50	2.60	0.90		
	No official policy	52.8	25.0	28.6	28.5		
7	Received formal training on smoking cessation approaches						
7.1	during studying	10.1	8.7	12.3	9.5	1.988	0.37
7.2	during working	19.1	18	10.4	16.7	5.48	0.064
7.3	during specializations	10.1	5.6	1.3	5.3	9.156	0.01
7.4	during conference	12.4	14.4	6.5	12.7	6.892	0.032
8	Ever received training on providing HE on smoking cessation	9	10.9	3.9	9.5	7.161	0.028
	For those who provided treatment	(n=60)	(n=490)	(n=118)	(N=668)		
9	Ever helped patients to quit smoking with						
9.1	Traditional method	1.7	6.5	9.3	6.6	3.798	0.15

9.2	Self-medication	61.7	38.2	35.6	39.8	13.39	0.001
9.3	Counselling	93.3	79.4	54.2	76.2	43.83	0.000
9.4	Nicotine gum & patch	41.7	40.6	20.3	37.1	17.32	0.000
10	Ever advised people to quit smoking during 30 days	58.3	50.8	58.5	52.8	3.035	0.219
11	Ever advised on the health effects of smoking during 30 days	58.3	51.8	59.3	53.7	2.702	0.259
12	How well are you prepared to be health educator on smoking cessation					7.181	0.127
	Well prepared	3.3	8.4	13.6	8.8		
	Prepared something	13.3	16.7	18.6	16.8		
	Not prepared	83.3	74.9	67.8	74.4		
13	Ever participated in the campaign or conference related to tobacco control	15	23.1	16.9	21.3		0.16

7.10. Intention to Participate in the Tobacco Control

The respondents were asked about their intention to participate in tobacco control. Tables 27 and 28 display the intention to participate in tobacco control by smoking status and region. A greater proportion of respondents had the intention to participate in tobacco control. The majority of them agreed that medical doctors should routinely advise smokers about smoking cessation. Non-smokers were more likely to agree to this statement than ex-smokers and current smokers (99.5% versus 96.8% & 96.2% respectively; $p=.003$).

Current smokers agreed to the statement “Should medical doctors serve as ‘smoke-free life role models’ for the public?” more than ex-smokers and non-smokers; and the difference between the smoke-free life role models and smoking status among health professions was statistically significant (p -value-.034).

Table 27: Intention to Participate in Tobacco Control by Smoking Status

No	Items	Current Smoker	Ex-smoker	Never-smoker	Chi-square	P-value
		(n=79)	(n=157)	(n=619)		
		% (Yes)	% (Yes)	% (Yes)		
1	Should tobacco control training be integrated into training curriculum for medical students	89.9	94.3	95.3	4.122	0.127
2	Should medical doctors get specific training on cessation techniques?	94.9	95.5	96.8	1.055	0.590
3	Should medical doctors routinely advise people who smoke to quit smoking?	96.2	96.8	99.5	11.51	0.003
4	Should medical doctors routinely advise people who use other replacement tobacco products to quit using these products?	91.1	93.6	96	4.362	0.113
5	Should medical doctors serve as “role models” in participating and implementing the smoke-free health facilities?	98.7	98.7	99.5	1.517	0.247
6	Should medical doctors serve as “smoke-free life role models” for the public?	99.4	98.7	96.2	6.77	0.036
7	Should medical doctors serve as “role models” to advocate policy makers in advancing tobacco control policy?	98.7	98.1	96.6	1.812	0.550

In terms of region, medical doctors from the Southern part were more likely to agree that tobacco control training should be integrated into the training curriculum for medical students compared to those from the Central and Northern parts (p-value- .008). A similar pattern was revealed for the statement “Should medical doctors routinely advise people who use other tobacco products to quit using these products” (p=.014) and the statement “Should medical doctors serve as ‘role models’ to advocate policy makers in advancing tobacco control policy?” with a statistical significant difference (p-value-.01).

Table 28: Intention to Participate in Tobacco Control by Region

Items	Northern	Central	Southern	Chi-square	P-value
	(N=89)	(N=612)	(N=154)		
	% (Yes)	% (Yes)	% (Yes)		
Should tobacco control training be integrated into training curriculum for medical students	88.8	94.6	98.1	9.559	0.008
Should medical doctors get specific training on cessation techniques?	95.5	96.1	98.1	1.586	0.453
Should medical doctors routinely advise people who smoke to quit smoking?	97.8	99.0	98.1	1.629	0.304
Should medical doctors routinely advise people who use other tobacco products to quit using these products?	88.8	95.9	95.5	8.561	0.014
Should medical doctors serve as “role models” in participating and implementing the smoke free health facilities?	100	99.0	100	2.399	0.648
Should medical doctors serve as “smoke-free life role models” for the public?	100	98.7	99.4	1.568	0.641
Should medical doctors serve as “role models” to advocate policy makers in advancing tobacco control policy?	92.1	97.4	98.7	9.295	0.01

7.11. Association between Attitudes and Participation in Tobacco Control

The relationship between attitudes and participation in tobacco control is given in Table 29. All attitudinal questionnaires were summed up with a higher score given to positive attitudes toward smoking and a lower score indicate negative attitudes. The score of sum of attitudinal questionnaires ranged from 15 to 33. Physicians with positive attitudes were more inclined to participate in tobacco control activities compared to those physicians with negative attitudes.

Significant difference was found between attitudes toward tobacco control and participation in tobacco control among physicians, only for the statement “Should medical doctors routinely advise people who smoke to quit smoking?” Medical doctors who hold positive attitudes toward the statement “Should medical doctors routinely advise people who smoke to quit smoking” were more likely to agree to participate in tobacco control (mean of 32.34 versus mean of 31.27, $p=0.016$).

Table 29: Association between Attitudes and Participation in Tobacco Control

Items of intention to participate in Tobacco Control		Attitudes toward anti-smoking				
		Mean	SD	N	F-test	P-value
Should tobacco control training be integrated into training curriculum for medical students	Yes	32.351	1.82	809	2.484	0.115
	No	32.00	1.44	46		
Should medical doctors get specific training on cessation techniques?	Yes	32.337	1.47	844	0.285	0.593
	No	32.19	1.32	11		
Should medical doctors routinely advise people who smoke to quit smoking?	Yes	32.346	1.436	844	5.814	0.016
	No	31.27	3.10	11		
Should medical doctors routinely advise people who use other tobacco products to quit using these products?	Yes	32.340	1.217	813	0.559	0.455
	No	32.166	1.34	42		
Should medical doctors serve as “role models” in participating and implementing the smoke free temples?	Yes	32.330	1.475	849	0.308	0.579
	No	32.00	0.632	6		
Should medical doctors serve as “smoke-free life role models” for the public?	Yes	32.332	1.456	846	0.000	0.998
	No	32.333	1.166	9		
Should medical doctors serve as “role models” to advocate policy makers in advancing tobacco control policy?	Yes	32.738	1.453	830	2.89	0.090
	No	31.24	1.929	25		

7.12. Correlation between Knowledge, and Attitudes Toward Smoking

Examining the data for the relationships between knowledge and attitudes, we found a positive correlation for all physicians and for non-smokers (Table 30). When data were sorted by smoking status, knowledge and attitudes, we found that there were statistically significant links between knowledge and attitudes for the non-smokers for males. This was not the case for women due to the small number of female physicians who smoked.

Table 30: Correlation between Knowledge and Attitude toward Smoking among Smokers and Non-smokers

No	Variables	Knowledge			Attitudes		
		Smokers	Non-smoker	Total	Smoker	Non smokers	Total
1	Knowledge	1		1	0.122	0.235**	0.227**
2	Attitudes	.122	0.235**	0.277**	1	1	1

*- Significant at the p level .05

**Significant at the p level <.01

7.13. Factors Associated with Smoking

Table 31 presents the association between determinants of smoking among medical doctors. The findings suggested that position, providing treatment and counseling to patients, receiving training on smoking cessation during specialization, ever advise people to quit smoking within 30 days and ever advise patients on the health effects of smoking were statistically significantly associated with smoking among health professionals.

Table 31: Factors Associated with Smoking Status among Medical Doctors

	Items	Smokers %/mean (n=79)	Non-smokers %/mean (n=776)	Chi-square	P-value
1	Sex			69.494	.000
	Male	97.5	48.3		
	Female	2.5	51.7		
2	Age			13.957	.003
	24-30 yrs	3.8	14.7		
	31-40 yrs	30.4	36.6		
	41-50 yrs	48.1	39.8		
	51-65 yrs	17.7	8.9		
3	Marital status				.081
	Single	6.3	14.7		
	Lived together	93.8	84.4		
	Separated	0	0.9		
4	Education			1.816	.403
	Bachelor	60.8	68.0		
	Master	38.	31.2		
	PhD/Specialized	1.3	0.8		
5	Position			13.173	.001
	Technical	55.7	70.7		
	Division	29.1	23.6		
	Head	15.2	5.7		

6	Responsibility			5.916	.052
	Technical	72.4	82.5		
	Administrative	10.5	5.2		
	Both	17.1	12.3		
7	Provide treatment & counseling	67.5	79.2	6.209	.022
8	Mean Knowledge on health consequences of smoking	8.51 2	8.72 1	t test -3.622	.166
9	Mean Attitudes toward smoking	31.6 37	32.4 03	t test 1.387	.000

Notes: Non-smokers - included who never smoke and ex-smokers
Smokers - current daily and occasional smokers

Table 32 displays adjusted odds ratio of factors associated with current smoking among medical doctors after controlling for other confounding variables. Only male physicians were included in the multivariate analysis due to the small number of smokers among the female physicians. There was a weak positive relationship with current smoking with marginal statistically significant ($p=.055$). One year increase of age corresponds with 1.03 time odds of smoking after adjusted for other covariance. Attitudes toward smoking were positively related to smoking status. Physicians who had positive attitudes were 0.654 times likely to be current smokers compared to physicians who had negative attitudes.

In conclusion, age and attitudes toward smoking were correlated with current smoking status among physicians after controlling for confounders.

Table 32: Logistic Regression of Smoking among Male Medical Doctors

	Variables	OR	95% CI		P-value
			Lower CI	Upper CI	
1	Age per year	1.038	0.999	1.079	0.055*
2	Marital status				
	Single				
	Lived together	0.964	0.324	2.865	0.947
	Separated	0.012	0.000	9.9	0.771
3	Education				
	Bachelor				
	Master	1.249	0.701	2.22	0.451
	PhD/Specialized	0.615	0.048	7.96	0.710
4	Position				
	Technical				
	Division	1.007	0.493	2.060	0.984
	Head	2.189	0.797	6.010	0.128

5	Responsibility				
	Technical				
	Administrative	0.945	0.313	2.853	0.919
	Both	0.781	0.326	1.874	0.580
6	Provide treatment	0.587	0.304	1.136	0.114
10	Knowledge on health consequences of smoking	0.996	0.809	1.226	0.966
11	Attitudes toward smoking	0.654	0.538	0.795	0.000***
	Constant	10.786			
	-2 Log Likelihood	353.670			
	Model Chi-Square	33.155			
	P value	0.002			
	Nagelkerke R square	0.126			
	Percent Correct	82.5			
	N	417			

QUALITATIVE DATA

8.1. Socio-Demographic Characteristics, and Working Experiences

Overall, 16 policymakers or key informants out of proposed 22 were extensively interviewed. The majority of participants were male and the age ranges from 42 to 62 years old. Almost half of the participants have high level of education, such as a master’s degree including specialists; and one interviewee had completed middle level. However, most of them have at least 10 years of experience working in the health sectors. Some of them have held high ranking administrative positions, such as, Director of the hospital, and Head of Department in the health sector (Table 33).

Table 33: Socio-demographics of Policymakers (Key Informants)

Infor- mants	Socio-demographic Characteristics			Working experiences
	Sex	Age	Education	Year’s Experiences
1	Male	57	MD graduate	15
2	Male	68	Medical College graduate	34
3	Male	56	MD, Specialist surgery	11.
4	Male	68	MD, Specialist of Ophthalmology	30
5	Male	56	MD graduate	24
6	Male	67	MD graduate	19
7	Male	57	MD graduate	21
8	Male	42	MD graduate, Specialist of Pediatrics	10
9	Male	52	MD graduate, Specialist of Anaesthesia	23
10	Female	53	MD graduate, MPH	27
11	Male	55	MD graduate, Master of Topical Disease	17
12	Male	60	MD graduate	25
13	Female	45	MD graduate	12
14	Male	52	MD graduate	22
15	Male	45	MD graduate	16
16	Male	55	MD graduate	25

8.2. Policy-makers' Opinion Toward Smoking Among Health Professionals

The majority of respondents when asked about their opinion on smoking among physicians agreed that the public might not accept the bad practice. This is especially true for those respondents who have never smoked or had totally quit smoking, including those who were knowledgeable about the health consequences of smoking, and who also believed that health professionals should act as role models by not smoking. Most respondents mentioned that the public might not accept smoking among health providers since medical doctors are believed to be people who should know better of all smoking consequences. Hence, health providers who smoke might not command the respect from the public when they provide health education and counseling on smoking cessation as well as the other health issues due to the negative image these health professionals project.

“In my opinion, people who never smoke would not accept physicians who smoke. They will criticize the physician’s smoking because they think that health care providers are knowledgeable person, and therefore they should not smoke; also they believe health care providers have a responsibility to be good role models”.

Regarding the various perspectives and attitudes toward smoking among health professionals, some of the respondents agreed that smoking behavior among physicians are generally accepted by the public as smoking is common in the society. This is particularly true for male physicians because they have to socialize. Therefore, it is very difficult to stop smoking among health care providers. However, some other respondents suggested that the socio-demographic, knowledge, and smoking behavior of health care providers can have an influence on the public’s acceptance of smoking among health care providers. One key informant said:

“Medical treatment is not based on the health provider’s smoking, but on their skills and abilities to provide health care services”.

8.3. Health Professionals as Role Models Against Smoking

Majority of respondents had mentioned that health practitioners should serve as role models for not smoking, because smoking is harmful to people’s health and medical doctors are respected people in the society. The majority of health care providers do believe they have an important role to play and think that health professionals should take on the responsibility as role models in terms of smoking cessation and promoting a smoke-free life through implementing preventive and curative health care. All of them agreed that physicians should be role models to stop smoking, which would be useful to persuade the general public and patients to avoid smoking which is hazardous. Major health care providers are usually at the frontlines of preventive primary health care; both primary care providers and other physicians should serve as role-models for appropriate health-related behaviors.

“I think that, health professionals should serve as role models of preventive primary care and observing good health behavior in order to advise patients and people to stop smoking by adopting a healthy behavior themselves.”

To this end, those health care providers who smoke should, firstly, quit smoking gradually or reduce the amount of cigarettes they smoke. A few of them mentioned that quitting smoking is a gradual

process given that there are personal and social reasons why it could not be stopped immediately. This observation is reflected in a statement made by one key informant:

“Health personnel should play a role in promoting a smoke-free life such as health care providers who smoke should try to stop smoking gradually. They should not smoke at the health institutions and health facilities in order to keep their position of respect and prestige among the public”.

Secondly, the respondents suggested that physicians should absolutely, concisely, and strongly decide for themselves to quit smoking once and for all, otherwise, they could not be good role models. Not only is smoking hazardous and incurs health expenditure, it is also inappropriate for the physicians’ status. Smoking could affect and cause them to lose their public image and prestige because the public and patients see them as role models of healthy behavior. Therefore, the importance of being a good role model is very important responsibility for a physician, However, policy makers should also initiate being good role models too for smoke-free living.

“The high ranking position among health providers, including the policy-makers, means that they should begin to be good role models in order to strengthen people’s beliefs about the hazards of smoking. Otherwise, the people will not take not smoking seriously whatever the health providers are giving them on health education, especially in educating them on the health consequences of smoking”.

Getting doctors to quit smoking can have profound effects on tobacco control. They become positive role models for patients and are far more likely to advocate for tobacco control than those who still smoke. Physicians have to be the good role models not just for quitting smoking, but also in providing counselling to patients to not to smoke as well as smoking cessation treatment and health education to the public in the form of anti-smoking campaign.

8.4. Regulation or Laws Related to No Smoking in the Health Institutions or other Institutions

The majority of respondents mentioned that there are regulations or laws related to no smoking in health institutions which they created prohibiting smoking at the hospitals; for example, smoking is prohibited in the hospital areas for all health staff as well as patients and their relatives by advocating through radio and reminding them whenever they smoked. Few of them mentioned that there were no regulations or laws related to no smoking in their health care facilities, because their facilities did not provide health services as well as there is no one who smoke in their offices. These were in the Centers of Maternal and Child Health, Malaria and Entomology Center and other Health Offices.

With regard to the smoking regulation as mentioned above, the respondents provided limited information when describing the smoking regulation and its context. Only a few respondents mentioned that they recognized and knew about the smoking regulations in the health institutions, but their descriptions was limited. On the topic of the no smoking regulations in the health sectors, statement such as the following was made:

“No patients, health personnel, nor the patient’s relatives should smoke in the health facilities areas, especially, in the patients and doctors’ rooms, or in each department in the hospital”.

On the other hand, one respondent mentioned that the health warning on the cigarette packages by law as well as the rule of no selling cigarettes in the hospital areas and nearby areas were implemented.

Moreover, health providers seemed not aware of the regulation on smoking in health institutions, with most of them had mentioned that they had not known about it. Some of them mentioned that they only heard about the regulation on no smoking declaration of the Ministry of Health, but they never saw or received any documents about it nor knew of the existence of any smoking-free policy in their respective health institutions. This is because the regulations related to the prohibition on no smoking as well as the smoking-free policy were not widely disseminated throughout the various health institutions. Only a few hospitals had established a free smoking zone in the city, such as “Mahosot Hospital, 103 Hospital”, “University of Health Sciences” and the 109 Hospital. Therefore, when physicians said that “Physicians are not aware of the smoking regulation because it never existed in Laos, except in other countries”, this statement should be seriously noted. This situation reflects the shortcomings of education campaign on the smoke-free zone policy and its implementation as well as the dissemination of information on smoking regulations among physicians.

8.5. Influences on Health Personnel’s Smoking Practices

Smoking is not only an individual behavior, but also a social behavior, influenced by peers, family members and working conditions. The smoking behavior among physicians started mostly after working in the health institutions. Some of them are occasional smokers, who might have experienced peer pressure, while they were in a group drinking, it was accompanied by smoking. A few respondents mentioned that the physicians smoked because they thought it made them look smart and manly in the public. This statement seemed indicated they try to adapt or take on smoking in order to increase their social value.

“I smoked only when I go out with my friends or my colleagues, especially when we go out to drink in beer shops”.

In addition, those physicians who smoked, some said they do so mainly to relieve themselves from the stress of working, especially, those who had to be on duty for long hours in the hospitals. For those working in remote areas, they said smoking had helped to keep mosquitoes away.

“I smoked a lot when I worked hard, especially when at night duty. When there were a lot of new admissions at night, I tended to smoke a lot”.

8.6. Smoke-free Policy of the Ministry of Health

The majority of respondents noted a prevailing low level of awareness of the smoke-free zone policy; and an existing restraint of the implementation of this policy. Some mentioned that they were not aware of the existing smoke-free zone policy of the Ministry of Health; and most respondents mentioned that they could not able to point out any health policy detail related to smoking; and there

was no official enforcement of smoke-free policy in their workplace. Only a few respondents said they were aware of the smoke-free policy that was put in place by the Ministry of Health in 2001. The policy bans smoking in schools, hospitals, government offices, restaurants and other public places

Some of the key informants mentioned that the smoke-free regulation or policy of the Ministry of Health as mentioned above was still not expanded extensively enough within the Central, as well as the Northern and Southern parts. The policy was implemented for a number of years in hospitals in the Central part, but it has yet to be implemented in hospitals and other health institutions in the Southern part of Lao PDR. However, in the Northern part, the smoke-free policy was enforced only in the whole Luang Prabang, but not yet to other provinces in the region. Indeed, the health policy related to the smoking-free policy was mentioned on the honorable certificate given to individual or organization which has shown the ability to apply the smoke-free policy that has been implemented in the Northern part, especially in Luang Prabang city which has been declared as the “Smoke-Free World Heritage” site. In the contrary, those who have not put into operation the smoking-free policy will be reminded and instructed to do so immediately.

However, the smoke-free policy within the hospital in the Central part is about prohibiting, advocating, and reminding those who smoke, but it still lack funding to produce the media materials such as brochures and posters to promote a smoke-free society and the hazards of smoking.

“Although, the smoke-free policy was implemented by providing advocacy and health education among health personnel, the public, and patients and their relatives on no smoking in the hospital area, however, it also lack funding for media materials production such as materials to encourage no smoking and on the health impacts of smoking”.

8.7. The Prevailing Limitation of Awareness on the Smoke-free Policy

According to the respondents’ understanding, smoke-free zones should be implemented only in the health care services sections of the hospitals, but not in other sections of the hospital facilities that are not related to health services such as the administrative office. Some of them mentioned that they did not implement the smoke-free policy as mandated by the Ministry of Health because actually nobody smoked in their office and that their workplace never provided services to patients.

Few respondents had mentioned the smoke-free policy that “no smoking is allowed in the health care service sections, including any offices or departments of the health sectors” and which calls for “advocating of the consequences of smoking and counseling to patients who smoke”.

As mentioned above, a few hospitals implemented the smoke-free zone for a few years now, in which they prohibited smoking among physicians, patients, and relatives of the patients, including advocating through radio and posters on the health consequences of smoking. The smokers in the health care services were reminded to stop or not to smoke in the non-smoking areas. However, there were some people who smoked in these areas because the smoking-free policy in each hospital did not include assigning a special room for smokers like in the other countries.

In Luang Prabang province in the North, it was declared the Smoke Free World Heritage on July, 2007. The smoke-free zone was implemented at government and non-government organizations places such as hospitals and private clinics; government and private schools; temples, hotels, guesthouses, other nightclubs; other public and tourist places such as market areas; the car and bus stations.

8.8. Integrate Lessons on Health Consequences of Smoking and Counseling Techniques in the Training Curriculum

The majority of respondents said that there were no lessons on health consequences of smoking and counseling techniques integrated into their training curriculum, especially in their workplace. This could be due to reasons that are related to the politics of tobacco production and the national economy. Some reasoned that since there had no import and manufacture of tobacco in the country, there would not be smoking among the people and the need to integrate such lessons in any training curriculum does not arise. Another reason cited was that given that the regulation and smoke-free policy of the Ministry of Health was limited and the advocating and promoting of quitting smoking was inadequate, how then could integrating lessons into the training curriculum be effective. Some of them mentioned that they never train their staff on the effects of smoking, because no one smoke in their workplace and their organization was never provided with such services, hence training and counseling were never considered.

However, a few respondents noted that they used to integrate some lessons on health consequences of smoking and counseling techniques in their training for their staff as part of the implementation of the smoke-free policy in their workplace. But their staff had to be retrained on the health hazards of smoking as well as on counseling techniques in order to be a skillful counselor to help patients to quit smoking. On the other hand, lessons on the topics of anatomy and physiology of the lung as they relate to the health consequences of smoking were integrated into the in-service training in order to improve their staff understanding on smoking. In addition, the techniques of smoking cessation are also an important topic for physicians in order to provide them the necessary knowledge when counseling on smoking cessation to the patients.

‘My staff who is working in the counselling sector was trained on the health impacts and counselling techniques in order to provide the best counselling to the public and patients to quit smoking. They also need to know in-depth techniques of smoking cessation’.

However, the majority of them suggested that there is a need to have comprehensive lessons integrated into the further training of health providers on the mechanisms of the health impact of the hazards of smoking, especially as they affect the lung, the heart, the blood vessels, and the brain; and how nicotine affects health. Some respondents mentioned that a refresher in-service training is of great importance to gain a better understanding of the health consequences of smoking, and also for the social and health expenditure impacts related to smoking. For example, on how a lot of money could be spent on buying tobacco and on medical expenditures when sick due to smoking. Apart from the smokers, there are also impacts on second-hand smokers, such as on their loved ones (children, wife or husband), family members, relatives, and other people surrounding the smokers. Hence, the awareness of both direct and indirect consequences of smoking needs to be understood in-depth and integrated into the in-service training of health providers. Otherwise, they will not be able

to be good counselors on smoking particularly in terms of providing clear explanations to their patients and others.

In my opinion, the integration into the service training of the health providers lessons on the mechanisms detailing the impacts on health as well as the socio-economic consequences of smoking is very crucial in order for them to gain a better understanding so that, not only could they provide the best explanation to their patients and the public but at the same time increase the latter's understanding.

8.9. Opinion on Counseling about Consequences of Smoking and Quitting Smoking

The majority of respondents mentioned about offering counseling on health consequences of smoking and methods of quitting smoking for the people which is very crucial and useful, because health professionals are powerful people who can persuade patients to quit smoking. Almost all respondents agreed that they should provide counseling on the consequences of smoking, and methods of smoking cessation, to help the public to stop smoking or quit smoking gradually, because most patients are more likely to believe in health professionals than the general public. Therefore, physicians should be equipped with skills in counseling techniques in order to be good counselors as well as good role models for encouraging people to quit smoking.

The majority of ideas regarding counseling procedure are classified in four ways. Firstly, counseling should be generated in the hospitals through the use of radio and posters in emphasizing the health impacts. Secondly, it would be better to use a face to face counseling technique at the end of the health treatment because this will encourage interaction between the counselor (doctor, or nurse) and the patient. Thirdly, it was suggested that there should be a radio hotline counseling center in order to provide information on the consequences of smoking and on quit smoking techniques to those who may not have a chance to go to the hospital, and/or might not want to have a face to face counseling session. Finally, it was suggested that a combination method involving radio and face to face counseling is crucial as it means that a person can see and hear thus increasing the interacting between counselor and patient.

However, the ideas above are expected to instill in the people/patient the necessary understanding of the health effects of smoking, in the hope that their awareness will lead them to decide to give up smoking. This will only be effective provided that the counseling centers are working regularly.

8.10. Policy Regarding Quitting Process and the Health Promotion Encouraging Medical Doctors to Stop Smoking in the Health Facilities

The majority of respondents suggested that a policy for quitting smoking and health promotion among physicians should be implemented as currently there is still a lack of official measures supporting smoking cessation among health professionals; as well as a lack in efforts to develop good role models among health policy makers.

The institutions or hospitals where doctors work also have an important role to play in tobacco control. Some mentioned that there is no official smoking policy in their workplace to support quit smoking among their staff, because smoking is not only an individual behavior, but also has a social dimension such as peer pressure, as well as the availability of tobacco products.

“There is no official smoke-free zone policy implemented in their workplace as well as the absence of leadership among health policy makers in stopping smoking; hence, it is very difficult to encourage the medical professionals to stop smoking”.

It has been suggested that it is crucial for high ranking policy makers to take the lead in not smoking because it is not only professional to do so, but also for public image.

It is important for policy makers to know that the professional practice of physicians is affected by their own habit which is demonstrated by the fact that physicians who smoke are less likely to be involved in smoking cessation counseling.

“Physicians who smoked were reluctant to counsel on smoking cessation because they also smoked and patients did not trust them. They could best persuade patients to quit if they themselves did not smoke”.

Some health professionals quit smoking because they recognized the negative health consequences of smoking or participated in the anti-smoking campaigns in their workplace. Some of them quit smoking when they became head or directors in their working place so that they could be role models to their staff as tobacco smoking usually project a negative image in the health care profession.

Some of them supported the sporting recreation activities which are very crucial among health professionals. The workplace introduced sporting activities in order to help physicians quit their smoking habit. For example, physicians who are able to stop smoking completely would be offered a certificate that would raise his/her image as a good role model to other people. Other sporting-related activities will also be organized during special days, such as, the National Day, World Anti-smoking Day, etc. in order to create a relaxing atmosphere for the physicians.

Another method employed to discourage health professionals from smoking is by imposing punishment on those who smoke. For example, if members of the staff, especially those in the health services, were found smoking, they would be warned not to do so the first time but would face punishment for subsequent offenses.

DISCUSSION

9.1. Smoking Prevalence of Medical Doctors

In this study, the smoking rate among medical doctors was 9.2%; which is lower than other studies carried out in China (16%) (Smith, *et al.*, 2006); in developed countries such as Denmark (15%) (Kannegaard *et al.*, 2001); Italy (28%) (Pizzo *et al.*, 2000); however, it was higher than the USA (7%) (Sotomas *et al.*, 2000); New Zealand (5%) (Hay, 1998); and the UK (4%) (McEwan & West, 1999). When stratified by sex, we found that the prevalence of smoking was 17.3% for men and 0.4% for women or about one third of the general population in Laos (males, 45%; females, 13%). In previous studies, such as the one carried out among physicians in one hospital in Laos (Mahosot Hospital) in 2003 revealed that the prevalence of smoking among male doctors was 35% (16% daily and 19% occasionally); while none of the female doctors ever smoked which was higher than that found in this study.

Compared to previous studies carried out in Asian countries, the smoking prevalence among male health professionals in this study (17.3%) is lower than in Malaysia (25%) (Yaacob, & Abdullah, 1993), China (32%) (Smith *et al.*, 2006), India (33%) (Sakar *et al.*, 1990); but is higher than in the USA (10%) (Corroa *et al.*, 2000). Our study found a small percentage of female physicians who smoked which was higher than Malaysia, Hong Kong and China, where none of the females smoked. It is evident that smoking entailed mostly males in the studied sample. This is largely due to social unacceptability of female smoking (Ernster *et al.*, 2000). Conversely, previous study carried out in Italy found the highest prevalence of smoking among female physicians (34%) (Zanetti *et al.*, 1998).

The highest smoking rates were seen in the older age group 41-50 years (48.1%), which corresponds to previous studies in China (Smith *et al.*, 2006); Japan (Ohida *et al.*, 2001). Furthermore, there were few smokers younger than 25 years, which is similar to study in New Zealand (Hay, 1998). Nevertheless, in some countries such as China (Smith, 2006, Japan (Kaetsu, 2002), Mexico (Tapia-Conyer *et al.*, 1997), India (Sakar *et al.*, 1990;) the highest smoking rates were found among the younger age group.

Furthermore, the physicians considered health concerns as the most important reasons why people should not smoke. Smokers considered self-discipline or setting good example as important reasons why doctors should not smoke. There were only 2 female physicians who smoked.

Male physicians who currently smoke (about 26.6%), consume 6-10 cigarettes per day, meaning that they are more likely to be moderate smokers. They show some signs of nicotine dependence which is illustrated by their smoking immediately after they wake up in the morning. This explains the finding of this study that 43.3% of physicians smoke within 1 hour of waking up.

The mean age at initiation of smoking is 21.28 years with 79.7% of smokers started to smoke before the age of 25 years. These findings are consistent with the studies in Turkey (Marakoglu, Kutlu & Sahsivar, 2006; Memon *et al.*, 2000).

About 84.8% of Lao medical doctors who currently smoked attempted to quit smoking and 74.7% indicated that they had made a serious attempt to quit smoking during last year, compared to more

than half of doctors in Syria (Maziak *et al.*, 1998). The literature suggested that less than 5% of self-quitters maintained their abstinence (Smoking cessation, 1993). This study revealed a higher rate among those who quit smoking, but they could not quit totally, an indication that their success rate is minimal unless there are active anti-smoking programs and specialized smoking cessation counseling.

It is interesting to note that the rate of smoking among physicians tend to be lower than that of the general population. This could be explained by the fact that physicians could access the health messages quickly; their devotion to health naturally conflicts with unhealthy behaviors and smoking projects a negative image of the medical profession among the public (Davis, 1993). He also mentioned that the smoking rate among the medical professions is a reflection of the maturity of the smoking epidemic in a particular country, as when the rate of smoking among physicians falls below that of the community.

9.2. Knowledge and Attitudes

The study suggested that the physicians had more favorable knowledge of the health effects of smoking which is similar to previous studies conducted in Bosnia (Hodgetts, 2004). However, our study revealed that medical doctors had low knowledge on fatality caused by tobacco and the impact on neonatal death due to smoking. The majority of Estonian physicians were aware of the association between smoking and various diseases, with significant differences between smokers and non-smokers (Perrin *et al.*, 2006). However, Tomson *et al* (2003) found that medical doctors from Mahosot hospital had a high degree of awareness of the link between smoking and cardiovascular and lung cancer; but low awareness about the association between smoking and osteoporosis and impotence.

With regard to attitudes toward anti-smoking, most of the physicians hold more positive attitudes toward anti-smoking measures and there were statistically significant differences in a complete ban of advertisements of tobacco products (p -value $<.001$); increasing cigarette price and ($p=.005$) and health professionals should get specific training on smoking cessation ($p=.014$), between non-smokers, current smokers and ex-smokers which were similar to studies in Bosnia and the USA (Hodgetts, 2004; Parna *et al.*, 2005; Perrin *et al*, 2006). A previous study conducted in Mahosot hospital (Tomson *et al.*, 2003) also revealed similar findings such as support for the banning of advertisements of tobacco products and an increase in cigarette prices.

Gunes *et al.* (2005) found that negative attitudes of physicians about smoking cessation counseling negatively affected their practices. A study by Ohida *et al.* (2001) also suggested that non-smoking physicians had more unfavorable views toward smoking and were more active in encouraging patients not to smoke than those physicians who smoked. Willaing and Ladelund (2004) also reported that individual smoking behavior among hospital staff was strongly associated with smoking-related knowledge, attitudes, and counseling practices.

According to the health behavior theory, there is a correlation between knowledge, attitude and practice in human behavior. Having a high level of knowledge might lead to positive attitudes and good practice. However, our study found that though physicians had more favorable knowledge, an

indication that they acknowledged some harmful effects of smoking, there was, however, no statistically significant difference in knowledge between smokers and non-smokers. In addition, physicians possessed more favorable attitudes toward smoking which correlated with knowledge of health effects of smoking between smokers and non-smokers among them.

9.3. Health Professionals as Role Models in Tobacco Control

The literature suggested that doctors, because of their unique position in the community and depending on their smoking status, can play an important role in assisting patients to stop smoking. The majority of physicians in this study agreed that medical doctors should routinely advise smokers about smoking cessation; while non-smokers were more likely to agree to this statement than ex-smokers and current smokers. Similarly, Perrin *et al.* (2006) & Ohida *et al.* (2001) also found that medical doctors have a key role to play in influencing their patients in the context of smoking. The highest levels of agreement were with statements that health professionals should routinely advise patients who smoke to not smoke in front of children, to quit smoking if they smoke, and that they should regularly ask patients if they smoke. Previous researches carried out in Mahosot hospital, Lao PDR indicated that 93% of them stated that their knowledge was sufficient to give advise to patients to stop smoking (Tomson *et al.*, 2003). According to the World Health Organization (WHO), “Health professionals are encouraged to personally exhibit and promote a tobacco-free lifestyle. The advice and treatment given by health professionals can be a major factor in whether or not a person tries and succeeds in quitting smoking.”

The qualitative data revealed that the majority of health providers perceived that physicians should be moral models in smoking cessation by encouraging the general public and patients to quit smoking. This finding corresponds to previous studies which suggested that physicians, as role models, can have a significant effect on the smoking behavior of the general public in that their smoking habits have been found to be effective means to predict changes in the smoking habits of the general population (Farquhar, 2005).

Similarly, a study conducted among medical students in Nigeria in 2002, agreed that doctors should play a major role in health promotion and education about tobacco prevention and cessation such as educating lay groups against smoking, convincing people to stop smoking, training on counseling about smoking prevention and cessation (Faseru *et al.*, 2006).

According to *Doctors and Tobacco: Medicines Big Challenge*, by David Simpson, health professionals have a unique potential to contribute to tobacco control in several complementary ways: as role models in not smoking, or quitting smoking; in counselling patients not to smoke; in providing smoking cessation treatment; in organizing and speaking out publicly and lobbying for comprehensive public policies to control tobacco use.

9.4. Smoke-Free Policy

The results indicated that about two quarters reported that there was no smoking policy at their workplace; while 52% of them pointed out that smoking are not allowed in all premises. It means that smoking policy has yet to be introduced throughout the country; thus there is a need to expand and disseminate the smoking policy to the health facilities at the provincial levels.

Most doctors in this study supported smoke-free policy in their health facilities. It is therefore important for tobacco prevention in Lao PDR that all health facilities and institutions implement a smoke-free policy and that health professionals do not smoke since they can be regarded as role models to patients and the general public. There are some health facilities in the Vientiane Capital City such as the National University of Health Sciences which has implemented a smoke-free policy; however, the smoke-free policy is not yet adopted throughout the country. As the majority of respondents in the in-depth interviews has mentioned, this is due to a prevailing limitation of awareness on the smoke-free policy; and a restraint in the implementation on free-smoking zones.

According to the in-depth interview with the directors of hospitals in Vientiane Capital City, the smoke-free policy has only been introduced in 2006. Similarly, Luang Prabang province has also launched the smoke-free policy in 2007 that included health facilities and health offices. The aim of the smoke-free policy in the health facilities is to provide a smoke-free environment for non-smokers and a pleasant and cleaner environment for all.

The former Faculty of Medical Sciences that has been renamed as the University of Health Sciences, has just implemented the smoke-free policy in 2006, which is a measure to reduce the number of new smokers and second-hand smoke and to provide protection from exposure to tobacco smoke inside workplaces, public places and other places. The smoke-free policy is not intended to stop people from smoking but to regulate where they smoke and how second-hand smoke affects others.

Since the policy has only been adopted by medical staff in Vientiane Capital City and Luang Prabang province to date, there is therefore a need to utilize multiple modes of communication to increase awareness of the policy amongst health staff, patients and visitors in other provinces in the hope that it would eventually be introduced in these areas.

9.5. Factors Associated with Smoking among Medical Doctors

The study confirmed evidence of several determinants of smoking among medical doctors. Factors that influence them to smoke included age, and attitudes after controlling for confounder variables. These findings were similar to previous studies by Lian Zhang *et al.* (2006) which reported that gender, age, education background, revenue, section, hospital administration, level harmful knowledge of tobacco scale, relationship between smoking and illness scale and doctors' social norm attitude were related to doctors' smoking behavior.

9.6. Limitations

The limitations of this study must be acknowledged. The nature of this study is cross-sectional study; thus the causes and effect could not be examined. The target group of this study is medical doctors who are working in administrative and treatment, including researchers and public health workers; hence generalization of the findings could be limited to only the medical doctors and not other types of health professionals. It is possible that recall bias or information bias might have occurred as medical doctors who were smokers might be reluctant to tell the truth.

CONCLUSION

This is the first nationwide study of the knowledge, attitudes and practices regarding smoking among health professionals, especially medical doctors in Laos. The prevalence of smoking among medical doctors within the medical community in Laos is low at 9.2% with daily smoking rate at 5.0%, where the number of male doctors smoked compared to female doctors is 17.3% versus 0.4%. The prevalence of smoking among physicians in this study is lower than that of the general population (38%). Only 2 female physicians (0.4%) who currently smoked – one (0.2%) smoked daily and the other (0.2%) occasionally; while 17.3% of male doctors smoked with 9.3% smoked daily and 8% smoked occasionally.

Almost all medical doctors have a high level of knowledge on the health consequences of smoking and hold favorable attitudes toward anti-smoking, with smokers having more positive attitudes toward anti-smoking than non-smokers. There was a positive correlation between knowledge and attitudes toward anti-smoking for all physicians and for non-smokers. Determinants of smoking status in this study were age and attitudes toward anti-smoking status.

The majority of doctors strongly supported tobacco control measures. Physicians with a high level of knowledge of the effect of smoking are more likely to support tobacco control and medical doctors with positive attitudes toward routinely providing advise those people who smoked to quit smoking are more supportive for tobacco control ($p=0.016$). In addition, the study also supported the hypothesis that physicians who are also smokers have lower support for tobacco control than non-smokers.

With regard to being role models, the majority of Lao medical doctors acknowledged that they should serve as good role models to the public and their patients by leading a tobacco-free life. In addition, they have to provide health counseling regarding quitting smoking and cessation treatment; however, many physicians said that they are not yet ready to be health educators on smoking cessation.

RECOMMENDATIONS

Based on the findings, there are some recommendations related to smoking and promotion of quit smoking among health professionals:

- Policymakers, especially those working on health matters, are the most appropriate people to be role models for stopping smoking. This is because they would have a greater appreciation of the regulations due to their position, which hopefully will lead to the implementation of the government's smoke-free policy throughout the entire health system in the country.
- It is essential that medical doctors actively promote quit smoking campaigns for their patients, public and for themselves. A focused and sustained anti-smoking campaign by the health facilities and the Ministry of Health may also be useful in controlling the smoking epidemic among the medical professions.
- The first step in remedying this situation is for the Ministry of Health, Medical and Nursing schools, central and provincial hospitals as well as clinics to bring their practices in line with their knowledge and enforce a total ban on smoking in their premises.
- Setting a good example applies to the University of Health Sciences. Hence, a thorough revision of the curricula, teaching methods, conditions of admission and requirements for graduation is urgently needed in order to introduce the necessary amendments that would enable graduates to set an ethical and practical example for the rest of society.
- Courses in tobacco control treatment can be offered and even mandated within the curriculum. Tobacco control responsibility can be incorporated into orientation lectures and brochures for incoming medical students and integrated into the in-service training or during their specialization.
- Advocate for national tobacco control legislation that provides grants for programs that recruit and train doctors in smoking cessation treatment.
- Prevent hospitals from selling tobacco, and promote a smoke-free hospital environment throughout the country.
- Likewise, the smoke-free policy as well as regulations related to smoking should be officially reviewed, advocated, and medical doctors and other health professionals should be counseled on the consequences of smoking and quitting smoking technique regularly. This is to remind the health professionals of their responsibilities as role models for a tobacco-free life.
- Enforcement of the law banning smoking in public places is important and a revision of the tobacco policy in the country is needed. Recently, the Ministry of Health revised the tobacco policy into a law on tobacco.

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APPENDICES

Appendix 1: Questionnaire Survey on Tobacco Use among Medical Doctors in Lao PDR

You are being invited to participate in a research study that will investigate the smoking behaviors and knowledge and attitudes about smoking among medical doctors, including physicians, specialists and public health officials in Lao PDR .The study being conducted by members of the Faculty of Medical Sciences, National University of Laos.

The questionnaire should only take about 25 minutes to complete. It is anonymous, meaning that we do not ask that you put down your name on the questionnaires. Please also be assured that all responses are strictly confidential and will only be used by the research team for this study.

Your participation in completing this questionnaire is voluntary. If you decide not to take part, it will not affect your participation in the Faculty of Medical Sciences, National University of Laos in any way.

Finally, when the study is completed, we will be sending the results to each province so that everyone has access to them. Also, the principal investigator will organize the dissemination workshop at the central level and we may organize a dissemination workshop in the Northern and Southern provinces.

For more details on this study, you may contact

Dr. Alongkone Phengsavanh, the Principal Investigator at email ogalk@yahoo.com
Dr. Vanphanom Sychareun, Director of Postgraduate Studies and Research Division
Email: vsychareun@yahoo.com

Questionnaire Survey on Tobacco Use among Medical Doctors in Lao PDR

Name of supervisor.....

Name of interviewer.....

Name of survey health facility.....

Province:----- District-----

Working Place-----

Types of surveyed health facility: (one answer)

1. Central Hospital, Section.....
2. Provincial Hospital, Section.....
3. District Hospital, Section.....

I. Socio-demographic Characteristics

No	Variables	Categories	Skip
101	What is your gender?	1. Male 2. Female	
102	How old are you?	-----	
103	What is your Nationality?	1. Lao 2. Chinese 3. Vietnamese 4. Thai 5. Half breed, specify	
104	What is your religion?	1. Islamic 2. Buddhist 3. Christian 4. Other	
105	What is your current marital status?	1. Single 2. Married 3. Cohabiting 4. Separate 5. Divorce 6. Widow	
106	What is your education?	1. PhD 2. Specialist 3. Master 3. Bachelor 4. Other	
107	Responsibility?	1. Administrative 2. Technical 3. Both 4. Other.....	
108	Do you provide treatment?	0. No 1. Yes	

II. Cigarette Smoking and Other Tobacco Use

No	Questions	Categories answers	Skip
201	Which of the following best describes your smoking behavior?	1. I have never smoked cigarettes 2. I have quit smoking 3. I currently smoke occasionally 4. I currently smoke everyday	Q202 Q205 Q202 Q211
	For those who have not smoked:		
202	Do you think that in the future you might experiment with cigarettes?	1. Definitely not 2. Probably not 3. Probably yes 4. Definitely yes	
203	At any time in the next year do you think that you will smoke a cigarette?	1. Definitely not 2. Probably not 3. Probably yes 4. Definitely yes	
204	If one of your best friends were to offer you a cigarette would you smoke it?	1. Definitely not 2. Probably not 3. Probably yes 4. Definitely yes	Q301 Q301 Q301 Q301
	For those who smoked in the past (Ex-smokers)		
205	When you did smoke in the past, how often did you smoke?	1. Occasionally (Some days) 2. Daily	
206	How old were you when you first tried a cigarette on a regular basis?	Age-----years	
207	On the days that you smoked, how many cigarettes did you smoke a day?	Average-----/day	
208	Have you ever used <u>hand rolled cigarettes, snuff, or pipes</u> ?	1. Smoke occasionally 2. Smoke everyday	Q220
209	On the days that you smoked, how many <u>hand rolled cigarettes, snuff or pipes</u> do you smoke a day?	Average-----/day	
210	Have you ever used <u>hand rolled cigarettes, snuff or pipes</u> in office/hospital buildings during the past year?	0. No 1. Yes	
211	How old were you when you stopped smoking completely?	Age-----years	Q220
	For those who currently smoke (Current Smoker)		
212	How old were you when you first tried a cigarette on a regular basis?	Age-----years	
213	How many cigarettes do you smoke a day?	Average-----/day	
214	Have you smoked 100 cigarettes in	0. No	

	your life?	1. Yes	
215	Have you ever stopped smoking for at least one week?	0. No 1. Yes	
216	Which of the following best describes how you feel about smoking?	1. Not ready to quit smoking within next 6 months 2. Thinking about quitting within 6 months 3. Ready to quit now	Q301 Q301 Q301
217	Have you smoked cigarettes in office buildings during the past year?	0. No 1. Yes	
218	Have you ever used <u>hand rolled cigarettes, snuff, and others</u> ?	1. I currently smoke occasionally 2. I currently smoke everyday	Q220
219	Have you ever used <u>hand rolled cigarettes, snuff or pipes</u> in office/hospital buildings during the past year?	0. No 1. Yes	
220	How many <u>hand rolled cigarettes, snuff or pipes</u> do you smoke a day?	Average-----/day	
221	How do you purchase commercial cigarettes? (More than one answer is possible)	1- as single cigarettes 2- in a pack 3- both 4- don't know/refuse to answer	
222	How much did you spend on cigarettes in the past week?Enter price in Kip	
223	Indicate your reasons for STARTING to use any tobacco (cigarette, chewing tobacco, pipe), (more than one answer is possible)	1. Experimenting 2. Fashionable 3. Social Pressure 4. Get Rid of Fatigue 5. To keep insects (example: mosquitoes) away 6. Warmth during Agricultural Work during the Rain Season 7. Influence of Older Relatives 8. Sorrow/Depression 9. To appear more attractive 10. To help with "Morning Sickness" 11. Due to being given "free cigarettes" while in the army 12. Stress 13. Easier to meet new people 14. Decreases hunger for food (decrease appetite)	
224	During the past 7 days, how many of those days did people around you (in	-----days	

	places other than where you live or work) smoked?		
225	How soon after you wake up do you smoke your first cigarette?	-----minutes	
226	What are the places that you smoked more often?	1. In residence 2. In building office 3. In hospital/health center 4. Others	
227	Do you want to quit smoking now?	0. No 1. Yes	
228	Have you tried to quit smoking within the past year?	0. No 1. Yes	Q230
229	How long ago did you stop smoking cigarettes?	-----months -----years	
230	What are the methods used to quit smoking?	1. Cold turkey 2. Drug therapy 3. Weaning 4. Others	
231.1	Do you receive advice to quit smoking?	0. No 1. Yes	Q232.2
231.2	If yes, from whom do you receive advice?	1. Doctor/Nurse 2. Lay people 3. Other monks 4. Media 5. Others	
232	Do you want to stop using chewing tobacco, snuff, bidis, cigars or pipes now?	1. I have never used chewing tobacco, snuff, bidis, cigars or pipes 2. I do not use chewing tobacco, snuff, bidis, cigars or pipes now 3. Yes 4. No	
233	What was your primary reason for quitting smoking? (quitting during the time described) (Select only 1 answer)	1. Illness (at or before time of quitting), 2. Health (at or before time of quitting) but wanted to prevent illness, 3. Seeing illness develop in other smokers, 4. Family Disapproval, 5. Health Education Program, 6. Not enough money to buy tobacco, 7. Disapproval of friends and co-	

		workers, 8. Don't know/refuse to answer	
234	Why can't you quit smoking?	1. Don't know how 2. Just don't want to 3. No advice 4. Others	

III. Knowledge About the Health Effects of Tobacco Use

No	Statement	No	Yes
301	Smoking is harmful to your health		
302	Nicotine in tobacco is highly addictive		
303	People can get addicted to cigarette smoking just like they can get addicted to cocaine or heroin		
304	Neonatal death is associated with passive smoking		
305	Maternal smoking during pregnancy increases the risk of Sudden Death		
306	Passive smoking increases the risk of <u>heart disease</u> in non-smoking adults		
307	Passive smoking increases the risk of <u>lung disease</u> in non-smoking adults		
308	Paternal smoking increases the risk of lower respiratory tract illnesses such as pneumonia in exposed children		
309	Tobacco kills more people each year than illegal drugs, AIDS and car crashes which causes death		
310	Smoke from cigarettes is harmful to people who are repeatedly exposed to it, not just to the smoker		

IV. Attitudes About Tobacco Use and Tobacco Control

No	Statement	Strongly agree	Agree	Disagree	Strongly disagree
401	Tobacco sales to children & adolescents should be <u>banned</u>				
402	There should be a <u>complete ban</u> of the advertising of tobacco products				
403	Health warning on cigarette package should be in <u>big print</u>				
404	Sport sponsorship by tobacco industry should be <u>banned</u>				
405	Smoking in all enclosed public places should be <u>banned</u>				
406	Smoking should be banned at the				

No	Statement	Strongly agree	Agree	Disagree	Strongly disagree
	Hospitals/Health Care Centers and Medical Institutions				
407	The price of tobacco should be increased sharply				
408	HP should serve as role models to their patients and the public				
409	Patient's chances of quitting smoking are increased if a HP advises him/her to quit.				
410	HP should routinely ask about their patients' smoking habits.				
411	HP should routinely advise their smoking patients to quit smoking				
412	HP who smoke are less likely to advise people to stop smoking				
413	HP should routinely advise patients/people who smoke to avoid smoking around children				
414	HP should get specific training on cessation techniques to be able to educate their patients on how to avoid using tobacco				
415	HP should speak to community groups about smoking				

V. Worksite Practice

No	Questions	Categories answers	Skip
501	Where is your workplace located?	1. Urban 2. Suburban 3. Rural	
502	Have you ever heard of or seen the smoke-free policy of the Ministry of Health (MOH)?	0. No 1. Yes	
503	What sort of smoke-free policy is in place at your workplace?	1. No smoking policy 2. Smoking rooms available 3. No smoking allowed at all on the premises	Q 504 Q503 Q503
504	Is the smoke-free policy of the MOH reinforced or implemented in your workplace?	1. Yes, always 2. Yes, sometimes 3. No 4. Don't know	
505	Selling cigarettes in the hospital/health center should be banned?	0. No 1. Yes	
506	Selling cigarettes nearby the hospital/health center should be banned?	0. No 1. Yes	
507	Which of the following best describes your hospital/office smoking policy for indoor public or common areas (i.e., lobbies, restrooms, dining areas)?	1. Not allowed in any public or common area 2. Allowed in some public or common areas 3. Allowed in all public or common areas 4. No official policy	
508	Have you ever received any formal training in smoking cessation approaches to use with patients? - Formal training in medical or nursing school - Formal training during specialization - Special conferences, symposia or workshops - Other, explain----- -	0. No 1. Yes 0. No 1. Yes 0. No 1. Yes	
509	Have you ever got training on quit smoking counseling?	0. No 1. Yes	
509.1	During your (medical, dental, nursing, or pharmacy) school training, were you taught in any of your classes about the dangers of smoking?	0. No 1. Yes	

	For those who are working at the hospital with patients		
510	Are the following interventions available to help your patients stop smoking? a. Traditional remedies b. Self-help materials c. Counseling d. Medication (Nicotine gum, patch) e. Others, specify----- --	0. No 1. Yes 0. No 1. Yes 0. No 1. Yes 0. No 1. Yes	
511	In the past 30 days, have you ever given advice to your clients or someone to quit smoking?	0. No 1. Yes	
512	Have you ever advice your clients about the effect of smoking to people during the past 30 days?	0. No 1. Yes	
513	How well prepared do you feel when you are counseling patients on how to stop cigarette smoking?	1. Very well prepared 2. Somewhat prepared 3. Not all prepared	
514	Have you ever appeared in the media or any meetings or forums to talk about problems of tobacco use on health?	0. No 1. Yes	

VI. Intention To Participate In Tobacco Control In The Future

No	Questions	Categories answers	Skip
601	Should tobacco control training be integrated into training curriculum for pre-service training of health professionals during their religion education?	0. No 1. Yes	
602	Should health professionals get specific training on cessation techniques?	0. No 1. Yes	
603	Should health professionals routinely advise their patients who smoke to quit smoking?	0. No 1. Yes	
604	Should health professionals routinely advise people who use other tobacco products to quit using these products?	0. No 1. Yes	
605	Should health professionals serve as “role models” in participating and implementing the smoke-free health facilities?	0. No 1. Yes	
606	Should health professionals serve as “smoke-free life role models” for the public?	0. No 1. Yes	
607	Should health professionals serve as “role models” in advocating policy makers to advance tobacco control policy?	0. No 1. Yes	

Appendix 2: Guidelines for In-depth Interviews with Policymakers (Key Informants)

The following questions were posed to each interviewee.

1. Key demographic information (age, general education, administrative positions, working experiences)
2. What do you think about smoking among Health Professionals? Is it acceptable for medical doctors to smoke? Why? What do you think about medical doctors as role models?
3. What do you know about the regulation or law related to smoking in hospitals/teaching faculties? What were the influences *on smoking practice among health professionals*?
4. What sort of smoke-free policy is in place at the health facilities/MOH? Is smoking policy enforced? If yes, Why? If no, why not?
5. Are there any lessons on smoking in the training curriculum? What are they?
6. What do you think about providing counseling about the effect of smoking to people? On quitting smoking?

What are the policies regarding the quitting process and on health promotion to encourage *medical doctors* to stop smoking in the health facilities/MOH? What are they? If none, why?



About SEATCA

The Southeast Asia Tobacco Control Alliance (SEATCA) works closely with key partners in ASEAN member countries to generate local evidence through research programs, to enhance local capacity through advocacy fellowship program, and to be catalyst in policy development through regional forums and in-country networking. By adopting a regional policy advocacy mission, it has supported member countries to ratify and implement the WHO Framework Convention on Tobacco Control (FCTC)

Contact persons:

Ms. Bungon Ritthiphakdee: **SEATCA Director**

Email: bungon@seatca.org

Ms. Menchi G. Velasco: **SEATCA Research Program Manager**

Email: menchi@seatca.org; menchi55@yahoo.com

Southeast Asia Tobacco Control Alliance (SEATCA)

Address: Thakolsuk Apartment Room 2B, 115 Thoddamri Rd., Nakornchaisri
Dusit, Bangkok 10300, THAILAND

Tel./Fax: +662 241 0082

Website: <http://www.seatca.org>
