AN APPLICATION OF ECOLOGICAL MODEL FOR IMPROVING SMOKING BEHAVIOR AMONG THE CONSCRIPTS IN THE ROYAL THAI ARMY

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Thesis
entitled

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LTC. Pannee Pantaewan

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AN APPLICATION OF ECOLOGICAL MODEL FOR IMPROVING SMOKING BEHAVIOR AMONG THE CONSCRIPTS IN THE ROYAL THAI ARMY

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ABSTRACT

This research was a quasi-experimental study designed to evaluate the effectiveness of a smoking cessation program based on an ecological model for improving smoking behavior among conscripts at three levels of behavioral change intervention; the intrapersonal level, the interpersonal level and the organizational level. The program applied processes of change in a Transtheoretical model (TTM) for intervention at the intrapersonal level. Social support from the family was used for the interpersonal level intervention and strengthening policies and activities to support quitting, including providing a smoke-free workplace, was used for the organizational level intervention.

The 89 participants of this study were purposively selected from the first infantry regiment of conscripts from the King's Royal Guard recruited into the Army in the first conscription section of 2009 and were used to test a trial of the behavioral change intervention process throughout their first six months of duty. One of the instruments used to collect the data was a self-administered questionnaire used between May 2009 and November 2009. In addition, the individual interviews and checklists of observations were employed to collect data. Data was analyzed using inferential statistics to compare mean by paired t-test, and a chi-square was used to analyze correlation. Data mining was used to predict influential factors in smoking behavior. The qualitative data were thematically analyzed.

The results revealed that the conscripts were able to change their smoking behavior. 62.9% of participants reduced smoking, and 4.5% quit smoking The number of cigarettes smoked per day were reduced at the significance level of p <0.001. In terms of cognitive change, there was a significant improvement in having self-efficacy to control smoking behavior, and an effort to quit at the level of p= 0.002, p < 0.001, respectively. In addition, the data mining analysis showed that having self-efficacy was the best model to predict smoking behavior. Behavioral factors, e.g., duration of smoking and the number of cigarettes smoked per day, was the next best model. Moreover, organizational intervention also had an influence on changes in smoking behavior. In short, smoking cessation programs based on an ecological model should be conducted at the intrapersonal, and organizational levels to change conscripts' smoking behavior for the better. Consequently, it can be concluded that a smoking cessation program based on an ecological model can effectively help conscripts reduce, or even quit smoking during their service in the Army.

KEY WORDS: ECOLOGICAL MODEL / SMOKING BEHAVIOR / CONSCRIPTS

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การประยุกต์แบบจำลองเชิงนิเวศสำหรับการปรับเปลี่ยนพฤติกรรมการสูบบุหรี่ในทหารเกณฑ์ กองทัพบกไทย

AN APPLICATION OF ECOLOGICAL MODEL FOR IMPROVING SMOKING BEHAVIOR AMONG THE CONSCRIPTS IN THE ROYAL THAI ARMY

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บทคัดย่อ

การศึกษาครั้งนี้เป็นการวิจัยกึ่งทดลอง มีวัตถุประสงค์เพื่อประเมินประสิทธิผลของโปรแกรมการปรับเปลี่ยนพฤติกรรมการสูบบุหรี่ในทหารเกณฑ์โดยประยุกต์ใช้แบบจำลองเชิงนิเวศในการออกแบบกลวิธีและกิจกรรมใน 3 ระดับ คือ ระดับบุคคล ระดับระหว่างบุคคลและระดับองค์กร ในระดับบุคคลใช้เทคนิคกระบวนการปรับเปลี่ยนพฤติกรรม ในระดับระหว่างบุคคลใช้แรงสนับสนุนทางสังคมจากครอบครัวหรือบุคคลที่มีความสำคัญกับทหารเกณฑ์และในระดับองค์กรใช้นโยบาย คำสั่ง และการจัดกิจกรรมที่สนับสนุนการเลิกสูบบุหรี่รวมทั้งการสร้างสิ่งแวดล้อมของหน่วยงานให้ปลอดบุหรี่

กลุ่มตัวอย่างเป็นทหารเกณฑ์ผลัดที่ 1 /52 ของกรมทหารราบที่ 1 มหาดเล็กรักษาพระองค์ที่สูบบุหรี่ก่อนเข้ามาประจำการ จำนวน 89 คน โดยได้รับโปรแกรมการเลิกสูบบุหรี่เป็นเวลา 6 เดือน ตั้งแต่เดือนพฤษภาคม 2552 ถึงเดือนตุลาคม 2552 เก็บรวบรวมข้อมูลโดยใช้แบบสอบถามประเมินผล 2 ครั้ง ในระยะก่อนให้โปรแกรมและ 6 เดือนภายหลังการให้โปรแกรม วิเคราะห์ข้อมูลโดยใช้สถิติเชิงอนุมานในการเปรียบเทียบความแตกต่างของค่าเฉลี่ยด้วยสถิติทดสอบที วิเคราะห์ความสัมพันธ์ระหว่างปัจจัยด้วยสถิติไคสแควร์ วิเคราะห์ปัจจัยทำนายการปรับเปลี่ยนพฤติกรรมการสูบบุหรี่โดยการทำเหมืองข้อมูล และวิเคราะห์ข้อมูลเชิงคุณภาพด้วยการวิเคราะห์เชิงเนื้อหา

ผลการศึกษาพบว่า หลังได้รับโปรแกรมการเลิกสูบบุหรี่ ทหารเกณฑ์มีการปรับเปลี่ยนพฤติกรรมการสูบบุหรี่ในทางที่ดีขึ้น โดยกลุ่มตัวอย่างสามารถเลิกสูบบุหรี่ได้ 4.5% สูบบุหรี่ลดลง 62.9 % ปริมาณมวนบุหรี่ที่สูบต่อวันลดลงอย่างมีนัยสำคัญทางสถิติ (p <0.001) กลุ่มตัวอย่างมีความสามารถของตนเองในการควบคุมการสูบบุหรี่และมีพฤติกรรมการพยายามเลิกสูบบุหรี่ดีขึ้นกว่าก่อนได้รับโปรแกรมอย่างมีนัยสำคัญทางสถิติที่ p= 0.002, p < 0.001 ตามลำดับ นอกจากนี้การวิเคราะห์ปัจจัยทำนายพฤติกรรมการสูบบุหรี่ด้วยโปรแกรมเหมืองข้อมูลแสดงให้เห็นว่า ปัจจัยการรับรู้ความสามารถของตนเองในการควบคุมการสูบบุหรี่เป็นปัจจัยหลักที่สำคัญที่สุดของการทำนายการปรับเปลี่ยนพฤติกรรมการสูบบุหรี่ รองลงมาคือ ปัจจัยด้านพฤติกรรมการสูบบุหรี่ ได้แก่ ระยะเวลาการสูบบุหรี่และปริมาณการสูบบุหรี่ อีกทั้งยังพบว่า การให้โปรแกรมในระดับองค์กรมีอิทธิพลต่อการปรับเปลี่ยนพฤติกรรมการสูบบุหรี่อีกด้วย ดังนั้นการนำโปรแกรมการเลิกสูบบุหรี่โดยการประยุกต์แบบจำลองเชิงนิเวศไปใช้ขยายผล ควรดำเนินการอย่างน้อยใน 2 ระดับ คือ ระดับบุคคลและระดับองค์กรเพื่อสามารถปรับเปลี่ยนพฤติกรรมของทหารเกณฑ์ในการลดหรือเลิกสูบบุหรี่ได้ในระหว่างการเข้ารับราชการทหาร

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LIST OF ABBREVIATIONS

TTM	Transtheoretical Model
BMT	Basic Military Training
PHC	Primary Health Care Unit
HQ CO	Headquarters Company
HVY MORT CO	Heavy Mortar Company
AT PLT	Antitank Platoon
APC PLT	Armored Personnel Carrier Platoon
Precont.	Precontemplation stage
Cont.	Contemplation stage
Prep.	Preparation Stage
Action	Action Stage
Maint.	Maintenance Stage
SE	Self-efficacy
SS	Social support
Pros	Pros of smoking
Cons	Cons of smoking

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CHAPTER I
INTRODUCTION

1.1 Background and rationale

Tobacco consumption is the leading preventable cause of death in many countries. Many researches and findings showed the negative effects of tobacco consumption on health and increasing the number of affected people (WHO, 2005). Cigarette smoking is the major cause of disability and premature death, for instance, lung cancer and other organs, chronic obstructive pulmonary disease, chronic bronchitis and ischemic heart disease (Mackey et al., 2006). Moreover, smoking is harmful not only to smokers but also to non-smokers including spouses, children and anyone elsewho may suffer from passive smoking as those who actively smoke. Millions of people, including one half of the world's children, are exposed to second-hand smoke, known as passive smoking. Currently, there are around 1.3 billion smokers in the world. The death from tobacco consumption is 4.9 million people a year and if tobacco consumption still be continued, the number of deaths will increase to 10 million by the year 2020, and 70% of the deaths will occur in developing countries (WHO, 2005). By the year 2030, according to current projections, tobacco consumption will be the leading cause of death and disability, killing more than 10 million people annually, thus causing more deaths worldwide than HIV, tuberculosis, maternal mortality, motor vehicle accidents, suicide and homicide combined (Hurt, 1999).

People in many countries have initiated smoking cigarettes at younger ages under 15 years (WHO, 1997). The smokers who started smoking at an early age were more likely to become heavy smokers and have a high risk of smoking-related diseases more than those who began smoking at later ages (WHO, 1993). Therefore, cigarette smoking in adolescence or young adult is an urgent health problem that should be prevented and stopped. Martin (2007) reported global youth smoking situation in 2002 that smoking of youth aged 13 to 15 was about one in five worldwide

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smoking. 80,000 and 100,000 children worldwide start smoking every day, and half of them live in Asia. The U.S.A data showed young adult smoking rates becoming equivalent to or even greater than those of other adults. The same as the National Health Survey, smoking prevalence rates among young adults have remained high and relatively stable which were 24.5% in 1990 and 23.6% in 2004 (Soldberg et al., 2007).

In Thailand, smoking is the second most significant risk factor affecting Thai health, with approximately 42,000 Thais died from smoking-related diseases annually which were the last two decades. (Sitthipan, 2008).The smoking prevalence of current smokers in 2006 showed that the people with the age of 41-59 years was the highest smoking rate around 25.81%, followed by the age of 25-40 years, 19-24 years, more than 60 years, and 15-18 years respectively. The prevalence of current smokers who are older than 15 years old decreased from 12.26 million in 1991 to 11.03 million in 2006. Of these number, female smokers decreased from 0.95 million to 0.73 million and male smokers decreased from 11.3 million to 10.31 million. It was found that the number of occasional smoker is increasing from 0.60 million to 1.5 million, while the number of daily smokers is decreasing. Males had a prevalence of smoking ten times higher than females. When considering the change from 1991 to 2006, the rate of young adult and adult smokers still decreased slowly. The prevalence was high among the less educated population (Benjakul et al., 2007). It was found that 92.5% of current smokers became addicted to smoking before 24 years of age (Vathesatogkit, 2004).

Several studies found that cigarette smoking prevalence was higher among military employees than in the general population (Joseph et al., 2005; Owen, 2003; Bushnell, 1997; Cronan, 1991). Evidence has shown those who were smokers before military services, more than 99.0% continued to smoke after military service (Joseph et al., 2005; Chu et al., 2006). Many soldiers in Thailand, including the conscripts who are younger adults are also current smokers. The previous research showed that the smoking rates among soldiers were higher than 50% and the conscripts who did not smoke before entering to the military service changed their behavior and began smoking (Seksarnviriya, 1992; Prommobol, 2003; Ketgudee, 2004; Eakbannasingh, 2007).

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Military personnel who smoked are at risk for increased illness, decreased physical fitness and reduced endurance capacity that leads to increase risk of injury, decreased productivity, and increased hours lost to sickness (Jensen, 1986; Marsden et al., 1988; Sienko et al., 1992). The reasons of smoking among the recruits in U.S. military were imitation, curiosity, friends who are smoking, a calming effect and wanting to be cool (Cronan et al., 1991). In Thailand, the reasons of smoking among younger age groups, including the conscripts were wanting to try, decreasing stress, imitation,having idle time and feeling lonely (Seksanviriya et al., 1992, Prommobol, 2003). The conscripts tried to stop smoking but were unsuccessful because of stress and seeing their friends smoked (Prommobol, 2003).

Tobacco control in Thailand began in 1986. A non-governmental organization, “No-Smoking Campaign Project” was established and now its name is the Action on Smoking and Health Foundation. Afterwards, the National Committee for the control of tobacco use was established under the Ministry of Public Health in 1989 and 1990. Since 1992 Thailand has had two good pieces of legislation to control tobacco consumption: the Non-Smokers’ Health Protection Act and the Tobacco Products Control Act. The Ministry of Public Health is responsible to enforce the laws by authorizing officials to monitor compliance. Throughout the period, the Action on Smoking and Health Foundation has continuously worked for tobacco consumption control. The important activities included the Project for Smoke Free in many settings, e.g. school, temple, workplace, home, restaurants etc. and the New Generation of No-smokers Project and No-smoking Thai Woman Project. In 2005, Thailand signed and later ratified the WHO Framework Convention on Tobacco Control (WHO FCTC) which impacts on tobacco consumption of the population. The strategies of the law enforcement for smoke free environments and anti-smoking activities have been done rigorously. At present, the expansion of smoke-free zones cover in all of public places, such as buses, government agency transports, toilets, medical clinics, cinemas, hotels, restaurants, department stores etc. The impact from the enforcement is the more effective protection of non-smokers’ health from smoke, it can also reduce the prevalence of smoking among population (Supawongse, 2007). Despite its success in preventing four million people from smoking and becoming a good model for other countries, there are still more than 10 million Thai smokers. The smoking prevalence

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among males is 37 percent, which is still high when compared with 25-29 percent in developed countries. Therefore, tobacco consumption control must continue to reduce the number of male smokers, assisting people who want to quit smoking, preventing youths and more females from smoking (Mackay et al, 2006; Supawongse, 2007).

Thailand has implemented universal health care coverage for all Thai citizens so active smokers should have a free access to smoking cessation services. Smoking cessation services are available in most provincial and district hospitals and from recent survey. There are more than 300 healthcare facilities that provide smoking cessation, but there are still problems in providing effective smoking cessation for Thai smokers. Most of the smoking cessation services are managed by individual hospital/ clinic and many smokers don't have access to effective treatment. The effective pharmacotherapy is not reimbursable by universal health care coverage and smokers usually have to pay for medication costs which considered being expensive in Thailand. There are some strategies to improve smoking cessation services, for example, national quit line, anti-smoking and smoking cessation project aims to develop effective approaches of quitting smoking and model for smoking cessation clinic, setting up of Thai health alliance against tobacco, and making effective pharmacotherapy (Sitthipan, 2008).

The activities for tobacco control in the military emphasize to the policy bans on smoking. In 1986 the Department of Defense (DOD) of U.S. Military reported on smoking and health and the strong evidence for adverse health effects of tobacco products, the Secretary of Defense mandated an intensive anti- tobacco campaign and established the Army Tobacco Cessation Action Plan . Tobacco use was banned in all U.S. military work facilities worldwide in 1994 (Carroll et al, 1989). The U.S. Navy prohibits tobacco use during recruit training for the entire 8–week duration of basic training. The results revealed that the smoking ban was moderately effective in helping smokers quit smoking and stay stopped for the long term (Hurtado & Conway, 1996; Conway et al., 2004). The Army Medical Department of Thai Military joined the smoke free hospital project of the professional health network to promote health professionals to be the role models and created a smoke free workplace in 2005; after that the Army hospital started the activities for smoke free hospital. During 2004-2006, the Royal Thai Armed Forces started a vigorous campaign to encourage the

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soldiers to reduce and stop smoking. The project's name is the Ministry of Defense Smoke Free Project. The activities focus on setting the areas for smoke free zone and smoking areas, survey the prevalence of smoking among the army officers, and promoting exercise for the soldiers to support quitting. However, some military areas can conduct only some parts of the activities. In addition, this project does not have smoking cessation activities to help or support the soldiers to quit smoking. Therefore, most army officers including the conscripts cannot access smoking cessation program in the military.

The benefits on smoking cessation, according to U.S. Surgeon General's report (USDHHS, 2000) are that people who quit, regardless of age, live longer than people who continue to smoke. Smokers who quit before age 50 have half the risk of dying before the age of 65 when compared with those who continue to smoke. Various methods and approaches have evolved to assist smokers wishing to stop their habit ; support groups, hypnosis, acupuncture, a variety of nicotine adjuncts and education on the effects of smoking and creating and applying coping mechanisms such as biofeedback, mental imagery, relaxation techniques and breathing exercises (Chollat-Traquet, 1996). Multi-component programs which contain behavioral, cognitive and, perhaps, a pharmacological component are favored because they usually produce greater quit rates at one year follow up than single component programs, with quit rates which range from eight to twenty- five percent, and relapse rates of 70 to 90 percent (Moffatt & Whip, 2004) and include a higher level of intrinsic motivation relative to extrinsic motivation (Curry et al., 1997). In spite of using the combination program, the average range of continued abstinence after a smoking cessation intervention was between 30-50% in 3 months after treatment and abstinence drops to between 20% and 30% by 6 months to 1 year later (Fiore, 1990). Previous studies indicated that 70% or more of participants in formal smoking cessation programs would relapse to smoking status within a year (Rice et al., 1994; Shiffman, 1993; Wynd, 1992). Most smokers relapsed during the first 90 days after program completion (Shiffman, 1993; Bushnell, 1997; Conway et al., 2004). In U.S., however, over 90% of people who quit on their own started smoking again within a year (Chollat-Traquet, 1996).

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The determinants related to smoking are relevant to intrapersonal factors, e.g., socio-demographic and psychosocial factor. In addition, smoking is often influenced by social forces (interpersonal factors) and the environment (institutional, policy and community factors). Therefore, the tobacco control program should approach in multi-level because the environments, particularly the policy can control cigarettes consumption. It is now believed that extensive multilevel interventions targeting individuals, social norms, policy and regulatory initiatives, and environmental change by reducing availability of cigarettes have led to long term changes in smoking rates (CDC, 1999). McLeroy and colleagues (1988) proposed an ecological model of health behaviors that identified multi level of influence. These levels include intrapersonal or individual factors, interpersonal factors, organizational or institutional factors, community factors and public policy. Kothari et al., (2007) reviewed the intervention research on tobacco control from 333 articles published in tobacco control from 2001-2006 and found that the majority of the interventions examined only individually-oriented interventions. There are no multiple levels of intervention anti-tobacco and less than 25% of the articles examine the interventions targeted at other level. Therefore, the authors recommend to apply the ecological perspective in the intervention research on tobacco prevention and cessation for effective outcomes.

The conscripts are the group of soldiers who have been recruited to the military. After completion of the services, they become a labor-force group of the community who can support and improve their community in several aspects. The researcher did a preliminary study in 2008 aimed to explore the determinants, behaviors and experiences related to smoking and smoking cessation among the conscripts and investigate the organizational structure, the culture of the soldiers, the policy and activities related to smoking and health of the 1st infantry regiment, King's Royal Guard and the three battalions in Bangkok. The results guide the ways to develop smoking cessation program. The data revealed that most conscripts were current smokers. They had ever tried to quit but they failed because of craving when they saw someone smoking. They lived or contacted with many smokers, especially their closed friends. Most of them were in precontemplation stage (72.4%). They are under the enforcement ban on smoking during BMT for 2 ½ months, nearly all of

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them can stop smoking but after they are allowed to go back home, they returned to smoke. The relationships in the family and the environments in the military could influence them to smoke or not smoke. Some conscripts had the family's member who smoked such as father, brother, however, their mothers frequent warn them to quit smoking. Most conscripts perceived the harmful effects of smoking but some of them perceived pros of smoking more than pros of quitting such as smoking can help them relax and relieve tired, especially, when they are bored and get stress during staying in the military. According to the interviews, campaigns or projects related to tobacco control of the 1st infantry regiment had not been done. In addition, there were not any cessation programs for the soldiers, including the conscripts in the military.

Based on the preliminary study, it is suggested that most conscripts decided to quit smoking because of the request from their families, health concern and economic problem. Most of them relapsed because they felt craving during drinking alcohol and seeing their friends smoking. The support from their families would help the conscripts to control cigarette smoking. Cohen (1990) reported that social support is associated with successful cessation and remaining abstinent. The role of a spouse or a person who closely followed the quit effort has also been examined.

The environmental factors, especially social influences can increase cessation and promote reduction in cigarette consumption. The atmosphere and culture of the soldiers consisted of smoking and drinking alcohol, therefore, smoking cessation in military needs to facilitate change in organizational culture. One strategy to control cigarette smoking is relevant to the regulation of ban on smoking and smoke free workplace. Glynn et al (1990) and Borland (1990) suggested the strategies to promote smoking cessation at the worksite or workplace, e.g., formal smoking policy, informal campaigns, smoking restriction and bans, incentive program, smoking cessation clinics. Thus, the methods for sustained cessation and prevention of smoking should create better environments in the workplace for a shift to a smoke free workplace when optimum policy or rules are used in developing the program. Ban on smoking during basic military training should be informed to the conscripts.

Hence, the conscripts who are younger adults and have smoked for a few years should be supported to quit smoking in the military because they have peer group to increase motivation to quit together and the situation during BMT is suitable

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to continue quitting after the enforcement ban on smoking, therefore, it is essential to develop the cessation program to encourage the conscripts to quit smoking. From the empirical evidence, most smokers relapsed during the first 90 days after program completion, so the interventions based on ecological model for health promotion which focuses on both individual and social environment factors as target for health promotion interventions are likely to help the conscripts to quit smoking and remain abstinent because there are relevant factors in many levels that influence them to smoke or quit and prevent relapse from literature reviews and preliminary study.

Therefore, this study focused on applying ecological model for program planning and implementing smoking cessation to the conscripts. The interventions targeted at changing in intrapersonal, interpersonal and organizational factors. For intrapersonal level intervention, the program applied processes of change in TTM to increase the motivation to quit, self-efficacy to quit smoking, skill enhancement and prevent relapse. Evidence is discovered that smokers move through a series of stages of change in their efforts to quit smoking (Prochaska & DiClemente, 1983). In order to avoid relapsing in the individuals, the strategies of coping skill and stress management training are needed for relapse prevention. The interpersonal level applied social support from the family or significant others to support the conscripts to quit and maintain abstinence, including emotional support, informational support and appraisal support. The intervention in the organizational level aimed to change in the organization because it is necessary to support long term behavior changes among individuals, and essential component of creating an organizational culture supportive of health issues. The organizational characteristics such as management and supervisor support, increasing competency of the training officers about smoking cessation, setting rules and regulations about smoking restrictions, the use of incentives, and creating smoke free environments have been used to support in smoking cessation program.

Thus, the objective of this study was to examine the effectiveness of smoking cessation program based on ecological model in improving smoking behaviours among the conscripts of the First Infantry Regiment, King's Royal Guard. The benefit of this program would increase the conscripts to reduce a number of cigarettes smoked or quit smoking in long term. In addition, it could encourage the

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commander and staff officers to set the policy and create the activities related to tobacco control in the military including, change the organizational climate and culture about smoking to enable the army officers to move toward smoking cessation that would reduce medical costs associated with tobacco use and the related negative effects on combat readiness. Moreover, the benefit from this study was for program diffusion to implement for the conscripts in other military units to quit smoking and eventually reduce the prevalence of smoking among the Thai population as a whole because these young men would be dispersed throughout the country when their service ends, and consequently increased the number of healthy people in our country.

1.2 Research Questions

1.2.1 To what extent, the multi-levels smoking cessation program based on ecological model assisted the conscripts in changing their smoking behaviour.

1.2.2 What are influencing factors supporting smoking behavior change of the conscripts after attending the program.

1.3 Research Objectives

1.3.1 To evaluate the effectiveness of smoking cessation program applied ecological model on improving smoking behavior among the conscripts.

1.3.2 To explore the multi-factors of psycho-sociodemographic and environmental factors of the model such as perceived pros and cons of smoking, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior, attempt to quit behavior which have influenced on smoking behavior.

1.4 Research Hypotheses

The hypotheses of this study are as follows:

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1.4.1 After program implementation, the conscripts who received the intervention in applying ecological model can change smoking behavior positively.

1.4.2 Psycho-socio-demographic characteristics, pros of smoking, cons of smoking, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior and attempt to quit behaviors can facilitate changes of the smoking behavior among the conscripts after program implementation.

1.5 Operational Definitions

1.5.1 Anapplication of ecological model for improving smoking behavior refers to smoking cessation program based on ecological model targeted at changing in intrapersonal, interpersonal and organizational factors regarding smoking behavior change, physical and social environmental change. The multi-levels of the interventions are as follows:

1.5.1.1 Intrapersonal level refers to the intervention aims to change the attitude, behavior, skills of the conscripts by using the package intervention consisted of six sessions which are applied from the seven processes of change in TTM (consciousness raising, dramatic relief, self-reevaluation, self-liberation, stimulus control, counter conditioning, and reinforcement management). The objectives of the seven processes of change are to increase motivation to quit, self-efficacy to quit and enhance skills for cessation, deal with craving and prevent relapse. For maintain abstinence, the conscripts received telephone counseling from the researcher at least one time/month to feed back and follow up during the 3rd month to 6th month.

1.5.1.2 Interpersonal level refers to the intervention applied social support from the family or significant others to give emotional, informational support and appraisal support to the conscripts. The intervention consisted of two types of family support.

1) Family support by training via face to face with booklet. The researcher gave the booklet to the family at the military, discussed with the family for advice and support the conscripts to quit smoking at home following the guidelines in the booklet.

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2) Family support by training via telephone with booklet. The researcher gave the booklet to the conscripts to bring to their families at home, then phoned and discussed with them to support the conscripts to quit.

1.5.1.3 Organizational level refers to the intervention focused on strengthening and forming the policy related to tobacco control and organizational development. The activities consisted of group meeting and discussion with the commander, staff officers, training officers and health care providers to form committees, inform the policy about smoking in the workplace, set the activities regarding tobacco control in the military such as provide smoke free workplace, train the training officers about smoking and smoking cessation, provide recreational activities and exercise for the conscripts.

1.5.2 Improving smoking behavior refers to the outcomes of smoking cessation intervention which consist of overt and covert behaviors. This study measures from the perception and smoking behavior. The perceptions are perceived pros and cons of smoking, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior, attempt to quit behaviors and stages transition. Smoking behavior are the behaviors of the conscripts to change their smoking such as reduce or stop smoking.

1.5.2.1 Perceived pros and cons of smoking refers to the perception of the conscripts by weighing between perceived positive(pros) and negative (cons) of smoking. It is measured by the decisional balance scale which consists of 20 items (10 items of pros and 10 items of cons) with a 5-point scale (1 = not important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important) (Velicer, Diclemente, Prochaska, Brandenburg,1985).

1.5.2.2 Perceived self-efficacy to control smoking behavior refers to the perception of the conscript on his ability to control smoking in the situations or when they have temptation to smoke, assessed by using self-efficacy/temptation questionnaire of Velicer, DiClemente, Rossi et al, (1990). It provides a measure of confidence in resisting smoking in situations represented by the items with a 5-point scale. There are three subscales that measure broad aspects of

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self-efficacy to resist smoking; positive affect/social situation, negative affect situations, and habitual/craving situation.

1.5.2.3 Perceived social support to control smoking behavior refers to aids and assistance exchanged through social relationships and interpersonal transaction focusing on emotional, informational and appraisal supports from a conscript's parent, partner (wife, girlfriend) or significant others. It is assessed by Partner Interaction Questionnaire (PIQ) which consisted of negative and positive behavior subscale with a 5-point scale (Mermelstein, Cohen, Lichenstein, Baer, and Kamarck,1986).

1.5.2.4 Attempt to quit behavior refers to the behavior to do for quitting smoking such as reduce the number of cigarettes smoked, do the alternative behaviors to avoid smoking, the behaviors that should do during quitting to reduce craving which are measured by self-report of questionnaires.

1.5.2.5 Smoking behavior refers to the conscripts who can quit smoking, reduced a number of cigarettes smoked or not change cigarettes consumption after receiving smoking cessation program.

1.5.3 Stages of change refers to a person's readiness to change from smoking to quitting which is accomplished through five progressive stages**:** precontemplation, contemplation, preparation, action, and maintenance. This study classifies the conscripts by stage algorithm before implementation. It is measured by questionnaire asking whether the conscripts are seriously considering planning to quit smoking. *Pre-contemplators* are those who answer no to quitting within the next 6 months; *contemplators* are those planning to quit within the next 6 months, or planning to quit within the next 30 days without a recent quit attempt; and those in the *preparation stage* plan to quit within the next 30 days and had a recent quit attempt at least one 24 hour quit attempt within the past year. *The action stage* is the conscripts who quit smoking for less than 6 months, and those who quit smoking for more than 6 months are in the *maintenance stage.*

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1.6 Scope of the study

This research was conducted for applying ecological model to improve smoking behavior among the conscripts of the Royal Thai Army during May to November 2009. The implementation of the study started when the newly registered conscripts were recruited into the Army in the first section of the year 2009. The intervention in intrapersonal level emphasized to behavioral modification, therefore, it did not use nicotine replacement therapy to assist the conscripts for changing their smoking behavior.

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CHAPTER II
LITERATURE REVIEWS

The relevant theories and concepts guiding in this study are presented in the following topics; 1) Cigarette smoking: situation of cigarette smoking both global and Thailand ,burdens or Impacts from smoking , factors related to cigarette smoking; 2) Organizational structure of the 1st infantry Regiment, King's Royal Guard; 3) Smoking behavior and cessation 4) Smoking Cessation Intervention 5) Theoretical concepts

2.1 Cigarette smoking

2.1.1 Situation of cigarette smoking

Tobacco use has been identified as an important risk factor for many non-communicable diseases both in developed and developing countries (WHO, 2002).The prevalence of smoking in men is more than women. Almost 1 billion men in the world smoke, about 35 percent of men in developed countries, and 50% of men in developing countries. Trends in both developed and developing countries show that male smoking rates have now peaked and slowly, but surely, are declining. Tobacco is killing nearly 4 million men every year. In general the higher-educated man is giving up the habit first, so that smoking is becoming a habit of poorer, less educated males. China recognized the magnitude of the problem because of consuming more than 30% of the world's cigarettes, with almost 70 percent of males still smoking. The top 10 countries for heavy smokers with highest reported smoking rates among men 2005 were Yemen 77%, Djibouti 75 %, Cambodia and China 67%, Kazakhstan and Republic of Korea 65%, Armenia 62%, Russian Federation, Samoa 60% and Guinea 59%. About 25 million women in the world are daily smokers; 22% of women in developed countries smoke and 9 percent of women in developing countries smoke. In

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some part of South Asia, prevalence of oral tobacco use is estimated to be as high as 30 percent in females, compare with 25 percent in males. (Mackey et al., 2006)

Martin (2007) reported global smoking statistics among youth in 2002 and showed that, among young teens (aged 13 to 15), about one in five worldwide smokes. Between 80,000 and 100,000 children worldwide start smoking every day, roughly half of whom live in Asia, and evidence shows that around 50% of those who start smoking in adolescent years go on to smoke for 15 to 20 years. In U.S., recent data showed young adult smoking rates becoming equivalent to or even greater than those of other adults. According to the National Health Interview Survey, smoking prevalence rates among young adults have remained high and relatively stable. Smoking rates in this group were 24.5% in 1990 and 23.6% in 2004 (Soldberg et al., 2007). The 2005 National Survey on Drug Use and Health showed that rates of current cigarette smoking among adults peaked at 41.2% among young adults aged 21 to 25 years, compared with a rate of 22.3% for persons aged 35 years or older (Curry et al., 2007). Many young adults who smoke only a few cigarettes per day do not consider themselves to be smokers and therefore may not be receptive to the usual cessation messages, particularly those highlighting the health hazards of smoking (Husten, 2007).

In Thailand, the number of current smokers who are older than 15 years old decreased from 12.26 million in 1991 to 11.03 million in 2007.The smoking rate decreased from 32 % to 21.91%. Female smokers decreased from 0.95 million to 0.73 million and male smokers decreased from 11.3 million to 10.31 million. When comparing daily smokers and occasional smokers, the report showed that daily smokers decreased from 11.67 million to 9.54 million while occasional smokers increased from 0.59 million to 1.5 million. Therefore the rate of occasional smokers increased from 1.54 % to 2.97 %. The male population had a prevalence of smoking ten times higher than the female, but the trend of prevalence among occasional female smokers is rapidly increasing. However, the rate of smoking in the total population is decreasing, but the number of young adult and adult smokers still decreased slowly (Benjakul et al., 2007).

Several studies found that cigarettes smoking prevalence was relatively higher among military employees than in the general population in many countries. A

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high prevalence of smoking in the military has also been reported in U.S., Norway, Canada, Great Britain and Israel. Evidence showed that those who were smokers before military service, >99.0% continued to smoke after military service. The high frequency risk group were the military non-commissioned officers and privates (Tekbas et al., 2002). Military personnel are more likely to engage in heavy use of cigarettes (Joseph et al., 2005). In Taiwan, the prevalence among 7,931 young military conscripts before and during military service were 49.2% and 51.9% respectively. The military service is a potential factor associated with starting cigarette smoking for adolescents and young adults. Possible explanations include greater exposure to tobacco products and advertising, peer pressure, stress, boredom, inexpensive cigarettes and lack of other forms of recreation during military service (Chu et al., 2006).

In Thai military, the smoking rate has been higher than the general population. like other countries. Many soldiers in Thailand are current smokers. A study among 2,187 soldiers in Khon-Kaen province found that 50.5% were smokers. Some of them had tried to stop smoking but they did not succeed. Most smokers preferred to smoke after a meal and while drinking alcohol. The reasons for smoking were decreasing stress, following their friends, wanting to try, having idle time and feeling lonely (Seksarnviriya et al., 1992). The study in Adisorn Fort indicated that the smoking rate of 558 conscripts was 93.7%. Some of them had started smoking between 10-12 years old. Almost half (43.24%) tried to stop smoking but were unsuccessful because of stress and the numbers of their friends who smoked (Prommobol, 2003).

2.1.2 Burdens or impacts from smoking

Smoking is a known risk factor for chronic obstructive pulmonary disease, cardiovascular disease and a cause of different cancers because there are more than 4,000 chemicals in cigarette smoke that affect human organs and biological functions (Warner et al., 2006).The evidence base confirms that smokers face significantly increased risks of death from numerous diseases, particularly lung cancer, heart disease, stroke, emphysema and many other fatal and non-fatal diseases. Smoking is responsible for 90% of all lung cancers, 75% of chronic bronchitis and emphysema,

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and 25% of ischemic heart disease (Mackey et al., 2006).About 8.6 million people have at least one serious illness caused by smoking, a pernicious habit that leads to more than 440,000 deaths each year, or one in every five deaths, resulting in annual direct medical costs of more than $75 billion and $82 billion in lost productivity (CDC, 2002). Furthermore, smoking costs the United States more than $100 billion each year in healthcare and lost productivity costs (CDC, 2001).

Smoking accounts for 12 percent of global adult mortality, with more men dying from smoking in developing countries than in industrialized countries, but with smoking rates increasing among women in many developing countries (Mackey et al., 2006). Currently, approximately four million people worldwide die each year from smoking-induced diseases in both developing and developed countries. Over the next 50 years, tobacco use is projected to lead to 450 million deaths worldwide (CDC, 2005b).The World Health Organization predicts this figure will rise to 10 million a year by 2030, of which seven million deaths will occur in developing countries (WHO, 1999). Smoking has been linked to a number of both long-term and short health problems. Besides suffering negative health consequences and decreased physical fitness, smokers cost employers more than nonsmokers because of higher health care needs, lost productivity and increased absenteeism (Cronan et al., 1989). Non-smokers exposed to second hand smoke have an increased lung cancer risk of between 20 percent and 30 percent, and a 25 percent increased risk of heart disease. Exposure to secondhand smoke in the home, workplace, and public areas also kills tens of thousands of non-smokers every year (Mackey et al., 2006). Currently, nonsmokers are affected from the exposure to environmental tobacco smoke (ETS) that causes about 35,000 deaths annually from ischemic heart disease and 3,000 deaths from lung cancer among adult nonsmokers (CDC, 2003a, 2003b).

Women and children also suffer additional risks from tobacco. Smoking during pregnancy is dangerous to the mother as well as to the fetus and may result in developmental problems that haunt children throughout their lives. Maternal smoking during pregnancy is responsible for many fetal deaths and is also a major cause of Sudden Infant Death Syndrome. Health risks due to smoking n pregnancy are spontaneous abortion, ectopic pregnancy, abruptio placenta, premature birth and others. Effects for fetus, infants and children are smaller infants, birth defects, e.g. oral

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clefts and limb reduction, reduced lung function and long-term physical and mental effects. Exposure to secondhand smoke during childhood compounds the adverse effects of fetal exposure. Cigarettes low in tar or nicotine do not reduce smoking hazards. However, quitting greatly reduces health risks and produces immediate and long term health benefits (Mackey et al., 2006).

Besides affecting health and increasing risks of illness, smoking also affects to military efficiency, including negative effects on fitness as measured by their performance on the Army Physical Readiness Test (Jensen, 1986). The previous studies indicated that smoking could reduce endurance capacity in military smokers and reduce muscle endurance, leading to early fatigue and increased risk of injury. Moreover, further studies have demonstrated that the smoker is to some extent visually challenged in darkness, requiring some 20% more time to readapt following a flash. The frequency with which smokers cough, the lighting of a cigarette or the smell of the tobacco can give away the soldier's location which may identify a soldier's position which affects effectiveness in combat (Owen, 2003). The military personnel who smoked one or more packs of cigarettes per day were more likely to experience illness and report more physician visits and hospitalizations compared with nonsmokers (Marsden et al., 1988). The previous study found that those who smoked more than 10 cigarettes per day had the greatest risk (36%) for coronary heart disease; others found increased upper respiratory infection and days lost from training, advanced periodontitis, and crucial variance in lipoprotein levels (Bushnell, 1997). This is a similar to the results from a cohort study in 1,087 male and 915 female Army recruits undergoing 8-week basic military training, which found that during the 8-week training period, 33% of men and 50% of women had at least one clinic visit for injury, including 14% of men and 25% of women who lost more than 5 days of training due to injury. Recruits who reported smoking at least one cigarette in the month prior to beginning basic training had significantly higher injury rates during training than those who did not report smoking (Altarac et al., 2000). Smoking has also been identified as an important determinant of ill-health in the British Armed Forces and as a risk factor for exercise-related injuries in basic training. (Robbins et al., 2000). In addition, Miedinger (2006) found the conscripts who smoked had

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respiratory symptoms, such as regular cough, at a significantly higher rate than the non-smokers and former smokers.

The economic burden of smoking-related disease in Thailand has been investigated by estimating the direct out-of-pocket medical costs of treating major diseases attributable to smoking in 2006. A prevalence-based, disease-specific, approach was used to estimate the direct medical costs of treating lung cancer, chronic obstructive pulmonary disease (COPD), and coronary heart disease (CHD) attributable to smoking. The result revealed that number of cases attributable to smoking was 5,299 for lung cancer, 624,309 for COPD, and 52,605 for CHD. The out-of-pocket expenditures for treatment were 368.49 million baht for lung cancer, 7,714.88 million baht for COPD, and 1,773.65 million baht for CHD. Total smoking-attributable out-of-pocket medical costs amounted to 9,857.02 million baht, or 0.48% of GDP in 2006 (Leartsakulpanitch et al., 2007). Therefore, the health and economic impacts of smoking in Thailand are substantial, and should be reduced by implementing smoking-cessation and related tobacco control policies.

2.1.3 Factors related to cigarette smoking

Cigarette smoking starts during a stage in children's and adolescents' lives when they are experiencing rapid, profound, physical and psychological development. There are many reasons that influence them to smoke. It is a complex behavior, and have many factors to initiate smoking .

2.1.3.1 Socio - demographic factors

Initially, the people who have higher socioeconomic status (SES) were more likely to smoke cigarettes. However, since the first Surgeon General's report in 1964, the profile of cigarette smokers has reversed. Cigarette smokers now are more likely to be poor and less educated (Benjakul et al., 2007). The well educated may have higher levels of health literacy, and were more responsive to messages concerning health-promotion and disease-prevention behaviors and beliefs (USDHHS, 2000). Additionally, the poor may have the least information on the health risks of smoking, the fewest resources, and the least access to cessation services. Socioeconomic disadvantage is associated with persistent smoking, and consequently the burden of smoking-related disease. Can et al. (2009) examined the risk factors

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contributing to regular smoking in adolescents in Turkey and found that the risk factors for male students to smoke were they had their mothers ,fathers, siblings and friends who smoked with statistically significance (p <0.01).

2.1.3.2 Psychosocial Factors

Emery, et al 1993; Murphy& Price, 1988 found that the lower the self-esteem of high school students the higher the frequency of smoking behavior. They often smoked due to peer pressure and felt "cool". Buller et al., (2003) found that the children in grades 6-9 in USA had positive attitudes toward smoking with regard to factors such as the mental effects, appearance features and safety of smoking and were less concerned about the negative physical and social consequences than ever users. As well as attitudes, social norms and perceived behavioral control can predict adolescent smoking in China (Guo et al., 2007). In addition, Smith (2007) examined the role of psychosocial factors in accounting for adolescents' smoking intentions. Participants from three high schools were surveyed to assess smoking-related characteristics and behaviors by applying a theory of planned behavior. The results revealed that attitudes, subjective norm (perceiving norms discouraging cigarettes' use) and perceived behavioral control were all associated with non-smokers' intentions to smoke. Having more favorable attitude toward remaining tobacco free and perceiving that friends would not be supportive of smoking were both associated with decreased likelihood of intending to smoke. Normative influence and peer use were significant factors, such that merely having more friends who smoke was associated with increased odds of intent to smoke. In Taiwan, the study of predictors of cigarette smoking behavior among military university students revealed that the main reason for first contact with smoking was curiosity. Avoiding the stress and the difficulties of smoking cessation explained continuing smoking behavior. Age, peer influence, and self-efficacy were major predictors of student smoking behavior (Wang et al., 2009)

2.1.3.3 Environmental Factors

The social contexts can influence adolescents smoking. The study among 92 children in grades 6-9 ages 11-15 years in public school in Tucson, Arizona and in New Mexico found that current users lived in social context with more smoking and where smoking was normative. They were more likely to perceive that smoking was normative among their peers, and to have more smoking friends, have

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their friends see them as smokers and consider smoking as more permissible in their home (Buller et al., 2003). As well, the qualitative study in 40 college-age smokers from 12 Pacific Northwest colleges revealed that social influences were strongly associated with both smoking and cessation (Thompson et al., 2007). The study of environmental factors such as availability of cigarettes, sales of single cigarettes, and positive social attitudes toward smoking were examined and found to facilitate or act as barriers to cessation among African American young adult. Young adults can buy or purchase cigarettes from street vendors and stores easily. Smoking is promoted as a normative behavior. The influences associated with increased prevalence of smoking and lack of interest in quitting are industry-targeted advertising as well as marketing and promotion campaigns that permeate the physical and social environments of these young adults, including special promotions at bars and clubs (Stillman et al., 2007).

In China, cigarette smoking prevalence was significantly different with respect to the particular branch of military service, educational level and duration of service. Highest smoking prevalence rate occurred in a Navy at a lower education level and variation in environmental factors such as smoking restrictions, working conditions and management policies might account for differences among service branch. Joseph et al., (2005) also found military personnel are more likely to engage in heavy use of cigarettes, especially in the Army and Navy. Social influences also related to cigarette smoking in the soldiers the same as in adolescents. Haddock et al., (1998) found that factors of social influences on smoking, for example, percentage of friends who smoke, predicted percentage of U.S. Air Force personnel who smoke and rating of the social attractiveness of smoking are the strongest predictors of smoking status among those USAF Basic Military Training (BMT) at Lackland Air Force. Specifically, basic trainees who had smoked before basic training were more likely to use other drugs, for example, alcohol, binge drinking and smokeless tobacco, and were less physically active. Therefore, BMT provides a unique setting to address social influences on smoking. The empirical evidence also demonstrated that during military service, an increase in daily consumption or initiating of smoking has been correlated with having a best friend who smoked, dissatisfaction with the military services, physical inactivity and frequent alcohol consumption. Tekbas et al., (2002) reported that one of the high frequency risk groups occurred within the military non-

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commissioned officers and privates in Turkey. The military is a unique environment, with a hierarchical organization, strict discipline and exhausting training, in which men are distant from their families and loved ones. Soldiers are at a particularly high risk for starting to smoke

Tobacco use among recruits in the military depended on the company commanders. Some recruits may have smoke less during recruit training because the opportunities to smoke were restricted by the company commanders. In addition, perceptions related to tobacco use, perception of their peers as discouraging tobacco use, and the behaviors and attitudes of the company commanders may also be an important influence on recruits' smoking behavior. Many company commanders used smoke breaks as a motivational tool. Thus, smoking may have become highly valued by some recruits. Use of smoking as a reinforcement and the modeling of smoking behavior by the company commanders may contribute to some recruits taking up the smoking habits and other not quitting (Cronan et al., 1989).

The study of multiple factors related to cigarettes smoking behavior among the conscripts in Adisorn Fort, Saraburi province in Thailand by applying PRECEDE -PROCEED Model found that smokers and non-smokers group had family members and relatives smoked. Most of them finished secondary school. The factors related to cigarette smoking behavior were predisposing factors e.g. perceived vulnerability, perceived severity, response efficacy and self-efficacy but age, duration of service, income and level of education were not related to cigarette smoking behavior. The reinforcing factors were seeing family's member smoke, being persuaded by other conscripts and closed friends. However, being persuaded by supervisors and receiving information and suggestions about tobacco from medical/ public health personnel were not related to smoking behavior. The enabling factors were getting cigarettes from others and accessible to buy cigarettes. Hence, it should be prohibited in all Army Forts and having all Army Forts smoke free areas and this regulation must be enforced (Nunthapol, 2003).

The predictors of Thai adolescent cigarette smoking according to the theory of planned behavior among 510 male and female vocational students in Chantaburi province. Data were collected for two times to predict smoking behavior in the next month and assess smoking behavior one month following the first

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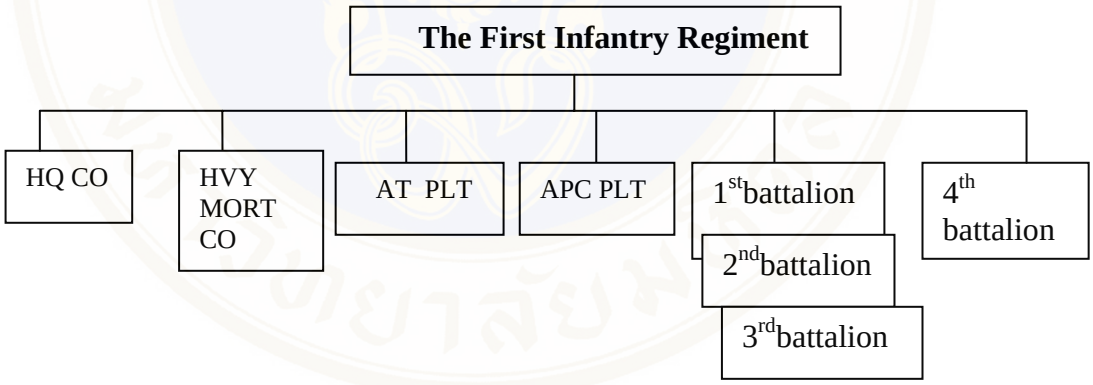
measurement. The results revealed that smoking cigarettes was predict by smoking intention and perceived behavioral control while smoking intention was predicted by attitude, subjective norm and perceived behavioral control (Hemchayat, 2003).

2.2 Organizational structure of the 1st infantry Regiment, King's Royal Guard

2.2.1 Structure and Organization

2.2.1.1 The First Infantry Regiment, King's Royal Guard

Structure and Organization : The First Infantry Regiment, King's Royal Guard is divided into 6 units; headquarter company, heavy mortar company, antitank platoon, armed personal carrier platoon, and four battalions. The head commander is the regimental commanding officer.



Code

HQ CO (HEADQUARTERS COMPANY) : กองร้อยกองบังคับการ (ร้อย.บก.)

HVY MORT CO (HEAVY MORTAR COMPANY) : กองร้อยเครื่องยิงหนัก (ร้อย.ค.หนัก)

AT PLT (ANTITANK PLATOON) : หมวดต่อสู้รถถัง (มว.ตถ.)

APC PLT (ARMORED PERSONNEL CARRIER PLATOON) :

หมวดสายพานลำเลียงพล (มว. รสพ.)

1st ,2nd, 3rd, 4 th Batt alion : กองพันทหารราบที่ 1, 2, 3 และ 4

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Personal and staff : The number of commissioned and non-commissioned officers including the commander and staffs are 160 persons. The number of the conscripts are around 300 persons.

2.2.2 Data base among staff officers and the conscripts

2.2.2.1 The conscript's life

The new conscripts enter to the military twice a year on 1st May and 1st November.The conscripts are trained during three months for basic military training. They start the activities everyday in the morning at 5.30 a.m. to get up and do physical exercise. After that, they have breakfast at 7 a.m. and start training at 8 a.m. They are taught from 8 a.m. -17 p.m. in the class and in the field for combat training. They get a break for 10-15 minutes every hour. After having dinner and taking a bath, they are taught again between 7-9 p.m. and then go to bed in the barrack. They have to act following the training officers order; if someone can not do or not follow the rules, they will be punished by doing heavy physical exercise. After they finish the basic training, they have to be assigned to a company for a special duty and responsibility for guard's duty, including cleaning the military's area. In addition, they have to do other work if the commanders order.

Procedure and schedule about basic training

Week 1 : activities for collecting personal data, physical examination and laboratory testing (HIV, urine for drug addiction), orientation and meeting with the commanders including recreational activities. Health histories of the conscripts were recorded and kept in the 7th and 8th primary health care unit. If the conscripts get sick and can't be treated at primary health care unit, they will be referred to Phramongkutklao Hospital .

Week 2 -9 : The activities are as follows

0600 - 0700 : physical exercise

0700 - 0800 : personal care and breakfast

0800 -1700 : basic training every 45-50 minutes andbreak every 10-15 minutes

1700- 1800 : dinner and personal care

1900- 2030 : general learning in the classroom

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2100 : go to bed

Week 10- 11 : go back home for a short rest

Week 12 : special duty training

After three months, the conscripts are under the supervision of the company commander. The commander will set a learning experience and training to them one time per month.

2.2.2.2 Health Care Resources

The 1st infantry regiment had one health care center under the control of the 11th Bangkok Health Center which consisted of three to four community health volunteers to work for primary medical care such as screening DM and hypertension, give basic medicines etc. However, most soldiers in the area used health care services from the 7th primary health care unit more than health care center. Twenty housewives from the 1st Infantry regiment, 1st infantry battalion and 4th infantry battalion have been trained to be health volunteers and support for health activities under the supervision of the 7th primary health care unit. Health care providers in a primary health care unit such as nurses and non-commissioned officers do not have the role to give health education about tobacco control to the conscripts or other soldiers. Half of non-commissioned officers still smoke and they do not have the knowledge and skills about smoking and quitting to advise other soldiers to quit smoking. There are few activities related to tobacco control in the area

2.2.2.3 Policy in the workplace

In each unit, most policy comes from the top commander of the Royal Thai Army and order to the inferior commanders. The policy, rules or regulations are announced by the memorandums, and presentation at the meeting room, or in front of the soldiers stand in row in the morning. Health policy focuses on promoting health of the army officers and the families, such as standing operating procedure for exercise. Every unit has the routine order for exercise on Wednesdays afternoon. The regiment and the battalion provide the places, facilities and equipments to promote exercise in the workplace and around the residence. In addition, there are physical fitness test for all soldiers two times per year. Ban on smoking during basic military training is ordered to the training officers with direct command and announced to the conscripts on the first week during entering the military. This rule is

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enforced for ten weeks of basic military training. When the conscripts go back home for a short rest, they are allowed to smoke, after that they aretrained for one week and separated to stay for special duty in the company until the retirement. Some new conscripts entering the military have the problem with drug addicted, so the military has the policy to take care the new conscripts during basic military training by applying Fast Model from Tanyaruk Hospital to deal with the conscripts. The 1st infantry regiment and the three battalions have started to conduct the activities since 2008. Fast Model consists of four strategies; family, alternative, self-help and therapeutic community. The activities focused on family participation for conscripts' problem solving, provide recreational activities to the new recruits, adjusting the conscripts' behavior by self-learning, and promoting interpersonal relationships between staff officers and the conscripts and their friends as well.

2.2.2.4 Smoke free workplace and smoking area

Every unit follows the memorandums from the Ministry of Defense about smoke free workplace. The buildings have been pasted with non-smoking signs but do not cover in some places such as the toilet, the entrance of the building. The executive officer said that there were few commanders and staff officers who smoked, but non-commissioned officers and the conscripts have still smoked a lot. From observation of the working room of staff officer, the researcher found burned cigarettes and ashes in the ashtray on the desk. Even though some officers realized the area was a smoke free zone, they were not aware of the effects to other people. In addition, the smoking zone in some area was not suitable because it was close to the entrance of the building and close to a working room. The top commander in each regiment and chief of battalion agreed to provide smoke free workplace in the Army unit.

2.3 Smoking cessation

2.3.1 Definition and Benefit of Smoking Cessation

Smoking cessation means "to quit smoking," or "withdrawal from nicotine." Because smoking is highly addictive, quitting the habit often involves irritability, headache, mood swings, and cravings associated with the sudden cessation

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or reduction of tobacco use. Cessation is one of the principal goals of tobacco control . Smoking cigarettes is hazardous to health and cessation of smoking has positive health benefits in terms of both mortality and morbidity (Cohen ,Collins,& Britt, 1997; U.S. Surgeon General, 1990). The benefits on smoking cessation, according to U.S. Surgeon General's report (USDHHS, 2000, 1990), are that people who quit, regardless of age, live longer than people who continue to smoke. Smokers who quit before age 50 have half the risk of dying before the age of 65 compared with those who continue to smoke. Quitting smoking substantially decreases the risk of lung, laryngeal, esophageal, oral, pancreatic, bladder, and cervical cancers. Moreover, benefits of cessation include risk reduction for other major diseases including coronary heart disease and cardiovascular disease. Cromwell et al., (1997) investigated the cost-effectiveness of clinical recommendations in AHCPR guidelines from 15 recommended smoking cessation interventions and found that three counseling interventions for primary care clinicians and two counseling interventions for smoking cessation specialist were modeled with and without trans-dermal nicotine and nicotine gum. The results indicated that smoking cessation is extremely cost-effective when compared with other preventive interventions. The more intensive the intervention, the lower the cost per QALY saved. The greatest benefits of quitting are seen among those who have smoked for relatively few years, smoked only a few cigarettes per day, or who have an absence of disease at the time of quitting (US.DHHS, 1990).

Cigarette smoking is a significant public health problem among young adults (US.DHHS, 1994). In U.S. smokers, approximately 3000 youth begin smoking cigarettes each day (CDC, 1998). Although young adult smokers attempt to quit, they are more likely to relapse and less likely to achieve long-term abstinence compared with older smokers (US.DHHS, 1994; Spurlock, 2005). Often, it is with their first quit attempt that young smokers realize that they have become addicted to tobacco and will not be able to quit easily. In theory, it should be somewhat easier for young adults to quit because of their potentially lower levels of addiction and fewer years living with tobacco use as a regular part of their daily lives. However, too few young adults try to quit, too few get assistance in quitting, and too many relapse.

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Cessation begins with a decision to stop smoking and ends with abstinence from cigarettes maintained over a long period of time (U.S.DHHS, 1990). Any successful program must increase their interest in quitting and support quit attempts with environmental changes ,such as increasing the price of tobacco products, making all workplaces and public places smoke free, encouraging smoke free homes, improving insurance coverage of pharmacotherapy, and telephone cessation counseling (Husten, 2007). Helping smokers to quit involves 2 processes; motivating them to attempt to quit and helping them to stop once they try. At any given time, only about 10% of smokers are planning to quit in the next month, while 30% are contemplating quitting in the next 6 months, 30% plan to quit at some unknown time, and 30% have no plans to quit (Cohen, 1997). There are now techniques to assist those who want to quit smoking: social support; clinics; quitlines; internet sites; skill training; nicotine replacement therapy and pharmaceutical treatments. But few regular smokers successfully quit (Mackey, 2006).

Many countries, including developing countries, have already shown that smoking rates can be reduced. The main health hazards of smoking are reduced when smokers quit, even among those who have smoked for 30 or more years. Smokers move through stages in relation to quitting; precontemplation, contemplation ,preparation ,action, maintenance or relapse several times before the finally quit successfully. Most smokers who relapse do not return to the precontemplation stage. Several staged measures of change in individual cessation have been developed to link measures of intention to quit and actual cessation behavior in order to define where smokers are in their individual cessation efforts and to predict the likelihood of future cessation activity and success (U.S.DHHS, 1990; Prochaska et al., 1991).

Therefore, the conscripts who are late adolescents or young adults need to get the assistance in quitting and prevent relapse from the cessation program. Because of this age, the smokers would like to quit on their own and using the advice of friends, so the cessation program need to encourage them to self-evaluate about smoking and quitting and use peer group to promote quitting.

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2.3.2 Measurement and validation of self-reported abstinence

Measures of cessation need to consider the target population and the interventions. Measures are selected with the following criteria; the measures should reflect the target population of most interventions- i.e., regular daily smokers and the occasional smokers group, and they should link between a programmatic intervention and the cessation measure. For example, the quit ratio (the ratio of former smokers to ever-smokers) may be a good measure of total cessation in a population, but it is less useful in examining the effect of recent programmatic efforts on cessation activity. The measures should also examine both cessation activity and cessation success as separate entities. Both cessation attempts and cessation success rates are increased with high levels of education attainment. The cessation activity is one that includes any change in smoking behavior (a cessation attempt, becoming an occasional smoker, or currently being a former smoker). The cessation attempt measure includes all those who have made a successful or unsuccessful cessation attempt in the last 12 months.

The Analyses of the California Tobacco Survey (CTS) measured cessation success by the percentage of those who were daily smokers 1 year prior to the survey and were former smokers of 3 or more months duration at the time of the survey. Approximately 65 percent of all quitters relapse in the first 3 months, with 10 percent more relapsing from 3 to 6 months after quitting and an additional 3 percent relapsing between 6 months and 1 year following a quit attempt (U.S.DHHS, 1988). As a result, these measures of 3+ month success are useful approximations of actual rates of long-term successful cessation rates in the population and can be used to evaluate the relative impact of tobacco control interventions (Burns et al., 2007). The Cochrane reviews about relapse prevention in smoking cessation demonstrated that all studies were required to report smoking status a minimum of six months from the start of the intervention. Some studies reported a point prevalence rather than a sustained measure of abstinence (Hajek et al., 2005).

For outcomes of smoking cessation, Gutmann et al., (2004) reviewed data for various follow-up procedures from 109 studies and found that almost all studies (99.1%) reported using participants' self-reports as a source of outcome data, followed by biochemical validation of self-reported abstinence; carbon monoxide expiration CO (54.1%) and cotinine (36.7%) tests. At least one of four biochemical measures (i.e.,

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CO, cotinine, blood serum nicotine, thiocyanate) was used as a post-treatment outcome measure in 72.5% of the studies (79/109). Some studies found self-report is a valid one when compared with a biochemical one. For example, Faue et al., (1997) tested the validity of a self-report and CO level and found that there was a 99.3% positive correlation between CO level and self-report use of tobacco. They suggested that in general, individuals were accurately reporting lapses in abstinence when they occurred. The limitation of using the biochemical measure (CO level) is that CO level has a relatively short half-life and thus cannot be used to confirm long-term periods of abstinence. Pisinger et al., (2005) also found no significant difference between predictors of self-reported and validated abstinence by CO level.(< 8ppm) among 144 smokers continuously abstinent after 17 weeks. In this study, the researcher uses only self-report to determine the outcome of smoking cessation because their self-report will be reliable about quitting or still smoking. Therefore, there is no need to use biochemical confirmed.

2.3.3 Factors of Smoking Cessation

Smoking cessation is described as a process. Smokers become motivated to change, decide to change, and finally they manage to change. The higher the readiness to change, the higher the percentage of smokers that successfully quit. Intention is the most proximate cognitive predictor of behavior (Dijkstra et a., 1998). Relapse is common during smoking cessation; between 60% and 98% of attempts to quit end in relapse, with the greatest proportion (44%) occur within 14 days (Garvey et al., 1992). It is important to understand the predictors of smoking cessation and their relationships to the psychological process of cessation in order to develop successful intervention. There are many factors that predict smoking cessation and relapse, for example, socio-demographic factors, physiological, behavioral, and psychosocial factors. Thus, there is a need for a thorough understanding of how these factors contributing to smoking cessation and relapse.

2.3.3.1 Socio-demographic Factors

1) Age

There is some evidence that age of smokers related to smoking cessation. Older age found to be significant predictors of smoking

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cessation (Hymowitz et al., 1991; Hymowitz et al., 1997). Older men are more likely to quit smoking when compared to young men (aged 16-24 years), while older women (especially those aged 35-54) are less likely to quit compared to younger women (Chandola, 2004). Young adult smokers may be less successful in their quit attempts compared to older smokers (Pollonen et al., 1990). There is some evidence that a younger age of starting smoking (before 20 years of age) is associated with a reduced probability of cessation or lower quit rates (Chen & Millar, 1998; Pallonen, 1987 cited in Sussman et al., 1998; Sohn et al., 2007). Khuder et al., (1999) also reported the relationship between cessation and age at which person starts smoking from a survey of nine neighborhoods in Philadelphia. Interviews were conducted in the home using a structured questionnaire. Sixty-six percent of the smokers started smoking before 18 years of age. Age, race, marital status, education, health condition, amount smoked, and duration of smoking were significant predictors of smoking cessation. Age at initiation of smoking was a significant factor for continuation of smoking. Men who started smoking before 16 years of age had an odds ratio of 2.1 (95% CI: 1.4–3.0) for not quitting smoking compared to those who started at a later age. Men who started smoking at or before age 16 had a mean of 6.7 years of abstinence from smoking in comparison to 11 years for those who started after age 19. Smoking initiation between ages 11 and 15 appears to be a critical factor influencing smoking cessation.

2) Gender

Cessation and initiation rates were higher among men while relapse rates were higher in women (Hymowitz et al., 1997). Concerning the predictors of initial smoking cessation and relapse through the first years of the Lung Heart Study, Nides et al., (1995) found men were more likely than women to quit smoking initially, but relapse rates were similar for both genders. Baseline variables associated with initial quitting for both genders included greater education, lower nicotine dependence, and fewer respiratory symptoms. Among men, alcohol use, caffeine consumption, and negative affect predicted smoking on quit day. Men who smoked on quit day were more nicotine dependent (OR=1.18, $p < 0.05$), consumed more caffeine (OR=3.66, $p < 0.05$), and were more likely to be alcohol users (OR=2.75, $p < 0.05$).

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3) Education

It has been shown that educational level is a strong predictor of smoking and quitting among the adult population (Soldberg et al, 2007).Smoking cessation was positively associated with education of the smokers. Less educated people are less likely to quit (Hymowitz et al, 1997 ;Osler & Prescott, 1998) Likewise, Green et al, (2007) reported that current smoking prevalence among US young adults aged 18-24 years who are not enrolled in college or who do not have a college degree was 30%, which was more than twice that among college educated young adults (14%). Non-college-educated young adults were more likely than college-educated young adults to start smoking at a younger age and were less likely to have made a quit attempt. As well as, Lee and Kahende (2007) used data from the 2000 National Health Interview Survey, and compared demographic, behavioral, and environmental characteristics of current smokers who tried unsuccessfully to quit in the previous 12 months and those able to quit for at least 7 to 24 months and found that the successful quitters were more likely to have at least a college education, be aged 35 years or older, married or living with a non-smoker.

Hymowitz et al., (1991) examined the relationship between baseline variables and smoking cessation and relapse for usual care group (UC) and special intervention group (SI) during the 6 years of the clinical trial. The results showed that the cessation rate was lower among smokers in the UC group compared with that among SI smokers, and that higher educational attainment was associated with increased cessation rates for both SI and UC smokers .In addition, cessation rates were higher among older participants. Relapse occurred for 22.5% of SI and 39.8% of UC smokers who quit during the first year.

4) Marital status

The previous research found the smokers who get married or who never married tend to become abstainers more than divorced or separated smokers after participating in smoking cessation program. For example, Matheny & Weatherman (1998) conducted a follow-up study of 263 volunteers who had completed a national smoking cessation program to measure the factors to maintenance of smoking cessation. The results revealed that abstainers had significantly higher income were more likely to be married or never married than

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relapsers. ($p < .01$). As well, Chandola et al., (2004) found that smokers who were divorced or never married were less likely to quit compared to married smokers. Some studies emphasized not only being married but also living with a non-smoking spouse or cohabitant. Chen et al., (2001) found becoming married to a nonsmoker is the more relevant facilitator of quitting because smokers lived in a smoke free environment which encouraged them to quit and that they found family support has a positive influence on their attempts to quit .

5) Income

Fagan et al., (2007) investigated variables associated with quitting behaviors among young adult smokers. The methods used data from the national 2003 Tobacco Use Special Cessation Supplement to the Current Population Survey. The results revealed that income and employment status were associated with quitting and intention to quit among non-daily smokers**.** The study among adult smokers in the British population found that those with lower household income were less likely to quit smoking (Chandola et al., 2004). Smoking cessation may be particularly difficult for poor people for several reasons, including high nicotine dependence. Matheny & Weatherman (1998) conducted a follow-up study of 263 volunteers who had completed a national smoking cessation program to measure the factors to maintenance of smoking cessation. The results revealed that abstainers had significantly higher income, and more likely to be married or never married than relapsers ($p < 0.01$). The number of other smokers in the household is a significant factor. Successful abstainers may wish to quit smoking to enhance their sense of well-being rather than only wishing to avoid disease.

In conclusion, demographic factors; older age , male smoker, married with a non-smoker or non-married and higher socioeconomic status (education, income and employment) can predict smoking cessation and are associated with higher quit rates. The smokers who started smoking at an early age had only a low confidence in quitting and cessation. This study did not concern about these factors because the conscripts have similar characteristics.

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2.3.3.2 Behavioral Factors

1) Cigarette Consumption

Previous research examined the consumption of cigarettes and found that the number of cigarettes smoked per day, the duration of smoking and the number of pack years were predictors of cessation and relapse (Agudo et al., 2004). Heavier smokers are less likely to quit than light smokers and unsuccessful cessation outcomes (Hymowitz et al., 1997; Osler & Prescott, 1998; Cohen et al., 1989). Those who have smoked for a relatively longer period are less likely to quit than those with a short period (U.S.DHHS, 1982; Pallonen, 1987 cited in Sussman et al, 1998). In UK, West et al., (2001) examined the stability of desire to stop smoking, intention to stop, attempts to cut down and attempts to stop among adult smokers over a 1-year period by investigating face to face interviews. Success at quitting was lower in heavier smokers at an earlier age, who had their first cigarette of the day soon after waking and who believed that withdrawal symptoms were a problem for them. Likewise, the study of Soldberg et al., (2007) found that heavy smokers (those who smoked more than 15 cigarettes a day) were less successful at quitting in the preceding 18 months than light smokers**.**

The study among adolescent smokers aged 12–19 years from the national Teenage Attitudes and Practices Survey found the frequency of smoking was a significant predictor of quitting. A total of 15.6% of adolescent smokers had quit smoking at the follow-up survey four years later. Occasional smokers were more successful than daily smokers in quitting. Daily smoking is an indicator of nicotine dependence (Zhu et al., 1999). Level of baseline smoking was a predictor of adolescent self-initiated smoking cessation in Southern California. The mean score of baseline cigarette smoking among quitters was less than the score among non-quitters (Sussman et al., 1998). When followed up the samples for five years, the results also showed that quitter reported a lower level of cigarette smoking at baseline and had the intention to smoke fewer cigarettes in the future (Sussman & Dent, 2007).

Consistency of smoking behavior to predict cessation was also found in a military setting. Hurtado and Conway (1996) reported the number of cigarette smoked per day and years of regular tobacco use predicted

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changing smoking status at the 1-year follow up among recruits during U.S. Navy recruit training. The recruits who smoked many cigarettes per day were less likely to report becoming a former smoker than those who smoked fewer cigarettes per day as well as those who used tobacco regularly for more years. In addition, intention to quit can predict changing smoking status from current smoker to former smoker at recruit training graduation. In contrast with the findings of some other investigators, Matheny & Weatherman (1998) found that ex-smokers who smoked a greater number of cigarettes daily and used cigarettes with a higher tar content were actually more likely to become abstinent.

2) Past Quit Attempts

An assessment of past quit attempts to quit smoking is important because certain characteristics of past quit attempts can have an impact on a smoker's success in quitting. The length of the longest past quit attempt and the length of the most recent quit attempt are the strongest determinants of smokers' success with quitting. The indicators for predicting smoking cessation success may be a lifetime past quit attempt of one year or more and a most recent attempt of more than five to four days (Farkas et al., 1996).In addition, the number of quit attempts in the past year can predict success at quitting. Jetiyanuwatr (2002) examined the factors associated with successful smoking cessation of public health officials in Kanchanaburi province and found that one or two times of attempts to quit were associated with successful smoking cessation. Experience of attempts to quit fewer than three times influenced six month smoking cessation in military personnel (Bushnell et al., 1997). As well, many studies reported that a greater number of previous quit attempts was negatively associated with successful cessation (Carlson et al., 2003; Macy et al., 2007).

Zhu et al., (1999) found length of past quit attempts was the significant predictor of quitting in U.S adolescents. Past quitting success is a good predictor of the current quit attempt .Those who have made any quit attempts that lasted longer than two weeks are much more likely to succeed than those who have not sustained a stoppage for that long, and those who had never tried to quit before were also more likely to succeed than those who tried but for whom the quit attempt lasted less than two weeks. Therefore, the "longest time ever quit" is a

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behavioral index of the level of accomplishment in the past. Recently, young adult smokers who reported that they were seriously considering quitting within the upcoming 6 months were more likely to report one or more quit attempts than those who either were not considering quitting or never expected to quit (OR=1.99; 95% CI= 1.32, 2.98). The study showed that the smokers who had the experience in past quit attempts were more likely to have an intention to quit in the future (Soldberg et al., 2007).

3) Methods use to quit

Smokers who quit on their own will use gradual cessation or abruptly quit method. Most guidelines do not recommend reduction before a quit date as a method to quit smoking because smokers who reduce their consumption may feel they have lowered their risk and improved their health, and that therefore they do not need to make any more effort toward cessation, but many studies reported that higher quit rates were observed among reducers (Bolliger et al., 2000; Carpenter et al., 2004). Smokers may choose to reduce rather than quit smoking because they are less motivated to change (Bolliger 2000). However, smokers with the goal of quitting abruptly were more likely to make a quit attempt than those with a goal of quitting gradually (Peters et al., 2007).Additionally, Jetiyanuwatr (2002) also found the “abruptly quit” method of cigarette use was the one of five variables related to successful smoking cessation.

Soldberg et al., (2007) asked about the types of cessation approaches among young adult smokers and found that 290 smokers who reported having quit or attempting to quit in the past year had not used any form of assistance and had quit "cold turkey," rather by reducing their use of cigarettes gradually. Of those reporting use of assistance, 22% had used nicotine replacement products, 8.5% had used bupropion, and 9.4% had sought support from a friend or family member. Only a total of 12% had used self-help books, attended classes or groups, or sought counseling on the Internet, in person, or by telephone. Sohn et al., (2007) found the most common methods that the patients with cardiovascular disease used to quit in the past were “my own way with no other assistance” (52.9%), followed by cigarette substitutes (17.1%), snacks (15.7%), and nicotine replacement therapy (NRT; 14.3%).

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4) Alcohol Consumption

Smokers are significantly more likely to drink than nonsmokers (Miller & Gold, 1998; Shiffman & Balabanis, 1995 cited in McClure et al., 2002). Drinking increases the rate and amount of smoking among smokers (Mintz et al., 1985; Chang et al., 2006). In addition, McClure, et al (2002) reviewed from many studies and found that alcohol consumption, particularly among heavier drinkers, may interfere with smoking abstinence. Heavy drinkers are less likely to attempt to quit smoking and are less successful when they do try to quit. Agudo et al., (2004) reported that high alcohol consumption and high cholesterol intake were predictors of low cessation rate in adult men in Spain. Cessation rates were lower among those who consumed more alcoholic beverages per week (Hymowitz et al., 1991). It shows that nearly one fifth of ex-smokers had been drinking alcohol prior to the relapse crisis, which suggests that alcohol consumption is an important factor in relapse episodes. The rate of relapse rises from 33% to 61% when the ex-smoker is drinking (Shiffman et al., 1982). Therefore, consumption of alcohol may interfere with smoking cessation attempts or even serve as a trigger for relapse (Fertig & Allen, 1995cited in Gutmann et al., 2004).

The relationship between alcohol consumption and smoking abstinence also found in the community-based sample from the Working Well Trial (WWT) that drinking level was related to smoking history (never, former, or current smoker; $p<0.001$) at baseline and to abstinence history. Mean monthly alcohol consumption increased linearly with decreases in duration of recent abstinence (among current smokers) and current abstinence (among former smokers). Among baseline smokers, lower beer consumption predicted smoking abstinence at 4-year follow-up (p <0.01). Heavier drinkers are less likely to quit smoking over a 4-year period. The authors commented that if consuming less alcohol increases one's chances of quitting smoking, then smoking cessation interventions may be well served to focus more specifically on alcohol reduction, even among non-diagnosed drinkers. (McClure, et al., 2002) .

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2.3.3.3 Physiological Factors

1) Nicotine Dependence

Nicotine dependence is a clearly different concept from the act of cigarette smoking and refers to the tenacity of an individual's need for nicotine. Some conceptions of dependence suggest that it may reflect a physiological-based requirement implicit in an individual. The most common clinical measure of nicotine dependence is the Fagerstrom Tolerance Questionnaire (Fagerstrom, 1978; Fagerstrom & Schneider, 1989; Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). Several indices of nicotine dependence include cigarettes smoked per day, time to first cigarette, smoking earlier in the day, smoking when ill and smoking where forbidden. The physical and psychological dependence on nicotine are the major barriers to smoking cessation at the individual level (Ockene et al., 2000). The variable associated with quitting behaviors among young adult smokers indicated that nicotine dependence measures were significantly associated with quitting and intention to quit among current smokers and daily smokers (Fagen et al., 2007;Hammond, 2005). As well as, the result of Faue et al.,(1997) who study the Tripler tobacco cessation program demonstrated that less nicotine dependence and less alcohol use among daily smokers were significantly associated with quitting and intention to quit. The low Fagerstrom Test for Nicotine Dependence (FTND) is identified as confirming positive predictors of abstinence at six months after a smoking cessation intervention (Granda-Orive et al., 2004).

Time to the first cigarette of the day has been studied extensively as a measure of nicotine dependence. Some authors (e.g., Fagerstrom, 2003) suggested that time to first cigarette may be the best single measure of nicotine dependence. Toll et al., (2007) studied the subjectivity (e.g. craving ,mood) to the first cigarette of the day and determined whether subjectivity reactivity was predictive of smoking relapse The result revealed that after smoking the first cigarette, craving, withdrawal, and negative effects were removed. Larger decreases in the score representing desire to smoke were associated with relapse at the end of treatment and at 3 months. This finding demonstrated that craving is the strongest single withdrawal symptom that predicts a positive smoking outcome. In addition, the indices of nicotine dependence (FTND) was associated with relapse at 3 months ($r = .14$ $p < .05$). Subject

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reactivity was related to daily cigarette consumption and number of years smoking but neither of these variables were related to relapse.

Novella et al., (2004) identified predictors of successful outcome in a smoking cessation program at 6-month follow up of 248 adult smokers who attended a smoking cessation clinic. Success was defined as self-reported abstinence, confirmed by CO <10 ppm. The results did not show nicotine dependence as a predictor variable of successful smoking cessation at 6 months but success at 3 months was the only predictive variable of successful smoking cessation. In a cohort study of adult smokers in the British population, Chandola et al., (2004) found the degree of dependence was the strongest predictor of quitting smoking, followed by occupational social class, social support, marital status and the proportion of smokers in the household. The smokers with greater dependence (who smoked greater numbers of cigarettes) were less likely to quit smoking. Likewise, Westman et al.,(1997) found that lower levels of nicotine dependence and achievement of abstinence on the quit date predicted a greater likelihood of abstinence at 6 months post-treatments. Similarly to, Farkas and colleagues (1996) found that the level of addiction is a more likely predictor of smoking cessation than is stage of change among 2,066 currently smoking adults taking the California Tobacco Survey.

A brief and valid assessment of a smoker's current dependence level is assessed with two questions from the Heaviness of Smoking Index (HIS : Heatherton et al., 1989).One item assesses time to first morning cigarette, and another assesses the number of cigarettes smoked per day. An individual who smokes within 30 minutes of waking and who smokes more than 25 cigarettes per day is probably more dependence on nicotine and indeed of more intensive treatment. Therefore, the smokers who attempt to quit on their own may not successfully quit, because some are heavier smokers whose need for assistance, such as behavioral modification and nicotine replacement therapy.

2) Withdrawal Symptoms and Craving

Withdrawal symptoms would occurred after quit smoking. Shiffman (1979) and others have suggested that withdrawal symptoms play a major role in precipitating relapse. Physical symptoms included complaints such as headache, nausea, and diarrhea, drowsiness, restlessness and craving for cigarettes.

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Psychological symptoms refer to complaints of irritability, anxiety, and inability to concentrate (Shiffman,1982). Russell (1988) referred to craving or the urge to smoke as “the most fundamental and difficult problem for smokers who are trying to quit”. West and Schneider (1987) suggested that craving is potentially the most important feature of cigarette withdrawal (Killen & Fortmann, 1997). Urges to smoke are often reported as being stronger after meals. They may also be associated with drinking coffee and being with other smokers. Craving seems to be less in evidence when smokers are busy at work, or engaging in an enjoyable or physical activity. West & Schneider (1987) reported the urge to smoke is by far the most commonly reported subjective response to cigarette withdrawal. It is worse in smokers with higher nicotine intake and can be reduced by a nicotine substitute. Although the urge may occur at the time during abstinence, it can be increased by stress and boredom. Craving for cigarettes probably has multiple causations, arising partly out of the perceived benefits of smoking and the negative consequences of not smoking and partly as a direct result of loss of nicotine.

The experienced craving of smokers had been reported when they had to go to see their family doctor without cigarettes. Forty-five per cent reported that they experienced craving either frequently or always. Among smokers of more than 15 cigarettes per day the figure was 66%. Prospective studies among volunteers or smokers clinic clients suggest that some 80% experience some craving during abstinence (West et al., 1984). In a study of self-quitters, found that lower nicotine dependence levels predicted abstinence at 2 months, whereas higher nicotine dependence levels predicted relapse at 12 and 24 months, and a lower level of post cessation craving predict abstinence at 2 months, whereas a higher level of craving predicted relapse at 12 months (Nides et al., 1995). In the military, Faue et al., (1997) used a 10-week course of transdermal nicotine replacement combined with education and cognitive/ behavioral therapy in a group format at a major military medical center. After 6 to 15 months post treatment, the participants were placed into one of three outcome groups: abstinent (A), early relapser (ER), or late relapser (LR). Most relapsers had relapsed within 90 days after quitting. The perceived reasons for failure to quit were strong temptations (triggers such as coffee, termination of a meal, and smoking by others) and strong cravings (physiological withdrawal symptoms),

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indicating that psychological and physiological dependence were perceived as important factors in relapse. Killen & Fortmann (1997) studied the relationship between abstinence effects in 64 ex-smokers and relapse rate over four weeks of biochemical confirmed follow-up. The results identified increases in depressed mood and craving as the most significant predictors of relapse. The study of Shiffman et al., (1997) also found the relationship between craving and smoking relapse. Using palm-top computers, and assessed smoking urges 4 to 5 times per day. Participants also rated urges on waking and when they reported episodes of temptations to smoke.

2.3.3.4 Psychosocial Factors

1) Motivation to quit

In the general population of adult smokers, 70% say they want to quit, but the majority (80%) are not ready to quit within 30 days, and 30-45% are not intending to quit even within 6 months (CDC1994a). Motivation appears to be an important predictor of whether or not someone will quit smoking (Miller &Rollnick, 2002). Over time, a smoker's motivation can be thought of as his/her *"readiness to change"*, the treatment or the program for cessation are to move smokers along continuum of readiness to change and to increase or maintain their motivation to actively engage in the change process. There are several reasons that smokers may not be interested in or willing to make a commitment to quit smoking such as less concerned about the impact of smoking on their own health, concerned about the effects of quitting (e.g., withdrawal, irritability, difficulty handling stress), afraid of failing again because of previous relapse, or they may have other concerns and priorities that are more pressing (e.g., stress at work or home, poverty).It is important to assess a smoker's motivation status, as well as the factors that may be affecting his/her readiness to quit smoking (Abrams et al., 2003)

The smoker's stage in the change process is the variable that has been studied by several authors; the contemplation and action stages are considered to be better predictors of successful outcome (Ward et al., 1997). In a prospective study of more than 1,400 smokers, stage of change was significantly related to the likelihood of making a quit attempt and actual success of the attempt. It is assumed that stage movement may be associated with factors such as beliefs in the pros of quitting and the cons of smoking, motivation and confidence about quitting

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smoking, and increased social support during quitting (DiClemente et al., 1991). As well, the result from the study of smoking cessation intervention related to readiness of change found quit rates among smokers in the precontemplation stage, contemplation and preparation stage were 20%, 38%,and 67% respectively. Because both the intention to quit and the success rate of the intervention differ among the three groups, it is plausible that the effective of interventions can be improved by developing specific interventions aimed at each motivational stage (Prochaska, 1991).

Adolescents' becoming more or less 'ready' to quit smoking are influenced by their nicotine dependence and motivation to quit. From baseline to 10-weeks, results showed a change in motivation to quit and baseline stage were significantly associated with stage progression and regression. Lower nicotine dependence at baseline predicted that adolescents were less likely to regress to earlier stages of readiness. A precontemplator whose self-efficacy score increases over time would be more likely to progress in stage than one whose self-efficacy did not increase (Kohler et al., 2008). The relationship between stages of change and smoking behavior in the 10,136 Air Force recruits who were in basic military training (BMT) and were not allowed to smoke, found that those in the precontemplation group stated a likelihood to resume smoking after BMT, while the contemplation group indicated that they were thinking about continuing cessation following BMT. The action group indicated an intention to remain nonsmokers after BMT (Thompson et al., 1998).

2) Reason to quit

Hymowitz (1997) investigated the reasons for making quit attempts and found that nearly all mentioned health concern as an important factor motivating their decision to quit smoking. Similarly to the finding of Gilpin et al, cited in CDC, 1990 who reported that concern about their health was the most important reason smokers gave for stopping smoking. Most adult smokers are motivated to stop smoking, but are able to do so easily. Likewise, Sohn et al., (2007) explored beliefs about the health benefits of smoking cessation, and identified factors associated with confidence in quitting smoking among South Korean men hospitalized with cardiovascular disease. The results showed that 93% of the participants reported their intention to quit and that 74% had moderate to high confidence about quitting during the next month after hospital discharge; 88% preferred to quit by themselves

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without help. The most common reason to quit (95.6%) was “for my health” Other less frequent responses included “bad smell on my body or hair”(5.6%); “my wife or girlfriend dislikes smoking”(2.2%); “people’s negative attitude against smokers” (2.2%); “bad smell within the house” (1.1%). The reason “for health” to quit smoking is consistent from the study among ex-smokers. The main reasons for quitting smoking were to become more healthy (66%), health problem (32%), for the sake of their family (23%) or economic factors (19%).They had more than one reason for quitting (Osler & Prescott, 1998). Various health effects are frequently cited in retrospective reports of adolescents as reasons for quitting (Stone & Kristeller, 1992) Social reasons, including perceived peer and family pressures to quit, also are mentioned frequently (Sussman et al, 1998).

3) Stress and Depression

Smokers often report they smoke to relax or reduce tension, particularly in response to stress and in response to anxiety, sadness, and anger. A study among the members of the U.S. Armed Forces in all four services (Army, Navy, Air Force, Marines) experienced a high level of stress unique to their status as service members. Many military personnel report high levels of nicotine use. Those who use tobacco products specifically to reduce stress report significantly higher stress levels than those who do not use tobacco. Bushnell et al., (1997) also found the reasons for relapse in U.S. military personnel were coping with stress, craving tobacco, depression, boredom and mood changes. Likewise, Poston et al., (2008) examined the reasons for smoking initiation among never smokers, relapse among former smokers, or increased smoking frequency among current smokers among junior-enlisted personnel during deployments by focus groups. Important reasons for smoking included managing stress, boredom, anxiety, and sleep deprivation; lack of alternate activities and privileges; the perception that dangers in the field trump the health impact of smoking; and the role of the military environment in encouraging smoking. The military environment include the historical relationship between tobacco use and the military, the positive portrayal of military members in the media as smokers, the belief that smokers get breaks from work and nonsmokers do not, and the easy accessibility and low cost of tobacco products during deployments. Therefore, in recent times the military has been proactive about addressing some

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environmental supports for tobacco use for example, the banning of tobacco use during basic training, providing free smoking cessation services as a part of the comprehensive health care benefits, enforcing rules concerning tobacco use during operations, and reducing accessibility.

The previous research indicated that stress may trigger smoking behavior ,and is associated with increased smoking and urges to smoke. Stress played a large role in smoking relapse among clients, as close to 50% of smokers identified stress as the reason for relapse up to 1 year after cessation. This suggests the utility of incorporating on-going stress management components into tobacco cessation programs (Xino et al., 2008). The study of Zhu et al., (1999) reported that a higher depression score led to a lower quit rate among adolescents. (OR=1.87; 95% CI=1,04-3,35).Therefore, depressive symptoms were found to predict continued smoking because depression may inhibit the attempt to quit or increase the probability of relapse after the quit attempt. Some smokers may have earlier experienced or perceived smoking as an effective coping strategy and cigarette smoking by some as a means of mood regulation.

Approximately, seventy-one percent of the preceding relapse crises occurred in the presence of negative effect. The effect which most frequently reported by the smokers was feelings of anger or severe frustration and increased frequency of depression (Shiffman, 1982). Lichtenstein et al., (1978) cited in West & Schneider (1987) stated that stress is a common cause of relapse among quitters and can also lead to increased smoking. Carlson et al., (2000) evaluated the effectiveness of a large group community-based behavioral smoking cessation intervention over an 8-year follow-up period and found that the reasons for relapse among 93 nonsuccessful 3-month quitters were stress, craving/addiction, being unmotivated or not ready to quit, social situations, relationship problems, death or illness in the family, and one person each cited weight gain and boredom. For the successful 3-month quitters who had relapsed after the program, the 23 respondents listed the following reasons: social situations, stress, death in the family, weight gain, craving/addiction, and relationship problems.

4) Attitude about smoking, Self-efficacy, Self-esteem and Social Support

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Attitude change about smoking can influence the successful quitting. Moffatt &Whip (2004) examined incentives and barriers to smoking cessation among twenty five blue collar males with pregnant partners by using structured interviews in grounded theory. The results revealed that the indicators which differentiated between successful and unsuccessful quitters were level of awareness in relation to smoking, and on approach to quitting such that they changed their behaviors and routines to reduce smoking. Those who had succeeded in quitting exhibited an overall awareness of society and themselves. Among adolescents, researchers have examined the impact of attitudes about the morality of smoking and found that they place on health as a value, and knowledge and beliefs about consequences of smoking. They found that the smokers who agree that society has the right to do something about smoking were more likely to quit and those whose beliefs changed in the direction of thinking that cigarette and alcohol use were wrong had higher quit rates.(Hansen et al., 1985; Skinner et al, 1985 cited in Sussman et al., 1998)

The individuals' self refusal efficacy, antismoking attitudes and beliefs have a greater impact on youth smoking cessation. Self-efficacy to resist peer pressure and antismoking beliefs were more found to be important to prevent and stop youth smoking (Chang et al, 2006). Self-efficacy beliefs contribute significantly to motivation and behavior. Fagan et al., (2001) found that daily smokers were less confident in their ability to avoid smoking than those who smoked less frequently. As nicotine dependence increased, self-efficacy beliefs decreased. In addition, as friends' encouragement to quit increased, self-efficacy beliefs also increased. Leatherdale (2008) examined the factors associating with the intention to quit smoking from a cross-sectional study among high school students in Canada. The "intending to quit in the next 30 days" was positively associated with students believing that they could quit smoking, as well as being highly active, but negatively associated with being overweight and having three or more smoking friends. In addition, most daily smokers intended to quit smoking, but occasional smokers did not intend to quit because they did not consider themselves to be really smokers or they reported that they had already quit. Kowalski (1997) compared psychological, biophysical, and socioeconomic variables as a predictor success in smoking adherence

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among 75 adults who had participated in smoking cessation program in Texas. The results revealed that self-efficacy and self-esteem correctly classified 75% of the subjects at the 3-month follow-up. Specific psychological obstacles for quitting smoking are the perceived benefits of smoking, friends who smoke, habit, low self-efficacy, associating smoking with emotional coping, and lack of self control. Therefore, interventions that increase self-esteem and self-efficacy appear necessary. Other studies also found successful quitters had higher self-efficacy perceptions than relapsers (Brandon et al., 1990; Scholte & Breteler, 1997). The meta-analysis to study the relationship between SE and future smoking from 54 studies revealed that the relationship depended upon the population studied and the timing of the SE assessment. The relationship between SE and future smoking was modest when SE was assessed prior to a quit attempt (.21SD) and it was stronger (.47 SD) when SE was assessed post-quit. The authors suggested that although SE has a reliable association with future abstinence, it is less robust than expected. (Gwaltney, Metrix, Kahler & Shiffman, 2009). Additionally, Boardman et al (2005) found the smokers who failed to quit were less likely than quitters to report high self-efficacy and motivation from posttreatment to follow- up and at post treatment, the smokers continued to sustain high self-efficacy and motivation.

Social support is a very important part of the smoking cessation process. Many smokers live with other smokers, which may be a significant barrier to quitting. Social support influences outcome after smoking cessation attempts (Fiore et al.,1996; U.S.DHHS, 1988; Borland et al., 1991). A greater amount of support (i.e.., encouragement from others, reinforcement from others) that the smoker perceives from important others in the social environment is a component of success (Mermelstein et al., 1996). The smokers who had been supported with a support person group had higher cessation rates at 3, 6, and 12 months when compared to those who did not have supported person (Carlson et al., 2002). Similarly, the study of Murray et al., (1995) reported that at the end of a 12-week group program and after 1 year from the Lung Heart Study, male smokers who were supported by significant others attending in the group program were more likely to be successful in quitting. The support from friends, family or partner may all affect

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the cessation rates differently, but particularly, spousal involvement is evidently more useful for men in the cessation intervention programs.

2.3.3.5 Environmental Factors

1) Social Influences/ Peer and Family Influences

The reviews of smoking prevention programs showed that the interventions which focused on social norms or social resistance skills were relatively more successful than other smoking prevention programs. A qualitative study in 40 college-age smokers from 12 Pacific Northwest colleges revealed that social influences were strongly associated with both smoking and cessation. Promoting change in social norms is essential to successful smoking cessation (Thompson et al., 2007). In addition, Haddock et al., (2007) also found current smokers among the U.S. Air Force Recruits were more likely to have a large percentage of friends who smoked, described themselves as rebellious and likely to take health risks and were much less likely to agree with the ban on smoking in BMT. Intake of alcohol and binge drinking were more strongly associated with smoking.

Putte, Yzer,and Brunsting (2005) explored social influences variables among 3,428 smokers which consisted of explicit social influences (explicit verbal norm and explicit behavior norm),and implicit social influences (descriptive smoking norm, descriptive quitting norm, injunctive norm, and subjective norm). The authors used the intention to quit smoking within the next three months, previous quitting behavior and self-efficacy on various aspects of smoking cessation. The results showed that the subjective norm had the strongest effect on intention to quit smoking, followed by the injunctive norm. This study showed that smokers are more motivated to quit by their perception of what ought to be done, especially for smokers whose previous cessation attempts were short-lived, or less than a month.

Among the factors that have been examined to understand the smoking cessation process in young adulthood, the peer environment emerges as one of the strongest and is one of the most consistent correlates of smoking behavior. Smokers are less likely to quit if they have greater exposure to peers who smoke, e.g, receive more cigarette offers, perceive peer tobacco and other substance uses, feel peer smoking attitudes, have contact with peer deviant behaviors or perceive

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a higher prevalence of smoking and the decrease in the proportion of friends who smoked were significant predictors of cessation in a non clinical sample of young adult, daily smokers (Chen et al., 2001; Tucker et al., 2002). Cessation rates were higher among those who had a greater number of nonsmoking friends (Hymowitz et al., 1991). Morgan et al., (1988) studied the actions of significant others at several points prior to relapse, including the helpful and hindering behaviors of other family members and friends in 225 adult smokers. The results revealed that at 2, 3, and 8 weeks following cessation, the participants reported the frequencies of specific behaviors from their spouses, families, and friends, and found 50 smokers who were still abstinent 13 weeks after quitting. Tucker et al., (2005) also found regular smokers were significantly more likely to quit for 6 months or longer if they were less often around people who smoked and perceived themselves to be in better health.

Parental smoking and parents' smoking disapproval attitudes can influence cigarette smoking in adolescents and young adults. Parental smoking cessation can often predict their young adult children's smoking cessation. Bricker et al., (2005) found that parental early smoking cessation is associated with substantially higher odds of their young adult children's 30-day successful smoking cessation and smoking reduction. Parental cessation could be considered a component of future interventions designed to target youth smoking. Additionally, the pervious study also found that peer, family and school were all important life domains contextually influencing subsequent smoking behavior among adolescents. Time spent with peers, best friend smoking and household member smoking were associated with higher risk. Parentechild closeness, parental control, attending a private school and having a higher percentage of Hispanic students at school were protective factors. (Wen, Duker & Olson, 2009).

2) Smoking Ban

Restricting or banning smoking in workplace, home, public buildings, health care settings, and transportation vehicles not only reduces the harm to nonsmokers but also may help smokers become motivated to quit (Emmons et al., 1995). Smokers who live in societies where there are more anti-smoking policies may feel more pressure to quit smoking and move to more advanced stages of change (Etter, 2004). Bans in both the workplace and in the home were also

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significant predictors of successful quitting (Farkas et al., 1999). Bans can increase cessation and promote reduction in cigarette consumption. City-level public place and workplace restrictions and individual-level workplace and household restrictions influence to smoking cessation. (Yang, Xu, Rockett, Guo & Zhou, 2011). The study of Macy et al., (2007) reported that one of the predictors for long term abstinence among young adult smokers who had reported not smoking for more than five years was working in a completely smoke-free building. Smokers who relapsed had family members who smoke, such as older siblings and even parents. In the military, tobacco use among recruits depends on the company commanders. Some recruits may smoke less and quit their smoking habit during recruit training because the opportunities to smoke were restricted by the company commanders (Cronan et al., 1989). The impact of no smoking policy during basic training can encourage Navy smokers to stop smoking and remain abstinent (Conway et al., 2004). In the United States, Air Force and Navy basic military training recruits are not allowed to smoke for a period of six weeks, but a high proportion of former smokers relapse after the smoking ban. However, they seemed to be more motivated to quit smoking at the one year follow-up compared to when they were in the basic military training phase (Cronan et al., 1989; Haddock et al., 2000; Hurtado & Conway, 1996).

Summary of the factors of smoking cessation

The finding from the review demonstrated that predictors of smoking cessation have many factors and variables which influence them. The demographic variables associated with attempting to quit and with successful cessation are older age, being male, being married with a non-smoker, and living with a partner or cohabitant. Higher socioeconomic status such as achieving a higher level of education, higher income and occupation are all related to quitting smoking. However, in this study the researcher did not concern about these variables because the conscripts had similar characteristics. Behavioral factors are important, especially the number of cigarettes smoked per day, including the number of cigarettes smoked and duration of time spent smoking. The smokers who had the experience of past quit attempts are more likely to quit, and those who tried to quit less than three times may finally be successful in quitting with regard to the method used to quit, many studies suggest that

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abrupt cessation or cold turkey is best, but others agree to emphasize gradual cessation because of the smokers addiction to nicotine which means they cannot stop suddenly without support for cessation. Alcohol use can be as obstacle to remaining abstinent. Physiological factors focus on nicotine dependence because of which most smokers have withdrawal symptoms after quitting, particularly the urge to smoke or continuous craving. It relates to number of cigarettes smoked per day and duration of smoking. Psychological factors consist of readiness to change following stages of change. The smokers who are in the later stages can successfully quit at a higher rate than those in the earlier stages. Reason to quit is a variable which indicates smokers have a motivation and intention to quit. Most quitters give the reasons of health and family as motivations to quit. Stress and emotional state can influence tendency to relapse after quitting. Attitude toward smoking, perception of one's self-efficacy to quit and self-esteem ,social support influence to quit smoking and remain abstinent. Environment factors, particularly peer group, can influence adolescent and young adults to decide to quit and be successful in quitting. Finally, ban on smoking can protect non-smokers from ETS and encourage smokers to quit.

In conclusion, the barriers to quitting smoking not only reduce an individual's motivation to change but also increase the risk of relapse following a quit attempts. Barrier to change can be physical and /or social barriers (e.g., living with a smoker; working in an environment in which smoking is allowed); psychological or emotional barriers that make the smoker feel he/she cannot survive or live without cigarette (e.g., stress, depression, anxiety, substance use, co-morbidity); barriers to access (e.g. to health education campaigns; to ability to purchase nicotine replacement therapy), and social contextual barriers (e.g., poverty, social isolation)

Suggestion for developing smoking cessation intervention

The smoking cessation program should encourage the smokers to incorporate an exercise regime or a relaxation procedure in their daily activities because it can reduce stress and increase respect for their physical well being. The program should focus on coping strategies such as assertive skills and avoidance behaviors. Smokers should be encouraged to focus on the positive effects of cessation and on the improved quality of life rather than to focusing on smoking cessation as a

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means of avoiding health problems. Living with the other smokers in the household or workplace should be considered in the program. Hymowitz et al., (1997) suggested that the cessation intervention should have both public policy and treatment implications. Heavier smokers need nicotine replacement therapy to help overcome nicotine addiction. The policy options, such as a regulation of nicotine-containing cigarettes and the use of cigarette taxes to fund low cost or free smoking cessation treatment programs for smokers should be implemented. The study of Lee and Kahendo (2007) found that successful quitters were more likely than those unable to quit to have rules against smoking in their homes. They suggested several important implications for a smoke-free home to support the smokers in their quit attempts because the smokers in a smoke free home were 10 times as likely to be successful quitters as those who lived in homes where smoking took place. The programs promoting smoking cessation might benefit by involving family or other household members to encourage smoke-free homes. Sussman et al., (1998) suggested that smoking cessation programs for adolescents should include counteraction of problem-prone attitudes, support of wellness attitudes, provision for motivation to quit strategies, and assistance with overcoming withdrawal symptoms. In addition, Xino et al., (2008) suggested the intervention had to address stress and addiction by adding a component to educate clients about the symptoms of nicotine withdrawal, the reasons for their occurrence, and specific coping strategies for these symptoms. Clients are reminded that withdrawal symptoms are temporary and a sign that the body is healing itself. Nicotine replacement therapies and cessation medications can ultimately overcome physical addiction.

2.3.4 Smoking Cessation Intervention

Most smokers experience substantial difficulty quitting. The Cochrane Tobacco Addiction Group reviewed the strategies use in smoking cessation such as acupuncture, antidepressants drug, enhancing partner support, individual behavioral counseling, self-help interventions and training health professionals in smoking cessation. Besides the interventions focus on the individuals to quit, there is a need for creating a supportive environment to encourage smokers in their attempts to quit. Raising tobacco taxes, banning advertising of tobacco products, smoke free

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environment policies, education and mass media campaigns to increase smokers' awareness and decrease accessibility of tobacco products, along with community-based smoking cessation programs are all parts of the important process for reducing the numbers of smokers (Spurlock, 2005).

Although there are many strategies to help the smokers to quit, the prevalence of smoking among adults, such as U.S. smokers has not changed in the past 10 years (CDC, 2002). This may be due to a failure to increase quitting over time which suggests a need for innovative strategies, particularly among the smokers who have no current plans to quit smoking (Carpenter, 2004). It needs to find the new effective program among adult smokers for quitting, including the interventions of individual and environment. Therefore, the review of smoking cessation intervention in this study is classified to each levels of intervention following the ecological model of health behavior change. The five levels are individual level, interpersonal level, organizational level, community level and policy level.

2.3.4.1 Smoking Cessation Intervention in general population

1) Individual level

Fiore (1990) analyzed smoking cessation methods used by adult smokers in the United States who tried to quit and found that 90% of successful quitters and 80% of unsuccessful quitters used individual methods of smoking cessation rather than organized programs. Most of these smokers who quit on their own used a *"cold turkey approach"*. Around 47 percent of persons who tried to quit on their own were successful whereas only 23.6% of persons who used cessation programs succeeded. Therefore, The Agency on Health Care Policy and Research (AHCPR) and the Centers for Disease Control (CDC) guidelines for healthcare providers recommend that all clinicians have to assess smoking status for every patient and then perform brief cessation (Fiore et al., 2000). About assessment of tobacco use , more than one- third of current smokers report never having been asked about their smoking status or urged to quit(Fiore et al., 2000). Advice from a physician has been shown to increase abstinence rates significantly by 30 percent compared to no advice (Carpenter, 2003). Based on the literature review and expert panel opinion, Fiore et al., (2000) recommended treating tobacco use and dependence for patients. Brief clinical interventions have been used for health care providers to help the smokers to quit. For

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the patient willing to quit, the guideline uses five major steps (the “5A’s ”) to intervene in the primary care setting. The strategies are designed to be brief, requiring 3 minutes or less of direct clinical time. Patients who willing try to quit ; ask about tobacco use ; advise all users to quit; assess willingness to make a quit attempt; assist the patient to quit; and arrange follow up contact. The strategies to assist the patients to quit, for example, help them with a quit plan, provide practical counseling (problem solving/skills training), provide intra-treatment and extra-treatment social support, recommend the use of approved pharmacotherapy. For the patient unwilling to quit, Fiore et al., (2000) suggested a motivational intervention that provided the clinician to educate, reassure, and motivate such as the motivational intervention built around the “5 R’s”: relevance, risks, rewards, roadblocks, and repetition to help the patient to quit. The patient who has recently quit should be preventing for relapse, therefore the clinicians should reinforce the patient’s decision to quit, review the benefits of quitting, and assist them in resolving any residual problems arising from quitting. Relapse prevention interventions are especially important soon after quitting because most relapse occurs within the first 3 months after quitting, relapse prevention is especially appropriate during this period. It can be delivered by means of either scheduled clinic visits, telephone calls, or anytime the clinician encounters an ex-tobacco user. Kim et al., (2005) evaluated a tailored smoking cessation intervention, using the Agency for Health Care Policy and Research (AHCPR) guideline which states the major steps (the 5 As) to intervention in the primary care setting among 200 patients in the OPD of internal medicine in Korea. The intervention consisted of individual counseling and follow up with telephone support to prevent a relapse. After 5 months, the cessation was measured by self-reported on the phone and validated later by a portable CO analyzer. The results revealed that the intervention group (aged 49 or less) was significantly more likely to be effective to quit than the older smokers group. Benefits of brief counseling effect in light to moderate smokers (less than a pack per day).

Behavioral modification is the one of the intervention for smoking cessation. Most program consisted of group sessions, social support networks or individual counseling (Aquilino & Lowe, 2004). The five-day plan to stop smoking (FDP) is an educational group technique for smoking cessation

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developed in the United States. The program focused on providing information about the effects of smoking, reinforcing motivation, stress management, avoidance of high-risk situations and emphasis of the possible benefits. The results showed that 82.9% of the participants had stopped smoking. Success rates were 66.7% at 1 month, 48.8% at 3 months, 30.9% at 6 months and 25.2% after 1 year. Stress was the most common cause of relapse. Irritability, agitation, difficulty in concentrating, frustration and nervous tension were found to be the main visible manifestations of this stress (Frikart et al., 2003). In addition, Novella et al., (2004) used cognitive-behavioral therapy involved 9 group sessions over 3 months with pharmacotherapy for 248 adult smokers who attended a smoking cessation clinic. These sessions include coping strategies, behavioral rehearsal, relapse prevention, benefits of quitting, and weight control. The results showed that success rates were 77% at one week, 30.2% at 3 months, and 31.9% at 6 months.

Self-help intervention /self-help materials are the methods to use for smoking cessation to reach a larger percentage of the eligible population than clinical interventions, and are more cost-effective. Several approaches have been proposed to increase the efficacy of self-help interventions, including personalized written feedback and telephone support, both for increasing abstinence rates and for reducing relapse rates after self-help programs (Prochaska et al., 1993). The examples of the content of self-help materials such as 1) self-monitoring and graphic representation of cigarette consumption; 2) information on smoking; 3) nicotine fading 4) stimulus control procedure; 5) strategies to cope with withdrawal syndrome; and 6) strategies to prevent relapse.

Telephone contact is an economic way of adding personal contact to self-help materials. Hanewinkel and Wiborg (2006) described the initial evaluation of a self-help manual with a shorter follow-up period aimed at adolescents and young adults aged 14 to 25 years. All participants received a 28 page self- help manual which consisted of three main parts: general information about smoking and health related-effect, behavioral modification techniques (self-monitoring and decisional balance, how to deal with withdrawal symptoms) and the supporters to support the smoker when quitting smoking. A quit and win contest was carried out and

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validated via a cotinine test. An analysis showed a quit rate of 8.5% with an average duration of abstinence of 51.30 weeks.

Guide Imagery is a form of mind-body therapy that involves controlled visualization of specific mental images and is often combined with deep breathing and progressive muscle relaxation (CDC, 2002). Wynd (2005) examined the effectiveness of guided imagery for immediate smoking cessation and long-term abstinence among adult smokers in outpatient clinic. The intervention and control groups received educational and counseling sessions in their homes but added instruction in the use of guided imagery with a 20-minute audio-taped exercise for reinforcement and relaxation techniques to the intervention group. The results revealed that at 24-months after the intervention, smoking abstinence rates were significantly higher for the guide health imagery intervention group. Therefore, guided imagery was an effective intervention for long-term smoking cessation and abstinence in adult smokers. Likewise, Tindle et al., (2006) examined a randomized controlled trial of an audio CD–based interactive guided imagery program for smoking cessation among adults who expressed a desire to quit smoking. Abstinence rates in the intervention versus control groups were 36% versus 18% at 6 weeks and 30% versus 12% at 12 weeks, respectively. At 1 year, 24% of intervention participants remained abstinent.

Many people are able to successfully quit smoking on their own and with behavioral self-help guideline. However, most smokers are nicotine-dependent and could benefit from interventions to address the physiological aspects, specifically the disorders of tobacco dependence and tobacco withdrawal. The pharmacotherapy has focused on the alleviation of tobacco-withdrawal symptoms. Most treatments use nicotine replacement therapy (NRT) to reduce withdrawal symptoms and antidepressant to reduce the cessation-induced depression that is related to nicotine withdrawal such as bupropion and nortriptylline. Current forms of nicotine replacement therapy are transdermal patch, nicotine gum, lozenge, sublingual tablet, oral inhaler and nasal spray (WHO, 2003). Counseling and pharmacotherapy are proven, effective treatments for nicotine dependence (Reid et al., 2007). However, nicotine replacement therapy has not been used in this study.

Motivational Interviewing (MI) is a well-developed treatment approach whose primary goal is to help trigger a decision and

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commitment to change (Miller & Rollnick, 1991),which is based on stages of change (SOC) model (DiClemente & Prochaska, 1985; DiClemente et al, 1991; Prochaska & DiClemente, 1983). The aim is to facilitate and enhance a person's intrinsic motivation and focus on cognitive process such as cognitive dissonance, self- efficacy and perceived pros and cons of changing behavior. This model focuses on helping smokers articulate their reasons for quitting as well as their concerns about smoking, and it offers concrete strategies for working with precontemplator and contemplator smokers to enhance their intrinsic motivation (Miller & Rollnick, 1991). A key feature of this intervention model is using open-ended questions to elicit self-motivational statements. Longitudinal studies demonstrated that smokers with higher baseline levels of intrinsic relative to extrinsic motivation were more likely to achieve abstinence at 3 and 6 follow-ups (Curry et al., 1990). However, MI was ineffective or negative results for the outcome of smoking cessation among teenage smokers, adult smokers with a low-income housing developments, and adolescent smokers with psychiatric disorders (Horn et al., 2007; Okuyemi et al., 2007; Brown et al., 2003). There is some evidence that MI is the best suited for clients who exhibit lower motivation and readiness for behavior change. The clients who have high motivation and high readiness may fare better with a skill-based rather than a motivation-based approach (Okuyemi et al., 2007).

Several conceptions of motivation to change behavior, in the context of tobacco and drug use cessation have been proposed, for example, the transtheoretical model, the intrinsic and extrinsic model of motivation, the self-regulation model of behavior change (McCuller et al., 2006). Project EX is the one of the example to increase motivation to quit. It is an eight-session teen school-based clinic tobacco use cessation program that involves the inclusion of enjoyable, motivating activities (games, talk show) to enhance quit rates among youth. This clinic program was tested in a three-group experimental design in southern California in 1998. In Los Angeles, the effects of Project EX among high school student smokers revealed that the students who participated in the program conditions were more likely to express higher motivation to quit tobacco use., compared to those in the control group. Higher motivation was also significantly related to higher quit rates (McCuller et al., 2006). In China, Project EX was also used in a 10^{th} grade-level cigarette

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smokers and reported a reduction in daily cigarette consumption at posttest and at 4-month follow-up (Zheng et al., 2004).

There is an extensive literature indicating the effectiveness of telephone counseling for smoking cessation (Fiore et al., 2000; Zhu et al., 2002).A recent study of the efficacy of telephone counseling found significant treatment effects with both young adult and older adult smokers. Telephone help lines used two main approaches: reactive, in which smokers can simply telephone the line, and proactive, in which counselors ring callers back and give ongoing telephone support. The effectiveness and cost-effectiveness of proactive telephone counseling for smoking cessation is now widely recognized (US.DHHS, 2000a). Three interventions counseling calls based on initial success or failure could encourage 164 adult smokers reduce their smoking. Participant reporting of success or failure at relatively early time points during the intervention are reasonable predictors of future objectively assessed success or failure. Successful participants were those that had a supportive home environment. (Estabrooks et al., 2010). In this study, the cessation program used telephone counseling to follow up and feed back to prevent relapse.

2) Interpersonal level

Social support from significant persons can promote quitting. Carlson et al., (2002) added partner support group component to a large-group community-based behavioral smoking cessation program to increase the higher success rates and remain abstinent. Six hundred smokers brought 156 support people with them to the groups. Support people were spouses, children, parents, and/or friends. The smokers who had support people attending at least one of the support group sessions had higher cessation rates at 3, 6, and 12 months (56%, 46%, and 43%) compared to those without a support person in attendance (36%, 35%, 32%). As well, Cohen& Lichtenstein (1990) measured received partner support from 221 smokers attempting to quit on their own by interview at 1, 2, 3, 6 and 12 months after their expected quit date. The results revealed that the more positive behaviors the subject received, the more likely he or she was to be continuously abstinent at 1 month and 3 month. The program in this study brings the support group from the parent, wife or girlfriend including the training officers to support the conscripts during quitting.

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3) Organizational Level

The smoke free workplace is a cost effective public health approach that encourage the important long term goal for tobacco control (USDHHS, 2000).The creation of smoke-free places ,especially smoke-free work sites, is thus an essential component of any successful strategy to promote smoking cessation. Numerous studies have documented the effects of these restrictions on employee smoking behavior. The studies have been conducted in health care setting, government agencies, insurance companies and the workforce which found reductions in average daily consumption of cigarettes and lower overall prevalence rates. The percentage of smokers contemplating quitting was also higher in smoke free work sites, and such sites also seemed to promote long-term quitting (Stillman et al., 1990; Borland et al., 1991).

There are many strategies to promote smoking cessation at the worksite. Glynn et al., (1990) reviewed the literature of self-help program at the worksite and identified four types of cessation strategies, e.g. bibliotherapy (self-help books and pamphlets), peer support, telephone recorded messages, and monetary incentive. The review showed the interpersonal environments (the effect of social support) significantly influences the initiation, maintenance, and cessation of smoking. Six major approaches to implementing employee smoking cessation are informal campaigns, smoking restriction and bans, physical examination and physician advice, incentive program, smoking cessation clinics (10-40% success rates have been reported) and multi-component intervention. Likewise, Frankish et al., (1997) concluded in the past two decades that the number of U.S. workplaces offered health promotion programs to their employees, which activities can take many forms. Those include smoking restrictions or prohibitions, policies to enable employees to engage in smoking cessation, the posting of tobacco warnings and offering of other forms of smoking-related information, sponsorship of smoking cessation programs, and economic incentives designed to encourage smokers to quit or to reward non-smokers. Other programs (i.e. workplace fitness, stress management, and health education programs) are also contributed to reduced smoking.

Findings of the second U.S. national survey of workplace programs, conducted in 1992, revealed a substantial improvement in the

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number of workplaces with formal smoking policies. Forty percent of workplaces offered information or activities to help employees stop smoking, including resource materials (91%), classes or workshops (56%), and individual counseling (23%) (USDHHS, 1993; WHO, 2003). The impact on smoking behavior of a workplace smoking ban in the Australian Public Service had been reported with reduced rates on smoking, particularly among heavy smokers which the reduction in consumption was over 25 percent (Borland et al., 1990).

4) Policy level

Tobacco control involves the target at personal and environment. Chollat-Traquet (1996) reported that at the policy level, health professionals should involve in tobacco control, not only as non-smoking role models ,but also by making every effort to reduce the tobacco consumption of their patients and of society in general. In addition, the policy or legislation has been conducted, e.g., advertising restrictions/bans, effectiveness of product/advertising warning labels, price policy, restriction of sales to minor, regulation of public smoking or lean indoor air and enforcement. The effect of smoke free workplaces policies on cigarettes consumption and prevalence of smoking in US. have been shown in a systemic review that implementation of totally smoke-free workplace policies was associated with a reduction in absolute prevalence of 3.8% and a decrease in consumption of 3.1 cigarettes per day per continuing smoker. Comparison with tax increases, when increasing the price of cigarettes by 10% leads to a 4% reduction in consumption per capita. The legislation restricting smoking in public and in workplaces to protect the health of non-smokers US local and state governments from seven studies found that the enforced legislation had the effects on adult consumption or prevalence. The five studies had 3.7% to 4.5% reductions in absolute prevalence (Fichtenberg, & Glantz in Warner et al., 2006). Likewise, Longo et al (2001) examined the long term impact of workplace smoking bans on employee smoking cessation and relapse among 1033 current or former smokers employed in smoke free hospital and 816 smokers employed in non-smoke free workplace. The results showed that employees in workplaces with smoking bans have higher rates of smoking cessation than employees where smoking is permitted, but relapse is similar between these two groups of employees**.** Therefore, this study will reinforce the policy about smoke free workplace

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and ban on smoking during BCT, including promote health care providers to take action about tobacco control in the military. Hublet (2009) investigated the associations between tobacco control policies at country level and smoking prevalence among 15-year-old adolescents from 29 Uropean countries. The results revealed that for boys, some of the currently recommended tobacco control policies may help to reduce smoking prevalence.

2.4 Theoretical Concepts

2.4.1 Ecological Model

McLeroy, Bibeau, Steckler, and Glanz (1988) proposed an ecological model of health behaviors that identified multiple levels of influence. These levels highlight the interaction and integration of biological, behavioral, environmental and social determinants, as well as the influence of organizations (e.g. workplace and schools), other persons (e.g. family, friends and peers), and public policies; all of which together help individuals make healthy choices in their daily lives. The ecological model focuses on both individual and social environments for health promotion interventions. The model views behavior as being affected by, and affecting social environment. A key feature is that the model highlights how health and well being are affected by changes and interactions among all these factors over the course of one's life (Glanz et al., 2002). This systems approach micro-level to macro-level factors that operate at the level of individuals, groups, organizations, communities, and populations (Green et al., 1996).

According to Broffenbrenner's ecological model, the patterned behavior which is viewed as being determined by five levels of factors. The intrapersonal factors consisted of characteristics of the individual such as knowledge, attitude, behavior, self-concept, self-efficacy, self-esteem, perceived susceptibility and skills, etc. The interpersonal level, factors include social-psychological variables such as social norms, social networks and social support systems, including the family, workgroup, and friendship networks. The institutional factors were social institutions with organizational characteristics, and formal and informal rules and regulations for operation. The community factors were

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relationships among organizations, institutions, and informal networks and the final factor was public policy which consisted of local, state, and national laws and policies. An example of an ecological approach to health behavior is the case of smoking cessation which Centers for Disease Control and Prevention (CDC, 1999) used to control tobacco in the United States targeting individual behavior, societal norms, policy initiatives, and change in the environment that forbid smoking, decrease cigarette availability, give financial incentives to those who do not smoke. A multilevel longitudinal analysis was studied to assess the prospective impact of individual, social-normative, and policy predictors of quit attempts and smoking cessation among Massachusetts adults. The results revealed that that perceptions of strong antismoking town norms were predictive of abstinence (odds ratio=2.06; $p<.01$). Household smoking bans were the only policy associated with abstinence, but smoking bans at one's worksite were significant predictors of quit attempts.

Corbett (2001) reviewed ecological framework to summarize the state of social science regarding tobacco initiation and approaches to prevention in youth. The programs consisted of five levels to change. With regard to the **individual level,** school programs can delay or prevent the uptake of tobacco use 20-40% (CDC, 2000b). Impacts of school based programs are achievable at least over the short-term, and are more likely to be sustained in planned, sequential interventions which provide recurring educational inputs (e.g., booster sessions). **Groups or social networks are at the next level**, one in which social norms, peers, and influences within personal social networks of youth, including parents and other family members, are targeted for both attitudinal change and informal restrictions, such as household policies prohibiting tobacco use. **The organizational level** includes youth group, club, sports, and school rules and curricular content, as well as the effects of rules and systematic messages in organizations, such as worksites and health-related settings in which clinical services and health education are provided. **The community level,** focused on restrictions on access to tobacco, and collaborative efforts of opinion leaders and public institutions, such as community-based campaigns that employ multiple strategies and channels for communication. **The population level** used society-wide communication campaigns through mass media, and policies that increase prices for tobacco products. Public policies and the mass media environment

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are influences affecting, respectively, the availability of tobacco products and their desirability for youth. Economic measures, such as tobacco taxation affect initiation both through direct effects on consumption and indirect effects. In Canada, the results from the assessment of integration of the ecological approach in public health organizations' tobacco control programs for youth in 129 regional public health organizations revealed that the programs were implemented mostly in schools and in communities settings. Most frequently, programs directly targeted youths themselves, followed by targeting interpersonal and organizational environment (Richard et al., 2002).

As the review, the ecological models have been used in smoking prevention especially in youth, but there is less intervention for smoking cessation which consists of multi-level approach for health behavior change. According to, 333 articles published in Tobacco Control from 2001-2006 revealed that 9.9 percent (33 studies) focused on single interventions anti-tobacco, Interventions by tobacco industry (13.2%), determinants of tobacco use (10.8%), and other (63.1%), but there was not any study about multiple interventions which approached in many levels. The interventions targeted at the individual level, regardless the social environments. (Kothari et al., 2007).

The study of the effects of smoking bans in the workplace based on an ecological model on cigarette consumption among 391 smokers showed a reduction of cigarette consumption, particularly among heavier smokers by more than 25% (Borland et al., 1990). Environmental and policy interventions to control tobacco use and prevent cardiovascular disease should have clean indoor air policies, restrictions on tobacco advertising and promotion, policies limited youth access tobacco, comprehensive school health programs, and excise taxes and other economic incentives. Interventions such as the clean air acts encourage change in individual behavior based on changes in the environment. (Brownson et al., 1995).

Ecological model was expanded by Emmons (2000) to be social ecological model (SEM) which considered social contextual factors that influence how policy, community, and organizational levels interact and influence opportunities for health behaviors in a specific organizational setting. It was used to

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provide insight on school-based physical activity (PA) promotion within one public school board in a large Canadian city. The result revealed that different levels of policy could simultaneously and independently influence in school environments and the opportunities available for children to engage in PA and the organizational-level factor could influence what and how the extent of government policies were actually implemented. Furthermore, the result suggested that schools need support and direction from higher level policies. (Langille & Rodgers, 2010). The ecological model applied to formative research for a WIC (Women, Infants and Children) training program in New York State which focused on individual, interpersonal and organizational level. Collecting data from the health care providers and the clients followed research questions at which ecological level. The data were analyzed as text using a coding scheme iteratively. The results showed the data of individual, interpersonal (provider-client) and organizational issues that could be targeted by a training intervention.

Besides using ecological model for the intervention regarding smoking behavior, it was used for other target behaviors such as to control obesity, increase physical activity, improve diets, and encourage other healthy people behavioral targets. Sallis, Bauman & Pratt (1998) reviewed environmental and policy intervention based on ecological models to promote physical activity behaviors of young people and adults, the result showed that the intervention to alter environments by removing barriers and providing more opportunities for physical activity can be effective. However, further research is needed to design the interventions, implementing and formulating research design and measuring change of evidence on their effectiveness. In alcohol use, the intervention of Project Northland with the goal of preventing or reducing alcohol use among young adolescents which consisted of social-behavioral curricula in schools, peer leadership, parental involvement/ education, and communitywide task force activities, the results suggested that multilevel, targeted prevention programs for young adolescents were effective in reducing alcohol use (Perry et al., 1996). Additionally, a multilevel ecological approach has been used to promote walking in rural communities which found in a quasi-experimental study of Brownson et al. (2005). The interventions were developed with community input and included individually tailored newsletters; interpersonal

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activities that stressed social support and health provider counseling; and community-wide events such as fun walks. The results revealed that a multilevel intervention approach was shown to promote walking.

2.4.2 Transtheoretical Model

The transtheoretical model (TTM) has been applied to many health behaviors since its introduction in the early 1980s (Prochaska & DiClemente, 1984) and has become one of the most widely used program planning models in health promotion. TTM has significantly influenced the development of behavioral interventions for smoking cessation over the last 20 years. There is a consistency of the findings across different areas that supports the idea that the transtheoretical model can serve as an integrative theme for accelerating change across a abroad range of problem behaviors, for example sexual behavior, alcohol abuse, diet and weight control, exercise adoption, mammography screening, smoking acquisition, smoking cessation etc (Prochaska & DiClemente, 1983, Glanz et al., 1994).Research in the area of smoking cessation has successfully utilized constructs from the transtheoretical model (Wilcox, Prochaska, Velicer, & Di Clemente, 1985). This model provides a general model of change that assists with explaining therapeutic processes and how individuals change their behaviors without professional help. The model consists of three core constructs: stages of change, processes of change, and decisional balance

2.4.2.1 Stages of Change

In the stages of change, people are thought to move from having no motivation to change to internalizing the new behavior. The early stages are defined by the level of intention to change a problem behavior, whereas the later stages are defined by the length of time a person has engaged in the new behavior (Bartholomew et al., 2006). The stages consisted of precontemplation, in which people have no intention of changing behavior; contemplation, in which people are thinking about changing the problem behavior in the next six months, but the individual has made no plan for change; preparation , in which people are planning to change their behavior within the short term (one month) and are taking steps to get ready for the change; action, in which people have recently changed behavior, and maintenance , in which people have performed the new behavior and maintained a behavior change for

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six months or more. People in the action or maintenance stages may relapse and then recycle to action or relapse to contemplation or even precontemplation.

2.4.2.2 Processes of Change

The processes of change which are overt and covert strategies and techniques are used to modify problem behaviors and transition from stage to stages. The 10 most consistently replicated processes of change include: consciousness raising, dramatic relief, self re-evaluation, environmental re-evaluation, self liberation, helping relationships, stimulus control, counter conditioning, reinforcement management and social liberation. There are two higher order process dimensions: experiential processes and behavioral processes. Experiential processes are those directed at the emotional or cognitive aspect of change (Table2.2), and behavioral processes which focus on behavioral skills (Table 2.3). The experiential processes appear to be primarily used in the earlier stages of change in most problem behaviors, while the behavioral processes are most heavily relied upon in *action* and less so in *maintenance*.

Table 2.1 Processes of change that mediated progression between the stages of Change

Precontemplation	Contemplation	Preparation	Action	Maintenance
Consciousness raising				
Dramatic relief				
Environmental reevaluation				
	Self-reevaluation			
		Self-liberation		
			Counter conditioning	
			Helping relationships	
			Reinforcement management	
			Stimulus control	

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Table 2.2 Experiential Processes of Change

Experiential Processes	Description
Consciousness raising	Awareness of the problem, feedback to break down individual defensiveness toward changing the problem behavior
Dramatic relief	Experiencing and expressing feelings about the problem behavior and solutions
Environmental reevaluation	Assessing how the problem behavior affects the physical environment
Self-reevaluation	The emotional and cognitive appraisal of the pros and cons associated with changing the problem behavior
Social liberation	Increasing alternatives in society for non problem behaviors

Table 2.3 Behavioral Processes of Change

Behavioral Processes	Description
Counter-Conditioning	Substituting a new or competing behavior for the problem behavior
Helping Relationship	Trusting others and accepting and utilizing their support to change the problem behavior
Reinforcement management	Changing the contingencies that control or maintain the behavior
Self-liberation	Individual's choice and commitment to change the problem behavior, including the belief that one can change
Stimulus control	The removal of cues or adding stimuli that encourage alternative Behaviors

(Rossi, 1992b)

In addition to the stages and processes of change, the transtheoretical model also incorporates two other intervening variables that mediate stage movement; decisional balance (the pros and cons of behavior change) and self-efficacy (situational confidence in one's ability to change and situational temptations to engage in the problem behavior). These variables can be used to monitor

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intervention effectiveness, assess individual progress toward problem resolution and indicate potentially troublesome situations that need to be targeted specifically to prevent relapse.

2.4.2.3 Decisional Balance

The decision to move towards action is based on the relative weight given to the pros and cons of changing behavior so as to reduce risk. The pros represent the advantages or positive aspects of changing behavior and may be thought of as facilitators of change. The cons represent the disadvantages or negative aspects of changing behavior, and may be thought of as barriers to change. The pros and cons are independent factors, so that someone can be high on one and low on the other, high on both factors, or low on both factors. Prochaska et al. (1994) reported that the cons of quitting smoking is higher than the pros in precontemplation. Pros and cons were about equal in the contemplation, whereas in the advanced stages, the pros of quitting exceed the cons.

2.4.2.4 Self-efficacy

Self-efficacy has been demonstrated to be an important mediator between knowledge and action. Within the transtheoretical model, self-efficacy has been operationalized in two ways: situational confidence in changing a problem behavior and situational temptations to engage in the problem behavior (Prochaska et al., 1994). Self-efficacy was measured by temptation to smoke in three categories of situations characterized by being either Positive/Social, Negative/ Affective, or Habit/Addictive (Velicer et al., 1990). The TTM has been successfully applied across the various stages of smoking cessation, and confidence in quitting increases almost linearly from its low point at the precontemplation stage to its peak at the maintenance stage. In smoking cessation studies, confidence has emerged as an important predictor to stage movement to action and maintenance. For the precontemplation stage, low self-efficacy scores can reflect both perceived inability and unwillingness to change.

Chen et al., (2008) assessed the relationships of the stages of smoking acquisition with self-efficacy and decisional balance in young Taiwanese adolescents. Students who were at the precontemplation stage had higher self-efficacy to resist smoking initiation than those who were at the decision-making or

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maintenance stages. In a discriminant function analysis, self-efficacy and decisional balance correctly predicted 77.4% of membership in the three stages. They suggested that health educators could use stage-specific skills and strategies based on self efficacy and decision balance constructs to develop smoking prevention programs. Additionally, Hudmon et al., (1997) reported that pros subscale and cons subscale differed significantly among those participants who reported no smoking experience, minimal smoking experience, or regular smoking.

2.4.3 Social Support

Social support has been demonstrated to affect a variety of health-related behaviors. Recent evidence suggests that social support can influence physical health through change in the performance of health-relevant behaviors such as decreased cigarettes and alcohol use or improved diet and exercise patterns (Cohen & Syme, 1985) According to House (1981), social support is the functional content of relationships that can be categorized into the following four broad types of supportive behaviors; *emotional support* involves the provision of empathy, love, trust, and caring; *instrumental support* involves the provision of tangible aid and services that directly assist a person in need.; *informational support* involves the provision of advice, suggestions, and information that a person can use to address problems; *appraisal support* involves the provision of information that is useful for self-evaluation purposes, in other words, constructive feed back, affirmation, and social comparison. Emotional support is known to be the most strongly and consistently associated with good health and well being (Glanz et al., 2002). Many theoreticians have argued the theoretical definitions of social support, but when considering as a multidimensional concept, it encompasses three constructs which can be measured in three aspects, support networks, supportive behaviors, and perceived support (Cohen, 1992 cited in Hupcey, 1997). Measuring social support, most research used three categories identified by Sarason et al.(1990); (a) the network model that focus on individual's social integration into a group and the interconnectedness of those within that group (b) the received support model that focused on what a person actually received or is reported to have received (c) the perceived support model that focuses

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on support the person believes to be available if he or she should need it (Hupcey, 1997).

2.5 Related research on Smoking Cessation Intervention

2.5.1 Smoking Cessation Intervention in Military

The interventions for smoking cessation in military emphasize in policy implementation. In U.S., Department of Defense (DoD) addressed prevention and smoking reduction by mandating smoke free workplaces and cessation support for military personnel, for example the U.S. Navy prohibits tobacco use during recruit training for the entire 8 weeks duration of basic training. This study found the impact of the Navy no smoking policy on the smoking behavior of male recruits at graduation from basic training (Conway et al., 2004). Besides ban on smoking during recruit training, the policy on smoking and other health risk behaviors have been established, for example, designed nonsmoking areas and smoking cessation campaigns, smoke free workplace, prohibition of health care providers from smoking on duty, and distribution of information to new personnel on health consequences of smoking and encouragement to quit (Joseph et al., 2005).

In contrast with the study among infantry battalion, the short-term impact of army smoking policies included restrictions on areas in which smoking is permitted, education regarding the hazards of smoking, and encouraging role of health professionals emphasizing cessation revealed that it had little or no impact on 73% of smokers. Seventy-eight percent of soldiers received question from army health care provider regarding their use of cigarettes but only 30% of current smokers had been suggested by to quit or cut down (Carroll et al., 1989). Another study examined the relapse prevention intervention after the recruits were banned from smoking during a 8-week Navy basic training program**.** The three interventions consisted of 1) training smoking ban and health education; 2) standard treatment and post recruit training regular motivational mailings**,** and 3) the telephone helpline group received standard treatment and access to a toll free telephone help line after recruit training .The results indicated that the three groups did not differ in smoking prevalence rates. However, there was a decline of 20% points of current smokers after one year. Therefore, recruit

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training may be an external motivation for smokers who desire to quit (Conway et al., 2004).

However, Klesges et al., (1999) found that forced cessation (6-week ban during basic military training) and a brief intervention is associated with the long-term cessation. The quit rates for those assigned to the intervention group were 18%, compared with 17% in the control group. But at the 1-year follow up, regardless of treatment condition, nearly 18% of smokers were abstinent. Because a brief intervention used was less than 1 hour and no effective for the whole group, so Klesges et al., (2006) conducted the tailored longer intervention and added preventing nonsmokers from initiating tobacco use or assisting those wishing to remain abstinent from smokeless tobacco use in a population of military personnel in U.S. The results indicated that smokers who received intervention were 1.16 times (7-day point prevalence) and 1.23 times (continuous abstinence) more likely to be abstinent than controls from smoking cigarettes at the 1-year follow up, the cassation rate difference was 1.60% and 1.73% for point prevalence and continuous abstinence. Smokeless tobacco users were 1.33 times more likely than controls to be continuous abstinence. But the program had no impact on smoking initiation which should prevent the factors to smoking such as stress, boredom, and alcohol intake.

The education intervention on tobacco use had the short term effect on tobacco use and intention to quit among 151 U.S. Army infantry soldiers. The intervention consisted of tobacco health hazards and effects on military readiness, preparing and approaches to quitting, maintaining abstinence and resource for quitting. The education content was structured from session one of the ACS Freshstart program, a four-session quit smoking program. After one month, the results demonstrated a decline in tobacco use in more than half of tobacco users; 14% quit and 37% decrease use, however 46% stayed the same. Eighty percent had positive thoughts or actions toward quitting tobacco use. (Morgan, 2001). In contrast with the result of 557 men for Naval basic training. about the short period of education could not affect on the cessation in the intervention group when compared with the control group, so it need more rigorous programs to reduce the numbers of smokers. The company commanders should not use smoking as a motivational tool to the recruits and might prohibit the company commanders from smoking in front of the recruits. Education programs for

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the company commanders on the hazards of smoking and the effects of modeling and reinforcement may help company commanders become better role models for a becoming smoke free organization (Cronan et al., 1989).

Bushnell et al.,(1997) evaluated the effectiveness of two behavioral interventions when added nicotine replacement therapy for smoking cessation among 512 active duty military, family, retirees, DOD civilians in US. The tobacco cessation programs were the American Cancer Society (ACS). Fresh Start program; four weekly 1- hour large group sessions and the Vanderbuilt University Medical Center (VUMC) behavior counseling program which used a relapse prevention model .In both programs, nicotine replacement were offered free of charge to all subjects. The results indicated that 57% of most smokers demonstrated a high level of nicotine dependence. The more intensive programs were effective at the end of program and at 3 months, but there was a relapse rate after 3 months and 6 months follow up. There was no difference in the program effect for the active duty participants.

2.5.2 Smoking Cessation Intervention in the Royal Thai Armed Forces

After WHO announced the Motto on World No Tobacco Day for "*Health Professionals and Tobacco Control*" in 2005, professional health network of Thai society set up the smoke free hospital project and promote quitting among health professionals. The Army Medical Department has joined in this project and announced to the 37 Army hospitals under control of the Army Medical Department. The activities consist of setting smoking areas and smoke free workplaces, providing smoke free tags and signs in the official areas ,giving health education to the army officers, providing quit clinics, and evaluating the prevalence of smoking and cessation rate among the army officers. The 11 army hospitals resumed to join in this project and found that some army officers can stop smoking after joining the project.

Suansomjit (2007) concluded the health promotion plan of the Royal Thai Armed Forces started in 2004, with the support of Health Promotion Fund that the Royal Thai Armed Forces started a vigorous campaign to reduce the numbers of the soldiers smoking following to the King's Royal Comment about the health of the people. In 2006, the Ministry of Defense set up the smoke free project under the responsibility of the Directorate of Personnel, so each Army unit including the Army

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hospital followed this project to support the Non-Smokers Health Protection Act, B.E. 2535. The activities consisted of 1) survey and set the areas for smoke free zone and smoking areas 2) survey the prevalence of smoking of the Army officers, clerks and others in the workplace 3) set up the activities to increase physical exercise in military to support the soldiers to quit smoking and 4) announce the smoke free project to each military unit.

In 2006, the Royal Thai Navy conducted the campaigns for the Navy Forces to stop smoking. The activities were followed to Tobacco Products Control Act, B.E, 2535 and Non-Smokers Health Protection Act, B.E. 2535, which included providing health service to support the Forces to encourage quitting smoking, e.g. set quit clinic, quit line service and create a smoke free environment in the workplace. The results showed that 472 Navy Forces could stop smoking. The Navy continued the project and activities in every unit of the Navy Forces, such as the project “reduce and stop smoking to celebrate the King's Birthday 80 anniversary year, 5 December 2007”

The evidences of smoking cessation interventions among Thai military conscripts focused on individual level and interpersonal level found the effect of the program could not be sustainable. The study of the conscripts at Chulachomklao Royal Military Academy infantry battalion which used peer motivation by training 12 non-smoking to persuade and motivate their friends to quit smoking revealed that the intervention group could quit smoking after the period of 2 weeks, 1 month, 3 months, 6 months and 1 year more than that non-peer motivation group. After 1 month, the cessation rate was 50%, but after 3 months, the program could reduce the number of privates to quit only 25.89%. This study suggested physician and peers to motivate smokers at least every month, and it has to conduct a tobacco control campaign for the whole unit to encourage them to quit smoking (Suansomjit et al., 1998).

Prommobol (2003) applied a health belief model and a life skill development smoking cessation program to encourage quitting smoking cigarettes among the conscripts in Adisorn fort, Saraburi province. The experimental group participated in health education program activities for four weeks. The results indicated that the experimental group had more change in their perceived severity of the disease, decision making skills to stop smoking, and in the lower number of cigarettes smoked per day more than the control group. Self-control technique was

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used to examine smoking reduction and cessation among army conscripts at Phanurangsri Fort, Rajburi province and found that smoking reduction and cessation behavior of the experimental group was found to be significantly better than of the comparison group ($p<0.05$), but none of the two sample groups were able to quit smoking (Prempasai, 2008). For non-commissioned officers at Kavila military camp in Chiang Mai the study applied the concept of Glasgow's self-management program on smoking behavior which comprised of five sessions in six weeks revealed that smoking behavior among the experimental group were significantly decreased after receiving the self-management program (Thungproun, 2004).

2.5.3 Related research on TTM

2.5.3.1 The relationships between Stages of Change, Processes of Change ,Decisional Balance and Self-efficacy

Prochaska and his colleagues (Prochaska,1994; Prochaska et al, 1994) described decisional balance constructs, the pros and cons of changing through the stages. Precontemplators anticipate more cons than pros with regard to changing the problem behavior, whereas the pros and cons are more in balance in the contemplation stage. In the action stage, people anticipate more pros than cons. In smoking behavior, the pros and cons of quitting are considered to be complimentary to the cons and pros of smoking. Therefore, change in decisional balance will predict progression from precontemplation to action. Prochaska proposed that smoking cessation interventions should target increasing the pros of changing which will lead to progress from precontemplation to contemplation, then target decreasing the cons of changing, which will lead to further progress from contemplation to action. Individual change processes, like consciousness raising and self-reevaluation can be used to increase the perceived pros of healthy behavior changes. Helping individuals to become more aware of the multitude of negative consequences of not quitting smoking can increase the perceived cons of not changing for these individuals. Many studies confirmed the association between the decisional balance and stage of change following the theory (Etter & Perneger, 1999; Carlson, 2003; Yalçınkaya-Alkar & Karanci, 2007). According to the theory, the cessation programs should emphasize environmental rewards and discuss the cons of smoking in more depth, and the

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extensive research with TTM has shown that progressive through stages of change can predict smoking cessation outcome (Ward et al., 1997; Ham & Lee, 2007).

From stages of change, it's found to be possible to skip stages, such as patients, new recruits in military that were forced smoking abstinence during basic military training. The person jumped from precontemplation to action stage proving that the decision to quit is not willful but it is necessary to support the goal of abstinence. In a prospective study of more than 1,400 smokers, stage of change was significantly related to the likelihood of making a quit attempt and actual success of the attempt. It is assumed that stage movement may be associated with factors such as beliefs in the pros of quitting and cons of smoking, motivation and confidence about quitting smoking, and increased social support during quitting (DiClemente et al., 1991). Wagner et al., (2004) also found that social support was positively associated with the processes of change. When looking at specific sources of social support, family and peer support emerged as significant predictors of behavioral and experiential processes. In addition, the study of self-efficacy in contemplators of 657 Kuwait male smokers found significant higher than precontemplators and self-efficacy is the first predictor of contemplating smoking cessation,therefore, it should be considered to mediate improvement in the smoking cessation programs (Badr & Moody, 2005).

2.5.3.2 TTM in Smoking Cessation Program

According to the theory, stage-matched interventions have a greater impact on smoking cessation than stage-mismatched interventions because the stage-mismatches which action-oriented interventions, delivered to person not ready for action may have unintended consequences of resistance by the smoker, frustration for the intervention provider and smoker, and lack of confidence by the smoker in the provider's ability to help (Goldberg et al., 2002).The model suggested that if the content of the program is not stage-matched, the client will resist change. The developing interventions should encourage pushing everyone to quit and towards helping as many smokers as possible make appropriate stage transitions; helping precontemplators shift to contemplation, those in contemplation shift to preparation and so on (Hotz, 2000).

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Prochaska et al., (2001) evaluated a stage-matched expert system intervention with four follow up over 24 months. Individualized and interactive expert system computer reports were sent to the smokers at 0, 3, and 6 months. At 24 months, the effect of expert system could reach 25.6% point prevalence and 12% prolonged abstinence, which were 30% and 56% greater than the control condition. Abstinence rates at each 6- month follow-up were significantly greater in the expert system than in the comparison condition. Sun et al., (2007) compared the tailored expert system intervention and control groups among 4,144 smokers and investigated the constructs of TTM in predicting cessation. The intervention group were mailed tailored expert system intervention materials at baseline, 3 months and 6 months. The successful quitters showed a decrease in the use of experiential processes (cognitive, affective and effective) and an increase in behavioral processes (e.g., counter-conditioning and stimulus control). The authors suggested best practice in clinical interventions from literature review to prevent relapse; nicotine replacement, proactive telephone counsellor, and a more intensive treatment with a doubling of the number of sessions. In addition, Dijkstra et al., (2006) used the Social Cognitive Stage model and found that the matched intervention were significantly more effective in stimulating forward stage transition (44.7%) than were mismatched intervention (25.8%) at two months follow up among smokers in Netherlands.

In contrast with the result of stage-matching intervention, Quinland& McCaul (2000) tested matching and mismatching interventions for smokers in a precontemplation stage. The 92 college- aged daily smokers were randomly assigned to the stage-matched group, the stage-mismatched group, and the assessment-only group. The stage-matched intervention asked smokers to think more about quitting smoking. The stage mismatched intervention consisted of action-oriented information and activities directed at smokers who are ready to quit smoking. The data were measured three times which consisted of smoking status, intention and motivation to quit, smoking behavior and smoking history including TTM variables. The results failed to support the value of matching interventions to a smoker's stage of change because more individuals in the stage-mismatched group reported a stronger mean intention to quit and greater over all motivation to quit and advancement in stage change than in the stage-matched group. It was indicated a stage -matched

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intervention is not a crucial intervention for smokers low with regard to their readiness to quit.

On the basis of earlier studies, it was suggested that smokers with low readiness to quit, especially need information on outcomes to progress to the next stage, whereas smokers with high readiness to quit need self-efficacy - enhancing information (De Vries & Backbier, 1994; Dijkstra et al., 1996). Therefore, Dijkstra et al., (1998) examined stage-matched and stage-mismatched condition in stages of low readiness to quit (immotives and precontemplators) and high readiness to quit (contemplators and preparers). The results revealed that the intervention directed at each stage should consist with two intervention; one intervention containing outcome information and self-efficacy-enhancing information to be directed at immotives, precontemplators, and contemplators and one intervention containing self-efficacy - enhancing information only, directed at preparers.

Dino et al., (2004) examined the association between stages of change and smoking cessation outcomes among youth receiving two interventions of varying intensity: a 10-min brief self-help smoking cessation intervention (BI) or the American Lung Association's 10-week, Not-on-Tobacco (N-O-T) smoking cessation program. The participants were classified into three stages; precontemplation, contemplation, and preparation. Smoking behavior, stage of change, self-efficacy, and beliefs about smoking were assessed at baseline and 3 months post baseline. Results demonstrated that the relationship between stage of change and cessation outcomes varied by treatment intensity. Logistic regression analyses revealed that BI participants in the preparation stage were 25 times more likely to quit smoking at post baseline than were participants in the contemplation or precontemplation stages. In contrast, N-O-T was effective for youth regardless of baseline stage. Additionally, N-O-T participants demonstrated greater forward stage movement from baseline to post baseline than did BI participants.

In Thailand, TTM applied to health education program has been shown in many cases such as smoking, DM, HIV etc. (Jaruchavalit, 1995; Nakkarug, 1997; Sanusanti, 2001). For smoking behavior, the outcome for smoking cessation was quite good, for example, the study among male junior high school students in Bangkok revealed that the intervention group had a significantly increased

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in attitude of smoking, perceived susceptibility to diseases caused by smoking, self-efficacy to quit smoking, and quitting smoking behavior more than the control group. Self-efficacy was significantly correlated to quitting smoking practices .The study suggested to follow up behavior change at least six months later and separated activities which followed to stages of change in each person and measured the transition of change through each step of the activities (Nakkarug, 1997). Likewise, the study among inpatients of Uttaradit Hospital, the results revealed that the mean score of smoking cessation behavior of the experimental group after receiving the health promotion program was significantly higher than that of the control group (Neamkulchon, 2005)

In conclusion, stage-matched intervention has been found to be effective in smoking cessation program. The smokers in the earlier stage should use the experiential process and receive the information to increase motivation to quit. In the later stage, the smokers should use behavioral process more than experiential process to increase self-efficacy, skill for quitting. Additionally, smoking cessation interventions should target increasing the pros of quitting from precontemplation to contemplation stage, then target decreasing the cons of quitting from contemplation to action. In action and maintenance stages, the intervention should encourage and reinforce self-efficacy to ensure a long-term positive outcome.

2.5.4 Related research on Social Support

Partner support and a perception of general support (perceived availability of the supportiveness of others, especially appraisal support) were positively associated with cessation and short-term maintenance, whereas the presence of smokers in social networks was negatively related to long term abstinence after 12 months in both men and women. According to the study among 3923 men and women with early stage of COPD used a multi-component approach combining general behavioral and social learning principles with nicotine replacement therapy, including a support person in 12-week group program. A support person may have been their spouse, or a friend who was ready to try quitting smoking or who was an ex-smoker and wanted to benefit from the program as well as to help them. The results showed that, at both the end of a l2-week group program and after one year, men but not

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women who were supported in quitting were more likely to be successful. Married status facilitated quitting but was less strongly related to long-term abstinence. Participants supported by an ex-smoker who had attended the group program with them were likely to be not smoking after 1 year (men, 74.7%: women, 72.4%), but those who were supported by a smoker were less than half as likely to have achieved abstinence after 1 year; however, they still had cessation rates greater than 30% (Mermelstein et al., 1986). Therefore, support people should be included in cessation intervention programs. Spousal involvement is evidently more useful for men than for women (Murray et al., 1995). However, social support which used the buddy system to aid smoking cessation in a group treatment program in clinical setting was found to non significant benefit for smoking cessation (May, 2006).

Social support can be a strength of worksite smoking cessation programs. Fisher et al., (1994) studied social support in a worksite smoking cessation program. The intervention consisted of steering committees included representatives of management and line employees and tailored the program from plans and materials for program promotion, self-help manuals, and a standard curriculum for a Group Comprehensive Clinic. After 24 months of the program initiation, smoking cessation among active participants ranged from 21% to 41% and 10% to 25% of nonparticipants were abstinent at follow-ups. McMahon & Jason (2000) tested how social support operates in smoking cessation by three models of social support; main effects, stress-buffering and indirect effects. Employees from 61 worksites received (a) self-help manuals (b) self-help manuals and incentives or (c) self-help manuals, incentives, and social support groups .At 24 months, results suggest that social support had a direct influence on smoking cessation. The group intervention significantly enhanced positive partner support and partner support facilitated quitting smoking. Higher levels of appraisal support also predicted successful quitting

In Thailand, the studies of social support from peer group and teachers on the effectiveness of smoking cessation program among male students found that the students changed their behaviors in terms of perceived susceptibility and perceived severity of disease, perceived benefit of stop smoking. The cessation rates was higher in the experimental group than in the comparison group (Pleankham, 1994, Pundee, 1999). Social support could affect the prevention of relapse for ex-smokers and the

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reduction of number of cigarettes smoked for the current smokers (Meetongpun, 2001).The study among non-commissioned officers (NCOs) in Ratchaburi Province to test the effect of a smoking cessation program which based on Pender's Health Promotion Model found that social support from the housewives' counseling is a part of the influence in getting NCOs to give up smoking (Hoondee, 2007).

Summary

Based on the literature review, the smoking cessation program for the conscripts need to apply ecological model to guide the framework of the intervention because the successful cessation not only targets at the individual level, but also involve the environments where the individuals live and policy in the institution or organization related to tobacco control. Thus, the study used the multi-level intervention of ecological model in three levels of health behavior change; intrapersonal level, interpersonal level and organizational level For individual or intrapersonal level, the program applied the processes of change of the TTM to design the intervention in order to increase awareness of the harmful effect of smoking and motivation to quit, including increase self-efficacy and skill improvement. The interpersonal level, the program applied social support to guide the intervention by involving the parent or partner to support the conscripts during staying at home. The organizational level focuses on organizational development and policy reinforcement to follow the policy of the Smoke Free Project of the Royal Thai Army. The intervention need the commander, staff officers to cooperate and participate, therefore, the activities consist of group meeting and group discussion between the researcher and the officers to set the structure, job description, and activities for tobacco control in the military, e.g. campaigns for World No Tobacco Day, promote recreational activities and exercise for the conscripts. In addition, the environment in the military should be created for totally smoke free workplace and set the smoking zone in specific designed area. The training officers should be the role model of non-smokers in the military and have knowledge and skill to advise the conscripts to quit smoking.

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2.6 Data mining

Data mining is an integral part of knowledge discovery in databases (KDD),which is the process of automatically discovering useful information in large data repositories. It is one of the most popular of applied informatics in different disciplines. (Kartelj, 2010). It is the extraction of hidden predictive information from large databases, and is the process of extracting patterns from large data sets by combining methods from statistics and artificial intelligence with database management and analyze data from different perspectives and summarizing it into useful information, as shown in Figure 2.1 (Tan, Steinbach & Kumar, 2006).

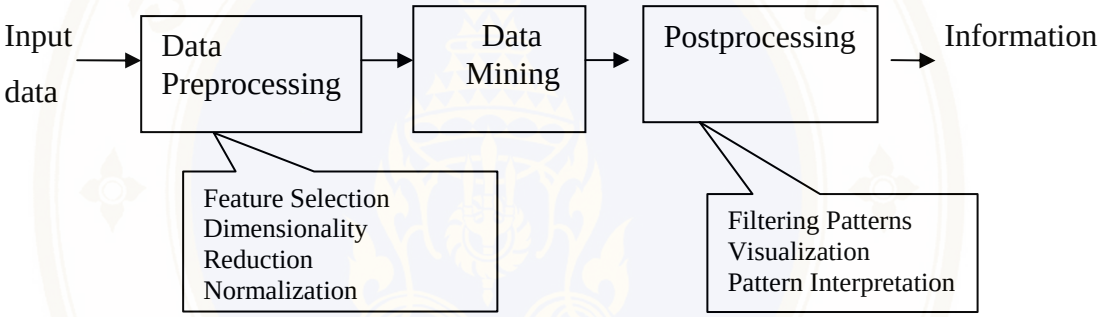

Figure 2.1 The process of knowledge discovery in databases (KDD)

The KDD process comprises of few steps starting from raw data collections to some forms of new knowledge derivation. The iterative process consists of the following steps: (Han & Kamber, 2000)

1. Data cleaning: This step is also known as data cleansing. It is a phase in which errors, noise and irrelevant data are removed from the collection.

2. Data integration: At this stage, multiple data sources, often heterogeneous, are combined into one source.

3. Data selection: At this step, the data relevant to the analysis is decided on and retrieved from the data collection.

4. Data transformation: This step is also known as data consolidation. It is a phase in which the selected data is transformed into forms appropriate for the mining procedure.

5. Data mining: This is the crucial step in which clever techniques are applied to extract patterns potentially useful.

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6. Pattern evaluation: in this step, strictly interesting patterns representing knowledge are identified based on given measures.

7. Knowledge representation: This is the final phase in which the discovered knowledge is visually represented to the user. This essential step uses visualization techniques to help users understand and interpret the results.

Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions, therefore, this study used data mining to find the predictor of smoking behavior after receiving smoking cessation program. Data mining works in four types of relationships; classes, clusters, associations and sequential pattern. Classification techniques will include decision tree based methods, rule based methods, and memory based reasoning, neural networks, genetic algorithms, bayesian belief networks and support vector machines.

In data mining, a decision tree is a predictive model which can be used torepresent both classifiers and regression models. In operations research, on the other hand, decision trees refer to a hierarchical model of decisions and their consequences. This study used of class type which consists of five major elements:

1) Extract, transform, and load transaction data onto the data warehouse system.

2) Store and manage the data in a multidimensional database system.

3) Provide data access to business analysts and information technology professionals.

4) Analyze the data by application software. Present the data in a useful format, such as a graph or table.

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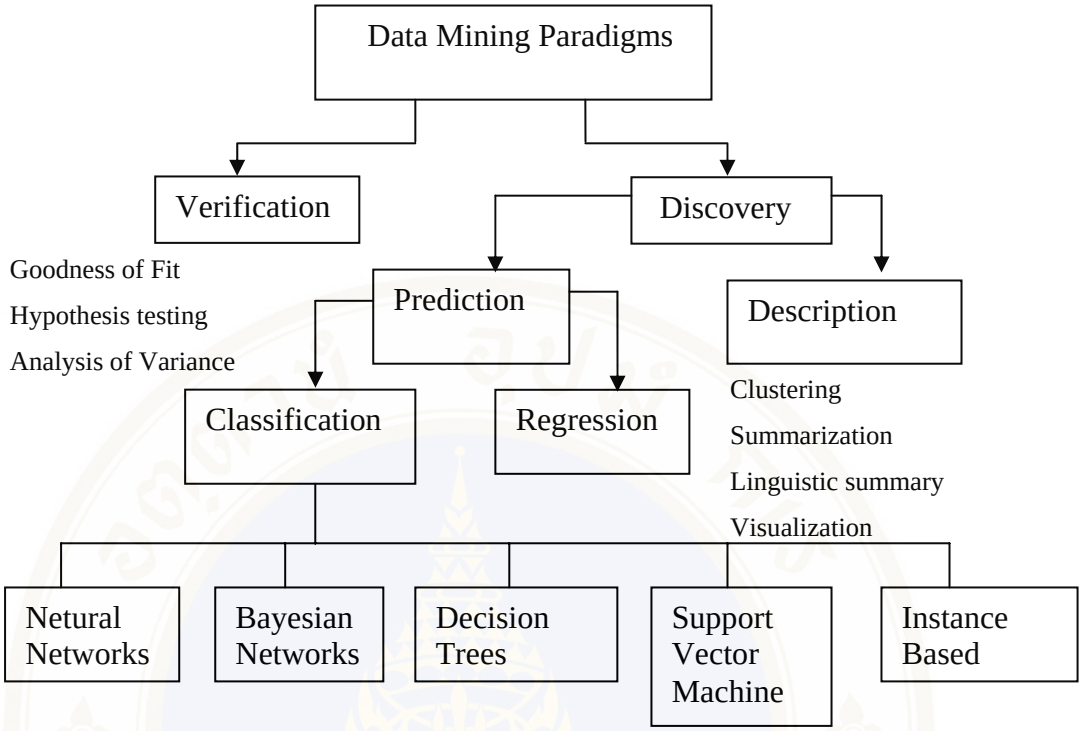

Figure 2. 2 Taxonomy of data mining methods

Classification

Classification is a data mining (machine learning) technique used to predict group membership for data instances. It is a two-step process consisting of model construction and model usage. The first step constructs a predictive model based on training data set.The second step applies the predictive model constructed from the first step to testing dataset. If the classification accuracy to testing dataset is acceptable, the model can be used to predicate unknown data. (Han & Kamber, 2000).

Step 1. Model construction

A set of records with class labels used for model construction is a training set. The model is represented as classification rules, decision trees or mathematical formulae. Figure 2.3 shows a visualization of model construction. (Tan, Steinbach & Kumar, 2005)

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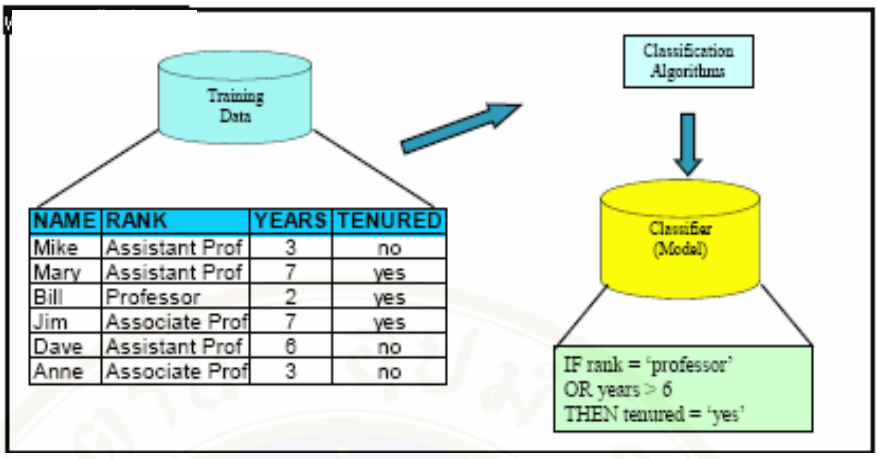
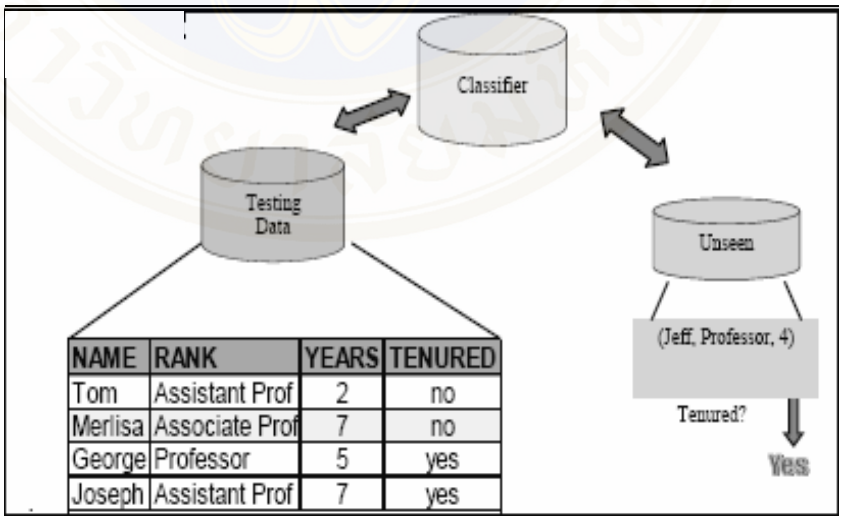


NAME	RANK	YEARS	TENURED
Mike	Assistant Prof	3	no
Mary	Assistant Prof	7	yes
Bill	Professor	2	yes
Jim	Associate Prof	7	yes
Dave	Assistant Prof	6	no
Anne	Associate Prof	3	no

Figure 2.3 Model Construction

Step 2 Model usage

Model usage is classifying future or unknown objects estimate accuracy of the model are known .The label of test sample is compared with the classified result from the model. The accuracy rate, is the percentage of test set correctly modeled as shown in Figure 2.4. (Tan, Steinbach & Kumar, 2005)



NAME	RANK	YEARS	TENURED
Tom	Assistant Prof	2	no
Merlisa	Associate Prof	7	no
George	Professor	5	yes
Joseph	Assistant Prof	7	yes

Figure 2.4 Using the Model in Prediction

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Classification by Decision Trees

A decision tree is a predictive model that, as its name implies, can be viewed as a tree. Specifically each branch of the tree is a classification question and the leaves of the tree are partitions of the dataset with their classification. For instance if we are going to classify loan applicants as good or bad credit risks, the decision tree might be looked like something as depicted in Figure 2.5

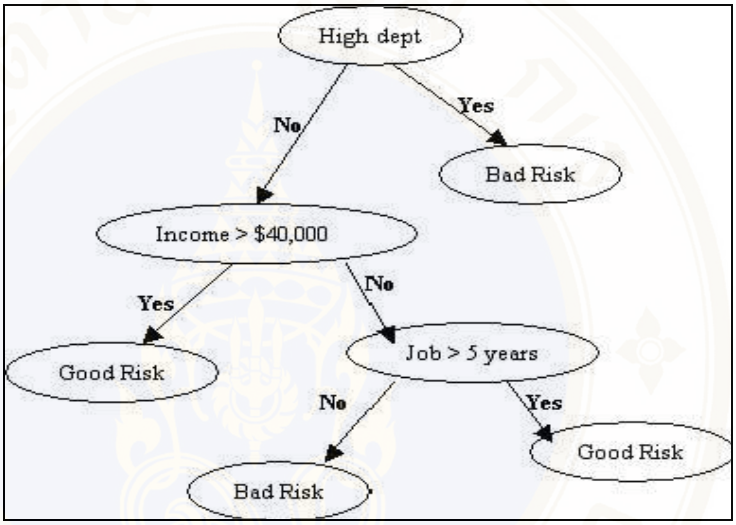

Figure 2.5 Example of Decision Tree

Armed with this tree and a loan application, a loan officer could determine whether an applicant is a good or bad credit risk. An individual with if Income >$40,000 and "High Debt" would be classified as a "Bad Risk,". An individual with "Income < $40,000" and "Job > 5 Years" would be classified as a "Good Risk."

The areas which were successful in application of data mining, for instance, a pharmaceutical company related to marketing activities, a credit card company, a transportation company can apply data mining to identify the best prospects for its service, and a large consumer package goods company which used to improve its sale process to retrailer. Kartelj (2010) applied data mining to classify smoking cessation status between former or current smokers. The processes consists of two essential parts. The first one determines which attributes are relevant to smokers status, by using methods like basic genetic algorithm and different evaluation

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functions. The second part is a classification itself, performed by using methods like logistic regression, neural networks and others. In addition, data mining was used to classify smoking cessation status from the 2001 National Health Interview Survey (NHIS). The results from the models can create the methods both scientific and clinical implication, decision support systems and mass customization of health behavior interventions (Poyn, 2005) .

Besides smoking, there were many studies used data mining in relating to health, for instance, the analysis of health care coverage which used twenty three variables and 193,373 records from the 2004 behavioral risk factor surveillance system survey data to identify the factors leading to the phenomenon (Delen et al, 2009), the analysis to find the factors contribute to improve in glycemic control in educational interventions in type 2 diabetes (Sigurdardottir, Jonsdottir & Benediktsson, 2007), and the study to use data mining solution for diagnosis of tuberculosis to start treatment on suspected patients without waiting the exact medical test results or not (Ucar & Karahoca, 2011). In addition, data mining was also used in cerebrovascular disease to apply the classification technology to construct an optimum cerebrovascular disease predictive model (Yeh, Cheng & Chen, 2011).

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2.7 Research Conceptual Framework

This study aims to examine the effect of smoking cessation program based on ecological model to improving smoking behavior among the conscripts. The model is used to guide the multi-level interventions. A conceptual framework is developed for the study in order to describe the relationship among the variables, as presented in Figure 2.6

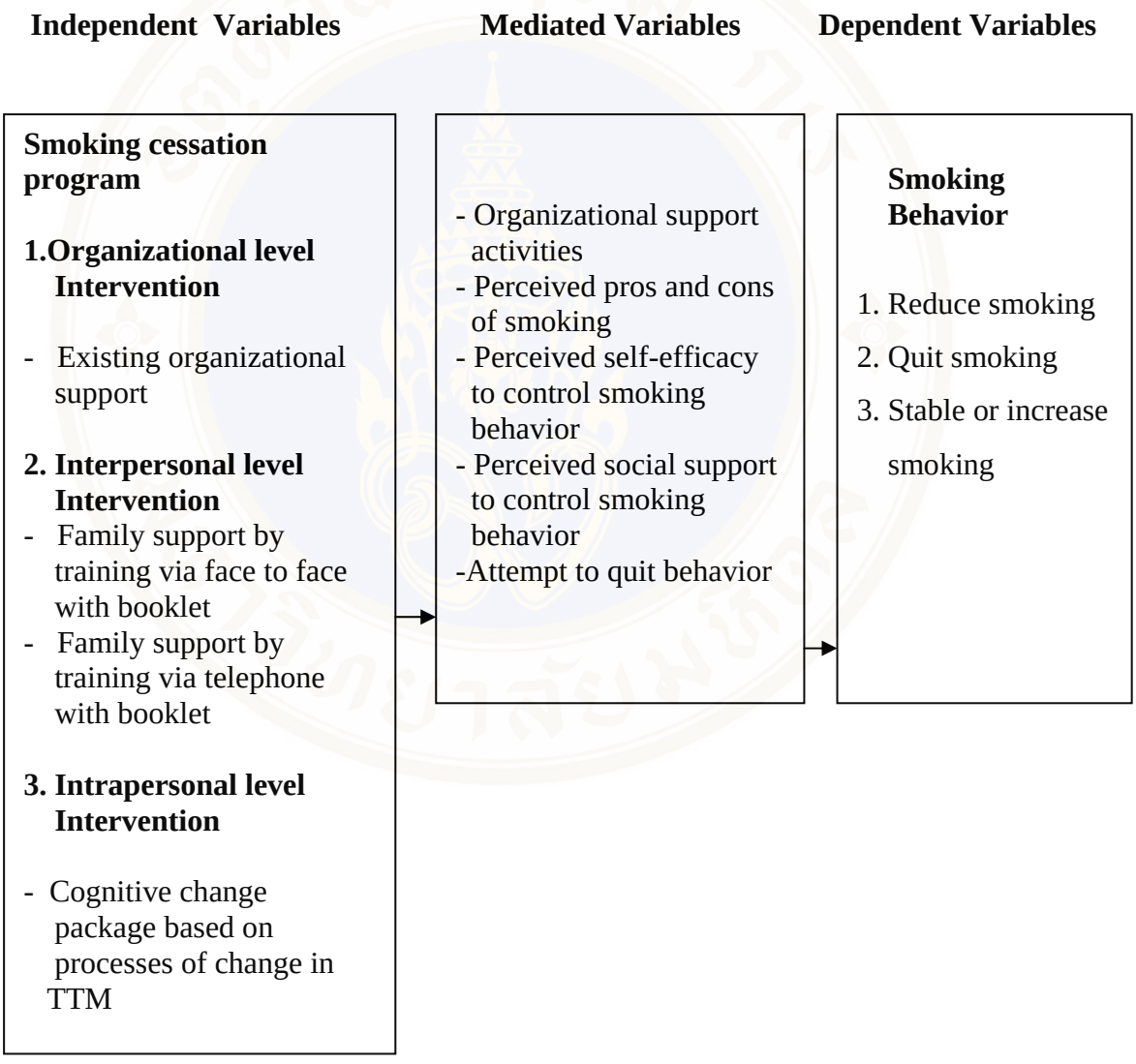

Figure 2.6 Research Conceptual Framework

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CHAPTER III
RESEARCH METHODOLOGY

This research aimed to evaluate the application of ecological model for promoting smoking behavior change among Thai Army conscripts. The research methodology consisted of five major topics : research design, population and samples , research instruments, research procedures, and data analysis.

3.1 Research Design

This study was a quasi-experimental research one group pretest- posttest design. Baseline data were collected before implementing the smoking cessation program. Result was collected 6-month after attending the program to evaluate the effect of the program on smoking behavior among the conscripts of the 1st Infantry Regiment, King's Royal Guard. The conscripts received smoking cessation program targeted at the three levels of change; intrapersonal, interpersonal, and organizational level. First, data were collected at baseline on the 3rd day after the conscripts entered the military, then they received the intervention during basic military training (BMT)

At that time, all conscripts were under the smoking ban regulation enforcment. The intervention in intrapersonal level consisted of package intervention based on processes of change of TTM. They received the intervention in interpersonal level from families' social support by training through face to face with booklet during 3rd week to 4th week or training through telephone with booklet during 10th week to 11st week of BMT.

In addition, they received the organizational level intervention with supporting activities following the policy, rule or regulation of the organization for quitting smoking. From 3rd month to 6 th month, the conscripts were separated to each company and received telephone counseling from the researcher for three months,

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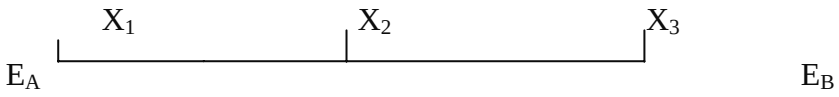
including received the activities to support quitting from the company commander in each company. The study design was illustrated in Figure 3.1



E_A	refers to data collection at baseline (before intervention)
X_1 - X_3	refers to the intervention targeted at three levels of change consisted of seven sessions in intrapersonal level, family social support in interpersonal level and organizational intervention
E_B	refers to data collection at six months after program implementation

Figure 3.1 Research design diagram

3.2 Population and Samples

3.2.1 Population The population in this study was the conscripts of the First Infantry Regiment, King's Royal Guard who recruited into the Army in the first section of the year 2009.

3.2.2 Research Setting The 1st Infantry Regiment, King's Royal Guard consisted of the 1st Infantry Regiment, and the four infantry battalions. Every unit had similar characteristics of the conscripts and the training officers, including ban on smoking policy during BMT and a schedule for training the conscripts. The 1st infantry regiment was purposively selected to this study because it is the main unit for policy implementation regarding tobacco control. The commander of the regiment have a power to order the policy to staff officers to conduct the smoking behavior change intervention.

3.2.3 Samples and samples selection : The researcher recruited all conscripts who were current smokers following the inclusion criteria. There were totally 150 conscripts and those who met inclusion criteria were 105 persons. As the result, there were 105 conscripts who were current smokers attended in smoking

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cessation program at baseline. At six months, 15.3% of the samples retired from the unit, therefore only 89 conscripts remained in this study.

Inclusion Criteria

The inclusion criteria in this study were

1. The conscripts who have smoked before entering the military and still smoked when entered basic military training.

2. They were in three stages of change; pre-contemplation stage, contemplate on stage and preparation stage

3. They are willing to participate in smoking cessation program.

Exclusion criteria

This study did not recruit the smokers who had higher addiction to nicotine. (nicotine < 8)

3.3 Research Instruments

Research instruments consisted of quantitative and qualitative data collection tools assessing behavior changes processes and outcome.

3.3.1 The instruments for data collection

Quantitative data were collected by the questionnaires developed based on the literature review as follows :

3.3.1.1 Socio- demographic data and smoking history, e.g. age to start smoking, the number of cigarettes smoked per day and frequency, and previous quit attempts

3.3.1.2 Stages of change / Readiness to change would be measured by using the staging algorithm as previously developed by Prochaska, DiClemente, and colleagues (e.g., DiClemente et al., 1991). Participants were asked to choose one statement that best described them and were later categorized into one of the five stages of change. If they answered yes to planning to quit, they were further questioned as to whether they planned to quit within the next 6 months, 1 month, or within the next 30 days. Precontemplators were those who answered no to quitting within the next 6 months; contemplators were those planning to quit within the next 6 months, or planning to quit within the next 30 days without a recent quit attempt; and

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those in the preparation stage endorse planned to quit within the next 30 days and had a recent quit attempt lasting over 24 hour.

3.3.1.3 Decisional balance. The concept of decisional balance weighed the reasons to smoke and the reasons to quit on the opposite sides of a plank on a fulcrum. Pros of smoking refered to the perception of benefits of smoking such as pleasure, tension relief, and concentration. Cons of smoking refered to the perception of negative effects of smoking including health, embarrassment to smoke, and social pressures to quit. The researcher translated from the decisional balance of Velicer et al., (1985) and adapted from Ketgudee (2004). There were 10 items scale to measure pros or cons of smoking which each item was answered with a five rating scale from 1 = not important; 2 = slightly important; 3 = moderately important; 4 = very important; 5 = extremely important. The range of score of pros of smoking or cons of smoking was between 10-50 points.

- Score 40-50 : pros or cons of smoking in a high level
- Score 30-39 : pros or cons of smoking in a moderate level
- Score < 29 : pros or cons of smoking in a low level

3.3.1.3 Self-efficacy to control smoking behavior; The researcher translated the instrument from the self-efficacy/ temptations scale from Velicer, DiClemente & Rossi et al. (1990) and adapted from Ketgudee (2004). It measures the confidence in resisting smoking in situations represented by the items with a 5-point scale. An overall score was computed by averaging across the 20 items. There were three subscales that measure broad aspects of self-efficacy to resist smoking

- Positive affect/social situation = items 1, 4, 6, 9,10, 16
- Negative affect /situation = items 3, 5, 7, 8, 12, 17, 18, 19
- Habitual/craving situation = items 2, 11,13, 14,15, 20

The range of score in positive affect/social situation was 6-30 points. The range of score in negative affect situation was 8-40 points and habitual/craving situation was 6-30 points.The overall scores were 20-100 points.

- Score 80-100 : self-efficacy in a high level
- Score 60-79 : self-efficacy in a moderate level
- Score <60 : self-efficacy in a low level

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3.3.1.4 Social support to control smoking behavior was translated and adapted from Partner Interaction Questionnaire (PIQ) of Mermelstein et al., (1986). It consisted of 20 Likert scale items; 0 = never; 1 = almost never (0-1 time/week), 2 = sometimes (2-3 times/week); 3 = fairly often (3-4 times/week); 4 = very often (equal or more than 5 times /week). The range of overall score was 0-80 points

- Score 64-80 : perceived social support from the parent, partner or significant others in a high level
- Score 48-63 : perceived social support from the parent, partner or significant others in a moderate level
- Score <47 : perceived low social support from the parent, partner or significant others in a low level

3.3.1.5 Attempt to quit behavior; The researcher developed the questionnaire from the literature review and adapted from Neamkulchon (2005). The questionnaire was consisted 20 Likert scale items that the conscripts acted to reduce or stop smoking.

Negative items (items1-4) : score 4 = never, 3 = practice 1-2 days/week, 2= practice 3-4 days/week, 1 = practice every day

Positive items (items 5-20) : score 0 = never; 1 = practice 1-2 days/week, 2 = practice 3-4 days/week; 3 = practice 5-6 days/ weeks, 4 = practice every day .

The overall score was between 0-80 points.

- Score 64-80: Attempt to quit behavior in a high level
- Score 48-63: Attempt to quit behavior in a moderate level
- Score <47 : Attempt to quit behavior in a low level

3.3.1.6 Physical dependence on nicotine was measured by the revision of the Fagerstrom Test of Nicotine dependence (FTND) which consisted of a 6-item scale. The FTND was used to stratify levels of addiction thus, 0–2, very low; 3–4, low; 5, medium; 6–7, high; and 8–10, very high (Heatherton, & Kozlowski, Frecker & Fagerstrom, 1991).

3.3.1.7 The reason to initiate smoking and quit smoking and the triggers to return to smoke after quitting were divided into 5 scales from the most

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important (score 5) until the least important (score1). The interpretation from mean score were as follows ;

Mean score between 4-5 : perceived in a high level

Mean score between 3-3.9 : perceived in a moderate level

Mean score < 3 : perceived in a low level

3.3.1.8 Knowledge about smoking and cessation of the training officers. The researcher developed from the literature review which consisted of ten multiple choice questions about knowledge of smoking and cessation. The score was 0 and 1 point.

Qualitative data were collected from checklist and observation forms to evaluate the organizational activities regarding tobacco control and smoke free environments .In addition, there were the results from interviews and discussion with the committees, the conscripts and their families. Score from checklist and observation were as follows:

Score 2 = the organization which has implemented a complete range of tobacco control activities. (100%)

Score 1 = the organization has partially implemented the tobacco control activities.

Score 0 = the organization does not have the tobacco control activities.

3.3.2 Instruments of smoking cessation intervention

The smoking behavior change interventions consisted of three levels of change: intrapersonal, interpersonal, and organizational levels.

3.3.2.1 Intrapersonal level. The package intervention of this level required seven sessions. It included guideline covering how to change smoking behavior, and printed materials to highlight and support learning for changing knowledge, attitude, and skill. The guideline of packaged intervention suggested strategies to increase motivation to quit, increase awareness about smoking and its consequences, increase self-efficacy to quit, and maintain abstinence. Ex-smokers role models, mouth wash (0.5% sodium nitrate solution) and self monitoring booklet were also introduced to the samples during seven sessions.

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3.3.2.2 Interpersonal level. The intervention focused on the families, partners or significant others to give social support to the conscripts. The researcher developed the booklet which consisted of the contents related to knowledge and the harmful effects of cigarette smoking, self-care during quitting, how to deal with craving and the role of the families or significant others to advise and support the conscripts during quitting. The booklet content has been consulted and approved by three experts in smoking and health education and behavioral science. They advised for text size, alignment and picture used in the booklet. The comprehension of the content in the booklet has been tested by five conscripts' mothers before implementation.

3.3.2.3 Organizational level. The intervention aimed to give the knowledge toward smoking and smoking cessation to the training officers via power point and VCD presentations which developed by the researcher based on Action on Smoking and Thai Health Foundation materials.

3.3.3 Instrument validation

3.3.3.1 Content Validity of the questionnaires were approved by six specialists whose specialty related to behavior change intervention (Appendix G). In addition, content and explicitness of the language being revised according to the experts and the instruments were adjusted.

3.3.3.2 Reliability : The questionnaires were tested in 30 conscripts of the 3rd infantry battalion. The results were analyzed for Cronbach's Alpha Coefficient. The reliability of the pros and cons of smoking, self-efficacy to control smoking behavior, social support to control smoking behavior and attempt to quit behavior had coefficient of 0.8261, 0.9123, 0.8870 and 0.8171 respectively.

3.4 Research Procedures

The aim of smoking behavior change program was to help the conscripts to reduce, quit smoking, and remain abstinent. The framework also integrated the results from the preliminary study to conceptualize the appropriate intervention. After approval by the Mahidol University ethical committee, MUPH2009-098 (See

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Appendix E), the program was implemented. The procedures to develop smoking cessation programs consisted of three parts: preliminary study, pre-intervention and intervention implementation. A summary diagram of the intervention was shown in Figure1 (Appendix I).

3.4.1 Preliminary study

The preliminary study was conducted by quantitative and qualitative methods at the 1st infantry regiment, King's Royal Guard before developing the smoking cessation program. The questionnaires and focus group discussions were used to collect data from the conscripts. The interview was used to collect data from the commander and the training officers. The results were demonstrated in Appendix B.

3.4.2 Pre-intervention activities

3.4.2.1 Coordination and ask for permission to collect the data and perform the interventions from the commanders of the 1st infantry regiment, King's Royal Guard and the 3rd infantry battalion were processed.

3.4.2.2 Invitation to join the study and signing informed consents were arranged for all conscripts who met the inclusion criteria of the study.

3.4.2.3 Data collection at baseline : Data from the conscripts were collected via self-report questionnaires at baseline in the 1st week of basic military training prior to starting the program. Demographic, smoking behavior, smoking experiences, and also questioned about stages of change, perceived pros and cons of smoking, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior, and nicotine dependence were recorded.

3.4.3 Intervention

The intervention which applied the ecological model for health behavior change consisted of three levels of change; intrapersonal, interpersonal, and organizational levels. The processes of change of TTM, social support, strengthen the policy and provide activities for tobacco control in the organization were used to guide the intervention and measurement. The researcher and research assistants who were trained conducted the intrapersonal level intervention for eight weeks from 7 p.m- 9 p.m every week. Regarding the interpersonal level change, the conscripts received social support from the family or significant others by the training from the researcher via face to face with booklet or training via telephone with booklet. Three months after

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recruited to the military, the conscripts were separated to the company, the researcher conducted a telephone followed up on the samples during their 4th month to 6th month in the military. The researcher acted as a facilitator for the intervention in the organizational level. The commander, staff officers and the training officers were encouraged to form a committee to conduct the activities relevance to the policy, set rule or regulation related to tobacco control and provide smoke free workplace to reduce the risk environments that promote cigarette smoking or craving to enhance sustainability for health behavior change. However, the sample group were under the rule of enforcement ban on smoking from the policy of the military before conducting the intervention. The concepts and activities of the intervention in each level were as follows:

3.4.3.1 Intrapersonal level

As guided by TTM, processes of change were applied to guide the activities designed to increase the motivation and intention to quit, change attitude towards smoking, increase self-efficacy to control smoking behavior and remain abstinent. Before conducting the intervention, the conscripts were assessed stages of change at baseline (before program implementation) and collecting data on the 3rd day of BMT. However, the intervention in each session could not deliver to the conscripts follow stages of change because there were some limitation about the time of training, therefore they had to receive the sessions together. The packaged interventions consisted of seven sessions which were detailed as follows :

1) The 2nd week of BMT. The researcher gave a behavior change program orientation, the 1st session was launched to the sample group which aimed to raise the information and doubts that the conscripts' current perspective on smoking was beneficial to them, and increase motivation to quit. Consciousness raising, dramatic relief and motivational interviewing technique have been used to design the intervention. The activities for consciousness raising designed to increase awareness about smoking and its consequences. Dramatic relief designed the activities to increase emotional experiences. The activities in this step consisted of giving information and health education to sensitize the issue to the conscripts by using audio-visual aids such as video tape, slide, lung model, poster, flip chart etc.,

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and stimulate thinking, talking and feeling about the pros and cons of quitting by group discussion, observation and experiencing exchange.

2) The 3rd week of BMT. The 2nd session was conducted to increase motivation to quit by using modeling. The conscripts learned by observational learning from verbal persuasion by the ex-smokers who could quit smoking, by friends who were never smokers or by patients who suffered from the disease related to smoking. Additionally, the session used environmental reevaluation to increase awareness of the effect of smoking to other persons and environment by learning from the group discussion.

3) The 4th week of BMT. The 3rd session was conducted to weigh pros and cons of smoking and evoke reasons for change and risks of not changing by self-reevaluation. The intervention would help the sample group to recognize their self-concept and personal life goals as being inconsistent with smoking, and resolve their ambivalence by increasing the pros of quitting relative to the cons of quitting. Techniques of brain storming and participatory learning were used together. The steps of the intervention for group activities consisted of experiences, idea reflection and discussion, conceptualization and idea application. (Details in Appendix A).

4) The 5th week of BMT. The 4th session aimed to increase self-efficacy to quit smoking. The intervention used techniques instruction from mastery experience, verbal persuasion and emotional arousal to increase self-efficacy to quit. In addition, the conscripts were practiced refusal skill when they were persuaded to smoke from friends or other persons. The activities consisted of participatory learning method and role playing. Finally, the researcher concluded the main issues to conceptualize idea to the conscripts.

5) The 6th week of BMT. The 5th session aimed to help the conscripts commit to cessation. The strategies reflected on reasons for quitting, and behavioral contracting. The intervention used self-liberation and goal setting to guide the activities to make a firm commitment to change by setting a specific and incremental goals and identifying barriers and planning solutions to the behavior change obstacles. The activities consisted of setting goal for quitting, sign

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contracting and learning skills with audio-visual aids/self-help materials, including learning coping skill training and stress management training.

6) The 7th week of BMT. The 6th session was conducted to the conscripts based on the strategies of counter conditioning, reinforcement management and stimulus control. The activities of counter conditioning were provided to help the sample group to substitute alternative behaviors for smoking such as relaxation, exercise and positive affirmation or positive self- statements. For reinforcement management, they were taught to learn how to effectively and meaningfully reward themselves for attaining cessation goals which can take the form of contingency contracting and be overt rewards, or covert rewards, such as writing in a personal daily note to admire themselves with a private word of congratulations; “Good work, Nice going, I can handle it”. For overt rewards, the conscripts would be admired from the commander and officers in the military unit. They learned to identify situations which were cues for smoking, and then avoid or modified them for stimulus control. In addition, they received a written record (Wrap Sheet) for self-monitoring and received 0.5 % sodium nitrate when they felt craving during staying at home (10th wk to 11st wk).

7) The 8th week of BMT. The 7th session aimed to empower the conscripts to increase the confidence to quit and give emotional support to continue abstinent at home. The researcher asked and gave advice for relapse prevention and coping skills. They learned about the nature and time course of withdrawal symptoms which were different in each person. The triggers or events that caused the quitters to have an urge and then to smoke could be feelings, thoughts, or situations. Therefore, coping skill training consisted of three types of behavioral strategies or self-control strategies which used to cope with these triggers to break up the chain of events that lead to smoking are as follows: (Abrams et al., 2003)

a) Avoid trigger situations. The intervention informed the conscripts to avoid social situations involving alcohol.

b) Alter the trigger situation. The conscripts should alter daily routine to manage their smoking urges.

c) Substitute something else for the cigarette when they encounter the trigger. The conscripts were told to put a piece of gum or hard

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candy in their mouth when they want a cigarette, chewing on toothpicks, calling a friend or talk with an ex-smoker for support, using a relaxation techniques in a stressful situation, or doing something else to keep hands busy.

Additionally, the conscripts were taught about coping strategy that involved changing thoughts or telling themselves such as using technique self-talk. The self-statements include reasons to quit, benefits of quitting, statements of determination and positive thoughts (e.g. “I can do it”, “I am doing great”), will power (e.g. give themselves not to smoke, tell themselves “no” when they are tempted), delay statements (e.g. “only five more minutes). Other types of self-statements include getting a new perspective on the situation. Take a step back when they feel the urge to smoke and ask themselves a simple question: “Do I really want to smoke here?” Then redefine the situation and their reduction (e.g. I don’t really want to smoke”), and use other coping strategies.(substitute alternative behavior rather than smoking). Additionally, the conscripts were taught about stress management training by relaxation technique smokers to reduce stress, cope with the stressful trigger situation and avoid the urge to smoke. The session focused on deep -breathing relaxation approach called the Benson Relaxation Procedure (Benson, 1975 cited in Abrams et al., 2003)

8) The 13rd wk to 24thwk or 4th month to 6th month of BMT. The intervention aimed to follow up and give telephone counseling to the conscripts. They were asked about smoking status, explored and open discussion about their problems or obstacles to continue quitting, then the researcher gave counseling to each of them for 5 to 10 minutes every month until six months. The objectives of telephone counseling depended on their smoking status at that time, such as enhance motivation, analyze the triggers for relapse, keep contact for abstinence (Details in Appendix A).

3.4.3.2 Interpersonal level

Social support was applied to the intervention to support the conscripts to remain abstinent and cope with stress by interpersonal relationship. This study focused on informational support and emotional support from the family or significant others to the conscripts and appraisal support from the researcher to the family. The activities were as follows:

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a) The researcher discussed with the conscripts' families or significant others (parent, wife, girlfriend) during the 3rd week and 4th week on Sundays at the military base, informed the objective for the study and asked for permission to deliver the intervention. The families received the booklets to guide the conscripts' support behavior at home. The researcher advised and discussed with the families and the conscripts followed by distributing the booklets. For those conscripts who could not meet at the military base, the booklets and consent forms were brought to the families by the conscripts during the 9th wk they went back home to take a rest.

b) The researcher phoned the conscripts at home during the 10th to 11th weeks to remind the families in supporting smoking behavior change of the conscripts. The phone conversation was also recorded as qualitative data.

3.4.3.3 Organizational level

The intervention in the organizational level aimed to develop the organization to set the policy and activities related to tobacco control in the military, encouraged the commander and staff officers to be aware of the hazard of smoking among the soldiers, including the conscripts. Before conducting the intervention, there was a smoking ban policy announced by the top commander and the regimental commanding officer brought the policy into action. As a result, smoking was not allowed in anyplace at any time during the BMT training of the conscripts.

The objectives of the intervention in organizational level were to increase awareness of the situation and the harmful effects of smoking, form a committee to be responsible for any activities related to tobacco control, and enforce the policy implement process in each unit. The strategies focused on communication for policy information, skill development of staff officers to quit smoking and conducting the intervention, including developing a tobacco control plan. The researcher acted as a facilitator, coordinator or an advisor to give the information and resources related to smoking and smoking cessation to the commander and staff officers. Detail objectives, activities and expected outcome of the organizational intervention can be presented as follows:

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Objective 1 : To increase awareness of the situation of smoking in the military and the harmful effects of smoking

: To form committee to conduct smoking cessation program

Activities : The researcher presented the situation and knowledge related to smoking and tobacco control to the commander and staff officers at the first meeting, including the objectives and the whole process of this research.

Expected outcomes : The commander and staff officers would be aware to the problem of cigarette smoking in the military and agreed to cooperate and participate in smoking cessation program.

Objective 2 : To implement the policy related to tobacco control through communication and enforcement activities

Activities : Meeting with the committee or working group. The researcher discussed together with the regimental executive officer and two subordinates who were appointed to work for tobacco control.

Expected outcomes : The tobacco control plans have written and set to create the activities, including smoke free workplace and the policy related to tobacco control was communicated in the military**.**

Objective 3 : To increase knowledge and attitude related to smoking to the training officers, including staff officers and inform their role and activities to support the conscripts during basic military training

Activities : Meeting and discussing with the training officers team.

Expected outcomes :

a) The conscript intervention timeframe was set.

b) The training for conscript training officers was set and delivered.

c) The conscripts' training officers develop a plan for implementing a regular recreational activities in concordance with the smoking behavior change program implementation.

Objective 4 : To facilitate participation of the company commander to support quitting

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Activities : Meeting and discussing with the company commander

Expected outcomes : The company commanders take role related to tobacco control

3.4.4 Post-intervention

The 2nd data collection were collected at 6th month after intervention. The data consisted of smoking behavior, stages of change, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior, attempt to quit behavior. Checklist observation was used to evaluate the activities of the organizational level. Qualitative data were collected from the conscripts and their families and staff officers by interviews.

3.5 Protection of Human Subjects

Data collection was commenced following approval by the committee on Human Rights Related to Human Experimentation of Mahidol University (Appendix E). The conscripts who meet the criteria were informed and explained of the purpose and process of the study, they were asked to sign a written informed consent form (Appendix E). If the conscripts wanted to discontinue the research project, they were allowed to do so. They had the right to agree to participate in the program or terminate their agreement and had the right the receive the intervention provided by the researcher, without any prejudice. After they have already accepted, the self-administered questionnaires were given to them and the completed questionnaires were returned back to the researcher (Appendix D). Then, the interventions were performed and conducted until 6 months and they have to completed the questionnaires again after intervention.

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3.6 Data Analysis

3.6.1 Quantitative Data

The data were entered into SPSS for Windows, version 17. Descriptive statistics including frequency distributions were applied to the data. Socio-demographic characteristics and the study variables (perceived pros and cons of smoking, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior, attempt to quit behaviors, and smoking behavior) were tabulated by frequency, percentage, mean and standard deviation.

The mean difference of pre-test and post-test of knowledge about smoking and smoking cessation among training officers before and after training was tested by paired t-test

The mean difference of the study variables at baseline and six months were tested by paired t-test.

Chi-square was used to analyze correlation between the study variables and smoking behavior.

Waikato Environment for Knowledge Analysis or WEKA Data mining analysis (Version 3.4.3.) was used to analyze which factors contributed to improve smoking behavior among the conscripts after program implementation. Weka was developed at the University of Waikato in New Zealand. The Weka's module, J48 classifier algorithm was employed for the construction of the C4.5 decision tree. Before analyzing the data, initial data-mining which attributed to code by studying histograms of values. Histograms of each attribute were examined to determine natural groupings of values into categories. The WEKA contains tools for data pre-processing, classification, regression, clustering, association rules, and visualization.

3.6.2 Qualitative Data

Qualitative data were collected from a conscript for their behavior change and from the family for their supportive behavior. In addition, observation checklist was applied during the smoke free workplace to evaluate organizational and policy change which indicate the effect of the program. Qualitative data were analyzed by content analysis methods.

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CHAPTER IV
RESULTS

This quasi-experimental research aimed to evaluate the effectiveness of smoking cessation program which applied an ecological model for improving smoking behavior among the conscripts of the 1st infantry regiment, King's Royal Guard. The samples consisted of 89 conscripts. Quantitative and qualitative data collection were used for collecting data at baseline and six months after intervention. The results were presented in four parts as follows:

1. Characteristics of the conscripts
    - 1.1 Socio-demographic data
    - 1.2 History of smoking behavior
    - 1.3 Interpersonal characteristics
2. Smoking cessation program based on an ecological model
    - 2.1 Smoking cessation program at organizational level
    - 2.2 Smoking cessation program at interpersonal level
    - 2.3 Smoking cessation program at intrapersonal level
3. Effects of smoking cessation program based on ecological model
    - 3.1 Effect of the program at organizational level
    - 3.2 Effect of the program at interpersonal level
        - 3.2.1 Perceived social support to control smoking behavior
    - 3.3 Effect of the program at intrapersonal level
        - 3.3.1 Perceived pros and cons of smoking
        - 3.3.2 Perceived self-efficacy to control smoking behavior
        - 3.3.3 Attempt to quit behavior
        - 3.3.4 Stages transition
4. Hypotheses testing

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4.1 Characteristics of the conscripts

The sample group were the conscripts who smoked before entering the military and still smoked. At baseline, 105 out of 150 conscripts (70 %) were recruited into the study. At six months after intervention, some samples withdrew from the study because of their different duties which affected to follow-up process. There were 89 conscripts left in the study at six months.

4.1.1 Socio-demographic characteristics of the conscripts

Majority of the conscripts came from the North-Eastern region. Most of them (47.2%) aged 21 years old in average. The range of their ages were 17-27 years old. Regarding education, 39.3% finished secondary education level, followed by primary education level (30.3%). Most of them were single (80.9%). Before entering the military training, they worked as wage earners with an average income 7,200 baht / month. Most of them drank alcohol regularly at least one time/week (78.6%). and majority of them (60.7%) had the family members smoked such as fathers, mothers, elder brothers and relatives as illustrated in Table 4.1.

Table 4.1 Socio-demographic characteristics of the conscripts

Characteristics	Conscripts (n=89)		
	Number	Percentage (%)	Mean± SD
Hometown			
Southern region	3	3.4	
North-Eastern region	40	44.9	
Bangkok Metropolitan	25	28.1	
Central region	21	23.6	
Age (years old)			**20.94 ± 1.855**
17	4	4.5	
18	6	6.7	
19	4	4.5	
20	10	11.3	
21	42	47.2	
22	9	10.2	
23	6	6.7	
24	6	6.7	
25	1	1.1	
26	0	0.0	
27	1	1.1	

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Table 4.1 Socio-demographic characteristics of the conscripts (cont.)

Characteristics	Conscripts (n=89)		
	Number	Percentage (%)	Mean± SD
Marital Status			
Single	72	80.9	
Couple	17	19.1	
Educational level			
Primary school	27	30.3	
Secondary school	35	39.3	
Senior high school	16	18.0	
Diploma/Bachelor Degree	11	12.4	
Occupation before entering the military			
Student	14	15.7	
Unemployed	12	13.5	
Agriculture	8	9.0	
Small trade business/ Personal business	8	9.0	
Wage earners	47	52.8	
Income before entering the military (baht/month)			**7,219.85 ± 3,387.49**
< 1,000	0	0.0	
1,000- 5,000	19	25.0	
5,001- 10,000	48	63.2	
10,001-15,000	8	10.5	
>15,000	1	1.3	
Alcohol drinking experience			
No drinking or only at social gathering	19	21.4	
Drink at least 1 time in a week or in a month	70	78.6	
Families' member smoked			
No	35	39.3	
Yes	54	60.7	

4.1.2 History of smoking behavior

4.1.2.1 Smoking experiences

Majority of the conscripts in this study started smoking at the age between 13 to 15 years old (46.6%) and more than half of them have been smoking for four to six years (51.6%). Most of them were daily smokers (85.1%). Regarding a number of cigarettes smoked per day, most of them smoked 6-10 cigarettes with an average 12.51 cigarettes per day. They smoked filtered-cigarettes 71.9%, and combination of filtered and self-rolled cigarettes reported 27.0%. Regarding quitting experiences, 61.8% reported having experiences of quitting and 75.5% of them tried to quit attempts one to three times. After assessing their nicotine dependence status, data indicated that 33.7% were in a very low level, followed by

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low level (29.2%). Nevertheless, there were 18% of nicotine dependence in a high level as illustrated in Table 4.2.

Table 4.2 History of smoking behavior among the conscripts at baseline

History of smoking behavior	Conscripts (n=89)		
	Number	Percentage (%)	Mean± SD
Age to start smoking (years)			**15.71 ± 2.307**
10-12	7	7.9	
13-15	41	46.6	
16-18	28	31.8	
≥19 years	12	13.7	
Duration of smoking (years)			**5.24 ± 2.226**
1 -3	22	24.7	
4 -6	46	51.7	
7 -9	20	22.5	
≥10 years	1	1.1	
Type of smoking			
Daily	74	85.1	
Occasional	13	14.9	
Number of cigarettes smoked per day			**12.51 ± 7.433**
1-5 cigarettes	15	16.9	
6-10 cigarettes	34	38.2	
11-15 cigarettes	16	17.9	
16-20 cigarettes	17	19.1	
>20 cigarettes	7	7.9	
Type of cigarettes smoked			
Filtered	64	71.9	
No Filtered/self-rolled only	1	1.1	
Other (Filtered and self-rolled)	24	27.0	
Previous quit attempts			
Never	34	38.2	
Ever	55	61.8	
Times to quit attempts			**4.25 ± 13.423**
1-3 times	34	75.6	
4-6 times	6	13.3	
7-9 times	3	6.7	
≥ 10 times	2	4.4	
Nicotine dependence			**3.63 ± 2.176**
Very low	30	33.7	
Low	26	29.2	
Medium	17	19.1	
High	16	18.0	

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4.1.2.2 The reason to initiate smoking

The conscripts perceived the reasons to initiate smoking in a low to moderate level. The main reason was to reduce stress or increase relaxation ($\overline{X}$ = 3.42), followed by they wanted to try or persuaded from friends ,and feeling cool ($\overline{X}$ = 2.76, $\overline{X}$ = 2.18) as shown in Table 4.3.

Table 4.3 Mean and standard deviation categorized by the reason to initiate smoking

Reason to initiate smoking	Conscripts (n=89)	
	Mean	SD
1. Reduce stress/ relaxation	3.42	0.998
2. Wanted to try /persuaded from friends	2.76	1.266
3. Feeling " cool	2.18	1.130
4. Increase confidence to get in society	2.02	1.000
5. Social acceptance	1.89	1.113
6. Imitation from the family	1.45	0.941

4.1.2.3 The reason to quit smoking

The conscripts perceived the reasons to quit smoking or having intention to quit smoking in a high to moderate level. The highly level of reason to quit smoking was the family or significant others asked for quitting ($\overline{X}$ = 4.21), followed by they were afraid of the harmful effect of smoking, economic loss and had health problem ($\overline{X}$ = 3.79, $\overline{X}$ = 3.35 and $\overline{X}$ = 3.18, respectively) as illustrated in Table 4.4.

Table 4.4 Mean and standard deviation categorized by the reason to quit smoking

Reason to quit	Conscripts (n=89)	
	Mean	SD
1.The family/significant others asked for quitting	4.21	1.065
2. Fear about the harmful effect of smoking	3.79	1.065
3. Economics loss	3.35	1.142
4. Have a health problem	3.18	1.295
5. Campaign from the society	2.75	1.116

4.1.2.4 The triggers to relapse

The triggers to relapse in a moderate level was drinking alcohol with their friends ($\overline{X}$ =3.88) ,followed by seeing someone smoke, under stress, being bore and feeling lonely ($\overline{X}$ = 3.54; $\overline{X}$ = 3.35) as illustrated in Table 4.5.

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Table 4.5 Mean and standard deviation categorized by the triggers to relapse

Triggers to relapse	Conscripts (n=89)	
	Mean	SD
1. drinking alcohol with their friends	3.88	1.255
2. seeing someone smoke	3.54	1.151
3. stress/ boredom/ feeling lonely	3.35	1.246
4. lack of willpower	2.56	1.337
5. would not like to quit	2.11	1.021
6. perceived smoking could not affect their health	2.07	1.142

4.1.3 Interpersonal characteristics

Most conscripts lived with the families (parent or wife) around 85%. Others lived with their partners or girl friends. They were closed to their mothers and elder sisters more than fathers. Majority of the parents' occupations were employees and small trade or personal business. For education,the parents who lived in the rural area finished primary education while those who lived in Bangkok Metropolitan and central provinces finished high school. The average range of family size of the conscripts were 4-6 persons. More than 70% of the conscripts had fathers who smoked. They had mothers or grandmothers smoked 8.9%. Most of them smoked around 10-15 cigarettes per day and ever tried to quit smoking many times but did not succeed. Some fathers could quit smoking because they had health problems related to smoking. They knew their sons' smoking and wanted them to quit. Three conscripts had their mothers smoked for more than ten years. A few conscripts had family problem that influenced them to start smoking.

4.2 Smoking cessation program based on ecological model

4.2.1 Smoking cessation program at organizational level

Smoking cessation program at organizational level aimed to create infrastructure of the organization which does not support smoking by strengthening the policy related to tobacco control, implementing the policy related to tobacco control through communication and enforcement activities., building the physical and social environments, increasing knowledge and awareness of the military commanders and staff officers about the hazard of smoking. The intervention in the organizational

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level started during the conscripts were trained in three months for basic military training and during the conscripts were separated to work in five companies after three months. The intervention was implemented at the main organization and the military company of the 1st infantry regiment which consisted of four activities; 1) meeting with the commander and staff officers to increase awareness of smoking problem, and to form committee for collaboration with the researcher 2) meeting with the committee and working group to inform the policy regarding tobacco control 3) training the conscripts' trainers, including the officers. 4) meeting and discussion with the company commander to take action regarding smoking cesstion for the conscripts.

Activitity 1 : Meeting with the commander and staff officers

The objectives of the meeting were to inform the situations about smoking among the commander and staff officers, to inform the policy related to tobacco control in the organization, to increase awareness of the hazard of smoking and to form committee. Besides the chief commander of the 1st infantry regiment, King's Royal Guard (the regimental commanding officer),there were four company commanders attending in the meeting together with the four battalions and the training officers. The company commanders who were under the command of the regimental commanding officer came from HQ CO, HVY MORT CO, AL PLT, and APC PLT. After the researcher presented about smoking problems and the activities for the conscripts to quit smoking, the chief commander ordered the company commanders and the training officers to bring the policy of the organization to set the activities to support the conscripts to quit smoking and provide smoke free workplace in each company. The researcher and assistants were the facilitator, advisor and supporter the resources for the intervention.

Activity 2 : Meeting with the committee

At the second meeting, the intervention aimed to bring the policy to action via direct and indirect command. The policy consisted of the rule of bans on smoking during BMT and the policy to provide smoke free workplace, including recreational activities. The researcher gave anti-smoking stickers to the committee to distribute to the company commanders and the conscripts' trainers. The process of meeting focused on the discussion about the training officers how to set the activities to support the conscripts to quit smoking and deal with craving during BMT.

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Activity 3 : Training the conscripts' trainers and staff officers

The objectives of these activities were to increase knowledge and attitude related to smoking to the conscripts' trainers, to inform their role and empower them to support the activities and teach the conscripts about smoking and smoking cessation during BMT. The researcher conducted the meeting on Saturday in 4th week. There were 37 trainers participated in the meeting. They did pre-test, and were divided into four groups for group discussion about the vision of the military regarding smoking and participating to help the conscripts to reduce or stop smoking. They presented the jobs and the researcher concluded the content related to knowledge of smoking and smoking cessation again and evaluated them with post-test.

Activity 4 : The company commanders take role regarding tobacco control

The objective was to facilitate participation of the company commander to support smoking behavior change program in their unit. The activities focused on the company commanders bringing the policy to provide the activities to the conscripts during 4th month- 6th month. The researcher suggested them how to conduct the activities.

At six months the researcher followed up the outcome and interviewed the conscripts and the company commanders to evaluate the results which the company were separated to good organization and fairly good organization. The company which got scores 2-3 were good organization and below 2 were fairly good organization as illustrated in Table F.11 (Appendix F).

4.2.2 Smoking cessation program at interpersonal level

The smoking cessation program at interpersonal level was the activities that the family support the conscripts to quit smoking and remain abstinent after they were not under the enforcement ban on smoking during BMT. The researcher trained the families to support the conscripts via two types and gave the booklets to them. After that the families gave informational and emotional support to the conscripts. The activities were as follows:

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4.2.2.1 Training the families and significant others

1) Training via face to face.

The researcher met the conscripts' families (parent, wife or girlfriend) who lived in Bangkok metropolitan and central region during the 3rd week and 4th week. They received information and explanation from the researcher by face to face discussion at the training company. The researcher explained protocols in the booklet how to help the conscripts, educated and reinforced them around 10 to 15 minutes per case. The expectation of meeting would like the families to advise, warn and support the conscripts during quitting.

2) Training via telephone. The families who lived in the north-eastern region and others could not come to visit the conscripts at the training company, so the researcher gave the booklets to them when the conscripts went back home during 10th -11th wk. The researcher phoned to each family for one time around 10 minutes/case during two weeks to advise and discuss with the family following the booklets.

4.2.2.2 Support the booklets. The researcher developed the booklets to the conscripts' families which contents related to knowledge of smoking and the harmful effects of smoking, the activities to do during quitting or craving, and the role of the family to help the conscripts.

4.2.3 Smoking cessation program at intrapersonal level

The intervention at intrapersonal level consisted of seven sessions. The intervention of session 1 to session 6 based on processes of change were conducted by the researcher and research assistants which all conscripts would be trained weekly during BMT. The conscripts were divided into five or six groups and received the sessions from the researcher similarly. Sometimes they had to do the activities with the whole group together. Most sessions used group discussion and participatory learning methods. After three months of BMT, the 7th session was conducted by the researcher to give telephone counseling to the conscripts. In short of 7 sessions were as follows :

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Session	Objective	Method/ Technique	Activities
Session1	To increase awareness about the harmful effects of smoking	- Consciousness Raising - Dramatic relief - Motivational Interviewing Technique - Observational Learning	1. Giving health education and information about smoking - Watching video, CD about smoking and health consequences from smoking - demonstrate the toxic agents of cigarette smoking by lung model and white handkerchief 2. Arouse the smokers' emotion by using their imagination
Session2	- To increase the pros of quitting or reduce the cons of quitting and increase the cons of smoking	- Modeling - Environmental reevaluation	1. Sharing experiences about smoking, past quit attempts and the pros and cons of quitting by the commander, friend and the patient suffering from smoking 2.use technique " think before you act" by asking the conscripts what smoking means to them by group process. 3. Give scenario about smoke free environments and group discussion

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Session	Objective	Method/ Technique	Activities
Session 3	- To weigh for pros and cons of smoking - To evaluate themselves for triggers to smoke and quit	- Self-reevaluation - Brain storming - Participatory learning	1. group discussion about the pros and cons of smoking 2. create a new self-image by imagination if they quit smoking , such as ;would they feel relieved?, Healthier
Session 4	- To increase self-efficacy to quit	- Perceive self-efficacy - Mastery experience - Verbal persuasion - Refusal skill	1. Give health education for doing during quitting and craving 2. Role playing, ideas reflection and discussion 3. Give scenarios and problem solving
Session5	- To set goal for decision making - To improve coping skill	- Self-liberation and Goal setting - Coping skill training and stress management training	1. Commitment 2. Group discussion 3. Stress management training 4. Distribute self-help materials,e.g.pamphlets, small booklets
Session 6	- To maintain abstinence and prevent relapse	- Self-regulation - Reinforcement management - Counter conditioning	1.Record craving and how to do on wrap sheet 2. give 0.5% Sodium nitrate to use when they feel craving

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Session	Objective	Method/ Technique	Activities
Session 7	- To give reinforcement and advise the conscripts to overcome the obstacles	- Individual telephone counseling	1. Telephone counseling the conscripts during 4th month to 6th month around 1-2 times/ month.

The intervention in each session could not give to the conscripts follow stages of change because the limitation of time for basic military training, therefore, the intervention was started to every conscripts with the 1st session aimed to increase awareness of the harmful effects of smoking by using consciousness raising, dramatic relief and motivational interviewing technique, then continued with the 2nd session to the 6th session every week which consisted of the motivation to quit, self-reevaluation, increase self-efficacy to quit, goal setting, make a commitment ,skill improvement, maintain abstinence and prevent relapse. The conscripts participated and cooperated well. The researcher talked and advised each conscripts every month around 8-10 minutes to increase motivation to quit, reinforce them to remain abstinent and help them to overcome obstacles during quitting.

4.3 Effects of smoking cessation program based on the ecological model

The smoking cessation program based on ecological model affected to organizational level, interpersonal and intrapersonal level which had indicators as follows:

1) The organizational level was measured by policy implemented, structure and activities related to tobacco control, smoke free environments including knowledge related to smoking and cessation among the training officers and qualitative data from the commander and staff officers.

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2) The interpersonal level was measured on the conscripts' perceived social support to control smoking behavior from the families or significant others and qualitative data from the families and the conscripts' interviews.

3) The intrapersonal level was measured on stages of change transitions, perceive pros and cons of smoking, perceived self-efficacy to control smoking behavior, attempt to quit behaviors, including qualitative data from the conscripts during telephone counseling. The time periods of data analysis were compared two times : at baseline (before intervention) and six months after intervention.

4) The final outcome to measure was smoking behavior after program implementation.

4.3.1 The effect of organizational level

The results of the three objectives demonstrated that there were success in organizational changes from expected outcome. The results from quantitative and qualitative data were as follows:

The success of objective 1: Awareness of the problem of cigarette smoking in the military as the expression from the commander and staff officers agree to cooperate and participate in smoking cessation program. The regimental commanding officer said that "I have smoked for many years, now I reduce a number of cigarettes smoked per day and try to quit smoking because I know about the harmful effects of smoking. Smoking seems to be a habit, when I get stress I start to smoke. Sometimes I've used lotus stem to hold instead of cigarettes, it can help me to reduce cigarette smoked." "At this time the soldiers in the regiment change their behaviors to reduce or stop smoking and it is good that the researcher come to conduct the cessation program for the conscripts. I and my staffs are ready to participate and support in the program." He ordered the regimental executive officer to coordinate with the researcher. Finally, he emphasized to everyone in the meeting to inform the controlee about the effects on smoking and health and benefit to quit smoking. In addition, he suggested the researcher to deal directly with the conscript's trainers to start the program. The researcher discussed with the commander and staff officers to set the activities related to tobacco control in the military to reduce a number of soldiers who smoked such as provide the campaigns to reduce or stop smoking on World No

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Tobacco Day. Additionally, the committee was appointed to do the activities regarding tobacco control. There were three persons from the regiment and the regimental executive officer was the leader to participate in the activities. The researcher could coordinate with them and work together very well.

The success of objective 2 : Tobacco control policy was communicated through top-down approach. Setting smoke free workplace and giving knowledge about smoking and cessation for the training officers was implemented. However, the unsuccessful result was the topic related to smoking and smoking cessation to train the conscripts could not be added in basic training schedule. The details of the results were as follows:

a) The tobacco control policy in the military was communicated from top organization to each unit.

There were the policy related to tobacco control in the military before conducting the program, for instance, the policy of bans on smoking during BMT for the conscripts, policy from the Ministry of Defense to set the activities in the military such as survey a number of soldiers who smoked, provide the exercise to support the soldiers, including the conscripts to quit smoking, and set smoke free workplace. However, the activities were less implemented because the military did not have the responsible persons. After the committee was set up and the new rule or regulation related to smoking and smoke free workplace plan was carried out, the researcher gave the document from Ministry of Defense Smoke Free Project and Health Protection Act to set smoke free workplace and smoking zone inside and outside the buildings. The regimental executive officer strengthened the policy ban on smoking in the workplace to punish the soldiers and the conscripts who did not follow the rules. The policy was announced by the order in memorandums, presentation at the meeting, and information when the soldiers stand in row in the morning. In addition, he emphasized the policy of ban on smoking to the training officers.

b) Physical environments were arranged to be smoke free environments.

The result from the structure of the organization after the meeting affected to create smoke free workplace to improve physical environment. All rooms in the buildings of the 1st infantry regiment and the training company have

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already patched with no-smoking signs. There were no ash-tray on the desk and no fag-end on the floor. Outside the building, smoking zone area were set together. For recreational activities, the training officers set the time to provide recreational activities such as play musics, see the movie besides taking the conscripts to run in the morning and evening during BMT. For evaluation, if the regiment and the training company could set or conduct activities or smoke free environments completely (100%), they received score 2 but incompletely the score was 1 and if they could not set or did not have the activities, therefore, they received score 0. Before intervention, the total score of activities for tobacco control and smoke free environments was 2 points. After intervention, the scores changed to 12 points as illustrated in Table 4.6

Table 4.6 The activities for tobacco control and smoke free environments betweenbaseline and six months

Activities	Baseline	Six months
1. Structure and activities		
1.1 There were the officers who were responsible to do the activities for tobacco control in the military	0	2
1.2 The activities related to tobacco control have been set from the committee	0	1
1.3 Tobacco content was added to the training schedule for the new recruits	0	0
1.4 The military unit had the officers to give health education	0	1
1.5 There was a plan or tobacco campaign in the military unit	0	1
1.6 There was a plan for increasing motivation or giving compliment for the soldiers who could quit smoking	0	0
1.7 There was an evaluation of the project or activities related to tobacco control	0	0
2. Smoke free environments		
2.1 prohibited sign for smoking were pasted at smoke free areas	1	2
2.2 provide smoking zone at outside the building	1	2
2.3 working room did not have ashtrays on the desk or smells of smoke	0	2
2.4 no fag-end on the floor inside and out side the workplace	0	1
Total	2	12

The unsuccessful about the policy was the basic military training schedule could not add the topic of smoking cessation to the conscripts in the next section. The conscripts' trainers said that "*The schedule of basic military training*

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came from the army training command of the Royal Thai Army which was strictly standard schedule and similarity in every military unit. They had not available time to teach other topics." However, they said that they will try to set time for this topic if they can do in the future. Additionally, they tried to conduct the activities to support the conscripts during the enforcement of ban on smoking such as setting recreational activities regularly, provide the sour fruits when the conscripts urge to smoke etc.

Objective 3 Increase knowledge and attitude related to smoking to the conscripts' trainers, including the officers in the military

Besides the commander of the 1st infantry regiment announced the policy related to tobacco control in the military, there were the activities to reduce a number of the soldiers who smoked. The regimental executive officer would like non-commissioned officers to quit smoking to enhance their quality of life, therefore the committee set the project to give health education to them. The meeting was set for a half day and invited Professor Prakit Vathesatogkit (Executive Secretary of Action on Smoking and Health Foundation Thailand) to lecture the topics related to the situation of smoking, burdens from smoking, the laws, and the methods how to quit smoking. There were 150 non-commissioned officers attending in the meeting and 75 persons were current smokers. The evaluation by the questionnaires from the attendance revealed that they had satisfaction in good to very good level 92%. Moreover, there were 30 non-commissioned officers who signed their name to participate in the next project which focus to reduce and stop smoking.

The main target groups to support the conscripts to quit smoking during BMT were the training officers. They should have knowledge and positive attitude toward smoking cessation. The results after training them revealed that there were 37 trainers attended in the meeting which consisted of the commander and assistants. Most of them were non-commissioned officers including the senior conscripts who were selected to be the assistants. Half of them were current smokers and they have ever tried to quit smoking. The activities of the intervention consisted of lecture from the researcher, group discussion and presentation from the training officers, and evaluating the knowledge of the trainers by pre-test and post-test.

There were four small groups to do brain storming and group discussion. The results revealed that the conscript's trainers worked together well.

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They created the vision and picture in the military that related to ban on smoking. They demonstrated the ideas through the picture and motto such as "*smoke free in the new company* " (*กองร้อยทหารใหม่ปลอดบุหรี่*), *"Healthy military company if the soldiers do not smoke "* (*กองร้อยน่าอยู่ ถ้าทหารไม่สูบบุหรี่*), *" Cigarette is harmful to life and toxic to surrounding people"* (*บุหรี่เป็นภัยต่อชีวิต เป็นพิษต่อคนรอบข้าง*). During presentation, they exchanged their ideas and discussed to gether. Hence, the atmosphere of participatory learning was occurred. They concluded about the characteristics of the good trainers, e.g., they should have discipline, good role model, do not drink alcohol and not smoke, including be counselor to the conscripts. The last issue of group discussion concerned about the role of the trainers to support the conscripts to quit smoking were as follows:

1. They have to inspect to the conscripts' behavior, cigarettes and the lighter and informed the rule, including the punishment if the conscripts do not follow the enforcement ban on smoking during BMT.
2. Act as a role model by trying to quit smoking. If someone want to smoke, they will not smoke in front of the conscripts
3. Do not make the conscripts stress and set the time for recreational activities routinely
4. Participate in the campaign to reduce or stop smoking in the military

Moreover, the trainers who were current smokers changed their attitude to continue smoking. They promised to the researcher for quitting and eagered to ask how to quit smoking or deal with craving. At the end of the training, some trainers had to train the conscripts, therefore, there were 25 persons who did post-test. The results about the knowledge of the trainers from 25 persons revealed that the scores of knowledge related to smoking and cessation showed a statistically significant increased at post-test when compared with pre-test. ($t= 3.079$, $p = 0.005$) as illustrated in Table 4.7. Consequently, the conscripts' trainers have improved knowledge and attitude related to smoking and cessation besides the announcement of the policy from the commander. This would be good to the conscripts because the

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trainers could be the role model and give counseling to the conscripts if they needcounseling during the enforcement of ban on smoking.

Table 4.7 Comparison of knowledge regarding smoking and cessation among the training officers before and after training

Knowledge	n	$\overline{X}$	SD	t-value	df	*p*-value
Before	25	5.60	1.50	3.079	24	0.005
After	25	6.68	1.63			

Objective 4 : The company commander participate to support quitting

The company commanders were the persons who influenced to smoking behavior of the conscripts after they were separated to each company because during that time they were free from the rule of ban on smoking, so the conscripts could smoke any time. The company commanders who attended at the first meeting with the chief of the 1st infantry regiment conducted the activities to support the conscripts and created smoke free workplace differently. The results from checklist, observation and interview demonstrated that the companies were separated into two types; organization I was the company which provided the activities to support the conscripts, including setting smoke free workplace in a fairly good level and there were three companies in organization I. The company in organization II provided the activities regarding tobacco control in a good level better than those in organization I which had two companies. The headquarters company could do the activities completely better than other companies as illustrated in Table 4.8. Consequently, ¾ of the conscripts who could quit smoking at six months stayed in the headquarters company, therefore, organizational intervention could influence to smoking behavior among the conscripts.

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Table 4.8 Comparison the activities regarding tobacco control among five military companies

Activity	Company				
	HQ CO	HVY MORT CO	AT PLT	APC PLT	CO of the 1st division
1. The company commander warned the conscripts not smoke	1	-	-	-	-
2. Enhance the activities to reduce stress of the conscripts	1	1	1	1	1
3. Setting smoke free workplace	1	1	-	-	-
4. Setting smoking zone outside the building	-	-	-	-	-
Total score	3	2	1	1	1

4.3.2 The effect of interpersonal level

The interpersonal level applied social support from the family to support the conscripts which consisted of two types were as follows:

4.3.2.1 Training via face to face

The conscripts came from many parts of Thailand such as Bangkok, the central provinces, and the north-eastern provinces, therefore, the researcher could contact some families at the military company. Forty-four families visited to the conscripts during 3rd and 4th week of BMT. Eighty percent of the families were the conscripts' parents. Others were wives or girlfriends. Most of them lived in Bangkok and metropolitan area. After advice and discuss with the families following guideline in the booklets, they approved with the researcher that they would like the conscripts to reduce and quit smoking. The conscripts' mothers told that they warn, ask the conscripts for quitting many times and the conscripts tried to do. One mother talked to the researcher and said that "*after entering the military for one month, my son looked good, and fresh. This is a consequence of ban on smoking during BMT. I told him all the time to quit smoking, but he has never done. He followed his friends and most of them smoked. I worry he will return to smoke when he go back home. I thank Ajarn to give advice to me and I will take care of him follow the guideline in the booklet."* Some conscripts' fathers talked to the researcher that they wanted to quit smoking because of some health problems. They failed to quit many times and tried to quit again from suggestion. The conscripts who received this types of social support from their families could reduce and quit smoking 68.2% (Table

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4.16). Additionally, the conscripts' fathers could change their attitude toward smoking that they perceived the harmful effect of smoking more than the benefit of smoking. However, there were some conscripts who still smoked cigarettes the same as before intervention.

The conscripts who had their own families found to reduce or stop smoking. One wife said that "*He reduced cigarettes from one pack/day to 5-10 cigarettes/day and did not smoke inside our house because he is afraid of the effect of secondhand smoke to our child, I would not like to force him to quit, but he would quit by himself".* The partners or girlfriends stated that "*Currently, the conscripts do not smoke or smoke a few cigarettes*. One girlfriend said that *"I did not like the people who smoke, therefore he did not smoke when he stay with me. I've ever told him to quit, and he promised me to quit in a few months."* Furthermore, there were lovely and supportive atmosphere between the families and conscripts during meeting at the company. They talked and discussed together and gave reinforcement to quit, including tried to find the way to help the conscripts to remain abstinent together.

4.3.2.2 Training via telephone

The results from this type of social support that the researcher contacted the conscripts' families by telephone at home and gave advice revealed that there were 45 families contacted with the researcher. Majority of them were the conscripts' parents. The researcher asked about their roles to support the conscripts at home to continue quitting and they said that they took care their son following the guideline in the booklets. Most conscripts' mothers understood the contents and the pictures in the booklets and applied to advise the conscripts' fathers who also smoked. They assigned housework and other jobs such as work for agriculture to the conscripts to avoid leisure time. They arranged some benefit food for the conscripts and aware of drinking alcohol. One mother stated that *"I provided sour fruits and benefit food for my sons but sometimes he did not like to eat. Anyway I told him to do housework to avoid leisure time, consequently, he's still quit smoking."* Another mother said that *"I always warn him not go to drink alcohol with his friends and he obey. I believed that he's still quitting"*. However, most conscripts have still quit smoking during the first week, after that some of them returned to smoke when they had a party with their friends and had nothing to do at home. In addition, there were some conscripts who

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started smoking again during two to three days within the first week because they urged to smoke when they saw someone smoking, but they smoked only one to two cigarettes/day.

The conscripts who received this type of support could reduce and quit smoking 66.7% while those who smoked the same as before intervention or increasing smoking were 33.3% (Table 4.16).

In conclusion, no matter what types of social support, the result demonstrated that the families received support from the researcher, and the conscripts received support from their families or significant others could improve their attitude toward smoking and smoking cessation. They perceived about the hazard of smoking and more interested in smoking behavior of the conscripts. They pay attention to the conscripts to support quitting more than before receiving the intervention, in addition, the fathers have motivation to quit to be the role model for their sons.

4.3.3 The effect of intrapersonal level

According to the package intervention in 7 sessions (referred to topic 4.2.3), the cognitive change after receiving intervention for improving smoking behavior which they affected to interpersonal level as follows:

4.3.3.1 Perceived pros and cons of smoking

Accordingly to the items of pros of smoking, there were some conscripts who perceived the pros of smoking in a medium average at baseline and six months, for example, *smoking could help them relax* ($\overline{X}$ = 3.40, $\overline{X}$ = 3.34 respectively), *smoking could relieve tension* ($\overline{X}$ =3.38, $\overline{X}$ = 3.09, respectively) as illustrated in Table F.1 (Appendix F). When compared between baseline and six months, the result revealed that there were statistically significance difference of mean score of pros of smoking in the items of *"I like the image of a cigarette smoker" and smoking makes me have a lot of friends"* which the mean scores at six months were higher than at baseline (p <0.001). In addition, the result from qualitative data found that most conscripts perceived smoking could relieve tired from hard work. They would have constipation, if they did not smoke. When weighed between the pros and cons of smoking, there were some conscripts who perceived the pros more than the cons of smoking, especially for relieve tension or stress, therefore, they have still perceived

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the benefit of smoking. Moreover, they believed from their grandparents that someone who stopped smoking immediately would be sick or die, therefore, they would not like to quit smoking abruptly.

The results of perceived cons of smoking revealed that the conscripts perceived some items in a medium average at baseline and six months such as *smoking cigarettes is hazardous to my health* ($\overline{X}$ = 3.90, $\overline{X}$ = 3.73 respectively), *I will be more energetic right now if I do not smoke* ($\overline{X}$ = 4.03, $\overline{X}$ = 3.87). The result could infer that most conscripts concerned about health to quit smoking. When compared between baseline and six months, there were statistically significant difference of mean score of cons of smoking in the item "they perceived their closely person concern to their health". (p <0.05). It was consistent with qualitative data that most conscripts have decision to quit because the families or significant persons asked for and they perceived that cigarettes smoking could affect their health. They concerned about body image and were afraid of their girlfriends would not like when they smoked, including loss of money. Additionally, in group sessions, they wrote the motto and sentences related to the cons of smoking such as "The smoker will die but the seller will be rich" (บุหรี่คนสูบตาย คนขายรวย), "Quit smoking is beneficial to himself and family" (หยุดบุหรี่ได้ ดีต่อสุขภาพตนเองและครอบครัว), "Lighting cigarette looks like lighting joss stick to call the devil" (จุดบุหรี่เหมือนจุดธูปเรียกยมทูต), "Cigarette is toxic, so be aware before smoking " (บุหรี่เป็นพิษ คิดให้ดีก่อนสูบมัน).

4.3.3.2 Perceived self-efficacy to control smoking behavior

According to the results of qualitative data, some conscripts said that they could control their cravings not to smoke when they need cigarettes in some situation such as when they stayed with the senior conscripts or their friends who smoked. This result supported with the items of perceived self-efficacy when compared at baseline and six months from Table F.2 (Appendix F). The mean scores of perceived self-efficacy to control smoking behavior at six months increased dramatically. For some items, there were statistically significant differences of mean scores of perceived self-efficacy between baseline and six months such as they can control smoking when they drink alcohol with their friends (p<0.001), when they need

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smoking (p<0.001), during talking with their friends (p= 0.001) ,and when they have to solve the problem (p= 0.004). The situations which they can control themselves mostly not to smoke such as when they miss the family, wife or girlfriend, and when they realize they have not smoked for a while. The mean score of perceived self-efficacy to control smoking behavior at six months which found to be lower than others such as in the situations "When I first get up in the morning" ($\overline{X}$ = 2.76), "When they have leisure time" ($\overline{X}$ = 2.78), and when they are on duty to be a guard ($\overline{X}$ = 2.76). The result is consistent to qualitative data that most conscripts feel craving and would like to smoke when they have leisure time.

4.3.3.3 Attempt to quit behavior

The results of attempt to quit behavior revealed that the conscripts tried to do the behavior related to quit smoking with statistically significant diference between baseline and six months such as these statements "you buy cigarettes" (p <0.001), "you have a match or a lighter." (p <0.001), "you find other activities to do instead when feel craving" (p = 0.002), "you breath deeply when need smoking until feeling relaxation" (p = 0.003), "you find the time to exercise" (p= 0.022), "you adjust daily activities to avoid smoking" (p= 0.028), "you record your smoking or feel craving" (p<0.001) as illustrated in Table F.4 (Appendix F). In addition, the results showed that the scores of attempt to quit behaviors in other items at six months had higher than those at baseline. Therefore, after they received the intervention, they tried to reduce or stop smoking in many ways which followed from the contents of the sixth and seven sessions in intrapersonal level. It was consistent to the results from the conscripts' interviews which found that the conscripts tried to do activities to overcome craving and remain abstinent. Even though some conscripts returned to smoke after three months, they tried to reduce a number of cigarettes smoked by doing other activities instead when they need cigarette smoking or avoid staying with the person who were smoking, including they did not buy cigarettes or borrow some cigarettes from their friends. The frequent time that they felt craving such as leisure time, talked with their friends, during drinking alcohol. The solution of 0.5% sodium nitrate (mouth wash) which the researcher gave them to use at home help them not much when they felt craving. The conscripts who used mouth wash said that "*sometimes we felt craving outside the house, we did not bring mouth wash solution*

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with us all the time, so we did not use everytime when urged to smoke". Some conscripts used only one time.

The intervention of 7th session during13th week to 24th week aimed to help the conscripts maintain abstinence for quitting. The researcher followed up and evaluated them by individual telephone counseling one to two times per month. The researcher assessed smoking behavior, then asked and advised them following the guideline (Appendix A, Thai version). The results revealed that around 90% of the conscripts relapsed after three months. They had to separate to the company and had new commanders (company commander and company first sergeant). They had to live with a new environment, including the senior conscripts who smoked. They smoked frequently after meal because all conscripts had to eat together, and they felt craving after seeing the senior conscripts smoked. Sometimes they got stress from their duties, and they still perceived that smoking could help them relax. Even though, they had learned about relaxation technique, they did not have the opportunities to do. However, most of them could reduce a number of cigarettes smoked/day when compared to the past. They smoked only 2-3 cigarettes. Some day they did not smoke. Besides urged to smoke after meal, they would like to smoke during leisure time, tired from working. Most of them reported that they could not quit smoking during staying in the military because they got stress frequently and they felt that their lives were not free. Moreover, at that time there was political problem in the country and they were sent to manage the situation, so they could not go back home and the situation made them bored and hopeless which remind them smoking cigarettes.

The analysis of cognitive and behavior changes revealed that the conscripts had a statistically significant change of perceived pros of smoking, perceived self-efficacy to control smoking behavior and attempt to quit behavior after receiving the intervention.($p = 0.012$, $p = 0.002$, $p < 0.001$, respectively) as illustrated in Table 4.9. However, the result of pros of smoking should have lower mean score at six months but it was higher than that before program implementation.

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Table 4.9 Comparison of cognitive and behavior change at baseline and six months

Cognitive and behavior changes	Baseline Mean (SD)	Six months Mean (SD)	*t*	*p*-value
Pros of smoking	25.76 (6.86)	27.92 (7.28)	2.56	0.012
Cons of smoking	36.28 (7.49)	35.29 (6. 64)	-1.05	0.296
Perceived self-efficacy	51.78 (11.49)	57.31 (12.80)	3.23	0.002
Perceived social support	42.87 (13.06)	42.78 (12.11)	-0.06	0.955
Attempt to quit behavior	33.81 (12.25)	38.62 (9.39)	3.64	<0.001

* 2- tailed test

The results of cognitive variables at baseline revealed that most conscripts perceived pros of smoking in a low level 69.7% and cons of smoking in a moderate level 41.6%. They perceived self-efficacy to control smoking behavior and perceived social support to control smoking behavior in a low level 74.2% and 58.4%, respectively. Additionally, 88.8% of them had a low score of attempt to quit behavior. After six months, the results revealed that most conscripts have still perceived pros of smoking in a low level, however, there were increasing in the percentage number of the conscripts in a moderate level. For cons of smoking, there were dramatically increased a number of the conscripts in a high level. (75.3%). The results of perceived self-efficacy to control smoking behavior and perceived social support to control smoking behavior showed that the percentage of the conscripts in each level distributed in the same as those before intervention. However, there were the number of the conscripts who perceived self-efficacy and attempt to quit behavior in a moderate and high level higher than the results at baseline. Therefore, it showed that the conscripts could change their perceptions in expected outcome for cons of smoking and perceived self-efficacy to control smoking behavior. The results of all variables showed statistically significant difference of scores in each variables at baseline and six months ($p = 0.03$, $p < 0.001$) as illustrated in Table 4.10

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Table 4.10 Comparison of the level of cognitive and behavior changes at baseline and six months

Variables	Level	Baseline		Six months	
		(n)	(%)	(n)	(%)
Perceived pros of smoking	low	62	69.7	52	58.4
	moderate	25	28.1	32	36.0
	high	2	2.2	5	5.6
	p-value$^{\alpha}$	<0.001		<0.001	
Perceived cons of smoking	low	18	20.2	22	24.7
	moderate	37	41.6	0	0.0
	high	34	38.2	67	75.3
	p-value$^{\alpha}$	0.030		<0.001	
Perceived self-efficacy to control smoking behavior	low	66	74.2	51	57.3
	moderate	22	24.7	33	37.1
	high	1	1.1	5	5.6
	p-value$^{\alpha}$	<0.001		<0.001	
Perceived social support to control smoking behavior	low	52	58.4	63	70.8
	moderate	34	38.2	21	23.6
	high	3	3.4	5	5.6
	p-value$^{\alpha}$	<0.001		<0.001	
Attempt to quit behavior	low	79	88.8	74	83.1
	moderate	9	10.1	14	15.7
	high	1	1.1	1	1.1
	p-value$^{\alpha}$	<0.001		1<0.001	

α = Chi square

Notice : X^2 of perceived cons of smoking at six moths was calculated with 2×2 table by accumulation low and moderate level compared with high level

4.3.3.4 Improving smoking behavior

a) Stage transitions

The results of overall stages of change at baseline revealed that most conscripts were in preparation stage 59.6%. After 6 months most of them were in contemplation stage 42.7% and action stage 4.5%. The results showed that the

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conscripts have slightly increased in action stage, and decreased in preparation stage. However, those who were in precontemplation stage at baseline and six months were not different. It can infer that this sample group did not change their mind to quit smoking. The details were illustrated in Table 4.11

Table 4.11 Comparison of stages of change at baseline and six months

Stages of Change	Baseline		6 Months	
	(n)	(%)	(n)	(%)
1. Precontemplation	12	13.5	13	14.6
2. Contemplation	24	27.0	38	42.7
3. Preparation	53	59.6	34	38.2
4. Action	0	0.0	4	4.5
Total	89	100.0	89	100.0

Table 4.12 Stage transitions from baseline to six months

Stages transition	Conscripts	
Baseline – Six months	(n)	(%)
1. same stage	38	42.7
2. forward stage	32	36.0
3. backward stage	19	21.3
Total	89	100.0

The analysis of stage transitions from baseline to six months revealed that most conscripts stayed in the same stage 42.7% and moved forward to the next stage 36.0%. Majority of them were in contemplation stage (42.7%), followed by preparation stage (38.2%). However, there were some conscripts who moved backward 21.3% as shown in Table 4.12. When considering to each stage, the results showed that those who were in precontemplation stage moved forward to contemplation and action stage 11.3%. Most conscripts in contemplation stage at baseline were in the same stage after receiving intervention 16.9%. Additionally, the conscripts who were in preparation stage stayed in the same stage at six months 23.6% and moved backward to contemplation stage and precontemplation stage 23.6% and

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9.0%, respectively as illustrated in Table F.10. The results were interpreted that the intervention in six sessions could not change in stage transitions to move forward stage not much and most conscripts were in the same stage, especially those who were in contemplation and preparation stage.

b) Smoking behavior

The result of smoking behavior revealed that the intervention could improve smoking behavior among the conscripts by reducing a number of cigarettes smoked/day or quitting smoking. The percentage of the conscripts who could continue abstinent at six months and reduce cigarettes smoking were 4.5% and 62.9% respectively. However, there were 32.6% of the conscripts who have still smoked or increased smoking as illustrated in Table 4.13

Table 4.13 Smoking behavior among the conscripts at six months

Smoking behavior at 6 months	Conscripts	
	(n)	(%)
quit	4	4.5
reduce	56	62.9
stable / increase	29	32.6
Total	89	100.0

According to the result, most conscripts could reduce smoking instead of quitting. When considering to four conscripts who could continue quitting smoking at six months, the data suggested that they were single, finished in secondary to high school and were employees before entering the military. Most of them were mild smokers with nicotine dependence in a low level. They had the experiences to quit less than three times. All of them drank alcohol at least one week to one month. At baseline, all of them were in the preparation stage. After three months ¾ conscripts worked in the headquarters company and ¼ worked in the heavy mortar company. The details in each cases were as follows:

Case 1 The conscript was 21 years old, single status, finished in secondary school. The occupation before entering the military was employee with the income 7,500 baht/month. He started smoking at 15 years old and had the duration

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to smoke for six years with a number of cigarettes smoked 13 cigarettes/day. He had the history of drinking alcohol at least 1 time/week and did not have the experience to quit smoking. He had score 6 for nicotine dependence. He perceived himself in a preparation stage at baseline. He received social support from the family by training via face to face with booklet. After three months, he worked at the headquarters company. He used self-control, including thinking about economic loss and the benefit to himself and his family if he could quit smoking.

Case 2 The conscript was 18 years old, single status, finished in high school. He applied to be a conscript because his parent would like him to have the discipline. He started smoking at 15 years old for three years with a number of cigarettes smoked 5 cigarettes/day. He had the history of drinking alcohol one time/month and the experience to quit smoking for two times with the longest duration to quit 2 ½ months. He had nicotine dependence in a score 1 and perceived himself in a preparation stage at baseline. He worked at the headquarters company and received social support from the family by training via telephone with booklet.

Case 3 The conscript was 21 years old, single status, finished in high school. The occupation before entering the military was employee with the income 6,000 baht/month. He started smoking at 17 years old and had the duration to smoke for four years with a number of cigarettes smoked 5 cigarettes/day. He had the history of drinking alcohol one time /week. He did not have the experience to quit smoking in the last year. He had nicotine dependence in a score 2. He perceived himself in an preparation stage at baseline and received social support from the family by training via face to face with booklet.

Case 4 The conscript was 19 years old, single status, finished in secondary school. The occupation before entering the military was employee with the income 4,000 baht/month. He started smoking at 15 years old and had the duration to smoke for three years with a number of cigarettes smoked 10 cigarettes/day. He had the history of drinking alcohol one time/ month and had the experience to quit smoking for two times. He perceived himself in a preparation stage at baseline and had nicotine dependence in a score 3. He worked at the heavy mortar company. From the interview, the result revealed that the conscript had an intention to quit during attending in the cessation program and thought about the effects of smoking more than

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the benefit of smoking. His mother asked for quitting many times and received social support by training via telephone with booklet. He thought that this is the appropriate time to quit smoking because he could quit during the enforcement ban on smoking so he intended to quit permanently.

The conscripts who could reduce smoking were single. They smoked cigarettes less than 10 cigarettes/day. They had education level in high school and over. They received the intervention in good organizational intervention, face to face discussion with booklet and package intervention.

4.4 Hypotheses testing

4.4.1 After program implementation, the conscripts who received the intervention in applying ecological model can change smoking behavior positively.

The analysis of smoking behavior at six months showed the results of the outcome in reducing and quitting. The total effect of the program revealed that most conscripts could reduce smoking instead of quitting, therefore, the effect or the success of the program would consider to reduce and quit smoking.

The result of smoking behavior when compared with three levels intervention revealed that the conscripts who received good organizational intervention from the company commander (organization II) and received social support from the family through face to face discussion and booklet (SS I) with intrapersonal package intervention could reduce and quit smoking more than any other groups (19.1%). However, those who received social support through telephone discussion but received fairly good organization could reduce and quit smoking in a nearly percentage as whom received good organization. When compared the association between the interventions and smoking behavior, the result showed no statistically significant difference between the variables, therefore the types of the intervention in three levels could not affect to improve smoking behavior among the conscripts but the overall of the three levels intervention could affect to change or improve smoking behavior in reducing or quitting 67.4% as illustrated in Table 4.14

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Table 4.14 Comparison of the interventions and smoking behavior at six months

Intervention	Smoking behavior				Total		**p-value$^{\alpha}$**
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. organization I+SS I+ package intervention	13	14.6	7	7.9	20	22.5	**0.866**
2. organization I + SS II+ package intervention	16	18.0	9	10.1	25	28.0	
3. organization II + SS I+ package intervention	17	19.1	7	7.9	24	27.0	
4. organization II + SS II+ package intervention	14	15.8	6	6.7	20	22.5	
Total	60	67.4	29	32.6	89	100.0	

α = Chi square

Comparative analysis of smoking behavior when considered to organizational intervention, the result revealed that the company (organization II) which provide good organizational intervention could influence the conscripts to reduce and quit smoking more than the company in organization I which provide fairly good organizational intervention. However, there was statistically significant difference between two organizations and smoking behavior at $p = 0.545$ as shown in Table 4.15

Table 4.15 Comparison of smoking behaviors at six months and organizational intervention

Types of organization	Smoking behavior				Total		**p-value$^{\alpha}$**
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. organization I	29	64.4	16	35.6	45	100.0	**0.545**
2.organization II	31	70.5	13	29.5	44	100.0	

α = Chi square

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Table 4.16 Comparison of smoking behavior at six months and types of socialsupport

Types of social support	Smoking behavior at six months				Total		p-value[α]
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. Training via face to face with booklet	30	68.2	14	31.8	44	100.0	**0.879**
2. Training via telephone with booklet	30	66.7	15	33.3	45	100.0	

α = Chi square

The result from analysis of smoking behavior when considered to types of social support revealed that there was statistically significant difference between two types of support and smoking behavior (p = 0.879) as shown in Table 4.16. The number of the conscripts who received each type of support were almost similarity.

Comparison of smoking behavior at six months between socio-demographic characteristics, the results revealed that the conscripts who finished high school and over could reduce and quit smoking 70.4 %, while those who finished secondary school or lower could reduce and quit smoking 66.1% and still smoked cigarettes the same as before intervention or increased smoking 33.9%. Therefore, the result could infer to the conscripts who had higher education level were more likely to reduce and quit smoking than those who had lower education level. For marital status, the result demonstrated that the conscripts who were single could quit smoking and reduce a number of cigarettes smoked more than the couple and those who still smoked the same as at baseline or increased smoking were the couple. The result could infer that the conscripts who were single lived with their parents and they were more likely influence them to improve their smoking behavior than wives or girl friends. However, there were no statistically significance difference between education level, marital status and smoking behavior (p = 0.695, p = 0.401) as illustrated in Table 4.17.

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Table 4.17 Comparison of smoking behavior at six months and socio-demographic characteristics

Socio-demographic characteristics	Smoking behavior at 6 months				Total		**p-value**[α]
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. Educational level							**0.695**
≤ Secondary school	41	66.1	21	33.9	62	100.0	
≥ High school	19	70.4	8	29.6	27	100.0	
2. Marital status							**0.401**
Single	50	69.5	22	30.5	72	100.0	
Couple	10	58.8	7	41.2	17	100.0	

[α] = Chi square

The results of comparison of smoking behavior at six months and history of smoking showed that the conscripts who started smoking at a later age (≥ 16 years) could reduce and quit smoking than those who started smoking at a younger age (77.5% and 59.2%, respectively) but not significant difference. The conscripts who had smoked less than or equal five years had a statistically significance difference to quit and reduce smoking than those who smoked more than five years. (p= 0.003). For a number of cigarettes smoked per day, the conscripts who smoked 21-40 cigarettes/day and ≤ 10 cigarettes/day could reduce and quit smoking more than any other group but no statistically significance difference as illustrated in Table 4.18. Therefore, the conscripts who smoked for a few years and started smoking at a later age were more likely to reduce and quit smoking.

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Table 4.18 Comparison of smoking behavior at six months and history of smokingat baseline

History of smoking	Smoking behavior at six months				Total		p-value[α]
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. Age to start smoking							**0.067**
10-15 years	29	59.2	20	40.8	49	100.0	
≥ 16 years	31	77.5	9	22.5	40	100.0	
2. Duration of smoking							**0.003**
1-5 years	37	82.3	8	17.8	45	100.0	
≥ 6 years	23	52.3	21	47.7	44	100.0	
3. A number of cigarettes smoked per day							**0.549**
1-10 cigarettes/day	34	66.7	17	33.3	51	100.0	
11-20 cigarettes/day	20	64.5	11	35.5	31	100.0	
21-40 cigarettes/day	6	85.7	1	14.3	7	100.0	

[α] = Chi square

Comparison of smoking behavior at six months between pros of smoking and cons of smoking, the results revealed that the conscripts who had score of perceived pros of smoking at six months decreased from baseline could reduce and quit smoking more than any other groups (75.0%) but no statistically significant difference. (p = 0.705). However, the conscripts who could quit smoking had both pros increasing and decreasing after program implementation as illustrated in Table F.7 (Appendix F). For cons of smoking, the conscripts who had perceived scores of cons of smoking at six months the same as at baseline could reduce and quit smoking more than any other groups but not statistically significant difference. (p = 0.728) as illustrated in Table 4.19. The results of pros and cons of smoking suggested that the conscripts who perceived the harmful effects of smoking at six months more than at baseline and perceived the disadvantage of smoking or the benefit of quitting the same as at baseline would reduce and quit smoking at six months.

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Table 4.19 Comparison of smoking behavior at six months between pros and consof smoking

	Smoking behavior at six months				Total		p-value[α]
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. Pros of smoking							**0.705**
same	34	64.2	19	35.8	53	100.0	
increase	17	70.8	7	29.2	24	100.0	
decrease	9	75.0	3	25.0	12	100.0	
2. Cons of smoking							**0.728**
same	26	72.2	10	27.8	36	100.0	
increase	25	64.1	14	35.9	39	100.0	
decrease	9	64.3	5	35.7	14	100.0	

[α] = Chi square

The analysis of smoking behavior at six months between the changes of perceived self-efficacy to control smoking behavior after program implementation revealed that the conscripts who had perceived self-efficacy scores at six months increased from baseline could reduce and quit smoking more than any other groups but no statistically significance difference.(p=0.527) as shown in Table 4.20. Therefore, the result could infer that higher perceived self-efficacy was related to improve smoking behavior among the conscripts. Nevertheless, when considered the conscripts who could quit smoking only, the result found in those who had perceived self-efficacy scores at six months decreased from baseline as illustrated in Table F.8 (Appendix F) .

Comparison of perceived social support and smoking behavior revealed that the conscripts who had perceived social support scores at six months the same as before intervention or had increased social support scores after intervention could reduce and quit smoking more than any other groups but non-statistically significance difference as shown in Table 4.20. When compared smoking behavior at 6 months and perceived social support scores, the results showed the percentage number of the

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conscripts were similar in each groups. For attempt to quit behavior, the conscripts who had scores of attempt to quit behavior increased from baseline could reduce and quit smoking more than any other groups as shown in Table 4.20. Additionally, when compared only quit smoking, the conscripts who had scores of attempt to quit behavior after intervention the same as at baseline could quit smoking more than any other groups as shown in Table F.8 (Appendix F). Therefore, highly attempt to quit behavior was likely related to improve smoking behavior.

Table 4.20 Comparison of smoking behavior at six months and change of perceived self-efficacy, perceived social support to control smoking behavior and attempt to quit behavior

	Smoking behavior at six months				Total		p-value[α]
	Reduce/ Quit		Stable/Increase				
	(n)	%	(n)	%	(n)	%	
1. Perceived self-efficacy (SE)							**0.527**
same	30	62.5	18	37.5	48	100.0	
increase	21	75.0	7	25.0	28	100.0	
decrease	9	69.2	4	30.8	13	100.0	
2. Perceived social support (SS)							**0.987**
same	35	67.3	17	32.7	52	100.0	
increase	9	69.2	4	30.8	13	100.0	
decrease	16	66.7	8	33.3	24	100.0	
3. Attempt to quit behaviors							**0.787**
same	48	67.6	23	32.4	71	100.0	
increase	8	72.7	3	27.3	11	100.0	
decrease	4	57.1	3	42.9	7	100.0	

[α] = Chi square

4.4.2 Factors to predict smoking behavior at six months

WEKA Data mining analysis was used to analyze factors contributing to improve smoking behavior among the conscripts after program implementation. Data

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mining involves finding pattern or rules which represents new knowledge or ideas which can be used to make prediction. Computer algorithms are used to find rules or decision trees that best explain a data set by recursively selecting the attribute which does the best job of classifying. A branch in a rule or decision tree occurs for particular values of an attribute (variable) and the consequent rule or the leaf nodes of a decision tree, makes the final classification for the attribute chosen as the attribute being predicted.

Data set in this study which were described by attributes (variables) consisted of nominal attributes. All variables run in the program consisted of 20 attributes. The details were as follows;

a) Outcome variable was taken as the dependent attribute. The main outcome analyzed were smoking behavior of the conscripts which consisted of 2 variables; one was quit and reduce smoking, another was smoking the same as at baseline or increase smoking.

b) The attributes to explain or predict smoking behavior in this study were selected from literature review which included socio-demographic status variables such as origin of the conscripts, marital status, education, history of drinking alcohol, age to start smoking. Other variables were history of smoking such as duration of smoking, a number of cigarettes smoked per day and past quit attempts. In addition, the variables which run into the program were company, the types of intervention in organizational level and interpersonal level. The company comprised of 5 places. The organizational level intervention could separate into two types; good organization and fairly good organization. The interpersonal level consisted of two types of social support; training via face to face with booklet and training via telephone with booklet. All conscripts received intrapersonal level intervention similarly, therefore, the overall intervention which run into the program consisted of four types; 1) fairly good organization + training via face to face with booklet 2) fairly good organization + training via telephone with booklet 3) good organization + training via face to face with booklet 4) good organization + training via telephone with booklet. Additionally, the variables from the outputs of intrapersonal level and interpersonal level were put into the program. The outputs of intrapersonal level consisted of the change of categorized scores of pros of smoking, cons of smoking,

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perceived self-efficacy to control smoking behavior, and attempt to quit behavior when compared between baseline and six months. In addition, stages of change at baseline and six months were also run in the program. The output of interpersonal level intervention was the change of categorized scores of perceived social support to control smoking behavior between baseline and six months. The predictive variables were as follows:

Table 4.21 The predictive variables in dataset

Variables	Description of the Variables
Company	Five military company; HQ CO, HVY MORT CO , AT PLT, APC PLT, The CO under the 1st infantry division
Types of intervention	Types of intervention in organizational and interpersonal level which consisted of 4 types; 1) fairly good organization + face to face discussion with booklet 2) fairly good organization + telephone discussion with booklet 3) good organization + face to face discussion with booklet 4) good organization + telephone discussion with booklet
Types of organization	Types of organizational intervention which consisted of 2 types; 1)good organization 2) fairly good organization
Types of social support intervention	Types of social support; 1) training via face to face with booklet 2) training via telephone with booklet
Pros of smoking	The change of categorized scores of pros of smoking when compared between baseline and six months which divided into 3 categories; 1) sam 2) increase 3) decrease
Cons of smoking	The change of categorized scores of cons of smoking when compared between baseline and six months which divided into 3 categories ;1) same 2) increase 3) decrease
Perceived self-efficacy	The change of categorized scores of perceived self-efficacy to control smoking behavior when compared between baseline and six months which divided into 3 categories; 1) same 2) increase 3) decrease
Social support	The change of categorized scores of perceived social support to control smoking behavior when compared between baseline and six months which divided into 3 categories; 1) same 2) increase 3) decrease

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Table 4.21 The predictive variables in dataset (count.)

Variables	Description of the Variables
Attempt to quit behavior	The change of categorized scores of attempt to quit behaviors when compared between baseline and six months which divided into 3 categories; 1) same 2) increase 3) decrease
Origin	Hometown divided into 2 parts; 1) Bangkok and Metropolitan area including central provinces 2) North-eastern region and Southern region
Marital status	There were two categories; 1) single 2) couple
Education	Educational level consisted of 2 categories; 1) ≤ secondary school, 2) ≥ high school
Alcohol drinking	Frequency of alcohol drinking; 1) No drinking or only at social gathering 2) Drink at least 1 time in a week or in a month
Age to start smoking	Age to start smoking divided into 2 categories; 1) age ≤ 15 years old 2) age ≥ 16 years old
Duration of smoking	Duration of smoking divided into 2 categories; 1) 1- 5 years 2) ≥ 6 years
A number of cigarettes smoked/day	A number of cigarettes smoked/day divided into 3 categories; 1) 1- 10 cigarettes/ day 2) 11 -20 cigarettes/ day 3) 21 - 40 cigarettes/ day
Types of smokers	Types of smokersdivided into 2 types follow frequency of smoking; 1) daily smoker 2) occasional smoker
Previous quit attempts	Previous quit attempts divided into 2 categories; 1) ever 2) never
Stages of change at baseline	Stage of change at baseline divided into 3 stages; 1) pre-contemplation 2) contemplation 3) preparation
Stage of change at six months	Stage of change at six months divided into 4 stages; 1) pre-contemplation 2) contemplation 3) preparation 4) action
smoking behavior change	Smoking behavior change consisted of ; 1) reduce and quit smoking 2) stable or increase smoking

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Rule of the model

The rule process produces a classification rules from the classification model. This process applied the C4.5 algorithm to transform the rule classifier to a rule set in straightforward format as "IF…THEN". Therefore, the model from decision tree rules were as follows:

4.4.2.1 Model I

The classification of Model I consisted of 20 attributes (variables). The dependent variable or the outcome variable was smoking behavior. The predictive variables consisted of 19 variables which regarding to smoking behavior from literature review; types of company, types of organizational intervention, types of social support intervention, types of intervention in organizational and interpersonal level, marital status, hometown, a number of cigarettes smoked/day, previous quit attempts, stages of change at baseline, stages of change at six months, educational level, alcohol drinking experience, age to start smoking, duration of smoking, a number of cigarettes smoked/day and output of intrapersonal level intervention; pros of smoking, cons of smoking, perceived self-efficacy to control smoking behavior, attempt to quit behavior and output of interpersonal level intervention ; perceived social support to control smoking behavior.

The result of data mining from Figure 4.1 were three shortage leaf node applied to model I that would be concluded in Rule 1 to Rule 3. The overall prediction was correctly classified 59.09%.

Rule 1 : If the conscripts smoked cigarettes ≤5 years and smoked ≤10 cigarettes per day, they would have a higher chance to reduce and quit smoking.

Rule 2 : If the conscripts smoked cigarettes ≤5 years and smoke ≤10 cigarettes per day and they have changed of pros of smoking from baseline, they would have a higher chance to reduce and quit smoking.

Rule 3 : If the conscripts smoked cigarettes >5 years and smoked 21- 40 cigarettes per day, they would have a higher chance to reduce and quit smoking.

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The result from Model I revealed that duration of smoking and the number of cigarettes smoked per day could predict smoking behavior in reducing and quitting. Therefore, the conscripts who smoked for a few years and were mild smokers that smoked cigarettes less than and equal to 10 cigarettes/day would improve their smoking behavior.

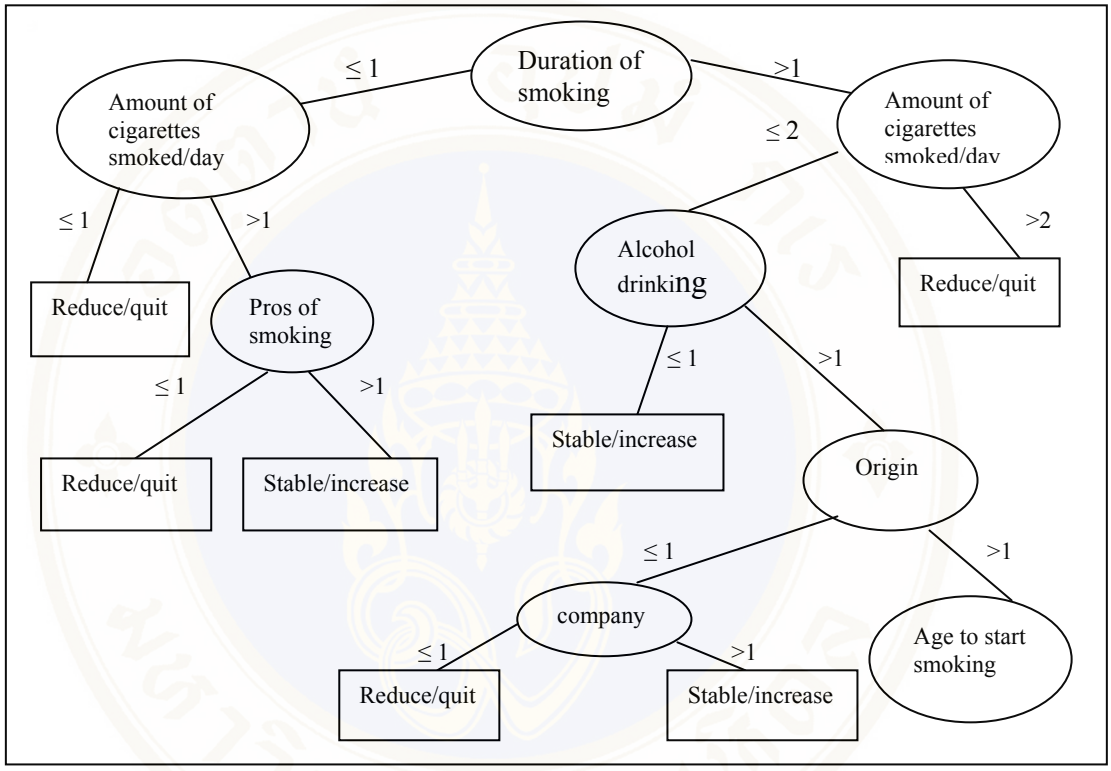

Figure 4.1 Decision tree rules of Model I

4.4.2.2 Model II

From this model, 14 variables of socio-demographic, smoking behavior and experiences, types of intervention and outputs of the intervention in intrapersonal level and interpersonal level were run to predict smoking behavior at six months. When considering the shortage leaf nodes, there were three rules in this model (Rule 4 to Rule 6). The overall prediction was correctly classified 61.36 %.

Rule 4 : If the conscripts smoked ≤5 years and smoked ≤10 cigarettes/day, they would have a higher chance to reduce and quit smoking. (the same as Rule 1).

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Rule 5 : If the conscripts smoked ≤5 years and smoked >10 cigarettes/day and have changed of pros of smoking scores from baseline, they would have a higher chance to reduce and quit smoking. (the same as Rule 2).

Rule 6 : If the conscripts smoked >5 years and smoked ≤20 cigarettes/day and drank alcohol at least one time in a week and lived in the north-eastern region or southern region and started smoking more than and equal to 16 years, they would have a higher chance to reduce and quit smoking.

The result from this model demonstrated that duration of smoking and a number of cigarettes smoked/day could predict smoking behavior change. The conscripts who smoked for a few years and were mild smokers would have a higher chance to reduce and quit smoking. However, the conscripts who smoked more than 5 years and smoked 21-40 cigarettes/day would have a higher chance to reduce and quit smoking as well. The results were the same as Model I.

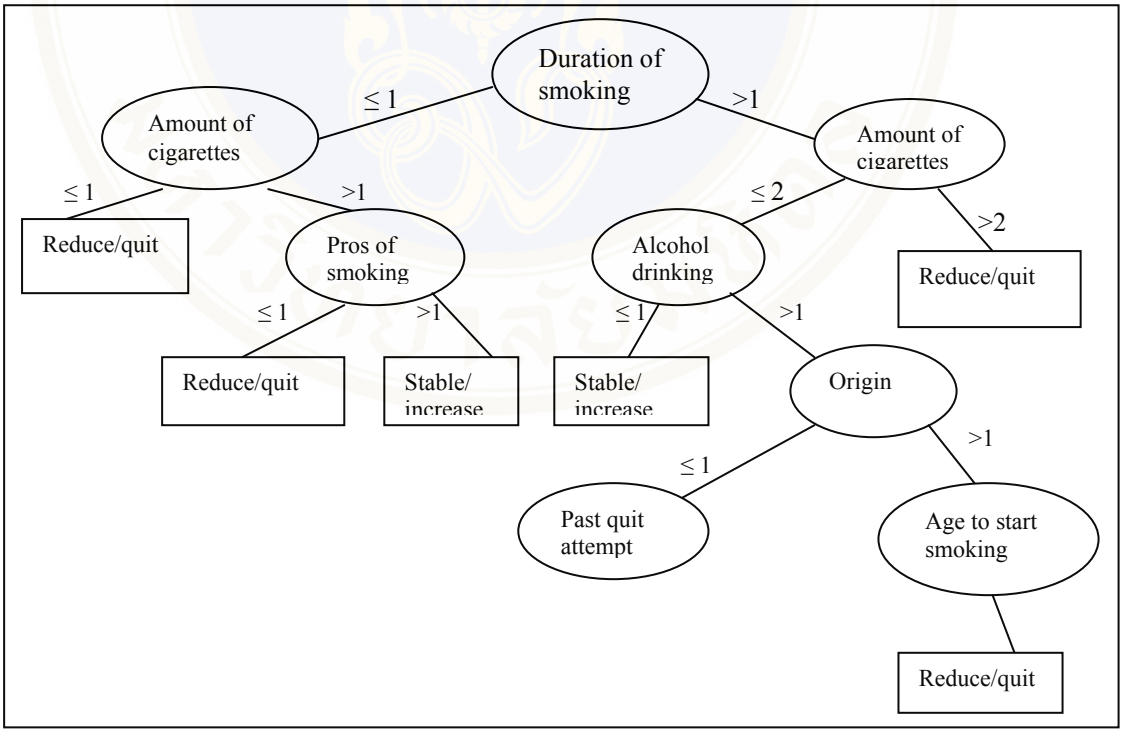

Figure 4.2 Decision tree rules of Model II

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4.4.2.3 Model III

From this model 11 variables were run to predict smoking behavior which consisted of socio-demographic variables, smoking behavior and experiences and stages of change at baseline and six months. The short armed of leaf node from figure 4.3 presented the result of Rule 7 which was similar to Model I and Model II. The overall prediction in this model was correctly classified 64.15%

Rule 7 : If the conscripts smoked less than and equal to five years, they would have a change to reduce and quit smoking. This rule showed the important of duration of smoking to improve smoking behavior. The shorter they smoke, the more they reduce and quit smoking.

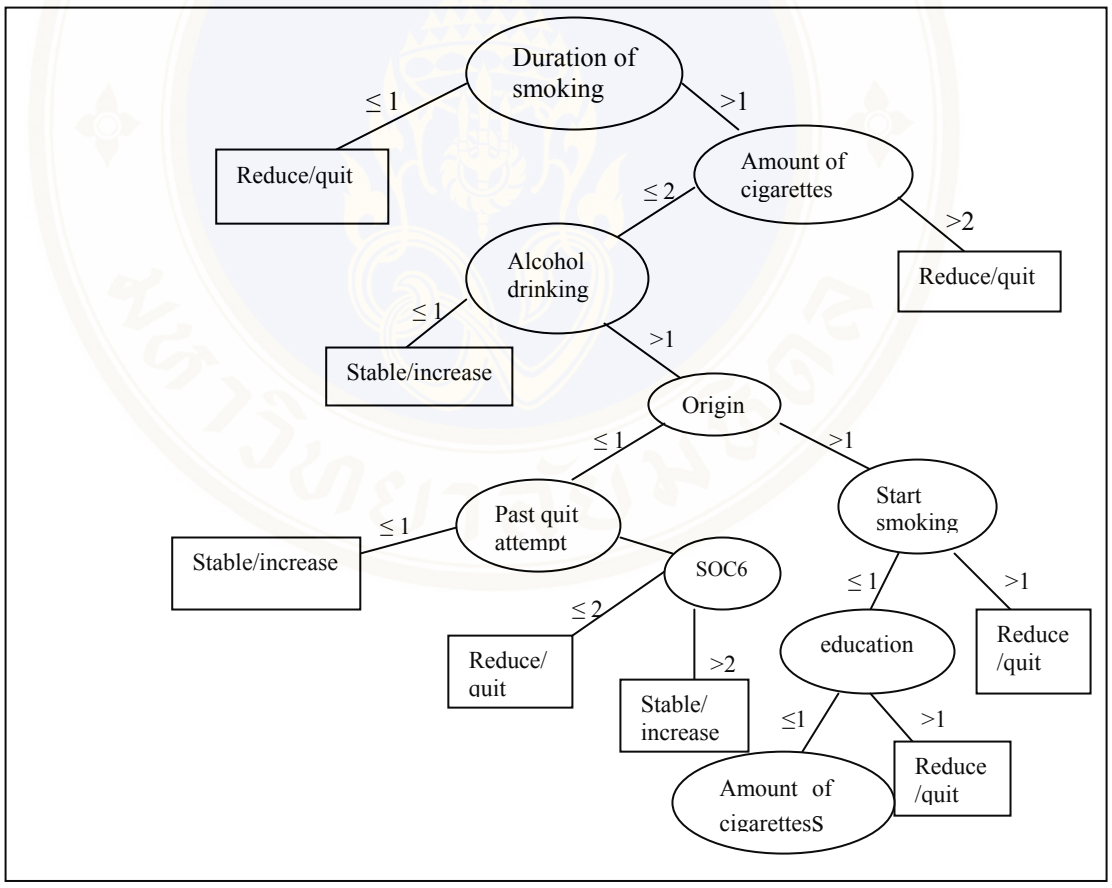

Figure 4.3 Decision tree rules of Model III

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4.4.2.4 Model IV

The variables for classification to predict smoking behavior of Model IV consisted of 7 variables which focused on the intervention and the outputs of cognitive and behavior change. The variables were types of organizational intervention, social support, output of pros of smoking, output of cons of smoking, output of perceived self-efficacy to control smoking behavior, output of attempt to quit behavior and output of perceived social support to control smoking behavior. There were three rules from Figure 4 in this model. The overall prediction was correctly classified 77.78%.

Rule 8 : If the conscripts have changed of perceived self-efficacy to control smoking behavior scores increasing from baseline, they would have a higher chance to reduce and quit smoking.

Rule 9 : If the conscripts have not changed of perceived self-efficacy to control smoking behavior scores and received social support by training via face to face with booklet, they would have a higher chance to reduce and quit smoking.

Rule 10 : If the conscripts have changed of perceived self-efficacy scores decreasing from baseline and received fairly good organization, they would have a higher chance to reduce and quit smoking.

The model IV analysis suggested that perceived self-efficacy was the main predictor to improve smoking behavior change. The conscripts who had perceived self-efficacy scores higher after intervention would have a higher chance to reduce and quit smoking. Additionally, in case of self-efficacy have not changed, social support by face to face could contribute changing smoking behavior. For those, who have self-efficacy decreased at six months could change their smoking behavior if they received organizational intervention, even though it was a fairly good organization. Therefore, organizational intervention could influence to improve smoking behavior with self-efficacy.

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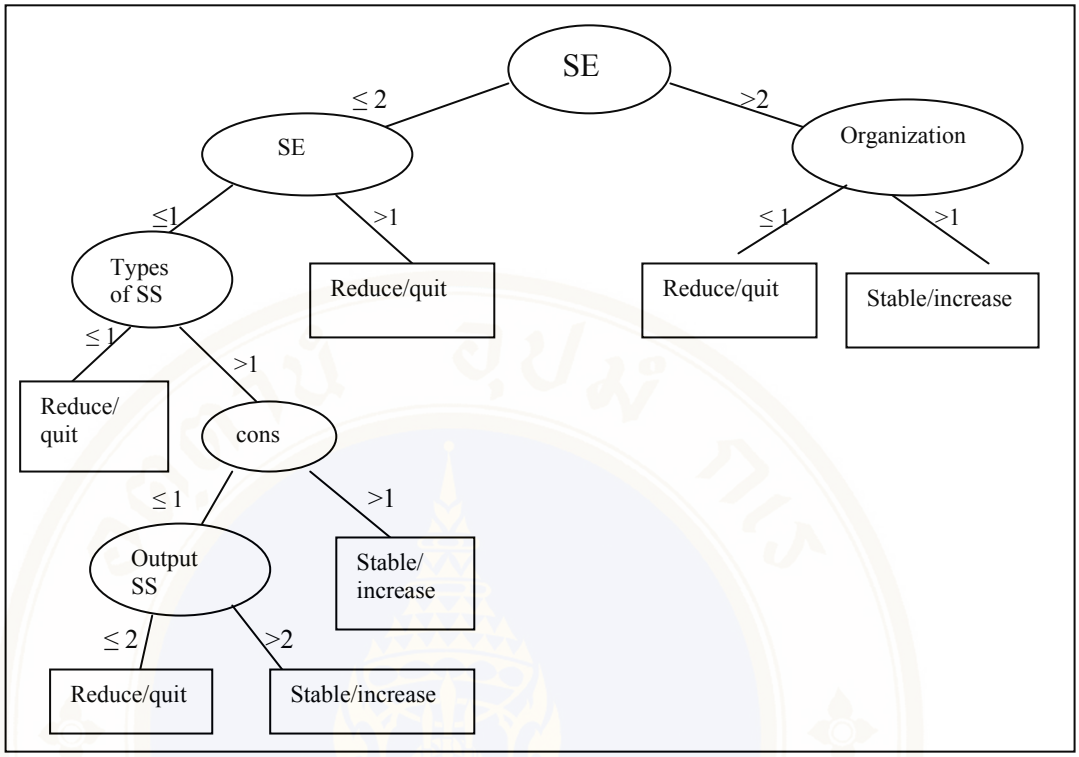

Figure 4.4 Decision tree rules of Model IV

4.4.2.5 Model V

The variables for classification to predict smoking behavior of Model V consisted of 6 variables which were organizational intervention, types of intervention, the outputs of cognitive and behavior change intervention. Three rules from the shortage leaf node were represented in this model. The overall prediction was correctly classified 73.33%.

Rule 11 : If the conscripts have changed of perceived self-efficacy scores equal to baseline and they have not changed of cons of smoking and attempt to quit behavior, they would have a higher chance to reduce and quit smoking.

Rule 12 : If the conscripts have changed of perceived self-efficacy scores decreasing from baseline and they received fairly good organization with social support from the family, they would have a higher chance to reduce and quit smoking.

Rule 13 : If the conscripts have not changed of self-efficacy scores and have changed of cons of smoking scores in decreasing or increasing from

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baseline and received intervention which included good organizational intervention and social support from the family, they would have a higher chance to reduce and quit smoking.

The result demonstrated that perceived self-efficacy was the significant variable to predict smoking behavior, and if the conscripts perceived cons of smoking scores equal to baseline and have done the behaviors regarding smoking cessation, they would have a higher chance to reduce and quit smoking. Moreover, this model also suggested that if perceived self-efficacy scores was different from baseline, the organizational intervention and received social support from the family could be effective in changing the smoking behavior of the conscripts which was similar to Model IV.

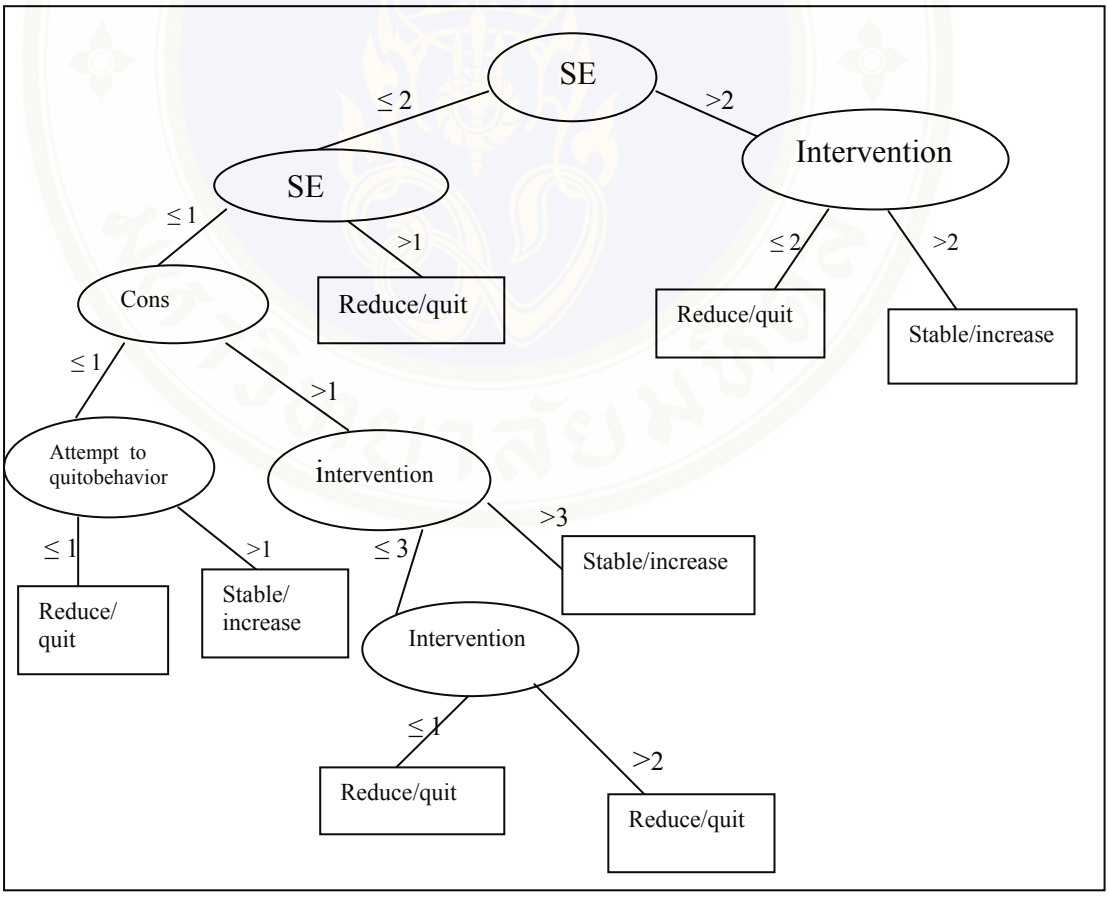

Figure 4.5 Decision tree rules of Model V

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Conclusion

The results from five models can conclude that the main predictive variables to improve smoking behavior were perceived self-efficacy and duration of smoking. Model I-III found the significant predictors of duration of smoking and the number of cigarettes smoked per day that influenced to improve smoking behavior. Model IV and Model V found perceived self-efficacy was the significant predictor. Model IV was likely to be the best model because it was correctly classified 77.78% which was higher than other models. The results were concluded as follows :

1. Perceived self-efficacy was the main variable to predict smoking behavior change in Model IV and Model V. The conscripts who have perceived self-efficacy scores increase from baseline would have a higher chance to reduce and quit smoking.

2. Duration of smoking was the main variable to predict smoking behavior change in Model I, II and Model III. The conscripts who smoked less than and equal to five years would have a higher chance to reduce and quit smoking.

3. Even though the conscripts have not increased of perceived self-efficacy scores, they could reduce and quit smoking if they received organizational level intervention and interpersonal level intervention. The conscripts who received good and fairly good organizational intervention and received social support from the family have a higher chance to reduce and quit smoking.

4. Besides duration of smoking, the number of cigarettes smoked per day was the additional variable to influence smoking behavior change. The conscripts who smoked less than and equal to 5 years and smoked less than and equal to 10 cigarettes/day would have a higher chance to reduce and quit smoking.

5. Although the conscripts smoked cigarettes more than 5 years and smoked 21-40 cigarettes per day, they would have a higher chance to reduce and quit smoking as well. Therefore, the heavy smokers in this study would have decision to reduce and quit smoking and try to improve their smoking behaviors.

6. Pros of smoking affected to improve smoking behavior when the conscripts smoked ≤5 years and smoked >10 cigarettes/day.

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7. Cons of smoking and attempt to quit behavior affected to improve smoking behavior when the conscripts have not changed of perceived self-efficacy scores after six months.

The conclusion of five models was shown in Figure 4.6

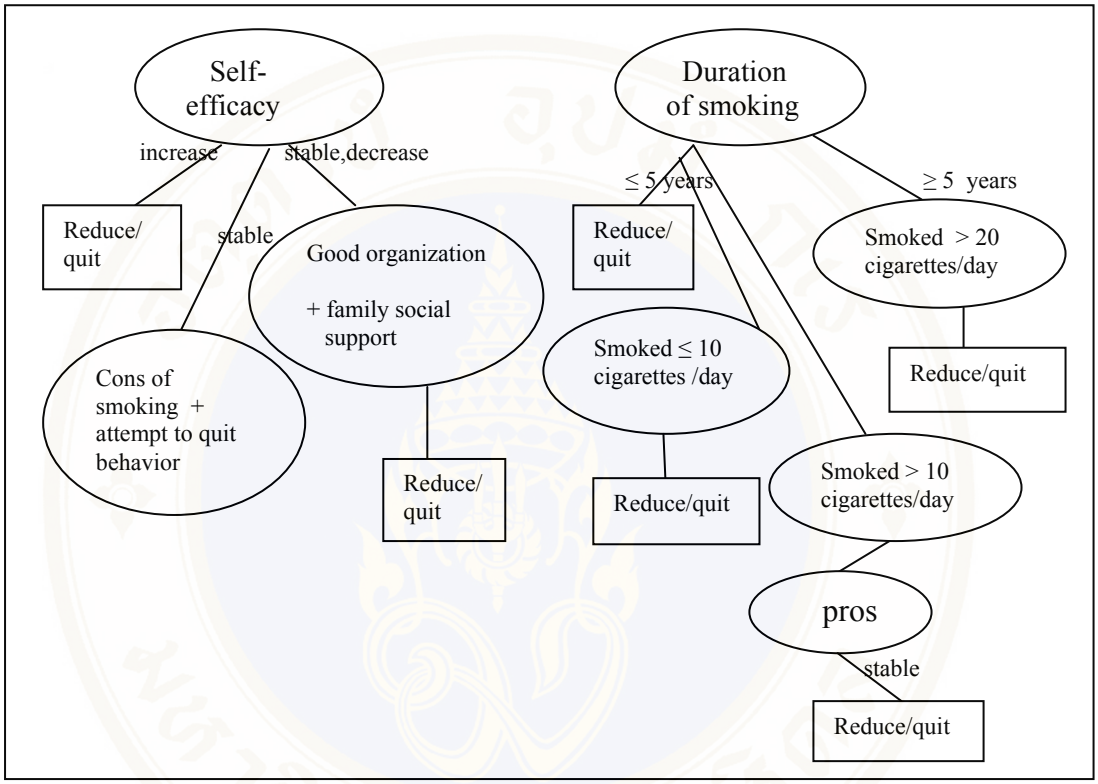

Figure 4.6 The Final Model

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Result from data mining suggests the most significant variable that could predict smoking behavior change from this study is intrapersonal variable or behavioral variable which consisted of perceived self-efficacy and duration of smoking, including cigarette consumption. However, perceived self-efficacy is more likely the best predictor because the prediction of perceived self-efficacy model was a higher correctly classified than the model of duration of smoking. Additionally, organizational intervention and both types of social support from the family could improve smoking behavior when the conscripts have not increased of perceived self-efficacy score after intervention.

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CHAPTER V
DISCUSSION

The smoking cessation program based on ecological model utilized processes of change to develop sessions in intrapersonal, applied social support from the family for interpersonal level intervention and used organizational support from meeting, forming the committee, informing the policy and conducting the activities related to tobacco control such as provide smoke free workplace for organizational level intervention to improve smoking behavior among the conscripts of the 1st infantry regiment, King's Royal Guard. This chapter presents the discussion of the smoking cessation program. The results from the study were discussed in four parts as follows:

Part 1 The effects of ecological model on smoking behavior

Part 2 The effects of the program on the three levels of health behavior Change

Part 3 The predictor of smoking behavior

Part 4 Lesson learned for smoking cessation program

5.1 The effects of ecological model on smoking behavior

Ecological model that applied to design smoking cessation program for improving smoking behavior among the conscripts could affect to change smoking behavior by reducing smoking 62.9% and quitting 4.5%. Even though, the cessation rate after six months was not high, the conscripts could reduce a number of cigarettes smoked per day which had a statistically significance difference between baseline and six months (p <0.001). Additionally, some conscripts changed from daily smokers to occasional smokers. This finding was consistent with the result of the previous study, for example, Corbett (2001) found that ecological framework in the school program can delay or prevent the uptake of tobacco use 20-40%.

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The ecological model which designed the intervention for three levels of behavioral change could affect to improve smoking behavior among the conscripts but in details in the three levels, there were limitations of the intervention that may not be suitable for the conscripts. For organizational level intervention, the program focused on strengthening the policy and forming committee to be responsible the activities of tobacco control in the military. The intervention is beneficial for improving the main organization (1st infantry regiment) but it may not affect directly to the conscripts. However, the intervention could encourage the commander and staff officers to aware of the harmful effect of smoking. The intervention after the conscripts were separated to the company could directly affect to the conscripts, therefore, if the program emphasized on conducting the activities in each company and involved the senior conscripts to attend in the smoking cessation program may be better for the outcome. In addition, the program should enhance the role of the company commander to work with the researcher.

The intervention during BMT may not affect to change smoking behavior among the conscripts because all of them were under the rule of ban on smoking ,so they have to quit smoking follow the enforcement, however, there were some conscripts who could not follow the rule and hide to smoke. Additionally, the intervention that applied processes of change for intrapersonal level may not be suitable because the conscripts could not receive the intervention following their stages of change. Hence, the intervention during BMT may emphasize on helping the conscripts to deal with craving and remain abstinent. Most conscripts get stress during BMT, consequently, they returned to smoke when they were not under the enforcement ban on smoking after three months.

The policy of ban on smoking during BMT has affected to the conscripts to start quitting. Nearly all of them stopped smoking during three months. The study of Air Force recruits found the contemplation group were thinking about continuing cessation following BMT and the action group would remain nonsmokers after BMT. (Thompson et al., 1998). In addition, Borland et al., (1990) studied the effects of smoking bans in the workplace on cigarette consumption and found a reduction on cigarette consumption by more than 25%. Informing the policy ban on smoking in the workplace from the commander to communicate to staff officers and the training

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officers to provide smoke free workplace and conduct the activities regarding tobacco control could influence to smoking behavior change because the conscripts who stayed in the company which the company commander set the activities following the policy could reduce and quit smoking more than those in other company.

When compared with the quit rates of other studies in U.S., the result in this study was lower quit rates. Klesges et al., (1999) found that forced cessation (6-week ban during basic military training) and a brief intervention is associated with the long-term cessation. The quit rates for those assigned to the intervention group were 18%. Why a comprehensive intervention with forced cessation in this study could not make the higher cessation rate among the conscripts, the reason may be the intervention applied processes of change in TTM may not be suited for the conscripts and they are younger group who need their lives free and thought that smoking could not affect to their health because they have smoked for a few years and they were younger to get illness. Nevertheless, the result was consistent with Premprasai (2008) which found none of the conscripts were able to quit smoking after receiving smoking cessation intervention at six months but they could reduce the number of cigarettes smoked. Additionally, Suansomjit et al., (1998) found the quit rate of the conscripts at Chulachomklao Royal Military Academy infantry battalion was lower after three months when compared at one month.

The analysis of social support revealed that the conscripts who have perceived social support scores equal to baseline or have increased social support scores after intervention could quit smoking but there were no statistical significance difference between perceived social support and smoking behavior. The limitation of the intervention was the families or significant others received the information to support the conscripts from the researcher differently because of their home town were far away from the military base. However, the families could give informational support, emotional support and appraisal support to the conscripts at home. If the program included peer support or supporting from the commander, the result may be effective more than using family support. The study of Pleankham (1994) & Pundee (1999) revealed that social support from peer group and teachers could influence on the effectiveness of smoking cessation program among male students. However, the study of the soldiers in Thailand demonstrated that social support from the

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housewives' counseling is a part of the influence in getting non-commissioned officers to give up smoking (Hoondee, 2007).

5.2 The effects of the program on the three levels of health behavior change

5.2.1 Organizational level

The results from the intervention in organizational level could affect to smoking behavior change, however, there were limitation of some activities. Although the commander, staff officers and training officers agree to conduct the activities related to tobacco control, they did not have enough time to do by themselves. They had to do their main jobs about the battle or the soldiers' jobs and there was a political conflict in the country at that time. Therefore, they focused on arranging the troops when the top commander of the Royal Thai Army required more than to focus on the smoking cessation program. The commander and the conscripts had to stay at the Royal Turf Club, so the process of activities to conduct the intervention could not do continuously. The expected outcome in the organizational level was not success about the role and job description of staff officers who were responsible to do the activities for tobacco control have not been written. The topic of smoking cessation has not added in basic training schedule because this schedule was designed from the Army Training Command of the Royal Thai Army. However, the training officers have approved to set the available time for health care provider to give health education to the conscripts during 7.00-9.00 p.m. For encouraging the conscripts to play sports or exercise, the military company has already set the schedule and provide equipments for physical fitness and exercise.

The important finding of the organizational level intervention was the policy or regulation about tobacco control in the military could bring to set the activities to support quitting by the company commander. The chief commander of the 1st infantry regiment informed the policy of ban on smoking in the workplace to the soldiers and ordered staff officers to follow the regulation, consequently, the result from checklist and observation of the activities regarding tobacco control and smoke free environments was quite good after intervention, particularly in the company. The

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conscripts who could quit and reduce smoking found in those who received good organizational support from the company commander. The result was consistent with the study of Borland et al., (1990) about implementation of totally smoke-free workplace policies found associated with a reduction in absolute prevalence of 3.8% and a decrease in consumption of 3.1 cigarettes per day per continuing smoker , as well as the study of Stillman et al., (1990) & Borland et al., (1991) reported that the creation of smoke-free places ,especially smoke-free work sites, is thus an essential component of any successful strategy to promote smoking cessation.

Additionally, the committee who were appointed by the chief commander of the 1st infantry regiment to be responsible the activities regarding tobacco control in the army should involve health care providers from the 7th primary health care unit to cooperate in working because the committee have a lot of jobs to do and they thought that these activities were not their main jobs. However, the program which increased knowledge and attitude toward smoking and smoking cessation to the training officers was success. Although some training officers have still smoked, they gave a promise to the researcher that they would try to quit smoking later. Moreover, they have improved the scores of knowledge on smoking and smoking cessation (t= 3.079, *p*= 0.005). From the result, the researcher believed that they could deliver the knowledge to the conscripts during BMT. However, the important issue for organizational intervention which emphasized on training and giving knowledge to staff officers and the training officers should focus on the intervention to assist them to quit smoking and they should be informed to follow the rule of ban on smoking in the workplace, particularly during training the conscripts. If the training officers have still smoked, they cannot be the role model and support the conscripts to quit smoking during BMT.

5.2.2 Interpersonal level

The result of social support in this study showed that the mean scores of perceived social support at six months was almost equal to baseline (Table 4.10). Most conscripts received social support from the family during basic military training in three months. The results from the interviews showed that at the beginning of being the soldiers, the families contacted them frequently including advise them about smoking following the booklet. After three months, the conscripts could adapt

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themselves in the military, therefore their families did not contact them as before. Some conscripts did not go back home because of their work for keeping forces in political conflict outside the military. They did not meet their parents, wives and significant others, consequently, they had the mean score of perceived social support to control smoking behavior equal to baseline, and social support from the family may not affect to change their smoking behavior. The previous studies demonstrated that greater amount of support (i.e.., encouragement from others, reinforcement from others) that male smokers perceived from significant others in the social environment was a component of success in quitting (Mermelstein et al., 1996; Murray et al., 1995).

The intervention applied social support from the family or significant others to assist the conscripts during BMT might not be suitable because the family received the information from the researcher to support the conscripts differently. Some of them received the information by training via face to face with booklet, others received by training via telephone with booklet because their hometown were far away from the military. Additionally, there were difficulty to train them to understand the contents and have skills to support the conscripts similarly because of their education and background. Some of them did not have enough time to take care of the conscripts closely.

Hence, social support from peer group is more suitable for the intervention during BMT because the conscripts are late adolescents or young adults who like to act behaviors follow their friends. They stay together in the training company during BMT, therefore, the motivation and support from their friends who are never smokers or former smokers are more likely to help them change their smoking behavior. In addition, the commander and the training officers also should have the role to support them as well. The evidence by social support from peer group among male students could change students' behaviors in terms of perceived susceptibility and perceived severity of disease, perceived benefit of stop smoking, including the cessation rates (Pleankham, 1994, Pundee, 1999).

5.2.3 Intrapersonal level

The outputs from intrapersonal level intervention consisted of cognitive change variables; pros and cons of smoking, perceived self-efficacy to control

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smoking behavior, stages of change and attempt to quit behavior. The details were as follows:

5.2.3.1 Pros and cons of smoking

According to TTM, the person in advanced stage who prepare themselves to quit or they are quitting stage should have the pros of quitting (cons of smoking) higher than the cons of quitting. The pros of smoking in this study paralleled to the cons of quitting, therefore, the pros of smoking should decrease after implementation program but the result at six months showed the mean scores of pros of smoking was higher than that at baseline (Table 4.10). However, the percentage of the conscripts who had a low score of pros of smoking at six months was lower than that at baseline (69.7%, 58.4%). The result can be inferred that the conscripts have still perceived the benefits of smoking, consequently most of them still smoked after six months. The result was supported by the conscripts' interviews that they got stress after three months because they were separated to the company to be under the command of the new commander and stayed in the new environment, including they were sent to the Royal Turf Club during political conflict in the country. Some conscripts complained that they did not allow to go back home, so they returned to smoke cigarettes to relieve stress and boredom, consequently the pros of smoking has increased.

The cons of smoking in this study paralleled to the pros of quitting. The result after six months showed the mean score of perceived cons of smoking was slightly decreased when compared at baseline (Table 4.10). However, when considering to the level score of cons of smoking, it showed that the percentage of the conscripts who perceived cons of smoking in a high level at six months were higher than at baseline (Table 4.9). The result demonstrated that many conscripts perceived cons of smoking better after intervention. Nevertheless, when compared the mean score of pros and cons of smoking, the results showed that the mean score of cons of smoking was higher than the mean score of pros of smoking, therefore, the conscripts have still perceived smoking is the harmful effects to their health and others more than benefits of smoking.

The intervention to increase fear arousal and stimulate thinking that related to the pros and cons of smoking were consciousness raising, dramatic

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relief and self-reevaluation. The researcher gave health education, provided group discussion and exchanged their experience. The important finding from self-reevaluation found that all conscripts thought positive self-image and benefit to them and their families if they quit smoking. In addition, they have an intention to quit and promise themselves to quit smoking in the next time.

5.2.3.2 Perceived self-efficacy to control smoking behavior

The analysis of paired t-test showed that the mean score of perceived self-efficay at six months was higher than that at baseline (p = 0.002). (Table 4.10). When considering to the levels of scores, the results showed that most conscripts perceived self-efficacy scores in a low level both at baseline and six months. However, perceived self-efficacy scores in a medium level to a high level at six months were higher than at baseline (Table 4.9). The result could infer to the effective intervention which designed to give health education and distribute self-help materials such as self-help book for quitting, pamphlets and role playing to have a refusal skill. The result of perceived self-efficacy would predict smoking behavior among the conscripts to reduce or stop smoking. This finding is consistent with the results of previous studies that self-efficacy has associated with the intention to quit smoking. (Kowalski, 1997) and other studies also found successful quitters have higher self-efficacy perceptions than relapsers (Brandon et al., 1990; Scholte & Breteler, 1997).

5.2.3.3 Attempt to quit behavior

The analysis of paired t-test showed that the overall mean scores of attempt to quit behavior at six months was statistically higher than that at baseline. (p <0.001). Even though, most conscripts had scores of attempt to quit behavior at baseline and six months in a low level but the scores in a moderate level at six months was higher than at baseline. When considering the items of attempt to quit behaviors from Table F.4 (Appendix F), the results showed that the conscripts tried to do the behaviors to reduce and quit smoking better than at baseline with statistically significance difference (p<0.01) such as do not buy cigarettes, do alternate behaviors when urge to smoke. During staying at home at 10^{th} week to 11^{st} week, they still have done the behaviors to avoid smoking. After three months, they were separated to the company where they saw the senior conscripts smoked which encouraged them to feel

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craving. They could not control themselves to remain abstinent, hence they returned to smoke. The problem of craving was supported from the study of Shiffman et al., (1997) about the relationship between craving and smoking relapse, therefore, most conscripts returned to smoke after three months. However, the overall of attempt to quit behavior score at six months showed that the conscripts tried to do the behaviors to reduce and quit smoking.

5.2.3.4 Stage transitions

Most conscripts in the three stages of change at baseline stayed in the same stage after program implementation 42.7% (Table 4.12), and those who stayed in preparation stage at baseline moved forward to action stage. The conscripts who could reduce and quit smoking were in preparation stage. The result was consistent with the previous study that stage of change was significantly related to the likelihood of making a quit attempt and actual success of the attempt. The quit rates among smokers in the later stage were higher than the earlier stage. (Prochaska, 1991).

However, there were some conscripts who moved backward to earlier stage. The reason is the intervention applied processes of change in TTM may be inappropriate to the conscripts because the program could not deliver the processes of change follow each stages of change to the conscripts, therefore all of them have to start the package intervention with consciousness raising and dramatic relief for the earlier stage until the counter conditioning, reinforcement management and stimulus control for the later stage. From TTM, the stage-matched interventions have a greater impact on smoking cessation than stage-mismatched interventions (Goldberg et al., 2002; Hotz, 2000; Prochaska et al., 2001). In this study, the intervention may be stage-mismated intervention, therefore, some conscripts still stayed in the same stage or moved backward to the earlier stage, consequently, they did not quit smoking. According to Dijkstra et al.(1996), the conscripts who stayed in the same stage or an earlier stage should be enhanced information on outcomes to progress to the next stage. For those who were in preparation stage should be enhanced for self-efficacy enhancing information to reduce or quit smoking.

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5.3 The predictor of smoking behavior

5.3.1 Self-Efficacy

The result of classification from data mining revealed that perceived self-efficacy to control smoking behavior is the most important factor to improve smoking behavior among the conscripts. From Model IV demonstrated that the conscripts who have changed of perceived self-efficacy scores increasing from baseline could reduce and quit smoking which the model was correctly classified 77.78%. Self-efficacy, a construct derived from social learning theory (SLT), refers to an individual's conviction that he or she is capable of executing a course of action to produce a given outcome (Bandura & Adams, 1977). It has been the important mediator between knowledge and action and it is commonly defined as the belief in one's ability to perform the behaviors necessary for a desired outcome. (Bandura, 1997). Previous studies have demonstrated that self-efficacy is a robust predictor of cessation (DiClemente, 1986; DiClemente et al., 1995). The successful quitters had higher self-efficacy perceptions than relapsers (Brandon et al., 1990; Scholte & Breteler, 1997; Boardman et al, 2005). Additionally, Kowalski (1997) found that self-efficacy and self-esteem correctly classified 75% to predict success in smoking adherence among 75 adults at the 3-month follow-up. Moreover, self-efficacy predicted long-term abstinence (12-18 months) from smoking as a result of self-initiated quit attempts in a group of female smokers (Gritz et al., 1992). Self-efficacy in the present study was measured by temptation to smoke in three categories of situations characterized by being either positive/social, negative /affective, or habit/addictive. The conscripts have increased perceived self-efficacy to avoid smoking in some situations that encouraged them to have temptation to smoke such as "staying with smokers", "when they have a party or stress situation", "when they are having a drink", "when the things are just not going the way they want and they are frustrated" (Table F.2). Therefore, they could control themselves not to smoke in those situations. The package intervention was designed to increase self-efficacy by giving health education to do the behaviors when they feel craving and enhance skills for relaxation, denying cigarettes etc. including distribute self-help materials. According to the results, most conscripts who could reduce and quit smoking were those who have perceived self-efficacy scores increase

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from baseline (Table 4.20). Therefore, self-efficacy is a cognitive determinant which should be considered to mediate improvement in the smoking cessation program.

The other variables from the model of perceived self-efficacy which could influence to smoking behavior change were the organizational level intervention and interpersonal level intervention. From Model IV and Model V, if the scores of perceived self-efficacy have not increased, the conscripts would have a higher chance to reduce and quit smoking when they received good and fairly good organizational intervention and received social support from the family. Good organizational level intervention referred to the organization in which the commander developed the infrastructure and environments, including the policy regarding tobacco control and set the activities to support the conscripts to quit smoking very well. This finding is consistent with the study by Borland et al (1990) that smoking bans in the workplace based on an ecological model on cigarette consumption showed a reduction of cigarette consumption, particularly among heavier smokers by more than 25%, and also the percentage of smokers contemplating quitting was also higher in smoke free work sites (Stillman et al., 1990; Borland et al., 1991). Additionally, the effect of smoke free workplaces policies on cigarettes consumption and prevalence of smoking in US have been shown in a systemic review that implementation of totally smoke-free workplace policies was associated with a reduction in absolute prevalence of 3.8% and a decrease in consumption of 3.1 cigarettes/ day per continuing smoker (Chollat-Traquet, 1996).

Social support, interpersonal level intervention in this study was an additional factor to predict smoking behavior. From Rule 9 of Model IV and Rule 12 of Model V found social support from the family could influence to improve smoking behavior change, especially social support by training via face to face with booklet. According to House (1981), the conscripts received support from the family or significant others in three types of supportive behaviors; emotional support, informational support and appraisal support, particularly, emotional support is known to be the most strongly and consistently associated with good health and well being (Glanz et al., 2002). The family gave social support to the conscripts through two types of support from the researcher. Those who contacted with the researcher at the military were more likely to give emotional, informational and appraisal support to the

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conscripts than the family who received the information from the researcher by telephone contact because face to face discussion, everyone meet together at the same time and the family can ask and talk with the researcher closely, consequently, training the family via face to face affected to smoking behavior more than training by telephone.

5.3.2 Behavioral variable: Duration of smoking, cigarette consumption

Behavioral variable, duration of smoking is the significant variable to predict smoking behavior, followed by cigarette consumption, the number of cigarettes smoked per day. However, the prediction of the model (Model I- Model III) was correctly classified between 60-65%. The conscripts who smoked less than and equal to 5 years would have a higher chance to reduce and quit smoking. It was consistent with Agudo et al. (2004) that the number of cigarettes smoked per day, the duration of smoking and the number of pack years were predictors of cessation and relapse. Similarly to U.S.DHHS (1982) reported that the smokers who have smoked for a relatively longer period are less likely to quit than those with a short period. For cigarette consumption, the number of cigarettes smoked per day is the additional variable in the model if the conscripts smoked less than and equal to 5 years and smoked less than and equal to 10 cigarettes/day they would have a higher chance to reduce and quit smoking which is consistent to many studies. (Osler & Prescott, 1998; Cohen et al., 1989; Soldberg et al., 2007). Heavier smokers are less likely to quit than light smokers and unsuccessful cessation outcomes (Hymowitz et al., 1997). Additionally, Hurtado & Conway (1996) reported the number of cigarettes smoked per day and years of regular tobacco use predicted changing smoking status at the 1-year follow up among recruits during U.S. Navy recruit training. Hence, the conscripts who could reduce and quit smoking were those who smoked for a few years with the number of cigarettes smoked/day less than 10 cigarettes/day.

However, the conscripts who smoked cigarettes more than five years and smoked 21-40 cigarettes per day would have a higher chance to reduce and quit smoking. The result contrasted to the many studies that heavy smokers are less likely to quit but it is consistent with the study by Weatherman (1998) found that ex-smokers who smoked a greater number of cigarettes daily and used cigarettes with a higher tar

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content were actually more likely to become abstinent. When considering to each cases, the results revealed that most of them (57%) started smoking at 14 years old, finished primary and secondary school and were wage earners. Half of them have ever tried to quit smoking less than three times and had their hometown in north-eastern region and central region. The number of cigarettes smoked per day were 25-30 cigarettes. Therefore, this study shows that the smokers who have low socio-demographic characteristics will try to reduce and quit smoking if they receive the intervention of smoking cessation program.

Pros of smoking could affect to improve smoking behavior relating to the duration of smoking and the number of cigarettes smoked per day when the conscripts have changed of pros of smoking scores from baseline. The result revealed that if the conscripts smoked greater than 10 cigarettes/day and they have pros of smoking scores increased or decreased from baseline, they would have a higher chance to reduce and quit smoking. This finding is consistent to the TTM if pros of smoking decreased from baseline which suggested that the conscripts perceived the benefits of smoking after intervention lower than before intervention, consequently, they have more intention to reduce and quit smoking. In addition, the model included the conscripts who have pros of smoking increased from baseline would have a higher chance to reduce and quit smoking which contrasted to the previous study (Prochaska, 1994). Nevertheless, this variable is not the crucial variable in the model and there were some other factors which could influence to this group to reduce and quit smoking.

Cons of smoking and attempt to quit behavior affected to improve smoking behavior when the conscripts have not changed of perceived self-efficacy scores after six months. The scores of cons of smoking and attempt to quit behavior would not change from baseline as well. This finding indicated that the conscripts who could reduce and quit smoking should have the perception about the negative effects of smoking or the benefit of quitting, including doing the behaviors to reduce and quit smoking such as do not buy cigarettes, do something else during craving, exercise regularly etc. the same as at baseline. According to TTM, if the smokers have increased the perception of cons of smoking or pros of quitting, they will move forward to the later stage and percentage of the conscripts who can quit and reduce smoking will be higher.

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5.4 Lesson learned for smoking cessation program

The smoking cessation program based on ecological model applied to change smoking behavior among the conscripts in the Royal Thai Army is suited for the intervention in organizational level and intrapersonal level. For interpersonal level, the intervention may to be well suited to the conscripts. Lesson learned from this study are as follows:

5.4.1 Organizational level

The organizational intervention should be set the meeting and evaluated the activities periodically. The meeting with the commander and staff officers to encourage them to aware smoking problem in the military should be done because the commander can order the operation to each unit and the policy will be informed by top organization. Regarding, the tobacco control policy in the Army, the enforcement ban on smoking during BMT for the conscripts is announced by the top commander ,however, there are the important issues that should be done for supporting the conscripts, for example the conscripts should be taught about smoking and cessation, including skills enhancement during there are under the rule of ban on smoking that will help them cope with craving and increase their motivation to quit. For sustainable change, this study suggests to add this topic in the training schedule but the training officers cannot make decision because the schedule is designed from the Army Training Command of the Royal Thai Army, therefore, the Army Medical Department and health professionals who work in the army unit should convince the top commander or responsible officers who work for planning the schedule to add the topic regarding smoking and cessation for the conscripts during BMT.

The policy from the Army about promoting health to all soldiers to improve their quality of life. should continue to act for tobacco control to reduce a number of soldiers who smoke and create smoke free environments. Health professionals who work in the primary health care unit of the army base can cooperate and collaborate with the commander and training officers to give health education regarding smoking and drug addicts for the soldiers, including the conscripts.

The committee who were appointed from the commander may be not suited for the jobs of tobacco control because there are main jobs related to their

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responsibility in the army unit and they are not experts about health, therefore, they cannot do well to continue the process and activities regarding tobacco control.

The intervention may focus on the company commander and the training officers to cooperate and collaborate with the researcher because the committee from the 1st infantry regiment are not directly responsible to the conscripts. Most conscripts will relapse after three months when they are separated to stay in the military company because there are some senior conscripts who smoke which encourage the new conscripts to feel craving. The company commanders are the mainly persons who are closely to the conscripts until they retired from the army service, therefore, if the intervention focused on each company instead of the training company, the outcome of cessation rate may be higher.

The intervention of smoking cessation program for the conscripts in the army unit is difficult when compared to the unit or workplace where the people in the organization are stable or immobilization. The organization of the Army is dynamic. The conscripts have to move to other units follow their jobs. The commander and staff offices, including chief of the training officers are changed continuously, therefore, the sustainability to conduct the activities regarding tobacco control depend on the policy and organizational concern in each commander and staff officers. If they think that tobacco control is not their main job, the smoking cessation program will not be conducted throughly.

5.4.2 Interpersonal level

The intervention of interpersonal level about family support may be suitable for the conscripts if their hometown are nearby the army base. The researcher could not give the information and support to the families of the conscripts similarly and there are some limitations of the families that could transfer knowledge and advice from the researcher to the conscripts, hence the peer group support will be likely suited for the conscripts during BMT.

5.4.3 Intrapersonal level

The intrapersonal level intervention may not need TTM to guide the intervention because the processes of change applied could not give directly to each

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stage of change. Therefore, the intervention should focus on increasing motivation to quit, increasing self-efficacy to quit and preventing relapse during BMT. The commander and the training officers should support the conscripts during BMT such as provide substitutes to eat (handy, sugar-free gum, sour fruits, and vegetables) when they feel cravings, set recreational activities to reduce stress etc. Moreover, the intervention for intrapersonal level should be done at the military company and involved the whole conscripts in each section who are current smokers to participate in smoking cessation program.

Telephone counseling for intrapersonal level during 4^{th} month to 6^{th} month might not be suited to reinforce the conscripts to remain abstinent because sometimes the researcher could not contact them by telephone. Some conscripts would not like to talk and did not tell the implicit information, therefore, the intervention should add small group discussion with the conscripts at the military to follow up them besides telephone counseling.

In conclusion, smoking cessation program in this study which applied ecological model to design the intervention may be used at least two levels ; organizational level and intrapersonal level to improve smoking behavior among the conscripts. The cessation rate seems rather low when compared with the previous studies. This group have the percentage of current smokers higher than other soldiers and general population. They are late adolescents or young adults who do not think much about their lives. Some conscripts perceived health problems related to smoking are far away from them. Additionally, they are under rules and principles in the new environments of Army Base which are different from their home that encourage them to get stress, so they still use cigarettes to help them relax. Some of them plan to quit after the service end. Moreover, there are some traing officers who are current smokers and still smoke during training the conscripts. The value and culture in the organization of the Army is close to the behaviors regarding smoking and drinking alcohol, therefore, the smoking cessation program should be done to the whole group of smokers in the Army, including commander and staff officers and be systematic to refer to the cessation clinic of the Army hospital.

The limitations of this study are the political situation in the country that interfered the researcher to coordinate and cooperatate with the commander,

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committee, and the appointment time to meet the conscripts to collect data. For interpersonal level, some conscripts forgot to bring the booklets to their families at home, therefore the role of the family or significant others to support the conscripts to remain abstinent may be done less than expected. For intrapersonal level, the intervention did not give the activities following stages of change among each conscripts because of a limitation of time during basic military training and they had to practice or train together following the rule of training for the new recruits, therefore, stage transitions could change to a later stage not much.

In summary, smoking cessation program was developed based on ecological model as a framework to evaluate the application of this model to improve smoking behavior among the conscripts and determine what factors influence or predict smoking behavior. According to the results, the program achieved to improve smoking behavior among the conscripts. The organizational level intervention encourages the commander, staff officers and the training officers to aware of smoking, inform the policy related to tobacco control and conduct the activities for smoking prevention and cessation in the military. The package intervention for intrapersonal level helps the conscripts to increase self-efficacy to quit, improve skill for cessation and deal with craving. The interpersonal level which focuses on family providing support to the conscripts can support other levels. However, there are some limitations and suggestions in the three levels intervention which can modify for sustainable change. The crucial factors which predict the conscripts to improve smoking behavior consisted of perceived self-efficacy and behavioral factors regarding duration of smoking and the number of cigarettes smoked per day.

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CHAPTER VI
CONCLUSION

6.1 Summary of the study

This study used a quasi-experimental research with a pretest-posttest one group design to evaluate the effectiveness of ecological model for improving smoking behavior and to explore what factors influenced to smoking behavior among the conscripts in the Royal Thai Army. The intervention applied ecological model for health behavior change which consisted of three levels of change in intrapersonal level, interpersonal level and organizational level.

The sample group were selected by purposive sampling from the 1st Infantry Regiment, King's Royal Guard with the inclusion criteria 1) they were current smokers before entering the military, and willing to participate in the cessation program 2) have a nicotine dependence score <8, and 3) They smoked less than 40 cigarettes per day. There were 89 conscripts attended in smoking cessation program.

The intervention consisted of three levels of health behavior change; intrapersonal, interpersonal, and organizational levels. Based on the literature review, the constructs from TTM, social support, organizational development and policy reinforcement were used to guide the intervention. The organizational level focused on forming committee, provide smoke free workplace, set the activities related to tobacco control. Additionally, it emphasized on the commander and staff officers to aware the problem about smoking. The researcher was a coordinator and facilitator in organizational level intervention. The interpersonal level intervention emphasized to family social support through the information from the researcher with booklet. The intrapersonal level aimed to increase motivation and intention to quit, increase self-efficacy to quit, and support the conscripts to maintain abstinence by the strategies of relapse prevention during BMT and followed up by telephone counseling until six months.

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Quantitative data were collected by using questionnaires. Qualitative data were collected by individual interviews from parents or significant others, the training officers and the conscripts, and observation checklist to evaluate organizational and policy change. Data were collected two times at baseline and 6 months after intervention from May 2009 to November 2009.

Descriptive statistics were used to analyze the data by frequency, percentage, mean and standard deviation. Paired t-test was used to analyze the mean difference of the study variables, e.g. perceived pros and cons of smoking, perceived self-efficacy to control smoking behavior, perceived social support to control smoking behavior and attempt to quit behavior between baseline and six months. Chi-square was used to analyze correlation between the study variables and smoking behavior, and WEKA Data mining analysis was used to analyze what factors contribute to improve smoking behavior among the conscripts.

6.2 Conclusion

Ecological model for smoking cessation program which is targeted atintrapersonal level, interpersonal level and organizational level intervention can improve smoking behavior among the conscripts. The results showed that the conscripts could quit smoking after six months 4.5%. They have significantly higher perceived self-efficacy to control smoking behavior and attempt to quit behaviors between baseline and six months (p=0.002, p <0.001, respectively). Although there are few conscripts who could quit smoking, they had significantly decreased a number of cigarettes smoked per day after six months (p <0.001).

Stage transitions did not accomplish in this study because most conscripts in the three stages of change at baseline stayed in the same stage after program implementation 42.7%. However, there were 36.0% of them moved to forward stages. The percentage of the conscripts who did not think to quit smoking (precontemplation stage) after 6 months were similar to the percentage at baseline. The conscripts who could quit smoking moved from preparation stage at baseline to action stage.

The program showed the benefit of the organizational level intervention was able to encourage the commander, staff officers and the training officers who

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smoke to think about quitting, forming committee to work for tobacco control in the military, informing the policy related to tobacco control to the soldiers, including the conscripts and provide smoke free workplace. Additionally, the training officers have significantly increased their mean scores of knowledge regarding smoking and cessation after training (t= 3.079, *p*=0.005). Thus, the training officers can bring the knowledge to advise or teach the conscripts in the next future.

Social support for interpersonal level intervention did not affect to smoking behavior definitely. The results showed that the mean score of perceived social support to control smoking behavior did not improve after six months. However, from data mining classification showed social support from the family or significant others could support perceived self-efficacy to control smoking behavior for improving smoking behavior. This study found the limitation to use social support from the family, and need to use support from other persons such as the training officers or peer group.

Classification of data mining showed self-efficacy was the crucial variable to predict smoking behavior. The conscripts who could reduce and quit smoking after six months were those who had scores of perceived self-efficacy to control smoking behavior increased or equal to baseline. In addition, good existing support from organizational level intervention could predict the conscripts to reduce and quit smoking. For behavioral factor, duration of smoking and cigarette consumption could predict smoking behavior. The conscripts who smoked cigarettes ≤5 years and smoked 1-10 cigarettes/ day could reduce and quit smoking.

6.3 Implications and Recommendations

6.3.1 Implications and Recommendations from the Research

Based on the research findings of the application of ecological model for smoking cessation program among the conscripts, the following is recommended :

6.3.1.1 The application of the theory

1) The ecological model can be applied to smoking cessation program because it emphasizes on physical and social environments of the smokers. To reduce a number of smokers, there is need to create

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the good environments for them to increase motivation to quit smoking or enhance the obstacles that encourage them to smoke. The important things to develop or create in the organization or the workplace of the smokers are the policy and regulation that should be informed, the committee to work for conduct activities regarding tobacco control, the activity plan to do and support the smokers to reduce and quit smoking, including the support from health professionals. However, the theory that applied for the conscripts in the Army affected to improve smoking behavior not much, especially for cessation because the conscripts have to move to the company after BMT, therefore, the intervention for creating smoke free workplace should be done continually in each company. If the smokers in the organization do not move to another area, the program may use participatory action research for better outcomes.

2) Stages of change and processes of change may not be suitable to conduct the intervention for the conscripts during BMT. The intervention cannot give to each conscripts following the classification of stages of change because of the limitation of time. They had to train together, hence, it's no need to classify stage of change among the conscripts before giving the intervention. The intervention of consciousness raising and dramatic relief by using VCD, VDO or mass media may focus on smoking, regarding in youth to increase their motivation to quit. However, processes of change in TTM can select to use for guide the intervention for some objectives and desired outcome.

3) Social support can use for supporting the smokers to change their smoking behavior. Even though the result of the present study which use social support from the family is not effective, most conscripts give the information to the researcher that the families, especially their mothers are significantly persons to increase their motivation to quit, help and support them during quitting. Therefore, this theory still benefits for other smokers who will use self-help methods to quit or those who are attending in smoking cessation program in a specific area.

6.3.1.2 The recommendation for smoking cessation program

1) Self-efficacy is the crucial variable to improve smoking behavior in this study, therefore the intervention to increase self-efficacy to quit should use techniques instruction from mastery experience, verbal persuasion and

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emotional arousal, including practice refusal skill when they are persuaded to smoke from friends or others by participatory learning method and role playing.

2) Suggestion to the organization. The organization of the Army should have the policy and regulation covering all workplaces rigorously. Regarding tobacco control policy, the Royal Thai Army Medical Department should have the meeting among health professionals who are responsible health care of the soldiers to set rule or regulation for smoke free workplace and activities to solve smoking problem in the Army and submit to the chief of Royal Thai Army Medical Department and the top commander of the Royal Thai Army to consider and approve to the new policy regarding tobacco control in the military. Furthermore, it is essential to convince the top commander of the Royal Thai Army or the Army Training Command to add the topic regarding knowledge of smoking and smoking cessation in basic military training schedule for the conscripts.

3) The environments in the military, including norm and organizational climate are the factors to promote cigarette smoking among the soldiers, therefore if there are campaigns or projects regarding tobacco control in the military and the commanders who smoke are the leader to reduce and quit smoking, a number of soldiers who smoke will decrease. Moreover, the training officers are role model of the new conscripts during BMT, so they should be trained how to quit smoking continually, particularly the senior conscripts who are selected to be the assistant trainers. Otherwise, the chief of training officers should select the senior conscripts who are never smokers to be the assistants.

4) Most conscripts had an intention to quit but after they separated to the company they returned to smoke because there were the seniors conscripts who smoked at the company that encouraged the new conscripts to feel craving, therefore, the smoking cessation program should involved to all conscripts in each company.

5) Health professionals in the military do not have the role to work against tobacco control, therefore, the organizational intervention should be supported from the Royal Thai Army Medical Department by assignment the role of health professionals about tobacco control in the military. The smoking

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cessation program should involve physicians or nurses in primary health care unit in the military to continue the program.

6) According to literature review, incentive is part of the reinforcement to change smoking behavior in the workplace. If there are competitions among military company which company can promote much more conscripts to reduce or stop smoking, the commander should give the rewards or incentive to that company, including the conscripts who can stop smoking.

7) The intervention in interpersonal level that applied social support from the family or significant others can affect to change smoking behavior of the conscripts not much, therefore the intervention may use peer group in the military to support each other because they have to live and stay together for two years. The conscripts who can be the role model should be appointed to be the peer group leader in each company. Health professionals should work with the company commander to conduct the activities and evaluation.

6.3.2 Recommendations for Future Research

The results of ecological model for smoking cessation program found some gaps that need further research as follows:

6.3.2.1 The application of ecological model for smoking cessation program should be expanded to other military areas and it is a challenge for future research in other targeted areas.

6.3.2.2 More guidance is needed on how to find the methods to increase motivation to quit and increase pros of quitting among the conscripts.

6.3.2.3 The application of smoking cessation program for the conscripts should involve the commander, staff officers, the training officers and military health professionals to conduct or run the intervention, therefore, it is essential to study in participatory action research to increase long-term suatainability.

6.3.2.4 The application of interpersonal level intervention needs to design the appropriate intervention besides applying social support., e.g. social norms, social networks.

6.3.2.5 Future research should study the variables; perceived pros and cons of smoking, perceived self-efficacy to control smoking behavior and

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smoking behavior among the conscripts in other areas and follow up them for more than six months.

6.3.2.6 Future research should be conducted to study the model to help the conscripts and non-commisionned officers to quit smoking by coordination and collaborating with the commander in the Royal Thai Army, 13 primary health care unit that located in the military area in Bangkok and Phramongkutklao Hospital to screen, advise, cure and care, and follow up the soldiers systematically.

In conclusion, ecological model proved effective in improving smoking behavior among the conscripts by reducing and quitting smoking. The significant variables to predict smoking behavior were perceived self-efficacy and duration of smoking. Organization and social support could be affected to improve smoking behavior as well. As a result, multi-level intervention proved to be successful in smoking behavior change for the conscripts in the Royal Thai Army.

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REFERENCES

Abrams, D.B., Niaura, R., Brown, R.A. et al. (2003). *The tobacco dependence treatment handbook: A Guide to Best Practice.* New York, The Guilford Press.

Agudo, A., Pera, G., Rodriguez, M., et al. (2004). Changes in smoking habits in adults: results from a prospective study in Spain. *Annals of Epidemiology*, *14*,235–243.

Altarac, M., Gardner, J. W., Popovich, R. M., Potter, R., Knapik, J. J. & Jones, B. H. (2000). Cigarette smoking and exercise-related injuries among young men and women. *American Journal of Preventive Medicine*, *3 (Suppl),* 96-102

Aquilino, M.L., & Lowe, J.B. (2004). Approaches to tobacco control: the evidence base. *European Journal of Dental Education*, *8* (suppl, 4), 11-17.

Badr, H.F., & Moody, P.M. (2005). Self-Efficacy: A Predictor for Smoking Cessation Contemplators in Kuwaiti Adults. *International Journal of Behavioral Medicine,12*(4), 273-277.

Bandura, A. J., & Adams, N. E. (1977). Analysis of self-efficacy theory of behavior change. *Cognitive Therapy and Research, 1*,287–308.

Bartholomew, L.K, Parcel, G.S.,Kok, G & Gottlieb, N.H. (2006). *Planning health promotion programs. An intervention mapping approach*. 2nd ed, John Wiley & Sons Inc, USA., 110-116.

Berg-Smith, S.M., et al. (1999). A brief motivational intervention to improve dietary adherence in adolescents. *Health Education Research*, *14* (9), 399-410.

Biener, L., Hamilton, W.L., Siegel, M., & Sullivan, E.M. (2010). Individual, Social-Normative, and Policy Predictors of Smoking Cessation: A Multilevel Longitudinal Analysis. *American Journal of Public Health, 100* (3), 547-554

Boardman, T., Catley, D., Mayo, M.S., et al. (2005). Self-Efficacy and Motivation to Quit During Participation in a Smoking Cessation Program. *International Journal of Behavioral Medicine, 12*(4), 266–272

Copyright by Mahidol University

Borland, R., Chapman, S., Owen, N., & Hill, D.(1990). Effects of workplaces smoking bans on cigarette consumption. *American Journal of Public Health,80* (2), 178-180.

Borland, R., Owen, N., Hill, D., & Schofield, P. (1991). Predicting attempts and sustained cessation of smoking after the introduction of workplace smoking bans. *Health Psychology*, 10, 336–342.

Borland, R., & Owen, N.(1995). Need to smoke in the context of workplace smoking bans. *Preventive Medicine, 24*, 56-60.

Boyle, P., Gray, N., Henningfield, J., Seffrin, J., & Zatonski, W.(2004).*Tobacco and public health: Science and policy.* New York. Oxford University Press.

Breslau, N., & Peterson, E.L. (1996). Smoking cessation in young adults: age at initiation of cigarette smoking and other suspected influences. *American Journal of Public Health , 86*, 214–20.

Brown, R.A. et al.(2003).Effects of motivational interviewing on smoking cessation in adolescents with psychiatric disorders. *Tobacco Control*, *12 (suppl IV),* 3-10.

Brownson, R.C. et al. (2005). A multilevel ecological approach to promoting walking in rural communities. *Preventive Medicine, 41,* 837 – 842

Brownson, R.C., Koffman, D.M., Novotny, T.E., Hughes, R.G., Eriksen, M.P. (1995). Environmental and Policy Interventions to Control Tobacco Use and Prevent Cardiovascular Disease. *Health Education Quarterly, 22* (4), 478-498.

Buller, D.B., Borland, R., Woodall, W.G., Hall, J.R., Burris-Woodal, P., & Voeks, J.H. (2003). Understanding factors that influence smoking uptake, *Tobacco Control* , *12* (suppl IV), iv16-iv 25

Burns, D.M., Anderson, C.M., Johnson, M., Major, J.M., Biener, L., Vaughn, J., &Shanks, T.G.(2007). Cessation and cessation measures among adult daily smokers: National and state –specific data .*Smoking and Tobacco Control Monograph*, 25-97.

Bushnell, Frances Kathleen, L., Forbes, B.,Goffaux, J., et al. (1997). Smoking cessation in military personnel. *Military Medicine*, *162* (11) ,715-719.

Copyright by Mahidol University

Can, G., Topbas, M., Oztuna, F., Ozgun, S., Can, E.,&Yavuzyilmaz, A. Factors Contributing to Regular Smoking in Adolescents in Turkey. *Journal of School Health, 79* (3), 93-97.

Cancer Prevention Research Center, University of Rhode Island. Smoking: process of change questionnaire (short form). Available from http:// *www.uri.edu/ research/ cprc/Measures/SmokingOl .htm*.

Cancer Prevention Research Center, University of Rhode Island. Smoking: decisional balance (short form). Available from: *http://www.uri.edu/research/cprc/ Measures/ Smoking03.htm.*

Carlson, L.E., Taenzer, P., Koopmans, J., & Casebeer, A. (2003). Predictive value of aspects of the transtheoretical model on smoking cessation in a community- based, large-group cognitive behavioral program. *Addictive Behaviors, 28*, 725–740.

Carpenter, C.R. (1998). Promoting tobacco cessation in the military: An example for primary care providers. *Military Medicine*, *163* (8), 515-518.

Carroll, D.A., Lednar, W., & Carter, W.B. (1989). The short-term impact of army smoking policies. *Military Medicine*, *154*, 603-607.

Center for Disease Control and Prevention.(1994). *Preventing tobacco use among young people.* A report of the surgeon general. Atlanta GA: U.S. Department of Health and Human Services, , CDC, National Center for Chronic Disease Prevention and Health Promotion.

Center for Disease Control and Prevention (2002).An annual smoking attributable mortality, years of potential life lost, and economic costs -United States,1995-1999, *MMWR Morb Mortal Wkly Rep*, *51*, 300-303.

Center for Disease Control and Prevention. (2003).Cigarette smoking attributable morbidity- United States 2000.An annual smoking ,*MMWR Morb Mortal Wkly Rep*, *52*, 842-844.

Center for Disease Control and Prevention. (2005b). Tobacco use and cessation counselling- Global health professionals survey pilot study, 10 countries 2005. *Morbidity and Mortality Weekly Report*, *54* (20), 505–509.

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Center for Disease Control and Prevention.(2006).Tobacco use among adults-United States,2005 .Morbidity and Mortality Report serial online, *55* (42), 1145–1148 [cited 2006 Oct 27]. Available at: http://*www.cdc.gov/mmwr/preview/mmwrhtml/mm5542a1.htm.*

Chandola, T., Head, J., & Bartley, M. (2004). Socio-demographic predictors of quitting smoking: how important are household factors? *Addiction, 99*, 770 –777.

Chang, F-C., Lee, C-M., Lai, H-R., Chiang, J-T, Lee, P-H., & Chen, W-J. (2006). Social influences and self-efficacy as predictors of youth smoking initiation and cessation: a 3-year longitudinal study of vocational high school students in Taiwan. *Addiction, 101,* 1645–1655.

Chen, H-S., Horner, S.D., Percy, M.S., & Sheu, J-J. (2008). Stages of Smoking Acquisition of Young Taiwanese Adolescents: Self-Efficacy and Decisional Balance. *Research in Nursing & Health, 31*, 119–129.

Chen, J., & Millar, W. (1998). Age of smoking initiation: implications for quitting. *Health Reports*. *9,* 39-46.

Chen, P-H., White, H.R., & Pandina, R.J. (2001). Predictors of smoking cessation from adolescence into young adulthood. *Addictive Behaviors*, *26,* 517-529.

Chollat-Traquet., C.(1996). Evaluating tobacco control activities :Experiences and Guiding Principles. WHO. Geneva.

Chu, N-F., Wu, D-M., Shen, M-H., &Lin,Y-S.(2006). Prevalence of adverse behaviors among young military conscripts in Taiwan. *Military Medicine*,*171*,4,301-305.

Cohen, S., Lichtenstein, E., Prochaska, J.O., & Rossi, J.S., et al., (1989). Debunking myths about self-quitting. *American Psychologist, 44,* 1355–1366.

Cohen, S. & Lichtenstein, E. (1990). Partner behaviors that support quitting smoking. *Journal of Consulting and Clinical Psychology*, *58* (3), 304-309.

Cohen, L.M., Collins, F.L. Jr., & Britt, D.M. (1997).The effect of chewing gum on tobacco withdrawal. *Addictive Behaviors*, *22*, 769-773.

Copyright by Mahidol University

Conway, T.L., Woodruff, S.I., Edwards, C.C., et al. (2004). Operation Stay Quit : Evaluation of two smoking relapse prevention strategies for women after involuntary cessation during U.S.Navy Recruit Training. *Military Medicine*, *169* (3), 236-241.

Corbett, K.K.(2001). Susceptibility of youth to tobacco: a social ecological framework for prevention. *Respiration Physiology, 128*, 103–118.

Cromwell, J., Bartosch, W., & Fiore, M. (1997). Cost effectiveness of the clinical practice recommendations in the AHCPR guideline for smoking cessation. *Journal of the American Medical Association*, 278, 1759-1766.

Cronan, T.A., Conway, T.L., & Hervig, L.K.(1989). Evaluation of smoking interventions in recruit training. *Military Medicine*, *154* (7), 371-375.

Cronan, T.A., Conway, T.L., & Kaszas, S.L.(1991). Starting to smoke in the Navy: when, where, and why. *Social Science Medicine*, *33*, 1349-1353.

Cummins, S.E.,Tedeschi, G.J.,Anderson, C.M.,Quinlan-Downs, R.,Harris, P., & Hong Zhu, S. (2008).Telephone Counselling for Pregnant Smokers: Essential Elements. *Journal of Smoking Cessation*, *2* (2),36-46

Curry, S. J., Wagner, E. H., & Grothaus, L. C. (1990). Intrinsic and extrinsic motivation for smoking cessation. *Journal of Consulting and Clinical Psychology*, *58*, 310-316.

Curry, S.J, Wagner, E.H., & Grothaus, L.C. (1991).Evaluation of intrinsic and extrinsic motivation interventions with a self-help smoking cessation program. *Journal of Consulting and Clinical Psy*chology, *5* (2), 318-324.

Curry, S.J. et al. (2007). Use of tobacco cessation treatments among young adult smokers: 2005 National health interview survey. *American Journal of Public Health*, August, *97* (8), 1464.

Curry, S.J., Grothaus, L., & McBride, C. (1997). Reasons for quitting: Intrinsic and extrinsic motivation for smoking cessation in a population-based sample of smokers. *Addictive Behaviors*, *22* (6) ,727-739.

Daughton, D,M., Roberts, D., Patil, K, D., & Rennard, S, I . (1990) .Smoking cessation in the workplace: Evaluation of relapse factors. *Preventive Medicine. 19*, 227-230.

Copyright by Mahidol University

Delen, D.,Fuller, C., McCann, C., & Ray, D.(2009). Analysis of healthcare coverage: A data mining approach. *Expert Systems with Applications 36,* 995–1003.

DiClemente, C.C. (1981). Self-efficacy and smoking cessation maintenance: A Preliminary report. *Cognitive therapy and research. 5(2),* 175-187.

DiClemente, C.C., Prochaska, J.O., Fairhurst, S.K., Velicer, W.F.,Velasquez, M.M., & Rossi, J.S. (1991). The Process of smoking cessation: An analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, *59,* 295-304.

DiClemente, C., & Prochaska, J. (1998). Toward a comprehensive, transtheoretical model of change. In W. R. Miller, & N.Heather (Eds.), *Treating addictive behaviors* (2nd ed.). New York7 Plenum Press.

Dijkstra, A., Vries, H.D., & Bakker, M. (1996). Pros and cons of quitting, self-efficacy, and the stages of change in smoking cessation. *Journal of Consulting and Clinical Psychology, 64* (4), 758-763.

Dijkstra, A., Vries, H.D., Roijackers, J., & Breukelen, G.V. (1998). Tailored interventions to communicate stage-matched information to smokers in different motivational stages. *Journal of Consulting and Clinical Psychology. 66*(3), 549-557

Dijkstra, A., Conijn, B., & Vries, H.D. (2006).A match-mismatch test of a stage model of behavior change in tobacco smoking. *Addictions, 101*, 1035-1043.

Eakbannasingh, P. (2007). *Health-promoting behavior among the Royal Thai Army under quality of life development project.* M.S.P.H.(Health Education and Behavioral Sciences).Faculty of Graduate studies, Mahidol University

Emont, S.L., Choi, W.S., Novotny ,T.E., & Giovino, G.A. (1993).Clean indoor air legislation, taxation, and smoking behavior in the United States: an ecological analysis. *Tobacco Control*, *2*(1), 13-17.

Emmons, K.M., Hammond, S.K., & Abrams, D.B. (1995). Smoking at home: The impact of smoking cessation on nonsmokers' exposure to environmental tobacco smoke. *Health Psychology*, *13,* 516-520.

Copyright by Mahidol University

Estabrooks, P.A., Gaglio,B., Morse, E.F., Smith, T., Edwards, A., Glasgow, R. (2010). Defining and understanding success at smoking reduction: A mixed methods study. *Addictive Behaviors, 35*, 1113- 1119

Etter, J-F., Perneger, T.V., & Ronchi, A (1997). Distributions of smokers by stage: international comparison and association with smoking prevalence. *Preventive Medicine*, 26, 580–5.

Etter,J-F. (2004). Associations between smoking prevalence, stages of change, cigarette consumption, and quit attempts across the United States. *Preventive Medicine ,38*, 369–373

Fagan, P., Eisenberg,M., Frazier,L., Stoddard, A.M., Avrunin, J.S., & Sorensen, G. (2003). Employed adolescents and beliefs about self-efficacy to avoid smoking. *Addictive Behaviors, 28*,613–626

Fagan, P. Augustson, E. Backinger, C. L. O'Connell, M. E. Vollinger, R. E., Jr. Kaufman, A., & Gibson, J. T. (2007). Quit attempts and intention to quit cigarette smoking among young adults in the United States. *American Journal of Public Health*. *97* (8), 1412-20.

Fagerstrom, K., Heatherton, T., & Kozlowski, L. (1990). Nicotine addiction and its assessment. *Ear, Nose & Throat Journal, 69*(11), 763−768.

Farkas, A. J., Pierce, J. P., Zhu, S. H., Rosbrook, B., Gilpin, E. A., Berry, C., & Kaplan, R.M. (1996). Addiction versus stages of change models in predicting smoking cessation. *Addiction*, *91*(9), 1271-1280.

Farkas, A.J, Gilpin, E.A, Distefan, J.M., & Pierce, J.P. (1999).The effects of household and workplace smoking restrictions on quitting behaviors. *Tobacco Control, 8*, 261-265.

Faue, M., Folen, R.A., James, L.C., & Needels, T. (1997).The Tripler tobacco-cessation program : Predictors for success and improved efficacy. *Military Medicine*, *162* (7), 445-9.

Fava, J, L., Velicer, W.F., & Prochaska, J.O. (1995).Applying the Transtheoretical Model to a representative sample of smokers. *Addictive Behaviors*, *20* (2), 189-203.

Fichenberg, C.M. & Glantz, S.A. (2002). Effect of smoke-free workplaces on smoking behavior: Systemic review. *British Medical Journal*, *325*, 188.

Copyright by Mahidol University

Fiore, M., Pierce, J., Remington, P., Giovoni G., Hatziandreu, E., Newcom, P.,Surawicz, T., & Davis, R. (1990). Methods used to quit smoking in the United States. Do cessation programs help? *Journal of the American Medical Association*, 263, 2760 - 2765.

Fiore, M.C., Bailey, W.C., Cohen, S.J., et al. (2000). *Treating tobacco use and dependence: Clinical practice guideline* . Rockville, MD: US Department and Human Service. Public Health Service

Fisher, E.B Jr., Bishop, D.B., Levitt-Gilmour, T., Cappello, M.T., Ashenberg, Z.S., & Newman, E. (1994). Social support in worksite smoking cessation: qualitative analysis of the EASE project. *American Journal of Health Promotion. 9* (1), 39-47.

Flaxman, J. (1978).Quitting smoking now or later: gradual, abrupt, immediate, or delayed quitting. *Behavioral therapy, 9,* 260-270.

Frankish, J., Johnson, J.L., Ratner, P.A., & Lovato, C.Y.(1997). Relationship of organizational characteristics of Canadian workplaces to anti-smoking initiatives. *Preventive Medicine. 26,* 248–256.

Frikart, M., Etienne, S.,Cornuz,J., & Zellweger, J-P. (2003). Five-day plan for smoking cessation using group behaviour therapy. *Swiss Medical Weekly,133*,39–43.

Garvey, A.J., Bliss, R.E., Hitchcock, J.L., Heinold, J.W., & Rosner, B.(1992). Predictors of smoking relapse among self-quitters: A report from the normative aging study. *Addictive behaviours*, *17*, 367-377.

Glanz, K., Rimer, B.K., & Lewis, F.M. (2002). *Health behavior and health education: Theory, Research ,and Practice*. 3 rd ed. John Wiley &Sons .CA., 185-189.

Glynn, T. J., Boyd, G. M., & Gruman, J.C. (1990) .Essential elements of self-help minimal intervention strategies for smoking cessation. *Health Education Quarterly*, *17* (3), 329-345.

Goldberg, D., Hofman, A., & Añel ,D.(2002). Understanding people who smoke and how they change: A foundation for smoking cessation in primary care, Part 1. *Disease-a-Month*, *48* (6), 390-439.

Copyright by Mahidol University

Goldberg, D., Hoffman, A., & Añel, D. (2002). Understanding people who smoke and how they change: A foundation for smoking cessation in primary care, part 2.*Disease-a-Month*, *48* (7), 441-485.

Green, M.P., McCausland, K.L., Xiao, H., Duke, J.C., Vaiione, D.M., and Heaiton, C.G. (2007). A closer look at smoking among young adults: Where tobacco control should focus its attention. *American Journal of Public Health, 97* (8), 1427-1433.

Guo, Q., Johnson, C.A.,Unger, J.R.,Lee, L.,Xie, B.,Chou, C.P.,Palmer, P.H.,Sun,P., Gallahe, R.P., &Pentz, M. (2007). Utility of the theory of reasoned action and the theory of planned behavior for predicting Chinese adolescent smoking. *Addictive behaviour*, *32* (5), 1066-81.

Gwaltney, C.J., Metrix, J.,Kahler, C.W.,& Shiffman, S. (2009). Self-efficacy and smoking cessation: a meta-analysis. *Psychological Addictive Behavior, 23* (1) :56-66

Haddock, C.K., Klesges, R.C., Talcott, G.W., Lando, H., & Stein, R.J. (1998). Smoking prevalence and risk factors for smoking in a population of United States Air Force basic trainees .*Tobacco Control*, 7, 232-235

Haddock, C. K., O' Bryne, K.K., Klesges, R.C., Talcott, W., Lando, H., & Peterson, A.L.(2000). Relapse to smoking after basic military training in the U.S.Air Force. *Military Medicine*, *165*, 884-8.

Haddock, C. K., Lando, H.A., Pyle, S.A., Debon, M., Weg, M.V., Klesges, R.C., Peterson, A.L., & Relyea, G. (2005). Prediction of adult-onset smoking initiation among U.S. Air force recruits using the pierce susceptibility questionnaire. *American Journal of Preventive Medicine*, *28* (5), 424-9.

Haddock, C.K. et al. (2007). Cigarette use among two Cohorts of U.S. Air ForceRecruits, compared with secular trends. *Military Medicine*, *172* (3), 288

Ham, O.K., & Lee, Y.J. (2007). Use of the transtheoretical model to predict stages of smoking cessation in Korean adolescents. *Journal of School Health August*, *77* (6), 319-326.

Han, J.W., & Kamber, M. (2000). *Data mining : Concepts and techniques.* San Diego: Academic Press.

Copyright by Mahidol University

Hanewinkel, R., & Wiborg, G. (2006). Initial evaluation of a real-world self-help smoking cessation programme for adolescents and young adults. *Addictive Behaviors*_, *31*, 1939-1945.

Heatherton, T., Kozlowski, L., Frecker, R., & Fagerstrom, K.(1991).The Fagerstrom test for nicotine dependence: A revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addictions*, *86,* 1119−1127.

Hemchayat, M. (2003). *Predictors of Thai adolescent cigarette smoking according to the Theory of Planned Behavior*. A Dissertation of Doctor of Philosophy, School of Nursing .University of Virginia. USA.

Herzog, T.A., et al. (1999).Do Processes of change predict smoking stage movements? A prospective analysis of the Transtheoretical Model. *Health Psychology*, *18* (4), 369-375

Herzog, T.A., & Blagg, C.O. (2007). Are most precontmplators contemplating smoking cessation? Assessing the validity of the stages of change. *Health Psychology*. *26* (2), 222-231.

Hey, K., & Perera, R. (2005). Quit and Win contests for smoking cessation. *Cochrane Database Systemic Review*. 2.CD004986

Hoondee, J. (2007). *The effect of the smoking cessation program on smoking behaviour among Non-Commisionned officers of engineer regiment.* M.N.S. (Community Health Nurse Practitioner). Faculty of Graduate Studies. Christian University.

Hotz, S.B. (2000). Understanding and using the transtheoretical stages of change model. Info- Pack for program training and consultation centre from TCC, CFC .

Hublet, A.,Schmid, H., Clays, E.,Godeau, E., Gabhainn, S.N.,Joossens, L.,Maes, L., & the HBSC Research Network (2009).Association between tobacco control policies and smoking behaviour among adolescents in 29 European countries. *Addiction, 104,* 1918–1926

Hudmon, K., Prokhorov, A., Koehly, L., DiClemente, C., & Gritz, E. (1997). Psychometric properties of the Decisional Balance Scale and the Temptations to Try Smoking Inventory in adolescents. *Journal of Child and Adolescent Substance Abuse, 6*, 1–18.

Copyright by Mahidol University

Hughes, J.R. (2003). Motivating and helping smokers to stop smoking. *Journal of General Internal Medicine*, *18* , 1053-1057.

Hughes, J.R., Gulliver, S.B., Fenwick, J.W., et al. (1992). Smoking cessation among self-quitters. *Health Psychology*, *11*, 331-4.

Hupcey, J.E. (1997). Clarifying the social support theory-research linkage. *Journal of Advanced Nursing, 27*, 123-1241.

Hurt, R.D.(1999). Treat tobacco dependence and "bend the trend". *Bulletin of the World Health Organization.*, *77* (5), 367

Hurtado, S. L. & Conway, T.L.(1996). Changes in smoking prevalence following a strict no-smoking policy in U.S. Navy recruit training. *Military Medicine*, *161* (10), 571-6.

Husten, C.G. (2007). Smoking cessation in young adults.*American Journal of Public Health*, *97* (8), 1354-6.

Hymowitz, N., Sexto, M., Ockene, J., & Grandits, G. (1991). Baseline factors associated with smoking cessation and relapse. *Preventive Medicine*, *20*, 590-601.

Hymowitz, N., Cummings, M.K., Hyland, A., Lynn, W.R., Pechacek, T.F., & Hartwell ,T.D.(1997) Predictors of smoking cessation in a cohort of adult smokers followed for five years. *Tobacco control*, (suppl2), S57-S62

Jensen, R.G. (1986). The Effect of Cigarette Smoking on Army Physical Readiness Test Performance of Enlisted Army Medical Department Personal. *Military Medicine*, *151*, 83-85.

Jetiyanuwatr, C. (1997). *Factors associated with smoking cessation of public health officials in Kanchanaburi Province*. M.S. (Biostatistics). Faculty of Graduate studies, Mahidol University

JiaIi, H., & Micheline, K. (2000). *Data Mining: Concepts and Techniques.* Morgan Kaufmann.

Joseph, A. M. et al. (2005). The Cigarette manufacturers' efforts to promote tobacco to the U.S. Military. *Military Medicine*, 170,10, 874-880

Kartelj, A.(2010). Classification of Smoking Cessation Status Using Various Data Mining Methods. *Mathematica Balkanica NewSeries, 24*, 199-205

Copyright by Mahidol University

Ketgudee, L. (2004). *Stages of change in smoking cessation behavior among conscript Antiaircraft Artillery Division 1_*. M.S.P.H. (Public Health Nursing). Faculty of Graduate studies, Mahidol University.

Khuder, S.A., Dayal, H.H., & Mutgi, A.B.(1999). Age at smoking onset and its effect on smoking cessation. *Addictive Behaviors*, *24* (5), 673–677.

Killen, J.D., & Fortmann, S.P. (1997). Craving is associated with smoking relapse: Findings from three prospective studies. *Experimental and Clinical Psychopharmacology, 5* (2) , 137-142.

Kim, J- R, Lee, M-S, Hwang, J-Y., & Lee, J.D. (2005).Efficacy of smoking cessation intervention using the AHCPR guideline tailored for Koreans: a randomized controlled trial. *Health Promotion international*, *20* (1), 51-58.

Kim, S.S. (2008). Predictors of Short-Term Smoking Cessation Among Korean American Men. *Public Health Nursing, 25* (6), 516-525.

Kim,Young-Ho. (2006). Adolescents' smoking behavior and its relationships with psychological constructs based on transtheoretical model: A cross-sectional survey. *International Journal of Nursing Studies*, *43*, 439–446.

Klesges, R.C, Vasey, M., & Glasgow, R.E. (1986).A workplace smoking modification competition: Potential for public health impact. *American Journal of Public Health*, *76,* 198-200.

Klesges, R. C., Haddock, C. K., Lando, H., & Talcott, G.W. (1999). Efficacy of forced smoking cessation and an adjunctive behavioral treatment on long-term smoking rates. *Journal of Consulting and Clinical Psychology*, *67* (6), 952-8.

Klesges, R.C., DeBon, M.V., Weg, M.W, & Haddock ,C.K, et al (2006). Efficacy of a tailored tobacco control program on long-term use in a population of U.S. military troops.*Journal of Consulting and Clinical Psychology*,*74*(2), 295-306.

Kothari, A, Edwards, N., Yanicki, S., & Hansen-Ketchum, P. (2007).Socioecological models: Strengthening intervention research in tobacco control. *Tobacco Control*, *6* (1), Suppl 3,iii 1- 24.

Kowalski, S.D. (2000). Self-esteem and self-efficacy as predictors of success in smoking cessation. *Journal of Holistic Nursing. 18*, 207-221

Copyright by Mahidol University

Langille, J-L D., & Rodgers, W.M. (2010). Exploring the influence of a social ecological model on school-based physical activity. *Health Education & Behavior,37* (6), 879-894

Leartsakulpanitch, J., Nganthavee, W., & Salole, E.(2007).The economic burden of smoking-related disease in Thailand: a prevalence-based analysis. *J Med Assoc Thai* , *90* (9) ,1925-9.

Leatherdale, S.T. (2008). What modifiable factors are associated with cessation intentions among smoking youth?. *Addictive Behaviors*, *33*, 217-223.

Lee, Chung-Won., & Kahende, J. (2007).Factors associated with successful smoking cessation in the United States 2000, *American Journal of Public Health* , *97* (8), 1503-9

Locke, E.A., & Latham, G.P. (2006).New directions in Goal-setting Theory. *Current Directions in Psychological Science, 15* (5), 265-268

Longo, D.R., Johnson, J.C., Kruse, R.L., Brownson, R.C., & Hewett, J.E. (2001).A prospective investigation of the impact of smoking bans on tobacco cessation and relapse. *Tobacco Control*, *10*, 267–272.

Mackay, J., Eriksen, M., & Shafey, O. (2006). *The Tobacco Atlas*. 2nd ed. American Cancer Society.Atlanta, Georgia. USA.

Macy, J.T., Seo, D-C., Chassin, L., Presson, C.C., & Sherman, S.J (2007). Prospective predictors of long-term abstinence versus relapse among smokers who quit as young adults. *American Journal of Public Health*, 97 (8), 1470-75.

Manske , S., Miller, S., Moyer, C., Phaneuf, M.R., & Cameron, R. (2004). Best practice in group-based smoking cessation: results of a literature review applying effectiveness, plausibility, and practicality criteria. *American Journal of Health Promotion, 18* (6), 409-23.

Marsden, M.E., Bray, R.M., & Herbold, J.R.(1988).Substance use and health amongU.S. military personnel : findings from the 1983 Worldwide survey. *Preventive Medicine*, *17*, 366-378.

Martin, T. (2005). 7 Coping skills to help you manage nicotine withdrawal. http: quitsmoking.about.com./od/craving/sandurges/a/copingskills.htm

Martin, T. (2007).Global Smoking Statistics for2002.*http://quitsmoking.about.com/cs/antismoking/a/statistics.htm*

Copyright by Mahidol University

Martin, T. (2007). The Health Consequences of smoking. http:// quit smoking. about. com/od/ tobaccostatistics/a/ SGR2004.htm

Matheny, K. B., & Weatherman, K.E . (1998) .Predictors of smoking cessation and maintenance. *Journal of Clinical Psychology*, *54* (2), 223-235.

May, S.,West, R.,Hajek, P., McEwen, A., & McRobbie, H.(2006). Randomized controlled trial of a social support ('buddy') intervention for smoking cessation .*Patient Education and Counseling*, *64*, 235–241.

McLeroy, K.R., Bibeau, D., Steckler, A., & Glanz, K.(1988). An Ecological Perspective on Health Promotion Programs. *Health Education Quarterly, 15* (4), 351-377.

McMahon, S.D., & Jason, L.A. (2000). Social support in a worksite smoking interventio : A test of theoretical models. *Behavior Modification*, *24* (2), 184-201.

Meetongpun, T. (2001). *The development of smoking cessation strategies among male students, Rajabhat Institute Bansomdejchaopraya*. Dr.P.H. (Health Education) Faculty of Graduate studies, Mahidol University.

Mermelstein, R., Cohen, S., Lichtenstein, E., Baer, J. S., & Kamarck, T. (1986). Social support and smoking cessation and maintenance. *Journal of Consulting and Clinical Psychology*, *54*, 447- 453.

Miedinger, D. ,Chhajed, P.N., Karli, C., Lupi, G.A. & Leuppi, J.D.(2006). Respiratory symptoms and smoking behavior in Swiss conscripts.*Swiss Medical Weekly*, *136*, 659-663.

Moffatt, J., & Whip, R. (2004).The struggle to quit : Barriers and incentives to smoking cessation. *Health Education Journal*, *63*, 101-112.

Monso. E., Campbell, J., Tonnesen, P., Gustavsson ,G., & Morera, J. (2001). Socio-demographic predictors of success in smoking intervention. *Tobacco Control*, *10*, 165–169.

Morgan, G.D., Ashenberg, Z.S., & Fisher,Jr. E.B. (1988). Abstinence from smoking and the social environment. *Journal of Consulting and Clinical Psychology***,** *56* (2) , 298 -301.

Morgan, B.J (2001).Evaluation of an educational intervention for military tobacco users. *Military Medicine*, *166* (12), 1094-1098.

Copyright by Mahidol University

Mudde, A., Kok, G., & Strecher, V.(1995). Self-efficacy as a predictor for the cessation of smoking: Methodological issues and implications for smoking cessation programs. *Psychology and Health, 10,* 353-367.

Murray, R.P., Johnson, J.J., Dolce, J.J.,Lee, W.W. & O'Harai, P. (1995).Social support for smoking cessation and abstinence : The lung heart study. *Addictive Behaviors, 20* (2) , 159-170.

Myint, T.L.(2005). *Factors associated with smoking status among high school student at Rajchavinit Mattayom in Bangkok*, Thailand M.S.P.H. .Faculty Public health, Mahidol University, 75-85.

Nakkarug, K.(1997). *The stages of Change Model Applied to a Smoking Cessation Program among Male Junior High School Students in Bangkok* M.S.P.H. Major in Health Education(.Faculty of Graduate studies, Mahidol University.

National Statistics Office. *Report of the health and welfare survey*. Office of the Prime Minister, Thailand ,2001

Neamkulchon, J. (2005).*The effect of using promoting smoking cessation program according to the transtheoretical model on attempt to quit behaviors of in-patients, medical units.* Thesis (M.N.S.).Chulalongkorn University.

Newes-Adeyi, G., Helitzer, D.L., Caulfield, L.E.,& Bronner, Y. (2000).Theory and practice : applying the ecological model to formative research for a WIC training program in New York State. *Health Education Research, 15* (3), 283-291

Nides, M.A., Rakos, R.F., Gonzales, D., Murray, R.P., Tashkin, D.P., Bjornson - Benson, W.M., Lindgren, P., & Connett, J.E. (1995). Predictors of initial smoking cessation and relapse through the first 2 years of the lung heart study. *Journal of Consulting and Clinical Psychology*, *63* (1), 60–69.

Novella, N.P., Crucelaegui, A., & Beamonte, A., et al.(2004).Predictors of success at 6- month follow up for smokers treated at a smoking cessation clinic. *.Arch Bronconeumol* , *40* (12), 558-62.

Nunthapol, N.(2003). *Factors relating to cigarette smoking behavior of the conscripts in Adisorn Fort, Saraburi Province*. M.S.P.H. (Health Education and Behavioral Sciences). Faculty of Graduate studies, Mahidol University

Copyright by Mahidol University

Ockene, J.K., Benfari, R.C., Nuttall, R.L., Hurwitz, I., & Ockene, I.S. (1982). Relationship of psychosocial factors to smoking behavior change in an intervention program. *Preventive Medicine*, *11* (1), 13–28.

Ockene, J.K., Emmons, K.M., Mermelstein, R.J.,Perkins, K.A.,Bonollo, D.S., Voorhes, C.C., & Hollis, J.F. (2000). Relapse and maintenance issues for smoking cessation. *Health Psychology*, *19* (1), 17-31.

Okuyemi, K.S., James, A.S., Mayo, M.S., Nollen, N., Catley, D., Choi, W.S., &Ahluwalia, J.S. (2007). Pathways to Health : Cluster randomized trial of nicotine gum and motivational interviewing for smoking cessaion in low-income housing. *Health Education& Behavior*, *34* (1) ,43-54.

Osler, M., & Prescott, E. (1998). Psychosocial, behavioural, and health determinants of successful smoking cessation: a longitudinal study of Danish adults. *Tobacc Control*, *7*, 262–267.

Owen, A.(2003). A Pilot project to evaluate smoking cessation services in the army. A report on a project involving a collaboration between the Army Medical Directorate and Department of Health Tobacco Policy Unit from January 2001- June 2002.United Kingdom

Pallonen, U.E, Murray, D.M., Schmid, L., Pirie, P., & Luepker, R.V. (1990).Patterns of self-initiated smoking cessation among young adults. *Health Psychology, 9*, 418 – 26.

Perry, C. L., Williams, C. L., Mortenson, S.V., Toomey, T.L., Komro, K.A., Anstime, P.S., McGovern, P.G., Finnegan, J.R., Forster, J.L., Wagenaar, A.C., & Wolfson, M. (1996). Project Northland: Outcomes of a Community wide Alcohol Use Prevention Program during Early Adolescence. *American Journal of Public Health, 86,* 956-965.

Peters, E.N., Hughes, J.R., Callas, P.W., & Solomon, L.J. (2007).Goals indicate motivation to quit smoking. *Addiction*, *102,* 1158-1163.

Pisinger, C., Vestbo, J., Borch- Johnsen, K., & Jorgensen, T. (2005). It is possible to help smokers in early motivational stages to quit. The Inter 99 study. *Preventive Medicine*. *40,* 278-284.

Copyright by Mahidol University

Pleankham, P. (1994). *The Effectiveness of Health Education Program with Social Support on Stop Smoking among Male Junior High School Students of Rajburi Province*. M.S.P.H. (Health Education) .Faculty of Graduate Studies, Mahidol University.

Poynton, M.R. (2005).Applying Data Mining Methods to Classify Smoking Cessation Status. WWW.http:// stti.confex.com/stti/in.

Premprasai, N.(2008). *The effectiveness of Health EducationProgram by Applying Self-Control Techniques in Smoking Reduction of Army Conscripts Section two at Phranurangsri Fort, Rajburi Province*. M.S.P.H. (Health Education) .Faculty Of Graduate Studies, Mahidol University.

Prochaska, J. O., & DiClemente, C.C. (1983).Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 56* (4), 520-528.

Prochaska, J.O., Redding, A.R., & Evers, K.E. (2002).*The transtheoretical model and stages of change*. In: Glanz, K, Rimer, B, Lewis, F.M, eds. Health Behavior and Health Education: Theory, Research, and Practice. San Francisco, California: Jossey-Bass, 99-120.

Prochaska, J.O., Velicer, W.F., DiClemente, C.C., & Fava, J. (1988). Measuring processes of change: Application to the cessation of smoking. *Journal of Consulting and Clinical Psychology*, *56* (4), 520-528.

Prochaska, J.O., DiClemente, C.C., &Norcross, J.C. (1992).In search of how people change: applications to addictive behaviors. *American Psychology, 1* (47), 1102-14.

Prochaska, J.O., DiClemente,C.C., Velicer,W.F., & Rossi,J.S.(1993). Standardized ,individualized ,interactive and personalized self-help programs for smoking cessation. *Health Psychology*, *13* , 399-405.

Prochaska, J.O., Redding, C.A., Harlow, L.L., Rossi, J.S., & Velicer, W.F. (1994). The transtheoretical model of change and HIV prevention: A review. *Health Education Quarterly, 24*, 471-486.

Prochaska, J.O. et al. (1994). Stages of change and decisional balance for 12 problem behaviors. *Health Psychology, 13* (1), 39-46.

Copyright by Mahidol University

Prochaska, J.O.(1994). Stages and weak principles for progressing from precontemplation to action on the basis of twelve problem behaviors *Health Psychology, 13* (1), 47-51.

Prochaska, J.O., Norcross, J., & DiClemente, C. (1995). *Changing for Good*. New York: W. Morrow.

Prochaska, J.O. (1996). A stage paradigm for integrating clinical and public health approaches to smoking cessation. *Addictive Behavior* , *21*, 721-732.

Prochaska, J.O., & Velicer, W.F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion, 12*, 38- 48.

Prochaska, J.O., Redding, A.R., & Evers, K.E.(2002).The transtheoretical model and stages of change. In: Glanz K, Rimer B, Lewis FM. *Health Behavior and Health Education: Theory, Research, and Practice.* San Francisco, Calif: Jossey-Bass, 99-120.

Prochaska, J.O., Norcross, J.C., & Diclemente, C.C. (2006). *Changing for good. A revolutionary six-stage program for overcoming bad habits and moving your life positively forward.* New York: Harper Collins Publishers

Prommobol, J. (2003). *The Effectiveness of an application of a Health Belief Model and life skill education to quit cigarettes among the conscripts in Adisorn fort, Saraburi Province*. M.S.P.H. (Health Education). Faculty of Graduate studies, Mahidol University.

Putte, B.V.D., Yzer, M.C., Brunsting, S. (2005). Social influences n smoking cessation: A comparison of the effect of six social influences variables. *Preventive Medicine, 41*, 186-193.

Quinlan, K.B., & McCaul, K.D. (2000).Matched and mismatched interventions with young adult smokers: Testing a stage theory. *Health Psychology, 19*(2), 165-171.

Robbins, A.S., Fonseca, V.P., Chao, S.Y., Coil, G.A., Bell, N.S.,&Amoroso, P.J. (2000). Short term effects of cigarette smoking on hospitalization and associated lost workdays in a young healthy population. *Tobacco control*, *9*, 389-396.

Copyright by Mahidol University

Robinson, L.A., Weg, M.W., Riedel, B.W., Klesges, R. C., & McLain-Allen, B. (2003). "Starting to stop" results of a randomized controlled trial of a smoking cessation programme for teens. *Tobacco control,12* (suppl IV) iv26-iv 33

Rossi, J.S. (1992b). *Stages of change for 15 health risk behaviors in an HMO population*. Paper presented at the 13th annual Society of Behavioral Medicine, New York.

Sallis, J.F., Bauman, A., & Pratt, M. (1998). Environmental and Policy Interventions to Promote Physical Activity. *American Journal of Preventive Medicine, 15* (4), 379-397

Sanusanti, U. (2001). *An application of transtheoretical model and participatory learning approcah to promote diabetic self-care behavior in Tha-Ta Ko District ,Nakhonsawan Province.* M.S.P.H. (Health Education) .Faculty of Graduate Studies,Mahidol University.

Scholte, R.H. J., & Breteler, M.H.M. (1997). Withdrawal symptoms and previous attempts to quit smoking: Associations with self-efficacy. *Substance Use & Misuse, 32,* 133–148.

Schumann, A., John, U., Rumpf, H.J., Hapke,U., & Meyer ,C. (2006). Changes in the "stages of change" as outcome measures of a smoking cessation intervention: A randomized controlled trial. *Preventive Medicine ,43*,101-6.

Seksarnviriya, C. et al., (1992).The epidemiological of smoking among soldiers and police, in Khon- Kaen province. *Research Report*. The Monopoly of Public Health.

Shiffman, S. (1982). Relapse following smoking cessation: A situational analysis. *Journal of Consulting and Clinical Psychology*, *50* (1), 71-86

Shiffman, S., Engberg, I., Paty, I., Perz, W.G., Gnys, M., Kassel, J., & Hickcox, M. (1997). A day at a time: Predicting smoking lapse from daily urge. *Journal of Abnormal Psychology, 106,* 104 - 116.

Sigurdardottir, A.K., Jonsdotti, H.,& Benediktsson, R. (2007). Outcomes of educational interventions in type 2 diabetes: WEKA data-mining analysis. *Patient Education and Counseling, 67 ,* 21–31

Copyright by Mahidol University

Silprasert, N.(2008). *Development of data classification tools to support analysis of network equipment maintenance of the revenue department.* M.S.(Computer Science). Faculty of Graduate studies, Mahidol University

Sitthipan, C. (2008). *Bringing more resources to quitting smoking to enable Thai smokers to stop tobacco use*. Paper report in the first Asian Regional Conference, SRNT. Bangkok,Thaland.

Skinner, W.F. et al. (1985). Social influences and constraints in the initiation and cessation of adolescents tobacco use. *Journal of Behavioral Medicine*, *8,* 353-376

Smith, B.N, Bean, M.K., Mitchell, K.S., Speizer, I.S. &Fries,E.A.(2007).Psychosocial factors associated with non-smoking adolescents' intentions to smoke.*Health Education Research, 22* (2), 238-247

Sohn, M., Stotts, N.A., Benowitz, N. et al. (2007). Beliefs about health, smoking, and future smoking cessation among South Korean men hospitalized for cardiovascular disease. *Heart & Lung*, *36* (5), 339-346

Solberg, L.I., Asche, S.E., Boyle, R., McCarty, M.C., & Thoeie, M.J. (2007). Smoking and cessation behaviour among young adults of various education backgrounds. *American Journal of Public Health* , *97* (8), 1421-6

Spurlock, A.Y. (2005). *Policy, Politics, & Nursing Practice*. Vol. 6 No. 4, 296-304

Stillman, F.A., Bone, L., Avila-Tang, E., Smith, K., Yancey, N., Street, C., & Owings, K. (2007).Barriers to smoking cessation in inner-city African American young adults .*American Journal of Public Health* , *97* (8), 1405-8

Stone, S.L., Kristeller, J.L. (1992).Attitudes of adolescents toward smoking cessation. *American Journal of Preventive Medicine*, *8* , 221-225

Stöffelmayra, B., William, C., Wadlandb, W.C., & Pan, W. (2003). An examination of the process of relapse prevention therapy designed to aid smoking cessation. *Addictive Behaviors*, *28*, 1351–1358.

Strecher, V.J et al. (1995).Goal setting as a strategy for health behavior change. *Health Education Quarterly*, *22* (2), 190-200.

Suansomjit, K. et al .(1998). Smoking cessation in privates by peer motivation. *Royal Thai Army Medical Journal . 51* (4), 219-225.

Copyright by Mahidol University

Supawongse, C. (2007). *Two decades of tobacco-consumption control in Thailand : Success and challenges*.Tobacco Control Research and Management Center.

Sun, X., Prochaska , J.O.,Velicer, W.F., Robert, G. & Laforge, R.G. (2007). Transtheoretical principles and processes for quitting smoking: A 24-month comparison of a representative sample of quitters, relapsers, and non-quitters *Addictive Behaviors*, *32,* 2707–2726.

Sussman, S., Dent, C.W., & Severson, H. et al. (1998). Self-initiated quitting among adolescent smokers. *Preventive Medicine, 27*, A19-A28.

Sussman, S., & Dent, C.W. (2007). Five-year prospective prediction of self-initiated quitting of cigarette smoking of high-risk youth. *Addictive Behaviors, 32,* 1094 -1098.

Tan, P-N., Steinbach, M. & Kumar,V. (2006). *Introduction to Data Mining*. Boston. Pearson Education, Inc.

Tekbas, ö., & Faruk, et al. (2002).Smoking Prevalence in Military Men, and Factors Affecting this. *Military Medicine,167* (9), 742-746.

Thompson, M.C., Klesges, R.C., Haddock, K., Lando, H., & Talcott, W.(1998). Relationships between stages of change in cigarette smokers and healthy lifestyle behaviors in a population of young military personnel during forced smoking abstinence. *Journal of Consulting and Clinical Psychology*. *66* (6) ,1005-1011.

Tindle., H. A., Barbeau, E.M., Davis, R.B., Eisenberg, D.M., Park, E.R., Phillips, R.S., & Rigotti, N.A. (2006).Guided imagery for smoking cessation in adults : A randomized pilot trial. *Complementary Health Practice Review*, *11* (3), 166-175.

Tucker, J.S., Ellickson, P.L., Orlando, M., & Klen, D.J. (2005). Predictors of attempted quitting and cessation among young adult smokers. *Preventive Medicine, 41* , 554-561.

Ucar, T., & Karahoca, A. (2011). Predicting existence of Mycobacterium tuberculosis on patients using data mining approaches. *Procedia Computer Science, 3*, 1404–1411

Copyright by Mahidol University

United states Department of Health and Human Services. [USDHHS].(1988). *The health consequences of smoking : Nicotine addiction.* A report of the Surgeon General.;U.S. Dept.of Health and Human Service. Public Health Service, CDC.Center for Health Promotion and Education, Office on Smoking and Health,DHHS publication No.(CDC) 88-8406.

United states Department of Health and Human Services. [USDHHS].(1990). *The health benefits of smoking cessation.* A report of the Surgeon General. (DHHS publication no. (CDC) 90-8416). Rockville, MD: CDC, National Center for Chronic Disease Prevention and Health Promotion.

United states Department of Health and Human Services. [USDHHS]. (2000).*Healthy People 2010: Understanding and improving health.* Washington, Available at *http://www.healthypeople.gov/Document /html/uih/ titlepg.htm.Accessed July 10, 2005.*

United states Department of Health and Human Services. [USDHHS]. (1993). national survey of worksite health promotion activities: summary *American Journal of Health Promotion*, *7*, 452–64.

Velicer, W.F., DiClemente, C.C., Prochaska, J.O., & Brandenburg, N. (1985). Decisional balance measure for assessing and predicting smoking status. *Journal of Personality and Social Psychology, 48,* 1279−1289.

Velicer, W.F., DiClemente, C. C., Rossi, J. S., & Prochaska, J. O. (1990). Relapse situations and self-efficacy: an integrative model. *Addictive Behaviors*, *15* (3), 271–283.

Velicer, W. F., Rossi, J. S., Prochaska, J. O., & DiClemente, C.C. (1996). A criterion measurement model for health behavior change. *Addictive Behaviors*, *21,* 555–584.

Wagner, J., Burg, M. & Sirois, B. (2004). Social support and the transtheoretical model: Relationship of social support to smoking cessation stage, decisional balance, process use, and temptation. *Addictive Behaviors, 29*, 1039-1043.

Wang.K-Y.,Chu,N-F., &Wu,D-M. (2009).Predictors of Cigarette Smoking Behavior Among Military University Students in Taiwan. *Journal of Nursing Research, 17(3),*161-168

Copyright by Mahidol University

Ward, K.D,Klesges.R.C., & Halpern, M,T. (1997).Predictors of smoking cessation and state-of –the –art smoking interventions. *Journal of Social Issues, 53 (1),* 129-145.

Warner, K.E., Isaacs,S.L. & Knickman, J.R. (2006). *Tobacco Control Policy*. John Wiley & Sons,Inc. New Jersey, USA.

Wen, M., Duker, H.V.& Olson,L.M. (2009). Social contexts of regular smoking in adolescence: Towards a multidimensional ecological model. *Journal of Adolescence ,32* , 671- 692

Westman, E. C., Behm, F. M., Simel, D. L. & Rose, J. E. (1997). Smoking behavior on the day of a quit attempt predicts long term abstinence. *Archives of International Medicine, 3,* 335– 340.

West, R. J., Jarvis, M., Russell, M., C. Arrltthers, M. and Feyerabend, C. (1984). Effect of nicotine replacement on the cigarette withdrawal syndrome, *British Journal of Addiction*, *79*, 215-219.

West, R. & Schneiders, N. (1987). Craving for Cigarettes. *British Journal of Addiction*, *82*, 407- 415.

West, R., McEwen, A., Bolling, K. & Owen, L. (2001). Smoking cessation and smoking patterns in the general population: a 1-year follow-up. *Addiction, 96*, 891–902.

World Health Organization. (1997). *Tobacco and health*: A global status report. Country profile Thailand. Geneva.

World Health Organization. (1999). The World Health Report. World Health Organization, Geneva.

World Health Organization. (2002). *The World Health Report 2002- Reducing Risks, Promoting Healthy Life.* World Health Organization, Geneva.

World Health Organization. (2003). *Policy recommendations for smoking cessation and treatment of tobacco dependence*. World Health Organization, Geneva.

World Health Organization. (2005). *The role of health professionals in tobacco control.* France.

Wynd, C.A. (2005). Guided health imagery for smoking cessation and long-term abstinence. *Journal of Nursing Scholarship*, *37* (3), 245-250.

Copyright by Mahidol University

Xino, H., Hoffman, C.D., & Brito, G., et al. (2008). Preventing smoking relapse in the Carolinas. *American journal of Public Health*, *98*(3) ,389-390.

Yalçınkaya-Alkar, Özden a & Karanci, A. Nuray. (2007). What are the differences in decisional balance and self-efficacy between Turkish smokers in different stages of change? *Addictive Behaviors, 32*, 836–849.

Yang, T., Xu, X., Rockett. I, R.H., Guo, W. & Zhou, H. (2011). Effects of household, workplace, and public place smoking restrictions on smoking cessation. *Health & Place, doi:10.1016/j.healthplace.2011.04.003*.

Yeh, D-Y.,Cheng, C-H.,& Chen, Y-W. (2011). A predictive model for cerebrovascular disease using data mining. *Expert Systems with Applications,38*, 8970–8977.

Zhu, S-H., Sun, J., Billings, S.C., Choi, W.S. & Malarcher, A. (1999). Predictors of smoking cessation in U.S. adolescents. *American Journal of Preventive Medicine, 16* (3), 202-207.

Zhu, S.H., Anderson, C.M., Tedeschi, G.J., Rosbrook, B., Johnson, C. E., & Byrd, M., et al. (2002). Evidence of realworld effectiveness of a telephone quitline for smokers.*New England Journal of Medicine, 347* (14), 1087–1093.

http://www.helpguide.org/mental/quit_smoking_cessation.htm. Quit Smoking Your Way: Creating a Personal Smoking Cessation Plan.

http*://*www.*everydayhealth.com/smoking-cessation/living/index.aspx?p=17Smoking* Cessation Center. Coping With the Urge, Behaviorally and Mentally,2007 http*://www.surgeryencyclopedia.com/Pa-St/Smoking-Cessation.html Ency-clopedia of Surgery: A Guide for Patients and Caregivers* Alexander, D. Data Mining. http://www.laits.utexas.edu/~norman/ BUS.FOR/. course. mat/Alex/#3.

บันทึกข้อความที่ กห 0401/1422 เรียน ผบ.ทบ.ลง 28 เม.ย .49 เรื่อง ขอความอนุเคราะห์ใช้สถานที่ ณ สถานที่ตั้งของ 29 หน่วยงานเพื่อดำเนินการกิจกรรมสัญจรในโครงการสถานที่ราชการปลอดบุหรี่2.

บันทึกข้อความที่ กห 0446.14/145 เรียน จก.พบ .เรื่อง ขออนุมัติเรื่องโครงการ “โรงพยาบาล ปลอดบุหรี่.”

Copyright by Mahidol University

บันทึกข้อความที่ กห 0446.7 / 9538 ลง 1 ธ.ค.49 เรียน จก.พบ .เรื่อง แจ้งและขอความร่วมมือปฏิบัติตามกฎหมายของกระทรวงสาธารณสุข ฉบับที่ 10,11,12,17 และพรบ.คุ้มครองสุขภาพของผู้ไม่สูบบุหรี่ พ.ศ. 2535 และ พรบ.ควบคุมผลิตภัณฑ์ยาสูบ พ.ศ.2535.

ประกิต วาทีสาธกกิจ (2547). ข้อเท็จจริงเยาวชนไทยกับการสูบบุหรี่. ใน *WWW.มูลนิธิรณรงค์เพื่อการไม่สูบบุหรี่*.

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APPENDICES

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APPENDIX A
INTERVENTION GUIDELINE FOR SMOKING CESSATION PROGRAM (THAI VERSION)

ขั้นก่อนชั่งใจและชั่งใจ

บทเรียนที่ 1 การให้ข้อมูลข่าวสารและการสร้างแรงจูงใจภายใน

1.1 กลุ่มสัมพันธ์

1.2 ความรู้เกี่ยวกับบุหรี่และพิษภัยของบุหรี่

1.3 การสร้างแรงจูงใจภายใน

บทเรียนที่ 2 การสร้างตัวแบบที่ดี

2.1 ตัวแบบที่ดีของการไม่สูบบุหรี่และที่ผู้สามารถเลิกสูบได้

2.2 การสำนึกถึงอันตรายของบุหรี่ต่อผู้อื่นและสิ่งแวดล้อม

บทเรียนที่ 3 ความสมดุลในการตัดสินใจ

3.1 การประเมินตนเอง

3.2 การระดมสมองเพื่อการตัดสินใจ

3.3 สร้างภาพลักษณ์ใหม่

บทเรียนที่ 4 ความสามารถของตนเองและความมั่นใจในการเลิกสูบบุหรี่

4.1 การตัดวงจรความอยากบุหรี่และการแก้ปัญหา

4.2 ทักษะการปฏิเสธ

ขั้นพร้อมที่จะปฏิบัติ

บทเรียนที่ 5 การตั้งเป้าหมายและพัฒนาทักษะการปฏิบัติตัวในการเลิกสูบบุหรี่

5.1 เป้าหมายในชีวิต

5.2 กิจกรรมคำมั่นสัญญา

5.3 เตรียมตัวอย่างไรให้เลิกบุหรี่

5.4 ทักษะการปรับตัวและการจัดการกับความเครียด

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ขั้นปฏิบัติ

บทเรียนที่ 6 การควบคุมตนเอง การเสริมแรงและการปรับเปลี่ยนพฤติกรรม

6.1 การควบคุมกำกับตนเอง

6.2 การปรับเปลี่ยนพฤติกรรม

6.3 การเสริมแรงตนเอง

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แผนการจัดกิจกรรมการเรียนรู้

บทเรียนที่ 1 เรื่อง การให้ข้อมูลข่าวสารและการสร้างแรงจูงใจภายใน

กิจกรรมที่ 1.1 กลุ่มสัมพันธ์

ความคิดรวบยอด สร้างบรรยากาศก่อนการอบรมให้กับสมาชิกกลุ่มและทหารเกณฑ์เห็นความสำคัญของความสามัคคีและการทำกิจกรรมร่วมกันเพื่อนำไปสู่เป้าหมาย

วัตถุประสงค์ ทหารเกณฑ์เกิดความสามัคคีและมีความรักในพวกพ้องเดียวกันเพื่อการทำงานและวางเป้าหมายร่วมกัน

วิธีการจัดกิจกรรม

1. แบ่งกลุ่มทหารออกเป็น 6 กลุ่ม ชี้แจงกติกาการเล่นโดยแต่ละกลุ่มจะต้องยืนบนกระดาษนำกระดาษหนังสือพิมพ์ ให้กลุ่มหาวิธียืนบนกระดาษหนังสือพิมพ์ให้ได้ โดยไม่ให้เท้า อยู่นอกกระดาษ
2. จับเวลาและเป่านกหวีด พับกระดาษหนังสือพิมพ์ให้เล็กลงเรื่อยๆ ถ้ากลุ่มใดยืนออกนอกกระดาษหรือไม่สามารถยืนบนกระดาษได้ ให้ถือว่าแพ้และต้องออกจากการแข่งขัน
3. หาทีมที่ชนะ ซักถามว่าทำอย่างไร และให้รางวัล
4. ให้ทหารเกณฑ์แสดงความคิดเห็นว่าเกมนี้ได้ประโยชน์หรือ ข้อคิดอะไรบ้าง
5. ผู้วิจัยสรุปกิจกรรมเรื่อง สามัคคีของการอยู่ร่วมกันและการทำงานร่วมกัน แล้วโยงไปสู่การเลิกสูบบุหรี่ว่าถ้าทหารเกณฑ์ร่วมมือ ร่วมใจมีความตั้งใจจริงและชวนกันเลิกสูบบุหรี่ได้สำหรับผลัดที่ 1/52 จะได้รับการกล่าวยกย่อง ชมเชยจากผู้บังคับบัญชาว่ารุ่นนี้ มีความรัก ความสามัคคีและช่วยเหลือกันทำสิ่งที่เป็นประโยชน์ทั้งต่อตนเองและส่วนรวม

เวลาที่ใช้ 15 นาที

สื่อการสอน/ อุปกรณ์ นกหวีด กระดาษหนังสือพิมพ์ เครื่องเล่นเทป/ เพลง

การประเมินผล สังเกตจากพฤติกรรมการเข้าร่วมกิจกรรม การแสดงความคิดเห็น การมีปฏิสัมพันธ์แก่กัน

กิจกรรมที่ 1.2 ความรู้เกี่ยวกับบุหรี่และพิษภัยของบุหรี่

ความคิดรวบยอด การสร้างความตระหนักและการรับรู้ถึงอันตรายและพิษภัยของบุหรี่มีความสำคัญสำหรับกลุ่มทหารเกณฑ์ที่มีความพร้อมในการเปลี่ยนแปลงอยู่ใน precontemplation stage จึงต้องใช้กระบวนการเปลี่ยนแปลง (processes of change) ในการสร้างความตระหนักการรับรู้พิษภัยของบุหรี่ และการกระตุ้นทางอารมณ์ (Emotional arousal)

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วัตถุประสงค์ เพื่อให้ทหารเกณฑ์

1. บอกถึงสารพิษในบุหรี่ว่าประกอบด้วยอะไรบ้าง
2. ตระหนักถึงอันตรายของพิษภัยจากการสูบบุหรี่
3. รับรู้โอกาสเสี่ยงในการเกิดโรคที่เกิดจากการสูบบุหรี่

วิธีการจัดกิจกรรม ใช้หลักการของการให้ความรู้โดยเน้นกระบวนการคิดจากการให้ข้อมูลข่าวสาร และการเรียนรู้โดยการสังเกตจากกิจกรรม (Observational learning)

1. ให้ความรู้โดยฉาย VCD เกี่ยวกับความรู้เรื่องบุหรี่และพิษภัยของบุหรี่ จากนั้นผู้วิจัยสรุปเนื้อหาพร้อมแจกเอกสารแผ่นพับ
2. สาธิตสารพิษในบุหรี่ ดังนี้

- นำผ้าเช็ดหน้าสีขาวมาและทดลองให้ทหารสูบบุหรี่แล้วพ่นควันออกมา เปรียบเทียบกับอีกผืนที่ไม่ได้พ่นควันแต่ผู้สูบอัดควันเข้าปอด ให้ผู้สูบบุหรี่สรุปให้เพื่อนฟัง
- ผู้วิจัยสรุปสิ่งที่จะเกิดขึ้นกับริมฝีปากและปอดของผู้สูบ 40-60 ครั้ง/วันจากคราบของทาร์ที่ติดกับอวัยวะของร่างกาย
- อธิบายและสรุปพร้อมสาธิตประกอบภาพโมเดลของปอดและโปสเตอร์มะเร็งริมฝีปาก

เนื้อหา 1. ความรู้เกี่ยวกับบุหรี่และพิษภัยของบุหรี่ กล่าวถึงสถิติการสูบบุหรี่ของคนไทย ใช้ข้อมูลจากศูนย์วิจัยและจัดการความรู้เพื่อการควบคุมยาสูบ (ศจย.)พ.ศ. 2550

2. สารพิษในบุหรี่ ในบุหรี่ 1 มวน มีสารพิษกว่า 4000 ชนิด สารพิษในบุหรี่ที่สำคัญ ได้แก่

- นิโคติน อยู่ในใบยาสูบตามธรรมชาติ เป็นสารที่มีลักษณะคล้ายน้ำมัน ไม่มีสี เป็นสารพิษอย่างแรงสามารถดูดซึมเข้าทางผิวหนังและเยื่อบุร่างกายได้ เป็นสารที่มีฤทธิ์เสพติด สูบแล้วติดเมื่อสูดควันเข้าไป เพียง 6-10 วินาที นิโคตินจะเข้าสู่สมองระยะแรกออกฤทธิ์กระตุ้นสมองทำให้รู้สึกสบายใจคลายเครียดระยะต่อมาจะกดระบบประสาท ทำให้รู้สึกเครียด
- ทาร์ หรือน้ำมันดิน มีอยู่ในใบยาสูบ เกิดจากการเผาไหม้ของยาเส้นในบุหรี่ เป็นของเหลว เหนียว สีน้ำตาลเข้ม ที่ทำให้เล็บมีสีเหลือง เป็นสารก่อมะเร็งร้อยละ 50 ของทาร์จะจับอยู่ที่ปอด

นอกจากนั้นเมื่อจุดบุหรี่สูบ ความร้อนจะเผาไหม้สารเคมีในมวนบุหรี่ เกิดปฏิกิริยากับออกซิเจน ไฮโดรเจน คาร์บอนไดออกไซด์ และไนโตรเจนที่มีอยู่ในอากาศทำให้เกิดสารพิษต่าง ๆ ขึ้นมากมาย ได้แก่

- คาร์บอนไดซัลไฟด์ : ทำให้ผนังเส้นเลือดแดงหนาและแข็งขึ้น
- คาร์บอนมอนนอกไซด์ : เหมือนควันจากท่อไอเสียรถยนต์, ทำให้เลือดข้นและหนืดมากขึ้น เป็นสาเหตุหนึ่งของโรคหัวใจ

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- ไนโตรเจนไดออกไซด์ : ทำลายเยื่อบุถุงลม เป็นสาเหตุของโรคถุงลมปอดโป่งพอง
- ไฮโดรเจนไซยาไนด์ : ก่อให้เกิดอาการไอ มีเสมหะ หลอดลมอักเสบเรื้อรัง
- ฟอร์มาลดีไฮด์ : เป็นสารก่อมะเร็งอย่างแรง
- เกิดสารก่อมะเร็งกว่า 60 ชนิด

3. อันตรายและโรคที่เกิดจากการสูบบุหรี่

- แก่ก่อนวัย
- มะเร็งปอด ผู้สูบบุหรี่จัดจะมีความเสี่ยงต่อการเป็นมะเร็งปอดมากกว่าผู้ไม่สูบถึง 50 เท่า ผู้ไม่สูบบุหรี่ที่เป็นมะเร็งปอด ร้อยละ 30 เกิดจากการได้รับควันบุหรี่ที่ผู้อื่นสูบ ถ้าหยุดสูบบุหรี่ได้ทันก่อนที่ปอดจะได้รับความเสียหายอย่างถาวร โอกาสเกิดมะเร็งปอดจะลดลงทันที หลังหยุดสูบ 10-15 ปี โอกาสเป็นมะเร็งปอดจะลดลงเหลือ 6 เท่าของคนไม่สูบ
- มะเร็งกล่องเสียง ผู้ที่ได้รับควันบุหรี่วันละ 3 ชั่วโมงขึ้นไป มีอัตรา เสี่ยงต่อการเป็นมะเร็งที่ ลำคอมากกว่าคนที่ไม่ได้รับควันบุหรี่ 3 เท่า
- การสูบบุหรี่ก่อให้เกิดความเสี่ยงต่อการเกิดมะเร็งที่อวัยวะต่างๆ มากกว่า 1 แห่ง เช่น มะเร็งริมฝีปาก มะเร็งกระเพาะอาหาร หลอดคอ หลอดอาหาร เป็นต้น
- คนสูบบุหรี่มีแนวโน้มเกิดแผลในกระเพาะอาหารมากกว่า คนไม่สูบ 4 เท่า
- โรคหลอดเลือดหัวใจตีบ ผู้สูบบุหรี่มีโอกาสหัวใจวายตายในอายุ 30-40 ปี สูงกว่าผู้ไม่สูบถึง 5 เท่า มีความเสี่ยงต่อการเกิดภาวะหัวใจวายจากกล้ามเนื้อหัวใจตายเฉียบพลันมากกว่าคนที่ไม่สูบ 10 เท่า
- หลอดเลือดในสมองตีบหรือแตก ทำให้มีความจำเสื่อมลงและอาจเป็นอัมพาตได้
- การเสื่อมสมรรถภาพทางเพศ ควันบุหรี่มีสารที่ทำให้หลอดเลือดตีบแคบลง การทำงานจึงเสื่อมลง และการสร้างเชื้ออสุจิลดลง และเชื้ออสุจิอ่อนแรง
- ระบบทางเดินหายใจ ทำให้เป็นเป็นหวัดบ่อย หายช้า หอบหืด หลอดลมอักเสบเรื้อรัง ถุงลมปอดโป่งพองโดยเฉพาะโรคโรคถุงลมโป่งพองนี้ ในระยะท้ายๆ ของโรคจะทำให้ผู้ป่วยทรมานมาก เนื่องจากเหนื่อยจนทำอะไรไม่ได้ ต้องนอนอยู่กับที่ และอาจต้องได้รับออกซิเจนจากถังตลอดเวลา

นอกจากบุหรี่จะทำลายสุขภาพของตนเองแล้ว ยังทำลายสุขภาพของคนในครอบครัวและผู้ที่ใกล้ชิด เช่น ถ้าพ่อ แม่สูบ ลูกในท้องจะได้รับพิษไปด้วย หญิงมีครรภ์ที่สูบเด็กจะคลอดก่อนกำหนด มีน้ำหนักตัวน้อย เสี่ยงต่อการเสียชีวิตหรือความพิการแต่กำเนิด สตรีที่สามีสูบบุหรี่จัด (มากกว่าวันละซอง) จะมีความเสี่ยงต่อการเป็นมะเร็งปอดสูงเป็น 2 เท่าของสตรีทั่วไป ผู้ไม่สูบบุหรี่ที่อยู่บ้านเดียวกับคนสูบบุหรี่เสี่ยงต่อการเป็นมะเร็งปอดเพิ่มขึ้น 20-30 %

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ภาพลักษณ์ของคนที่สูบบุหรี่ ได้แก่ หัวเหม็น ปากดำ ปากเหม็น ตัวเหม็น ฟันเหลือง นิ้วเหลือง

<u>ข้อสังเกต</u> ทหารเกณฑ์บางคนจะมีข้อสงสัยว่า ทำไมคนที่ใกล้ชิดไม่เป็นโรคมะเร็งปอด เช่น พ่อ แม่ ซึ่งการเป็นโรคหรือไม่เป็น ขึ้นอยู่กับปัจจัยหลายอย่าง เช่น เริ่มสูบบุหรี่ตั้งแต่อายุเท่าไร ได้รับสารพิษชนิดอื่นๆ นอกจากควันบุหรี่หรือไม่ ปัจจัยทางกรรมพันธุ์ ชนิดของบุหรี่ที่สูบ ถ้าสูบยามวนก็จะมีอันตรายน้อยกว่าบุหรี่ก้นกรองหรือไม่มีก้นกรองเพราะบุหรี่พวกนี้มีสารปรุงแต่งมาก การอัดควันเข้าเต็มปอดหรือสูบแล้วพ่นออกมา ลักษณะทางกายวิภาคของปอดแต่ละคนไม่เหมือนกัน แต่จากการศึกษาวิจัยพบว่าครึ่งหนึ่งของผู้ที่สูบบุหรี่จะป่วยและเสียชีวิตจากโรคที่เกิดจากการสูบบุหรี่

ทำไมถึงติดบุหรี่

การติดบุหรี่เป็นผลมาจากสารนิโคตินในบุหรี่ที่ออกฤทธิ์ต่อระบบประสาท โดยกระตุ้นสารสื่อประสาทในสมองทำให้เกิดความสุข เมื่อสูบเป็นประจำจะทำให้ร่างกายของผู้สูบเกิดความต้องการสารนี้มากขึ้น จึงเกิดการติดบุหรี่ เช่น หงุดหงิด โมโหง่าย นอนไม่หลับ เป็นต้น

เวลาที่ใช้ 30-45 นาที

สื่อการสอน/ อุปกรณ์

- VCD เรื่อง พิษภัยของบุหรี่ของมูลนิธิรณรงค์ไม่สูบบุหรี่
- เครื่องเล่น VCD
- แผ่นพับ เรื่องมะเร็งปอดกับบุหรี่, บุหรี่กับโรคหัวใจ
- โปสเตอร์รูปภาพโรคถุงลมโป่งพอง มะเร็งปอด มะเร็งกล่องเสียง

การประเมินผล

- สังเกตจากความสนใจและการซักถาม
- การตอบคำถาม
- การร่วมแสดงความคิดเห็น

กิจกรรมที่ 1.3 การสร้างแรงจูงใจภายใน

ความคิดรวบยอด การสร้างแรงจูงใจมีความจำเป็นในการทำให้ทหารเกณฑ์เลิกบุหรี่โดยเฉพาะแรงจูงใจภายใน (internal motivation) ที่เกิดขึ้นกับตัวของทหารเองโดยใช้แนวคิดของ motivational interviewing technique เน้นการให้ทหารเกณฑ์ได้คิด ทบทวนตัวเองโดยใช้คำถามประเมินปลายเปิด กระตุ้นความคิด ความรู้สึก และการให้ข้อมูลเพื่อขจัดความไม่แน่ใจ ในการเลิกสูบบุหรี่ (introduce ambivalence) เพื่อนำไปสู่การตัดสินใจที่จะเลิกสูบต่อไป

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วัตถุประสงค์ เพื่อให้ทหารเกณฑ์

1. ปรับเปลี่ยนความเชื่อและค่านิยมจากการสูบบุหรี่เป็นไม่สูบบุหรี่
2. เกิดแรงจูงใจในตัวเองและมีความพร้อมที่จะเลิกบุหรี่

วิธีการจัดกิจกรรม

ผู้วิจัยและผู้ช่วยวิจัยแบ่งกลุ่มทหารออกเป็น 3 กลุ่ม กลุ่มละ 20 คน แต่ละกลุ่มปฏิบัติกิจกรรม ดังนี้

1. Establishing rapport or express empathy เพื่อให้ทหารเกณฑ์ได้มอง คิด และแสดงความรู้สึกของตนเองรวมทั้งแลกเปลี่ยนประสบการณ์กับผู้อื่นในเรื่องบุหรี่

- ให้ทหารวาดภาพที่เกี่ยวกับสัญลักษณ์แทนชีวิตของตนเองที่เกี่ยวข้องกับความสุขหรือความเครียดที่นำไปสู่การสูบบุหรี่
- ขออาสาสมัครจำนวน 5 คน ออกมาบรรยายภาพ แลกเปลี่ยนประสบการณ์และอภิปรายร่วมกัน
- ผู้วิจัยให้กำลังใจในการปรับชีวิตใหม่เพื่อเปลี่ยนพฤติกรรมการสูบบุหรี่

2. Make an opening statement

- ผู้วิจัยแจกกระดาษ ให้ทหารช่วยกันคิดโดยใช้คำถามปลายเปิด (รายละเอียดตามเนื้อหา) อภิปรายกลุ่มแล้วสรุปลงในกระดาษที่แจกให้

3. Give feedback

- ผู้แทนกลุ่มสรุปข้อมูลเปรียบเทียบถึงผลดี/ผลเสียของการสูบบุหรี่ที่สัมพันธ์กับสุขภาพ จากนั้นผู้วิจัยสรุปในภาพรวม

4. Assess readiness to change ใช้แบบสอบถามประเมินกลุ่มเพื่อประเมินความพร้อมของการเลิกสูบบุหรี่

เนื้อหา คำถามที่ใช้ในการถามเพื่อกระตุ้นให้กลุ่ม Precontemplation stage ได้เริ่มคิดเกี่ยวกับการเปลี่ยนแปลง

- ในปัจจุบัน คนส่วนใหญ่เห็นว่า การสูบบุหรี่เป็นสิ่งไม่ดีต่อสุขภาพ คุณมีความคิดเห็นอย่างไร
- มีอะไรจะเกิดขึ้นกับคุณที่ทำให้รู้ว่าการสูบบุหรี่ทำให้เกิดปัญหาตามมา
- อะไรเป็นสิ่งบอกเหตุที่จะทำให้คุณรู้ว่าเกิดปัญหาจากการสูบบุหรี่
- คุณเคยพยายามที่จะหยุดการสูบบุหรี่ในอดีตมาก่อนหรือไม่

คำถามที่ใช้ในการถามเพื่อกระตุ้นให้กลุ่ม Contemplation stage เพื่อประเมินหรือตรวจสอบประโยชน์และอุปสรรคของการเลิกสูบบุหรี่และการคิดในแง่บวกและลบเกี่ยวกับการสูบบุหรี่

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- ทำไมคุณถึงคิดที่จะเลิกสูบบุหรี่ตอนนี้
- อะไรเป็นเหตุผลที่ทำให้ไม่อยากเลิกสูบบุหรี่
- อะไรเป็นสิ่งที่ทำให้ไม่อยากเลิกสูบตอนนี้
- อะไรเป็นอุปสรรคในวันนี้ที่ทำให้คุณเลิกไม่ได้
- อะไรที่จะช่วยคุณในการแก้ปัญหาหรือผ่านอุปสรรคเหล่านั้น
- ในอดีตที่ผ่านมามีอะไรช่วยคุณได้ เช่น ใคร โปรแกรมหรือพฤติกรรมอะไร แล้วในช่วงเวลานี้อะไรบ้างที่จะช่วยคุณได้
- คุณคิดว่าต้องการอะไรในการที่จะเรียนรู้เพื่อเลิกสูบบุหรี่

(Information from Miller WR, Rollnick S. Motivational interviewing: preparing people to change addictive behavior. New York: Guilford, 1991:191-202.)

เวลาที่ใช้ 45 นาที

สื่อการสอน/ อุปกรณ์ กระดาษ สีไม้ กระดาษปรู๊ฟ ปากกาเมจิก แบบสอบถามขั้นตอนการเปลี่ยนแปลงและความพร้อมของการเลิกสูบบุหรี่

การประเมินผล - ความสนใจในการเข้าร่วมในกิจกรรมกลุ่ม
- การซักถามแลกเปลี่ยนความคิดเห็น
- ผลการวิเคราะห์ข้อมูลความพร้อมในการเลิกบุหรี่จากแบบสอบถาม

บทเรียนที่ 2 การเรียนรู้จากตัวแบบ

กิจกรรมที่ 2.1 การนำเสนอตัวแบบ (Modeling)

ความคิดรวบยอด ใช้แนวคิดทฤษฎีปัญญาสังคม ในเรื่อง การเรียนรู้โดยการสังเกต (Observational learning) จากการกระทำของบุคคลอื่นเพื่อสร้างพฤติกรรมใหม่หรือยับยั้งพฤติกรรม การใช้ตัวแบบ Live Model จะกระตุ้นให้เกิดแรงจูงใจที่จะเลิกบุหรี่ และความสามารถของตนเองในการเลิกสูบบุหรี่จากตัวแบบที่เคยสูบบุหรี่และสามารถเลิกสูบได้และตัวแบบที่ไม่สูบบุหรี่ วิธีการเสนอตัวแบบสามารถทำให้กลุ่มทหารที่อยู่ในขั้นชั่งใจเคลื่อนไปสู่ขั้นพร้อมปฏิบัติได้

วัตถุประสงค์ 1. ทหารเกณฑ์ระบุถึงผลดีของการไม่สูบบุหรี่จากตัวแบบ

2. ทหารเกณฑ์อธิบายวิธีการเลิกบุหรี่ของตัวแบบและสามารถนำมาเป็นแบบอย่างในการเลิกบุหรี่ของตนได้

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วิธีการจัดกิจกรรม การรับรู้ความสามารถของตนเองจากตัวแบบ

1. การได้รับประสบการณ์จาก ตัวแบบ (Vicarious Experience) ใช้การอภิปรายหมู่โดยวิทยากร ครูฝึก ทหารเกณฑ์ที่ไม่สูบบุหรี่และครูฝึกที่สามารถเลิกสูบบุหรี่ได้พูดคุย แลก เปลี่ยนประสบการณ์ ผลดีของการไม่สูบบุหรี่ ผลเสียของการเลิกบุหรี่ เหตุผลของการเลิกบุหรี่ วิธีการเลิกบุหรี่ อุปสรรคและวิธีการแก้ปัญหาในขณะเลิกบุหรี่ได้สำเร็จ

2. การใช้คำพูดชักจูง (Verbal persuasion) วิทยากรและเพื่อนที่ไม่สูบบุหรี่พูดจูงใจให้ทหารเกณฑ์เกิดความคิดที่จะเลิกบุหรี่และเชื่อมั่นในตนเองว่าจะเลิกบุหรี่ได้สำเร็จ

เวลาที่ใช้ 45-60 นาที

สื่อการสอน/ อุปกรณ์ ไมโครโฟน เครื่องขยายเสียง โต๊ะ เก้าอี้ ทหารที่เป็นตัวแบบ

การประเมินผล - ความสนใจ การตั้งใจฟัง การซักถามแลกเปลี่ยนความคิดเห็น

กิจกรรมที่ 2.2 การสำนึกถึงอันตรายของบุหรี่ต่อผู้อื่นและสิ่งแวดล้อม

ความคิดรวบยอด การใช้กระบวนการเปลี่ยนแปลงในเรื่อง การประเมินสิ่งแวดล้อม (Environmental reevaluation) ซึ่งจะช่วยประเมินด้านความคิด ความรู้สึกของทหารเกณฑ์ต่อการสูบบุหรี่ เป็นวิธีการที่ช่วยให้กลุ่มที่อยู่ใน pre-contemplation stage เคลื่อนไปสู่ contemplation stage โดยการอภิปรายกลุ่มจากตัวแบบที่ไม่ดีในสถานการณ์สมมุติจะช่วยกระตุ้นให้ทหารเกณฑ์มีจิตสำนึกและเห็นความสำคัญของอันตรายของบุหรี่ที่มีผลกระทบต่อบุคคลอื่นและสิ่งแวดล้อม

วัตถุประสงค์ 1. ทหารเกณฑ์อธิบายอันตรายของการสูบบุหรี่ต่อคนรอบข้างและสิ่งแวดล้อมได้

2. ทหารเกณฑ์มีความตระหนักและบอกว่าไม่ควรสูบบุหรี่ในที่สาธารณะ

วิธีการจัดกิจกรรม การอภิปรายกลุ่มย่อย

1. แบ่งทหารออกเป็น 6 กลุ่มๆละ 10 คน แจกสถานการณ์สมมุติจำนวน 2 สถานการณ์ ให้กลุ่มช่วยกันตอบคำถามและอภิปราย

2. กลับมารวมกันในกลุ่มใหญ่ แต่ละกลุ่มนำเสนอผลงานและร่วมกันอภิปราย สรุปผล

3. ผู้วิจัยสรุปกิจกรรมในภาพรวม

เนื้อหา สถานการณ์สมมุติที่ 1

ทหารใหม่จำนวน 150 นาย ได้เข้ามาปฏิบัติหน้าที่รับใช้ชาติ เมื่ออยู่ประจำ ณ กองร้อยฝึกทหารใหม่ มีกฎระเบียบห้ามทหารใหม่สูบบุหรี่ในขณะฝึกจนกว่าจะได้กลับบ้าน มีทหารใหม่ 5 คน ติดบุหรี่มาก จะแอบครูฝึกไปสูบในช่วงเวลาพักเบรกเป็นประจำ ทั้งในห้องน้ำ หรือใต้ต้นไม้ จนกระทั่งในช่วงกลางคืนก่อนเข้านอน ทหารใหม่ทั้ง 5 คนนี้ ได้แอบสูบโดยการใช้ผ้าห่มคลุมตัวแล้วสูบ ท่านคิดว่าการกระทำนี้ถูกต้อง เหมาะสมหรือไม่ ขอให้ช่วยกันอภิปราย ผลที่จะเกิดขึ้น แล้วในฐานะที่เป็นเพื่อนทหารด้วยกัน ท่านจะทำอย่างไร เมื่อเห็นเพื่อนแอบสูบบุหรี่

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สถานการณ์สมมุติที่ 2 พลทหารสมชาย และ สมคิด ได้รับอนุญาตให้กลับไปพักที่บ้าน หลังจากการฝึกทหารมา 2 เดือนกว่า จึงชวนกันกลับบ้านที่ต่างจังหวัด เมื่อออกนอกรั้วทหาร มายืนอยู่ที่ป้ายรถเมล์ ทั้งสองก็คุยกันว่า

พลฯ สมชาย : เฮ้ย ! สมคิดข้าอยากบุหรี่จังเลยหว่ะ ไม่ได้สูบมานาน เอ็งมีติดตัวบ้างมั้ย ขอซักตัวสิ

พลฯ สมคิด : จะดีเหรอ นี่มันป้ายรถเมล์นะ เดี๋ยวคนเค้าจะว่าเอาได้

พลฯ สมชาย : ไม่เป็นอะไรหรอก มีคนนั่งอยู่เพียงคนเดียวเอง อากาศก็ระบายดีออก นี่ก็ปลอดจากครูฝึกแล้ว

พลฯ สมคิด : มองหน้า สมชาย เอาก็เอา ดีนะ ข้าแอบเก็บไว้ไม่ให้ครูฝึกเห็น เหลืออยู่ 3 ตัว จากนั้นก็ยื่นบุหรี่ให้สมชาย 1 ตัว แล้วทั้งสองก็พากันสูบบุหรี่อย่างเพลิดเพลิน โดยมีแม่ลูกเดินมารอรถเมล์ที่ป้าย เด็กชายอายุ 5 ขวบ ก็หันมามองทหารทั้ง 2 นายนี้

ให้ท่านช่วยกันอภิปราย การกระทำของพลฯสมชาย และพลฯสมคิด เหมาะสมหรือไม่อย่างไร มีผลกระทบอย่างไรต่อบุคคลอื่น แล้วถ้าท่านเป็นพลทหารทั้ง 2 คนนี้ ท่านจะทำอย่างไรเมื่ออยากบุหรี่

เวลาที่ใช้ 30 นาที

สื่อการสอน / อุปกรณ์ - สถานการณ์สมมุติ 2 เรื่อง (ทหารแอบสูบบุหรี่ขณะฝึก / ทหารกลับบ้านขณะยืนรอรถที่ป้ายรถเมล์) กระดาษ ปากกาเมจิก

การประเมินผล - การแสดงความคิดเห็น การซักถามขณะเข้ากลุ่ม

- การตอบคำถามและการนำเสนอผลงานกลุ่ม

บทเรียนที่ 3 ความสมดุลในการตัดสินใจ

กิจกรรม เรื่อง การประเมินตนเอง (Self-reevaluation) การตัดสินใจและการสร้างภาพลักษณ์ใหม่

ความคิดรวบยอด การประเมินตนเองและการตัดสินใจเป็นวิธีการในกระบวนการเปลี่ยนแปลง (processes of change) ที่ทำให้ทหารเกณฑ์จากระยะชั่งใจเคลื่อนผ่านไปสู่ระยะพร้อมปฏิบัติและปฏิบัติได้ โดยเน้นพัฒนาทักษะ การคิดประเมินตนเองในเรื่องผลดีและ ผลเสียจากการสูบบุหรี่ ชั่งน้ำหนักในการตัดสินใจที่จะเลิกบุหรี่ และการสร้างจินตนาการไปสู่ภาพลักษณ์ของคนที่ไม่สูบบุหรี่

วัตถุประสงค์ เพื่อให้ทหารเกณฑ์

1. บอกประโยชน์ของการเลิกสูบบุหรี่ได้ถูกต้อง
2. วิเคราะห์ผลดี ผลเสียของการสูบบุหรี่ได้ถูกต้อง

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3. ประเมินอุปสรรคของการเลิกสูบบุหรี่และหาแนวทางในการกำจัดหรือลดอุปสรรคที่จะเกิดขึ้นได้

วิธีการจัดกิจกรรม ใช้หลักการระดมสมอง (brain storming) และการเรียนรู้แบบมีส่วนร่วม (participatory learning) โดยแบ่งทหารออกเป็น 3 กลุ่มย่อย กลุ่มละประมาณ 20 คน ทำกิจกรรมกลุ่มตามขั้นตอน ดังนี้

1. Experiences

- ผู้วิจัยแจกกระดาษเปล่าให้ทหารคนละ 1 ใบ ตั้งคำถามให้ทหารคิดเพื่อที่จะประเมินตนเอง ได้แก่ ทำไมจึงสูบบุหรี่, ทำไมถึงต้องการบุหรี่ คุณรับรู้ตัวเองอย่างไรในการเป็นคนที่สูบบุหรี่ การสูบบุหรี่มีความหมายกับคุณอย่างไร

- ให้ทหารตอบคำถามแต่ละข้อลงในกระดาษที่แจกให้ จากนั้นให้นำไปติดไว้ที่บอร์ดของแต่ละกลุ่ม ให้ทุกคนไปอ่านของเพื่อนด้วยว่าเหมือนหรือต่างกับตนเองหรือไม่ อย่างไร 2. Ideas reflection and discussion

- ให้กลุ่มช่วยกันระดมสมองคิดถึงข้อดี/ข้อเสียของการสูบบุหรี่ต่อตนเอง ผู้อื่นและปฏิกิริยาของตนเองและคนรอบข้างและเขียนลงในกระดาษปรู๊ฟ

- นำเสนอผลงานกลุ่ม อภิปรายผล

3. Conceptualization

- ผู้แทนกลุ่มสรุปผลงาน ผู้วิจัยสรุปประเด็นในเรื่อง pros of smoking และ cons of smokingและชี้ให้ทหารเกณฑ์ทราบเพื่อการตัดสินใจ

4. Idea application

- รวบรวมข้อมูลในด้านอุปสรรคของการเลิกสูบบุหรี่ นำเสนอให้ทหารช่วยกันลดหรือแก้ไขโดยการอภิปรายกลุ่ม

- กระตุ้นภาพความคิดเชิงบวกในอนาคตของทหารเกณฑ์เมื่อเป็นผู้ที่ไม่สูบบุหรี่ โดยแจกกระดาษคนละ 1 แผ่น ให้ทหารวาดภาพของตนเองและเขียนข้อความประกอบในความรู้สึกที่ตนเลิกบุหรี่ได้และเป็นผู้ที่ไม่สูบบุหรี่ นำไปติดที่บอร์ด

- ผู้วิจัยยกตัวอย่างภาพ สรุปและให้กำลังใจ

เนื้อหา ใบงาน

1. ใบงานการประเมินตนเอง ขอให้ท่านตอบคำถามเหล่านี้ จากความคิดหรือประสบการณ์ของท่านให้มากที่สุด โดยการเขียนคำตอบลงในช่องว่างกำหนดให้ (ไม่ต้องลงชื่อ)

1. ทำไมท่านจึงสูบบุหรี่หรือต้องการบุหรี่.....

2. ท่านมองตัวเองหรือรับรู้ตนเองว่าอย่างไร เมื่อเป็นผู้ที่สูบบุหรี่.....

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3. การสูบบุหรี่มีความหมายอะไรต่อตัวท่าน .....

4. ให้ท่านลองคิดว่าถ้าท่านยังสูบบุหรี่ต่อไป จะมีผลกระทบต่อชีวิตของท่านอย่างไร...

5. ให้ท่านลองจินตนาการว่า ถ้าท่านเลิกสูบบุหรี่ได้ ท่านจะรู้สึกอย่างไรบ้าง ผลต่อตัวเอง บุคคลใกล้ชิดและคนรอบข้าง

2. การระดมสมองเพื่อการตัดสินใจ

<u>ใบงาน</u> ให้ทหารใหม่ช่วยกันคิดว่าถ้าตนเลิกสูบบุหรี่ จะมีผลดี ผลเสียต่อตนเองและผู้อื่นอย่างไรบ้าง แล้วสรุปเป็นตารางลงในกระดาษที่แจกให้กลุ่มละ 1-2 แผ่น

	ผลดีของการเลิกสูบบุหรี่	ผลเสียของการเลิกสูบบุหรี่
1. ต่อตนเอง	……..	……
2. ต่อผู้อื่น	……..	……
3. ปฏิกิริยาต่อตัวเอง	……..	……
4. ปฏิกิริยาของผู้อื่น	……	……

เวลาที่ใช้ 90-100 นาที

สื่อการสอน / อุปกรณ์ - กระดาษ A4 ปากกา บอร์ด กระดาษปรู๊ฟ ปากกาเมจิก สีไม้

- แผ่นพับเรื่องเหตุผลที่คุณควรเลิกสูบบุหรี่เพื่อคนที่คุณรัก
- แผ่นพับเรื่อง 10 คำถามไขข้อข้องใจการสูบบุหรี่เป็นอันตรายจริงหรือ

การประเมินผล

- การมีส่วนร่วมในกิจกรรม ความสนใจและความกระตือรือร้น
- แบบสอบถามวัดความสมดุลของการตัดสินใจเลิกสูบบุหรี่

บทเรียนที่ 4 ความมั่นใจในความสามารถของตนเองที่จะเลิกสูบบุหรี่

กิจกรรมที่ 4.1 เรื่อง การตัดวงจรความอยากบุหรี่และการแก้ปัญหา

ความคิดรวบยอด จากแนวคิด การรับรู้ความสามารถของตนเอง (self- efficacy) ในการปรับเปลี่ยนพฤติกรรมสุขภาพการสร้างความมั่นใจในความสามารถของตนเองที่จะเลิกบุหรี่ได้สามารถใช้วิธีการเรียนรู้จากตัวแบบที่เป็นคำสอน(instruction) จากการกระทำด้วยตนเอง (Mastery

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experience) การใช้คำพูดชักจูง (Verbal persuasion) และการกระตุ้นทางอารมณ์ (Emotional arousal) การรับรู้ความสามารถของตนเองสามารถช่วยปรับเปลี่ยนความพร้อมและแรงจูงใจของทหารเกณฑ์ที่อยู่ในกลุ่ม contemplation stage ไปสู่ preparation and action stage ได้

วัตถุประสงค์ 1. ทหารเกณฑ์สามารถบอกวิธีการเลิกบุหรี่ที่ได้ผลจากประสบการณ์ของตนเองและกลุ่มเพื่อน

2. ทหารเกณฑ์แสดงความมั่นใจว่าตนสามารถที่จะเลิกสูบบุหรี่ได้สำเร็จ

วิธีการจัดกิจกรรม

1. ผู้วิจัยให้ความรู้และอธิบายวิธีการเลิกสูบบุหรี่และการแก้ปัญหาเมื่อเผชิญกับความอยากสูบบุหรี่และอาการขาดนิโคติน

2. เปิดอภิปรายถึงวิธีการเลิกสูบบุหรี่ที่ทหารเคยใช้แล้วได้ผล วิธีการแก้ปัญหาเมื่อเกิดความอยากบุหรี่หรือมีอาการขาดนิโคติน

3. ผู้วิจัยพูดให้กำลังใจและให้ความมั่นใจว่าทุกคนสามารถเลิกบุหรี่ได้ โดยกล่าวถึงตัวแบบที่มีชีวิตซึ่งเคยมาอภิปรายให้ทหารฟัง พร้อมใช้ภาพโปสเตอร์ผู้ป่วยโรคมะเร็งปอด และถุงลมโป่งพองประกอบ แจกเอกสารแผ่นพับ

เนื้อหา

ในแต่ละปีมีคนไทยเลิกสูบบุหรี่ได้กว่า 200,000 คน โดยเฉลี่ยมีคนเลิกสูบบุหรี่วันละ 600 คน ร้อยละ 80 ของคนที่เลิกสูบบุหรี่สามารถเลิกได้ด้วยตนเอง โดยใช้วิธีหยุดสูบอย่างเด็ดขาด มีคนไทยเลิกสูบบุหรี่ได้กว่า 200,000 คนต่อปี การเลิกสูบบุหรี่จะทำให้สุขภาพดีขึ้นและลดอัตราการเสียชีวิตก่อนวัยอันควรลงได้ ถ้ายังไม่เลิกตอนนี้ จะมีคำถามให้คิดว่า ถ้ามวนที่กำลังสูดควันเข้าไปทำให้เป็นมะเร็งจะสูบไหม?, ถ้าลูกอยากสูบเหมือนคุณจะให้เขาเริ่มสูบหรือไม่? ถ้ารอเวลายังไม่เลิกสูบ จะรอจนกว่าจะป่วยหรือ? ท่านเสียเงินกับการซื้อบุหรี่มาเผาไปเท่าไรแล้ว?

ทหารอยากเป็น คนเลิกสูบบุหรี่ประเภทไหน? เลิกเพราะตาย เลิกเพราะป่วย เลิกเพราะคิดได้ว่าไม่มีประโยชน์ต่อตนเองและคนรอบข้าง

อาการที่เกิดขึ้นหลังจากการหยุดสูบบุหรี่

1. ในช่วง 2 ชั่วโมงหลังเลิกสูบบุหรี่ นิโคตินถูกขจัดออกจากกระแสเลือดทั้งหมด ทำให้รู้สึกหงุดหงิด เครียด อาการจะหายไปในระยะเวลา 2-10 วัน ขึ้นอยู่กับระดับการเสพติดของแต่ละคน ส่วนใหญ่จะไม่พบอาการเหล่านี้หลัง 4 สัปดาห์ อาการถอนยาที่เกิดขึ้นในสัปดาห์แรกของการเลิกบุหรี่ ทำให้ผู้ที่เลิกสูบหันกลับไปสูบอีก ดังนั้นถ้ามีความตั้งใจจริงก็จะสามารถผ่านช่วงเวลานี้ไปได้

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2. หลังจากนั้นอีกหลายชั่วโมงต่อมา คาร์บอนมอนอกไซด์ถูกขจัดออกจากร่างกาย ทำให้อาจรู้สึกมึนศีรษะ ง่วงนอน อาการจะหายไปเร็วถ้าได้ออกกำลังกาย ในเวลา 2 วัน ความรู้สึกรับรู้รสและกลิ่นจะดีขึ้นอย่างมาก

3. ในช่วง 3 สัปดาห์หลังเลิกสูบบุหรี่ ปอดจะทำงานได้ดีขึ้นออกกำลังกายได้ดีขึ้น และรู้สึกหายใจโล่งขึ้น

เทคนิคการเลิกสูบบุหรี่

1. ทบทวนเหตุผลที่ตัดสินใจเลิกบุหรี่ แล้วเก็บไว้เป็นข้อเตือนใจ เช่น แม่หรือภรรยาขอร้อง สุขภาพดีขึ้น ลมหายใจและเสื้อผ้าไม่เหม็น มีเงินเก็บมากขึ้น
2. บอกคนรู้ใจ ให้เป็นกำลังใจ หรือชวนเพื่อนให้เลิกสูบด้วยกัน
3. กำหนดวันที่จะลงมือเลิกบุหรี่
4. หักดิบ ทิ้งบุหรี่และอุปกรณ์การสูบบุหรี่
5. ปฏิบัติตัวในช่วงที่หยุดสูบบุหรี่และหลีกเลียงสิ่งกระตุ้นที่ทำให้อยากสูบบุหรี่ โดยควรปฏิบัติดังนี้
    - พยายามอยู่ในที่ห้ามสูบบุหรี่
    - ดื่มน้ำเปล่าวันละ 8-10 แก้ว หรือน้ำผลไม้ให้มากๆ เพื่อขับสารนิโคตินออกจากร่างกาย
    - หลีกเลี่ยงเครื่องดื่มที่ชอบดื่มคู่กับการสูบบุหรี่ เช่น เหล้า เบียร์ กาแฟ
    - หลีกเลี่ยงสิ่งเร้าปาก เช่น ลูกอม หมากฝรั่งเพราะจะทำให้อยากสูบบุหรี่
    - พูดคุยกับเพื่อนหรือผู้ที่สามารถให้กำลังใจเราได้
    - นำปากกา ดินสอมาถือไว้แทนการคีบบุหรี่
    - หลีกเลี่ยงสถานที่ที่เคยสูบเป็นประจำ
    - สูดลมหายใจเข้าออกลึกๆ เพื่อช่วยผ่อนคลายความเครียด
    - ในระหว่างการฝึกในช่วง 3 เดือนแรก ทหารใหม่จะได้ออกกำลังกายโดยการวิ่งเป็นประจำทุกวันอยู่บ้างแล้ว แต่ถ้ามีเวลาว่างในวันหยุดหรือเมื่อประจำการขึ้นกองร้อยแล้ว ควรหาเวลาออกกำลังกายอย่างสม่ำเสมอ เมื่อไม่มีภารกิจ
    - ให้แปรงฟันหลังอาหารแทนการสูบบุหรี่
    - ให้กำลังใจตนเอง อย่ายอมแพ้ต่อความยากลำบาก มุ่งมั่นที่จะเอาชนะอุปสรรคให้ได้

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- อย่าให้มีเวลาว่าง ช่วงที่ท่านกลับบ้านหรือเมื่อประจำการอยู่ตามกองร้อย ควรหาอะไรทำ อย่าให้ว่าง เช่น อ่านหนังสือ เล่นเกม ดูทีวี พูดคุยกับเพื่อน เล่นกีฬา เนื่องจากเมื่อมีเวลาว่าง จะรู้สึกเบื่อและทำให้นึกถึงบุหรี่

เมื่อมีอาการอยากบุหรี่ หรือรู้สึกอยากสูบบุหรี่ ควรปฏิบัติ ดังนี้

- หลีกเลี่ยงจากภาพหรือสถานที่ที่ทำให้อยากสูบ
- ให้คิดถึงเหตุผลที่จะเลิกสูบ บอกตัวเองว่าได้ตั้งใจที่จะไม่สูบบุหรี่แล้วและอ่านความตั้งใจที่เขียนไว้และเขียนเพิ่ม
- อย่าสูบบุหรี่ทันทีที่อยากสูบ ทำอย่างอื่น ยืดเวลา 3- 5 นาที
- ดื่มน้ำหรือล้างหน้าทันที เมื่อรู้สึกหงุดหงิดกระวนกระวาย
- สูดลมหายใจเข้าออกลึก ๆ และช้า ๆ 2-3 ครั้ง
- ทำกิจกรรมอื่น เพื่อเบี่ยงเบนความสนใจ
- ให้ข้อคิดเตือนใจทหารเกณฑ์ในการคิดอยากจะสูบ

เวลาที่ใช้ 60 นาที

สื่อการสอน / อุปกรณ์

- แผนการสอน
- power point การปฏิบัติตนเพื่อเลิกบุหรี่จากมูลนิธิรณรงค์เพื่อการไม่สูบบุหรี่
- เอกสารแผ่นพับ เรื่อง บุหรี่จิ๋วแต่เจ็บป่วย, วันก่อบอกลาบุหรี่, 10 เคล็ดลับเลิกบุหรี่

การประเมินผล ความสนใจ การตั้งใจฟัง การซักถามและการตอบคำถาม

กิจกรรมที่ 4.2 ทักษะการปฏิเสธ

ความคิดรวบยอด การปฏิเสธเป็นทักษะชีวิตที่จำเป็นสำหรับทหารเกณฑ์เพื่อเพิ่มความสามารถและความมั่นใจตนเองที่จะหยุดสูบบุหรี่ได้

วัตถุประสงค์ เพื่อให้ทหารเกณฑ์

1. อธิบายหลักการของการปฏิเสธได้ถูกต้อง
2. มีทักษะในการปฏิเสธการสูบบุหรี่เมื่อถูกเพื่อนหรือบุคคลอื่นชักชวน

วิธีการจัดกิจกรรม ใช้หลักการเรียนรู้แบบมีส่วนร่วม (participatory learning) ดังนี้

1. Experiences and create thought

- ให้ทหารแสดงบทบาทสมมุติ (role playing) ในเรื่องที่ถูกเพื่อนชวนไปดื่มสุราขณะพักอยู่ที่บ้านและช่วงเมาแล้วเพื่อนจะส่งบุหรี่มาให้สูบ
- ผู้วิจัยอธิบายหลักการและขั้นตอนของการปฏิเสธ แจกใบความรู้ให้ทหาร

2. Ideas reflection and discussion

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- แบ่งกลุ่มทหารออกเป็น 6 กลุ่ม แจกใบงาน สถานการณ์ให้กลุ่มละ 1 เรื่อง แล้วให้แต่ละกลุ่ม ร่วมกันบอกคำพูดที่จะใช้ในการปฏิเสธ แล้วเขียนลงบนกระดาษ ผู้วิจัยสุ่มกลุ่มทหารมา 3 กลุ่ม เขียนคำพูดของทั้ง 3 กลุ่มลงบนกระดาษปรู๊ฟ นำอภิปรายให้ทหารฝึกวิเคราะห์ถึงผลที่จะเกิดขึ้นกับตัวเองหลังจากการปฏิเสธ

3. Conceptualization

- ผู้แทนกลุ่มสรุปวิธีการปฏิเสธและข้อคิดที่ได้

4. Idea application

- นำทหารเกณฑ์ที่เล่นบทบาทสมมุติในช่วงแรก มาลองฝึกทักษะ ตามที่กลุ่มลงความเห็นว่าเป็นผลดีเมื่อกล่าวคำปฏิเสธแล้ว

- ให้ทหารช่วยกันสรุปผล ผู้วิจัยสรุปในภาพรวมของกิจกรรม

เนื้อหา

หลักการปฏิเสธ การปฏิเสธเป็นสิทธิส่วนบุคคลที่ควรเคารพสิทธิซึ่งกันและกัน ควรปฏิเสธในสิ่งที่ปฏิบัติแล้วไม่เกิดประโยชน์หรือเกิดผลกระทบในแง่ลบตามมา

การปฏิเสธที่ดี ควรมีลักษณะ 4 ประการ คือ

1. ปฏิเสธอย่างแข็งขันทั้งท่าทาง คำพูดและน้ำเสียง เพื่อแสดงความตั้งใจอย่างชัดเจนที่จะขอปฏิเสธ
2. ใช้ความรู้สึกเป็นข้ออ้างประกอบเหตุผล เพราะการใช้เหตุผลเพียงอย่างเดียวจะถูกโต้แย้งด้วยเหตุผลอื่น การอ้างความรู้สึกจะถูกโต้แย้งได้ยากขึ้น
3. การขอหรือถามความเห็นชอบ จะเป็นการรักษาน้ำใจของอีกฝ่ายและขอบคุณเมื่อผู้ชวนยอมรับการปฏิเสธของเรา
4. เมื่อถูกเซ้าซี้หรือสบประมาท ไม่ควรหวั่นไหวตามคำพูดนั้น ควรยืนยันการปฏิเสธและหาทางออกโดยวิธีต่อไปนี้

4.1 ปฏิเสธซ้ำโดยไม่จำเป็นต้องอ้างเหตุผล แล้วเดินห่างออกจากสถานการณ์

4.2 ใช้วิธีการต่อรอง โดยหาวิธีอื่นที่ดีกว่ามาทดแทน

4.3 การผัดผ่อนโดยขอยืดระยะเวลาออกไปเพื่อให้ผู้ชวนเปลี่ยนความตั้งใจ

ใบงานสถานการณ์ที่ 1 เพื่อนชวนไปดื่มสุรา

พลทหารวินัย ได้รับอนุญาตให้กลับบ้าน หลังจากการฝึกทหารใหม่ มา 2 เดือนกว่า ซึ่งอยู่ในช่วงที่พลฯ วินัยงดสูบบุหรี่ ขณะที่วินัยนอนพักอยู่ที่บ้าน ได้มีนายเอเพื่อนสนิทมาหาที่บ้านแล้วชวน พลฯ วินัยให้ไปสังสรรค์และดื่มเหล้ากับเพื่อนเก่าอีก 3 คน

ให้ทหารใหม่ ช่วยกันอภิปรายกลุ่ม ในประเด็นต่อไปนี้

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1. ถ้าท่านเป็น พลทหาร วินัย ท่านจะทำอย่างไร เพราะอะไร
2. ถ้าพลทหาร วินัย ปฏิเสธเพื่อนจะไม่ไปดื่มเหล้ากับเพื่อน ควรใช้คำพูดอย่างไรเพื่อรักษาสัมพันธภาพกับเพื่อนไว้
3. การปฏิเสธเพื่อนจะมีข้อดี ข้อเสียอย่างไร

ใบงานสถานการณ์ที่ 2 ทหารเกณฑ์รุ่นพี่ชวนให้สูบบุหรี่

พลฯ อ๊อฟ : วันนี้ ที่กองร้อยเรา งานเยอะจัง นะพี่ รู้สึกเหนื่อยและเครียดเหมือนกัน

พล ฯ เต๋า : เอาบุหรี่ไปตัวนึงสิ

พลฯ อ๊อฟ : ไม่เอาดีกว่าพี่ ผมตั้งใจเลิกบุหรี่แล้ว

พล ฯ เต๋า : เอาน่า สูบแล้วจะได้หายเหนื่อย แค่ตัวเดียวเอง ไม่เป็นไรหรอก

พลฯ อ๊อฟ : ขอบคุณครับ ผมเลิกแล้วจริงๆ

พล ฯ เต๋า : เอ็งจะเลิกได้จริงเหรอ ข้าเลิกมาตั้งหลายครั้งแล้ว ไม่ได้ผลซักที สูบแล้วก็ไม่เห็นจะเป็นอะไรเลย

พลฯ อ๊อฟ : ..... จะทำอย่างไรต่อ

เวลาที่ใช้ 45 นาที

สื่อการสอน / อุปกรณ์

- ใบงาน
- กระดาษ ปากกา

การประเมินผล - การมีส่วนร่วมในกิจกรรมกลุ่มและการแลกเปลี่ยนความคิดเห็น
- แบบสอบถามประเมินความสามารถของตนเองในการเลิกสูบบุหรี่

บทเรียนที่ 5 การตั้งเป้าหมายและพัฒนาทักษะการปฏิบัติตัวในการเลิกสูบบุหรี่กิจกรรมที่

5.1 การตั้งเป้าหมาย (Goal Setting) และกิจกรรมคำมั่นสัญญา (Commitment)

ความคิดรวบยอด กระบวนการเปลี่ยนแปลงโดยใช้ self-liberation และ Goal setting สามารถทำให้กลุ่มทหารที่อยู่ในขั้นพร้อมที่จะปฏิบัติ (preparation stage) เคลื่อนไปสู่ระยะปฏิบัติได้ (Action stage) การตั้งเป้าหมายช่วยให้เกิดแรงจูงใจและเพิ่มความมั่นใจในความสามารถของตนเอง (self-efficacy) อันจะนำไปสู่การเปลี่ยนแปลงพฤติกรรม การตั้งเป้าหมายร่วมกันของทหารเกณฑ์จะทำให้เกิดการยอมรับและตกลงใจในการเลิกบุหรี่ร่วมกันได้ (commitment) การใช้กิจกรรมคำมั่นสัญญา และการร่วมในกลุ่มให้กำลังใจซึ่งกันและกัน

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วัตถุประสงค์ เพื่อให้ทหารเกณฑ์สามารถ

1. วางแผนในการตั้งเป้าหมายชีวิตในอนาคตเพื่อนำไปสู่การตัดสินใจเลิกบุหรี่
2. ตั้งเป้าหมายเป็นกลุ่มร่วมกันในการเลิกบุหรี่ได้
3. มีความเห็นพ้องกันในการร่วมลงนามให้คำสัญญาในการเลิกสูบบุหรี่

วิธีดำเนินกิจกรรม

1. การใช้คำพูดชักจูง (Verbal persuasion) โดยเชิญอนุศาสนาจารย์ประจำหน่วยมาพูดโน้มน้าวใจและให้ข้อคิดในการดำรงชีวิต เพื่อให้ทหารเกณฑ์วางแผนและตั้งเป้าหมายชีวิตในอนาคต
2. ให้ทหารเกณฑ์เขียนเป้าหมายในชีวิตที่ อยากทำ หรือ อยากเป็น ในสมุดบันทึกพฤติกรรมเกี่ยวกับบุหรี่ที่แจกให้
3. ขอตัวแทนจากกลุ่มมาเล่าให้เพื่อนฟัง ประมาณ 5 คน
4. ผู้วิจัยสรุปและให้กำลังใจ
5. ผู้วิจัยแนะนำทหารเกณฑ์ในการตั้งเป้าหมายเป็นกลุ่มสำหรับการเลิกสูบบุหรี่ โดยเปิดโอกาสให้พูดคุยและหาคำปฏิญาณร่วมกัน เมื่อทุกคนเห็นด้วยแล้ว ก็จะดำเนินการในกิจกรรมคำมั่นสัญญาต่อ
6. ผู้วิจัยแจกใบสัญญาร่วมใจกันเลิกสูบบุหรี่และให้เซ็นสัญญาร่วมกัน
7. ทหารเกณฑ์ทั้ง 80 นาย ยืนแถวพร้อม จากนั้นผู้แทนของทหารเกณฑ์เป็นคนนำกล่าวปฏิญาณ คำสัญญาในการเลิกสูบบุหรี่ต่อหน้าผู้วิจัย ผู้บังคับบัญชาหรือครูฝึก
8. ผู้ฝึก/ครูฝึกทหารใหม่กล่าวให้กำลังใจทหารเกณฑ์

เนื้อหา - แนวข้อความใบสัญญา (ร่าง) โดยจะรอจากข้อตกลงร่วมกันของทหารเกณฑ์

ตัวอย่าง ใบสัญญาร่วมใจกันเลิกสูบบุหรี่ของทหารเกณฑ์ผลัดที่ 1/52 กรมทหารราบที่ 1 มหาดเล็กรักษาพระองค์

วันที่ ..... เดือน ..... พ.ศ. 2552

ข้าพเจ้า ขอสัญญาว่า ข้าพเจ้าจะตั้งใจ ยึดมั่น ในการปฏิบัติตนเพื่อที่จะเลิกบุหรี่ให้สำเร็จ เพื่อให้ทหารใหม่ผลัดที่ 1 /52 เป็นผลัดแรกที่รวมใจกันเป็นหนึ่งเดียวในการต่อต้านการสูบบุหรี่และร่วมมือ ร่วมใจกันในการเลิกสูบบุหรี่ ทั้งนี้จะส่งผลให้ข้าพเจ้าและเพื่อนทหารด้วยกัน มีสุขภาพอนามัยที่ดี แข็งแรง และเป็นกำลังที่สำคัญของกองทัพบกและประเทศชาติต่อไป

ลงชื่อ .....

.....

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เวลาที่ใช้ 45 นาที

สื่อการสอน / อุปกรณ์ สมุด กระดาษ ปากกาเมจิก ใบสัญญา

การประเมินผล - สังเกตความสนใจและการตั้งใจฟัง

- การมีส่วนร่วมในกิจกรรม

กิจกรรมที่ 5.2 เตรียมตัวอย่างไรให้เลิกบุหรี่

ความคิดรวบยอด การเพิ่มทักษะในการปฏิบัติตนเพื่อเลิกบุหรี่ เมื่อเผชิญกับความอยากบุหรี่หรืออาการขาดนิโคติน เป็นสิ่งจำเป็นที่ผู้ที่กำลังเลิกบุหรี่ในระยะ preparation stage ต้องเรียนรู้ กิจกรรมนี้เน้นการพัฒนาทักษะการแก้ปัญหา (coping skill training) และเมื่อเผชิญกับความเครียด (stress management training)

วัตถุประสงค์ เพื่อให้ทหารเกณฑ์สามารถ

1. มีความรู้และทักษะในการปฏิบัติตัวในระหว่างการงดสูบบุหรี่
2. บอกและอธิบายวิธีการแก้ปัญหาเมื่อเผชิญกับความอยากบุหรี่และความเครียดได้ถูกต้อง
3. ทหารเกณฑ์ฝึกปฏิบัติในการบริหารปอดเพื่อผ่อนคลายความเครียดได้ถูกต้อง

วิธีดำเนินกิจกรรม

1. แบ่งทหารเกณฑ์ออกเป็น 4 กลุ่ม ให้ทหารเขียนถึงการเตรียมตัวเองในการที่จะเลิกบุหรี่ในสมุดที่แจกให้
2. วิทยากรให้ความรู้และสรุปหลักการที่ถูกต้องซึ่งจะนำไปสู่ความสำเร็จในการเลิกบุหรี่
3. ประเมินผลย้อนกลับโดยให้ทหารตรวจสอบดูว่าสิ่งที่เขียนบันทึกไว้ยังขาดการปฏิบัติใดที่สำคัญอีกบ้าง ให้เพิ่มเติมลงในสมุดของตนเอง
4. ให้ทหารเกณฑ์ศึกษาจากคู่มือการเลิกบุหรี่ด้วยตนเอง
5. แจกใบงานเรื่อง สถานการณ์ที่ควรจะหลีกเลี่ยงในขณะเลิกสูบบุหรี่และวิธีการจัดการกับปัญหานั้น ช่วยกันคิด อภิปรายกลุ่มและนำเสนอ
6. ผู้วิจัยและผู้ช่วยวิจัยยกตัวอย่างวิธีการจัดการกับตนเองเมื่อเกิดความอยากสูบบุหรี่
7. ผู้ช่วยวิจัยสาธิตการฝึกการหายใจและบริหารปอดให้กับทหารเกณฑ์ โดยมีขั้นตอนดังนี้

7.1 การเตรียมตัว เลือกสถานที่หรือสิ่งแวดล้อมที่เงียบสงบที่จะไม่ถูกรบกวน

7.2 นั่งในท่าที่สบาย หลับตา

7.3 ผ่อนคลายกล้ามเนื้อทุกส่วนของร่างกาย

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7.4 สูดหายใจเข้ายาวๆลึกๆ ผ่านรูจมูก เมื่อหายใจเข้า หน้าท้องจะพองออกและผ่อนลมหายใจออกช้าๆ เมื่อหายใจออก หน้าท้องจะยุบลงในขณะหายใจทั้งเข้าออก อาจพูด เข้า- ออกไปพร้อมๆ กัน ทำแบบนี้ไปเรื่อยๆ ประมาณ 10 -20 นาที

7.5 นั่งนิ่งๆ สักพัก ลืมตา อย่าลุกยืนทันที

7.6 ให้ทหารเกณฑ์ฝึกปฏิบัติ 10 นาที สอบถามความรู้สึกและกระตุ้นให้นำไปปฏิบัติเวลามีความเครียด

7.7 ผู้วิจัยสรุปกิจกรรม

เนื้อหา

รายละเอียดอยู่ในคู่มือการเลิกบุหรี่ด้วยตนเอง ของ สำนักอนามัยกรุงเทพมหานครหรือของมูลนิธิรณรงค์เพื่อการไม่สูบบุหรี่

เวลาที่ใช้ 60 นาที

สื่อการสอน/ อุปกรณ์
- คู่มือการเลิกบุหรี่ด้วยตนเอง
- สมุดบันทึก
- ใบงาน กระดาษ ปากกา

การประเมินผล
- สมุดบันทึก
- การซักถามและการปฏิบัติในการฝึกผ่อนคลายความเครียด
- แบบสอบถามประเมินพฤติกรรมการเลิกสูบบุหรี่

บทเรียนที่ 6 การควบคุมตนเอง การเสริมแรงและการปรับเปลี่ยนพฤติกรรม

ความคิดรวบยอด การช่วยเหลือให้ทหารเกณฑ์สามารถคงพฤติกรรมการเลิกสูบบุหรี่ในระยะ action stage อยู่ได้และไม่เกิดการ relapse ต้องอาศัยการควบคุมและกำกับตนเอง (self-regulation) การเสริมแรง (reinforcement management) และการทำกิจกรรมอื่นแทนการสูบบุหรี่ (counter conditioning) ตาม กระบวนการเปลี่ยนแปลง (processes of change) โดยแนวคิดของการควบคุมกำกับตนเองตามทฤษฎีปัญญาสังคม ประกอบด้วย กระบวนการสังเกตตนเอง การตัดสินใจและการแสดงปฏิกิริยาต่อตนเองในการให้รางวัลหรือลงโทษตนเอง

วัตถุประสงค์ เพื่อให้ทหารเกณฑ์

1. บอกสิ่งเร้าที่ทำให้ตนอยากสูบบุหรี่ได้จากการบันทึกลงใน ตารางรู้ทันบุหรี่
2. อธิบายวิธีการปฏิบัติตัวเพื่อลดความอยากบุหรี่ได้ถูกต้อง
3. ใช้น้ำยาอดบุหรี่ได้ถูกต้อง
4. ระบุวิธีการให้รางวัลแก่ตนเองเมื่อสามารถงดสูบบุหรี่ได้

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วิธีการจัดกิจกรรม

1. กระบวนการสังเกตตนเอง ให้ทหารเกณฑ์ประเมินตนเองเกี่ยวกับตารางรู้ทันบุหรี่ (Wrap sheet) ในสมุดทุกวัน โดยผู้วิจัยกระตุ้นให้เห็นความสำคัญของการบันทึกตั้งแต่สัปดาห์ที่ 7 ของการฝึกจนถึงสัปดาห์ที่ 12 เพื่อเข้าใจตนเองว่าเวลาใดบ้างที่ตนต้องการบุหรี่ และตัดสินใจเพื่อหลีกเลี่ยงสถานการณ์นั้นและทำสิ่งอื่นทดแทน ผู้วิจัยจะติดตามขอดูบันทึกในสมุดสัปดาห์ที่ 12

2. แนะนำทหารเกณฑ์เมื่อมีความอยากบุหรี่ให้คิดและพูดเตือนใจตนเอง เช่น คิดถึงประโยชน์ของการเลิกสูบทั้งต่อตนเองและผู้อื่นประหยัดเงิน การคิดเรื่องอื่นแทนการนึกถึงบุหรี่ เตือนตัวเองว่า ถ้ากลับไปสูบแม้เพียงมวนเดียว ก็จะต้องหวนกลับไปสู่วงจรเดิมอีก

3. แจกน้ำยาบ้วนปากเพื่อลดอาการอยากบุหรี่ (0.5% Sodium Nitrate) คนละ 1 ขวด และแนะนำวิธีการใช้ว่าน้ำยานี้จะเปลี่ยนแปลงรสชาติของบุหรี่ การใช้ให้อมเหมือนน้ำยาอมบ้วนปากทั่วไป แล้วบ้วนทิ้ง ใช้ทุกครั้งที่รู้สึกอยากบุหรี่ ห้ามใช้เวลามีแผลในปากและห้ามกลืน ไม่ควรใช้ติดต่อกันเป็นระยะเวลานานๆ (2 -3 เดือนขึ้นไป)

4. แบ่งทหารเกณฑ์ออกเป็น 4 กลุ่ม แจกใบงานให้ช่วยกันคิดวิธีการชื่นชมหรือให้รางวัลตนเองเพื่อเป็นแรงจูงใจให้เลิกบุหรี่ได้สำเร็จ เขียนสรุปลงในกระดาษแล้วนำเสนอ เปิดโอกาสให้กลุ่มอภิปราย

5. ผู้วิจัยเพิ่มเติมให้ข้อเสนอแนะวิธีการอื่นๆ เช่น หยอดกระปุกวันละ 50 บาทแทนค่าบุหรี่, ยกย่องชื่นชมตนเองเมื่อสามารถหยุดได้ครั้งละ 3 ชั่วโมง

6. เปิดโอกาสให้ซักถามข้อสงสัยและวิธีปฏิบัติตนทั้งหมดที่แนะนำตั้งแต่บทเรียนแรกๆ และประเมินผลย้อนกลับ

7. ผู้วิจัยสรุปบทเรียนและชี้แจงการปฏิบัติของทหารในช่วงที่ได้กลับไปพักที่บ้าน

เนื้อหา

<u>ตัวอย่าง</u> Wrap sheet (ตารางรู้ทันบุหรี่) เพื่อใช้ในการเฝ้าระวังสถานการณ์ที่มีความอยากบุหรี่ ซึ่งจะนำไปสู่การป้องกันตนเองไม่ให้กลับมาสูบบุหรี่อีก ให้ทหารเกณฑ์บันทึกตั้งแต่ช่วงสัปดาห์ที่ 7 จนถึง สัปดาห์ที่ 12

ขอให้ท่านลงบันทึกความรู้สึกอยากบุหรี่ในแต่ละวัน โดยกาเครื่องหมาย ✓ ลงในช่องที่เป็นความรู้สึกว่าในช่วงเวลาที่มีอารมณ์อย่างไรจึงอยากสูบบุหรี่

วันที่ .....

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เวลาที่อยากสูบ	มีความสุข	ซึมเศร้า	ผ่อนคลาย	เบื่อ	วิตกกังวล	โกรธ	เหนื่อย	รู้สึกสับสน	ความรู้สึกอยาก มาก/ปานกลาง/น้อย	ขณะนั้นท่านกำลังทำอะไร	ผล ไม่สูบ/สูบ
8.00			✓						ปานกลาง	ดื่มกาแฟ	
10.00							✓		มาก	กำลังคุยกับเพื่อนที่สูบ	

หมายเหตุ พยายามบันทึกทุกวัน แต่ถ้าวันใดไม่มีความอยากบุหรี่ก็ไม่ต้องบันทึก

เวลาที่ใช้ 120 นาที

สื่อ/ อุปกรณ์ - สมุดบันทึกของทหารเกณฑ์
- 0.5% Sodium Nitrate
- ใบงาน

การประเมินผล - การเข้าร่วมกิจกรรมและการทำงานกลุ่ม
- การถาม-ตอบ

บทเรียนที่ 7 การให้คำปรึกษาทางโทรศัพท์ ในช่วงเดือนที่ 4 ถึง เดือนที่ 6

ความคิดรวบยอด การให้คำแนะนำปรึกษารายบุคคลทางโทรศัพท์ เป็นการติดตามประเมินผลและให้กำลังใจกับทหารเกณฑ์ รวมทั้งแลกเปลี่ยนความคิดเห็น ให้ข้อเสนอแนะปัญหาและอุปสรรคในระหว่างการเลิกสูบบุหรี่

วัตถุประสงค์ เพื่อให้ทหารเกณฑ์

1. ได้รับแรงสนับสนุนและกำลังใจจากผู้ให้คำปรึกษา
2. ได้รับคำแนะนำในการแก้ปัญหาและอุปสรรคที่เกิดขึ้นในช่วงที่เลิกบุหรี่

วิธีการจัดกิจกรรม

1. ผู้วิจัยสอบถามสถานภาพการสูบบุหรี่ของทหารเกณฑ์และเปิดโอกาสให้พูดคุยซักถามเกี่ยวกับการหยุดสูบบุหรี่และปัญหาที่พบ
2. ผู้วิจัยแนะนำและให้คำปรึกษาตามปัญหาที่พบ
3. ผู้วิจัยให้กำลังใจเพื่อให้สามารถหยุดสูบบุหรี่ต่อไป
4. การโทรศัพท์ติดต่อประมาณ 1-2 ครั้ง/ เดือน หรือผู้ที่มีปัญหาอุปสรรคมากจะติดต่อสัปดาห์ละ 1 ครั้ง การพูดคุยในแต่ละครั้งจะใช้เวลาแตกต่างกัน โดยเฉลี่ย ประมาณ 5-10 นาที

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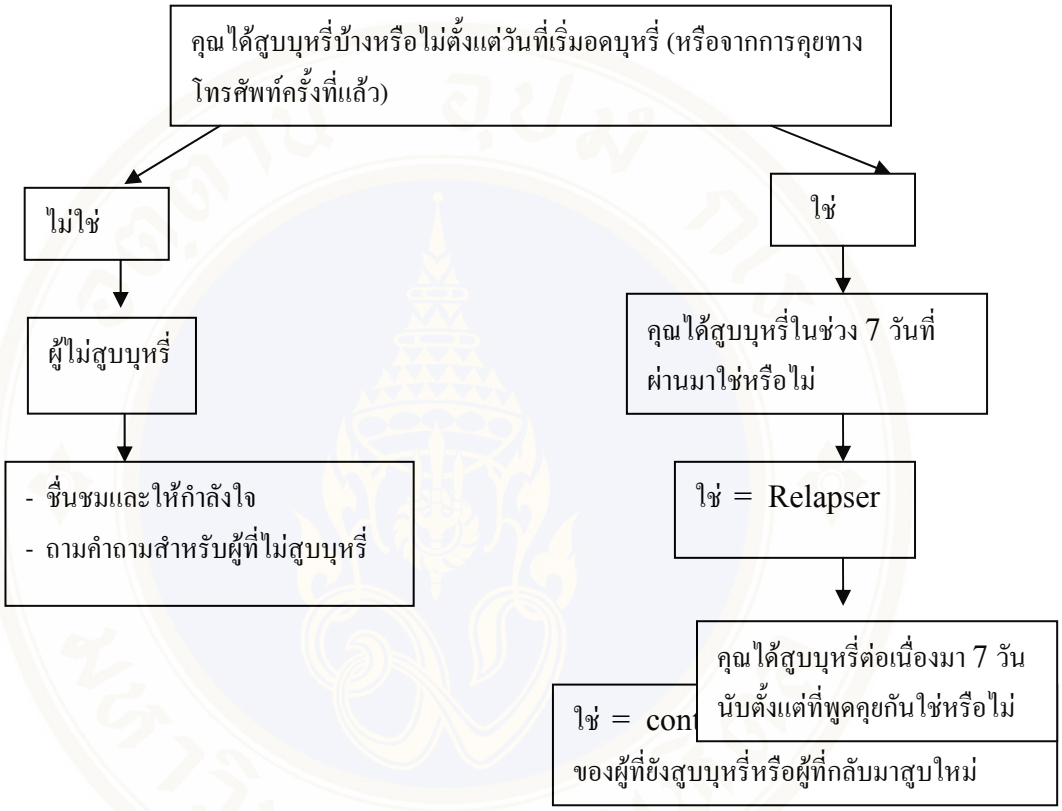
เนื้อหา แบ่งกลุ่มทหารในการให้คำแนะนำปรึกษา ตามการประเมินสถานภาพการสูบบุหรี่ (smoking status)

การให้คำแนะนำปรึกษาทางโทรศัพท์ ในแต่ละครั้ง ผู้วิจัยจะประเมินสถานภาพการสูบบุหรี่ของทหารเกณฑ์หลังจากทหารประจำการตามกองร้อยแล้ว ตามแผนผัง ดังนี้



1. สำหรับทหารเกณฑ์ที่ยังสามารถเลิกสูบบุหรี่ได้

โทรศัพท์ติดตามครั้งที่ 1

วัตถุประสงค์ของการให้คำปรึกษา

- เพื่อช่วยเหลือทหารเกณฑ์ให้สามารถหยุดสูบบุหรี่ได้ต่อไป
- เพื่อสร้างสัมพันธภาพที่ดีและให้ทหารเกณฑ์เกิดความไว้วางใจผู้วิจัย
- กระตุ้นให้แรงจูงใจที่จะหยุดสูบบุหรี่ต่อไป ให้กำลังใจและช่วยเหลือแก้ไขปัญหาอุปสรรคต่างๆ ที่ เกิดขึ้น

กิจกรรม - สอบถามถึงอาการอยากบุหรี่ หรืออาการขาดนิโคติน มีบ้างหรือไม่ มากน้อยเพียงใด ใช้การขจัด ปัญหาอย่างไร

- การปฏิบัติตัวเพื่อจัดการกับปัญหา เช่น การผ่อนคลาย การออกกำลังกาย ได้ปฏิบัติบ้างหรือไม่ ความถี่ของ การปฏิบัติ

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การติดตามในครั้งต่อๆไป

วัตถุประสงค์ของการให้คำปรึกษา

- สร้างแรงจูงใจ (Enhance motivation)
- กระตุ้นความสามารถหรือความมั่นใจของตนเองที่จะเลิกสูบบุหรี่ต่อไป
- วางแผนวิเคราะห์สถานการณ์ที่จะทำให้เกิดการ relapse และช่วยเหลือหากลวิธีป้องกันและจัดการกับปัญหานั้นๆ

2. สำหรับทหารเกณฑ์ที่กลับไปสูบใหม่ (relapse)

วัตถุประสงค์ เพื่อประเมินปัญหาและปัจจัยที่เป็นอุปสรรคของการเลิกสูบบุหรี่และให้กำลังใจในการตั้งต้นใหม่

กิจกรรม สอบถามทหารเกณฑ์ในหัวข้อต่อไปนี้

- คุณกลับไปสูบบุหรี่อีกเมื่อไร หลังจากที่งดสูบตั้งแต่ช่วงที่เข้ามาเป็นทหาร
- ในขณะที่กลับไปสูบบุหรี่นั้น เป็นช่วงเวลาที่อยู่ที่ไหน หรือทำอะไร
- อะไรเป็นสิ่งกระตุ้นให้กลับไปสูบบุหรี่ใหม่ (อารมณ์, การดื่มแอลกอฮอล์, สถานการณ์ในครอบครัว กลุ่มเพื่อน, อาการเครียดจากการขาดนิโคตินหรืออื่นๆ)
- ช่วงที่กลับมาสูบใหม่ สูบกี่มวนต่อวัน เปรียบเทียบกับเมื่อก่อนมากหรือน้อยกว่ากัน
- ตั้งแต่ที่ผู้วิจัยสอบถามในช่วงนี้ได้หยุดสูบและกลับไปสูบใหม่มาแล้วกี่ครั้ง
- มีอาการของการขาดนิโคติน เช่น ปากแห้ง ปวดศีรษะ หงุดหงิด กระสับกระส่าย นอนไม่หลับหรืออาการอื่นๆบ้างหรือไม่ มีมากน้อยเพียงใด

สื่อ/ อุปกรณ์ โทรศัพท์ กระดาษ ปากกา

การประเมินผล การซักถามและการให้ข้อมูลย้อนกลับ

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APPENDIX B
THE RESULTS OF THE PRELIMINARY STUDY

The researcher did a preliminary study in 2008 aimed to explore the determinants, behaviors and experiences related to smoking and smoking cessation among the conscripts and investigate the organizational structure, the culture of the soldiers, the policy and activities related to smoking and health of the 1 st infantry regiment,King's Royal Guard and the three battalions in Bangkok. The results guide the ways to develop smoking cessation program. The data were collected from qualitative and quantitative methods. Focus group discussions were done to collect the data from the conscripts of the first infantry regiment, King's Royal Guard section 1/50 and section 2/ 50, the 1st Infantry Battalion section 2/50 , the 3 rd Infantry Battalion section 2/49 and 1/50 , the 4th Infantry Battalion section 2/50. Interviewing technique was used to collect the data from the commanders, staff officers, training officers and health care providers from the 1st infantry regiment and the three battalions. The questionnaire was used to collect the data about stages of change, cigarette consumption, smoking behavior, cause of smoking, and the reason to quit.

The results from quantitative data among 150 conscripts of the 1st infantry regiment revealed that majority of them (75%) were ever smokers and 67.3% were current smokers. Most of them (68.4%) were daily smokers. The current smokers did not smoke after entering the military because of ban on smoking (49.3%). Most of them started smoking at 15 years old (26.3%), followed by 17 years old (14%). The youngest and the oldest to start smoking were 9 and 19 years old, respectively. They had an average duration of smoking for 5.53 years. Most of them started smoking because they wanted to try (36.8%). The average number of cigarettes smoked per day was 14.05 cigarettes.The highest and the lowest number of cigarettes smoked per day were 40 cigarettes and 2 cigarettes, respectively. They had ever tried to quit more than three times (45.07%). The average time for remain abstinent was one to two months (49.99%).They had the reason to quit because the families asked for quitting followed

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by concerning about health problems and economics. Most smokers used multiple combining methods ,e.g., cold-turkey, exercise and chewing gum or keep sweets nearby (46.0%), reduced number of cigarettes smoked per day (24%), and cold-turkey only (11%). Most conscripts gave the reasons why they failed quitting in the past because they felt craving when they saw someone smoking. They lived or contacted with many smokers, especially their closed friends.

The result about stages of change demonstrated that 9.2% of them had never thought to quit smoking. Some conscripts thought to quit, but they did not plan the time to quit (57.1%). Some had a plan to quit in the next year.(6.1 %), others thought to quit in the next six month (2.0%), and the next one month (25.5%). Therefore, when considering to stages of change, most conscripts were in the precontemplation stage (72.4%), followed by preparation stage (25.5%), nd contemplation stage (2.0%). Hence, the result showed that most conscripts were not ready to quit smoking.

The result from focus groups discussion among the conscripts of one regiment and the three battalions who were current smokers or former smokers revealed that they had similar characteristics of socio-demographic data. Their ages were between 21-23 years old. Most of them were single and had finished in high school. They are trained in basic military training for 2 ½ months, after that they were allowed to go back home for ten days, they returned to smoke because they joined to drink alcohol with friends in their hometown. During trained in the military, they were under the enforcement of ban on smoking for three months, most conscripts could follow the rule, but there were some conscripts who felt craving had to hide smoking from the training officers. The barriers to quit smoking in the military were cravings when they saw someone smoking, getting stress from basic training, and missing their families. The methods to help them quit were providing health education about the harmful effect of smoking, increasing skill for cessation and promoting them to do exercise regularly.

The results from the interviews among the commanders and staff officers of the 1st infantry regiment and the three battalions in January 2008 revealed that every military area had rule or regulation of ban on smoking for the conscripts during basic military training in three months. The training officers announced this rule to the

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conscripts when they entered the military. The regiment had a strictly enforcement, and there was punishment for the conscripts who did not follow the rule. Some battalion had the Main PX and Small Shop selling cigarette in the military that the conscripts could buy cigarettes easily. The smoke free workplace and smoking areas was not set in all military buildings. There were a few activities or campaigns for tobacco control in the military. Health care providers in the primary health care unit who had to cure and care of soldiers' health did not have the existing role for anti-smoking activities. In addition, the army officers including the commanders still smoke, therefore, the social environment in the military consisted of people who smoked that lead to the perception of social influence to smoking.

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APPENDIX C

RESEARCH INSTRUMENT (ENGLISH VERSION)

1. Stages of Change : An algorithm for assessing stage of readiness for smoking cessation

Are you currently a smoker?

Yes, I currently smoke
No, I quit within the last 6 months (action stage)
No, I quit more than 6 months ago (maintenance stage)
No, I have never smoked (nonsmoker)

For smokers only:

In the last year, how many times have you quit smoking for at least 24 hours?
Are you seriously thinking of quitting smoking?
1) Yes, within the next 30 days (preparation stage if they have one 24-hour quit attempt in the past year, refer to previous question. If no quit attempt, then contemplation stage.
2) Yes, within the next 6 months (contemplation stage)
3) No, not thinking of quitting (precontemplation stage)
From J Consult Clin PsychoI" and Cancer Prevention Research Center73 Available online at http://www.uri.edu/research/ cprc/Measures/ Smoking11.htm

2. The decisional balance scale

The following statements represent different opinions about smoking. Please rate how important each statement is to your decision to smoke according to the following 5-point scale: 1 = Not important; 2 = Slightly important; 3 = Moderately important; 4 = Very important; 5 = Extremely important

1. Smoking cigarettes is pleasurable.
2. My smoking affects the health of others,
3. I like the image of a cigarette smoker.
4. Others close to me would suffer if I became ill from smoking.
*5 I am relaxed and therefore more pleasant when smoking.
6. Because I continue to smoke, some people I know think I lack the character to quit.
7. If I try to stop smoking I'll be irritable and a pain to be around.
8. Smoking cigarettes is hazardous to my health.
9. My family and friends like me better when I am happily smoking than when I am miserably trying to quit.
*l0. I'm embarrassed to have to smoke.
11 I like myself better when I smoke.
*12. My cigarette smoking bothers other people.
*13. Smoking helps me concentrate and do better work.
*14. People think I'm foolish for ignoring the warnings about cigarette smoking.
*15. Smoking cigarettes relieves tension.
16. People close to me disapprove of my smoking.

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17. By continuing to smoke I feel I am making my own decisions.
18. I'm foolish to ignore the warnings about cigarettes.
19. After not smoking for a while a cigarette makes me feel great.
20. I would be more energetic right now if I didn't smoke.

Scoring

Pros 1,3,5,7,9,11,13,15,17,19 (odd numbers)

Cons 2,4,6,8,10,12,14,16,18,20 (even numbers)

Reprinted with permission from J Pers Sot Psychol.13 Available online at http://www.uri.edu/research/cprc/Measures/SmokingO7.htm.

3. Smoking: self-efficacy/temptation

Listed below are situations that lead some people to smoke. We would like to know how tempted you may be to smoke in each situation. Please answer the following questions using the following 5-point scale: (1 = Not at all tempted; 2 = Not very; 3 = Moderately; 4 = Very; 5 = Extremely tempted)

How tempted are you to smoke	Not at all	Not very	Moderately	Very	Extremely
1. At a bar or pub having a drink					
2. When I am desiring a cigarette					
3. When things are just not going the way I want and I am frustrated					
4. With my spouse or close friend who is smoking					
5. When there are arguments and conflicts with my family					
6. When I am happy and celebrating					
7. When I am very angry about something or someone					
8.When I would experience an emotional crisis, such as an accident or death in the family					
9.When I see someone smoking and enjoy it					
10. Over coffee while talking and relaxing					
11. When I realize that quitting smoking is an extremely difficult task for me					
12. When I am craving a cigarette					
13. When I first get up in the morning					
14. When I feel I need a lift					
15.When I begin to let down on my concern about my health and am less physically active					
How tempted are you to smoke	Not at all	Not very	Moderately	Very	Extremely

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16. With friends at a party					
17. When I wake up in the morning and face a tough day					
18. When I am extremely depressed					
19. When I am extremely anxious and stressed					
20. When I realize I haven't smoked for a while					

Scoring Instructions : The Self-efficacy/ Temptations Scale (Long Form) provides a measure of confidence in resisting smoking in situations represented by the items . An overall score is computed by averaging across the 20 items. In addition, there are three subscales that measure broad aspects of self-efficacy to resist smoking

Positive affect/social situation = items 1, 4, 6,9,10,and 16
Negative affect situations = items 3, 5, 7,8,17, 18,and 19
Habitual/craving situation = items 2, 11,12,13,14,15,and 20

Subscale scores are obtained by averaging the responses to items within each subscale
Reprinted with permission from Velicer WF, DiClemente CC, Rossi JS, et al. Addictive Behav 1990;15:271-83, and Cancer Prevention Research Center, University of Rhode Island.
Available online from http://www.uri.edu/research/cprc/Measures/Smoking02.htm.

4. Social Support : Mother or partner support

Partner Interaction Questionnaire (PIQ)

Part I Please answer with respect to how you expect that person will interact with you ,pick the person who will follow your progress in quitting most closely.

1. Whom are you thinking of?
   □ spouse/partner □ parent □ sibling □ friend
2. Does the person you are thinking of smoke? □ No □ Yes
3. Are they also trying to quit smoking ? □ No □ Yes

Part II For the following questions, think of the person you identified in Part I , please answer the items using the scale below :

Never	Almost Never	Sometimes	Fairly Often	Very Often
0	1	2	3	4

During I'm quitting ,how often will……do each of the following?	**Never**	**Almost never**	**sometimes**	**Fairly Often**	**Very Often**
1. Compliment you on not smoking	0	1	2	3	4
2. Comment that smoking is a dirty habit	0	1	2	3	4
3. Talk you out of smoking a cigarette	0	1	2	3	4
4. Comment on your lack of willpower	0	1	2	3	4
5. Comment that the house smells of smoke	0	1	2	3	4
6. Refuse to let you smoke in the house	0	1	2	3	4
7.Congratulate you for your decision to quit smoking	0	1	2	3	4
8. Help you think of substitutes for smoking	0	1	2	3	4
9. Mention being bothered by smoke	0	1	2	3	4
10. Celebrate your quitting with you	0	1	2	3	4

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11. Criticize your smoking	0	1	2	3	4
12. Express doubt about your ability to quit/stay quit	0	1	2	3	4
13. Refuse to clean up your cigarette butts.	0	1	2	3	4
14. Help to calm you down when you are feeling stressed or irritable	0	1	2	3	4
15. Tell you to stick with it	0	1	2	3	4
16. Express confidence in your ability to quit /remain quit	0	1	2	3	4
17. Help you to use substitutes for cigarettes	0	1	2	3	4
18. Express pleasure at your efforts to quit	0	1	2	3	4
19. Participate in an activity with you that keeps you from smoking (e.g., going for a walk in stead of smoking)	0	1	2	3	4
20. Ask you to quit smoking	0	1	2	3	4

Scoring Instructions : The PIQ yields two subscale scores : Negative Behaviors and Positive Behaviors .The Negative Behavior subscale is composed of items 2,3,4,5,6,9,11,12,13,and 20,while and the positive behavior subscale is composed of items 1,7,8,10,14,15,16,17,18,and 19. For each subscale, responses are summed to provide a total subscale score.

Note : From Mermelstein, R., Cohen, S., Lichtenstein, E., Baer, J. S., & Kamarck, T. (1986). Social support and smoking cessation and maintenance. Journal of Consulting and Clinical Psychology, 54, 447-453.

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5. The Fagerstrom test for nicotine dependence

Question	Answer	Score
1. How soon after you wake up do you smoke your first cigarette?	Within 5 min	3
	6-30 min	2
	31-60 min	1
	After 60 min	0
2. Do you find it difficult to refrain from smoking in places where it is forbidden to smoke (e.g, church, at the library, in cinema)?	Yes	1
	No	0
3. Which cigarette would you hate most to give up?	The first thing in the morning	1
	All others	0
4. How many cigarettes do you smoke?	10 or less	0
	11-20	1
	21-31	2
	31 or more	3
5. Do you smoke more frequently during the first hours after waking than during the rest of the day?	Yes	1
	No	0
6. Do you smoke if you are so ill that you are in bed most of the day?	Yes	1
	No	0

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APPENDIX D
RESEARCH INSTRUMENT (THAI VERSION)

เลขที่ .....

แบบสอบถามสำหรับงานวิจัยเรื่อง

การประยุกต์แบบจำลองเชิงนิเวศสำหรับการปรับเปลี่ยนพฤติกรรม

การสูบบุหรี่ในทหารเกณฑ์ กองทัพบกไทย

โดย

พรรณี ปานเทวัญ

นักศึกษาหลักสูตรปริญญาสาธารณสุขศาสตรดุษฎีบัณฑิต (นานาชาติ)

สาขาวิชาสุขศึกษาและพฤติกรรมศาสตร์ คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล

คำชี้แจงก่อนตอบแบบสอบถาม (โปรดอ่านให้เข้าใจก่อนตอบแบบสอบถาม)

1. แบบสอบถามฉบับนี้มีจำนวน 10 หน้า (รวมทั้งปกหน้า) แบ่งเป็น 7 ส่วน ดังนี้

ส่วนที่ 1 ข้อมูลทั่วไปและพฤติกรรมการสูบบุหรี่

ส่วนที่ 2 ความพร้อมและขั้นตอนการเปลี่ยนแปลงพฤติกรรม

ส่วนที่ 3 การรับรู้ความสมดุลในการตัดสินใจเลิกสูบบุหรี่

ส่วนที่ 4 การรับรู้ความสามารถของตนเองในการควบคุมการสูบบุหรี่

ส่วนที่ 5 การรับรู้แรงสนับสนุนทางสังคมในการเลิกสูบบุหรี่

ส่วนที่ 6 พฤติกรรมการเลิกสูบบุหรี่

ส่วนที่ 7 การวัดระดับการติดสารนิโคตินในบุหรี่

2. แบบสอบถามในการวิจัยนี้ ใช้เพื่อทำวิทยานิพนธ์ของนักศึกษาระดับปริญญาเอก สาขาสุขศึกษาและพฤติกรรมศาสตร์ คณะสาธารณสุขศาสตร์ มหาวิทยาลัยมหิดล คำตอบที่ได้จากท่าน ผู้วิจัยจะเก็บเป็นความลับและยืนยันว่าจะไม่มีผลกระทบต่อตัวผู้ตอบ โดยขอนำเสนอข้อมูลในภาพรวมเพื่อเป็นประโยชน์ในการวางแผนและการจัดโปรแกรมสุขศึกษาเพื่อการเลิกสูบบุหรี่ที่ถูกต้องสำหรับทหารเกณฑ์ต่อไป ผู้วิจัยขอขอบคุณทุกท่านที่มีส่วนร่วมในโครงการวิจัยนี้

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ส่วนที่ 1 ข้อมูลทั่วไป

<u>คำชี้แจง</u> โปรดเติมเครื่องหมาย ✓ ในช่องว่าง ☐ ที่ตรงกับความเป็นจริงเกี่ยวกับตัวท่านมากที่สุดหรือเติมข้อความลงในช่องว่างให้สมบูรณ์

1. ขณะนี้ท่านมีอายุ …….. .....ปี..... เดือน
2. ภูมิลำเนาเดิมจังหวัด.....ท่านอาศัยอยู่กับ……..
   ที่อยู่ปัจจุบันที่ติดต่อได้ ……
   เบอร์โทรศัพท์ที่บ้านหรือมือถือ.....
3. จบระดับการศึกษาสูงสุด
   - ☐ ไม่ได้เรียนหนังสือ
   - ☐ ประถมศึกษา
   - ☐ มัธยมศึกษาตอนต้น
   - ☐ มัธยมศึกษาตอนปลาย
   - ☐ ประกาศนียบัตร (ปวช/ ปวส)
   - ☐ ปริญญาตรี
   - ☐ สูงกว่าปริญญาตรี
4. สถานภาพสมรส ☐ โสด ☐ คู่ (อยู่ด้วยกัน) ☐ คู่ (แยกกันอยู่) ☐ ม่าย, หย่า

   สำหรับผู้สมรสแล้ว มีบุตรจำนวน ..... คน อายุ .....ปี
5. อาชีพของท่านก่อนเข้ามาเป็นทหารเกณฑ์
   - ☐ เรียนหนังสือ ☐ ว่างงาน ☐ เกษตรกรรม(ทำนา/ทำไร่)
   - ☐ ค้าขาย/ ธุรกิจส่วนตัว ☐ รับจ้าง ☐ รับราชการ/ รัฐวิสาหกิจ
   - ☐ อื่นๆ โปรดระบุ.....
6. ถ้าท่านประกอบอาชีพ รายได้ของท่านก่อนเข้ามาเป็นทหารโดยเฉลี่ย..... บาทต่อเดือน

   เพียงพอใช้จ่ายหรือไม่ ☐ เพียงพอ ☐ ไม่เพียงพอ
7. ท่านมีโรคประจำตัวอะไรหรือไม่
   - ☐ ไม่มี
   - ☐ มี ระบุ.....
8. ประวัติการดื่มสุรา
   - ☐ ไม่ดื่มหรือเคยดื่มแต่เลิกแล้ว
   - ☐ ดื่มเป็นประจำอย่างน้อยสัปดาห์ละ 1 ครั้ง
   - ☐ ดื่มเป็นครั้งคราว อย่างน้อยเดือนละ 1 ครั้ง
   - ☐ ดื่มนาน ๆ ครั้ง
9. ในบ้านของท่าน มีผู้สูบบุหรี่หรือไม่
   - ☐ ไม่มี
   - ☐ มี ระบุความสัมพันธ์กับตัวท่าน.....

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พฤติกรรมการสูบบุหรี่ (ตั้งแต่ก่อนเข้ามาเป็นทหาร)

10. ท่านเริ่มสูบบุหรี่มาตั้งแต่อายุ.....ปี สูบมานาน.....ปี
11. ท่านสูบบุหรี่จนถึงขั้นติดบุหรี่มานาน ..... ปี ..... เดือน
12. สาเหตุที่ทำให้ท่านสูบบุหรี่ (ทำเครื่องหมาย ✓ ลงในช่องว่างตามความคิดเห็นของท่าน)

เหตุจูงใจที่ทำให้ท่านสูบบุหรี่	สำคัญมากที่สุด	สำคัญมาก	สำคัญปานกลาง	สำคัญน้อย	ไม่สำคัญ
1. ทำให้คลายเครียดได้					
2. อยากทดลองสูบ					
3. ทำให้รู้สึกเท่ห์					
4 สร้างความมั่นใจในการเข้าสังคม					
5. ทำตามอย่างบุคคลในครอบครัว เช่น พ่อ พี่ชาย					
6. เพื่อนชวน, ตามเพื่อน					
7. เพื่อให้เป็นที่ยอมรับของสังคม					
8. สูบด้วยเหตุจูงใจอื่น โปรดระบุ……					

13. ความถี่ในการสูบบุหรี่ ☐ สูบทุกวัน ☐ สูบเป็นบางวัน ระบุ.....วัน/สัปดาห์
14. โดยเฉลี่ยแล้วท่านสูบบุหรี่.....มวน/ วัน
15. ชนิดของบุหรี่ที่สูบ (ตอบได้มากกว่า 1 ข้อ) ☐ ก้นกรอง ☐ ธรรมดาไม่มีก้นกรอง
☐ ยาเส้น ☐ อื่นๆ ระบุ.....
16. ปกติ ท่านมักสูบบุหรี่เวลาใด (ตอบได้มากกว่า 1 ข้อ)
☐ หลังตื่นนอน ตอนเช้า ☐ ก่อนเข้านอน
☐ หลังรับประทานอาหาร ☐ ขณะดื่มกาแฟ
☐ เมื่อเครียด ☐ ขณะดื่มสุรา
☐ เวลาเข้าห้องน้ำหรือสุขา ☐ ขณะทำงาน
☐ อื่นๆ โปรดระบุ.....
17. ลักษณะการสูบบุหรี่ของท่านเป็นอย่างไร
☐ สูบแบบอัดเข้าปอด ☐ สูบแล้วพ่นควันออก ☐ ทั้งสองแบบ
18. ในช่วง 1 ปีที่ผ่านมา ท่านเคยพยายามที่จะเลิกสูบบุหรี่มาบ้างหรือไม่
☐ ไม่เคย **(ข้ามไปตอบข้อ 22)**
☐ เคยพยายามเลิก จำนวน .....ครั้ง และเคยเลิกสูบบุหรี่ได้นานที่สุด.....ปี
หรือ…….. เดือน……..วัน **(ตอบข้อ 19-21 ต่อ)**

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(สำหรับผู้ที่พยายามเลิกสูบมาก่อน)

19. เหตุจูงใจที่ทำให้ท่านคิดที่จะเลิกสูบบุหรี่ (ทำเครื่องหมาย ✓ ลงในช่องว่างตามความคิดเห็นของท่าน)

เหตุจูงใจที่ทำให้ท่านคิดที่จะเลิกสูบบุหรี่	สำคัญมากที่สุด	สำคัญมาก	สำคัญปานกลาง	สำคัญน้อย	ไม่สำคัญ
1. กลัวอันตรายและโรคที่เกิดจากการสูบบุหรี่					
2 ครอบครัวบุคคลใกล้ชิดขอร้องให้เลิกสูบ					
3. มีปัญหาสุขภาพ					
4. สิ้นเปลือง เสียเงินค่าใช้จ่าย					
5. มีการรณรงค์จากสังคมมาก จึงอยากจะเลิกเหมือนคนอื่นๆ					
6. อื่นๆ โปรดระบุ…….....					

20. วิธีที่ใช้ในการพยายามเลิกสูบบุหรี่ (ตอบได้มากกว่า 1 ข้อ)

- ☐ หลีกเลี่ยงสถานการณ์ที่ทำให้ต้องสูบบุหรี่หรือมีผู้สูบบุหรี่
- ☐ ค่อยๆ ลดจำนวนการสูบบุหรี่ลง
- ☐ หักดิบหรือหยุดการสูบเลย
- ☐ ออกกำลังกาย
- ☐ อมลูกอมหรือเคี้ยวหมากฝรั่ง
- ☐ อื่นๆ โปรดระบุ…….....

21. สาเหตุที่กลับมาสูบบุหรี่อีก (ทำเครื่องหมาย ✓ ลงในช่องว่างตามความคิดเห็นของท่าน)

สาเหตุที่กลับมาสูบบุหรี่อีก	สำคัญมากที่สุด	สำคัญมาก	สำคัญปานกลาง	สำคัญน้อย	ไม่สำคัญ
1. ไปดื่มสุรากับเพื่อน					
2. เห็นคนอื่นสูบแล้วอยากสูบ					
3. เครียด/ เบื่อ/ เหงา					
4. ไม่มีกำลังใจ					
5. คิดว่าบุหรี่ไม่ทำให้เกิดโรคร้ายกับตนเอง					
6. ไม่อยากเลิก					
7. อื่นๆ โปรดระบุ.....					

22. ขณะฝึกทหารใหม่ ท่านสูบบุหรี่บ้างหรือไม่

- ☐ ไม่ได้สูบเลย
- ☐ สูบเป็นครั้งคราว
- ☐ สูบทุกวัน

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ส่วนที่ 2 ความพร้อมและขั้นตอนการเปลี่ยนแปลงพฤติกรรม

ขั้นตอนการเปลี่ยนแปลงพฤติกรรม

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงในช่อง □ หน้าข้อความที่ตรงกับการปฏิบัติหรือความคิดเห็นของท่าน เพียงคำตอบเดียว

1. ปัจจุบันท่านสูบบุหรี่ใช่หรือไม่

   □ ใช่ ปัจจุบันฉันสูบบุหรี่ (ให้ตอบข้อ 2 ต่อ)

   □ ไม่ใช่ ฉันหยุดสูบบุหรี่มาแล้ว แต่ยังไม่ถึง 6 เดือน

   □ ไม่ใช่ ฉันหยุดสูบบุหรี่มาแล้ว นานมากกว่า 6 เดือน

2. สำหรับผู้ที่ตอบว่า **ใช่** (กรุณาเลือกตอบให้ตรงกับความเป็นจริงหรือความคิดเห็นของท่าน โดยไม่ต้องคำนึงถึงกฎการห้ามสูบบุหรี่ในขณะฝึก)

   ท่านมีความตั้งใจจริงที่จะเลิกบุหรี่หรือไม่

   □ ใช่ ฉันคิดที่จะเลิกสูบบุหรี่ใน 1 เดือนข้างหน้า และหรือในช่วง 1 ปีที่ผ่านมา ฉันเคยหยุดสูบบุหรี่มาอย่างน้อย 24 ชม.

   □ ใช่ ฉันคิดที่จะเลิกสูบบุหรี่ใน 1 เดือนข้างหน้าและในช่วง 1 ปีที่ผ่านมายังไม่เคยหยุดการสูบบุหรี่เลย

   □ ใช่ ฉันคิดที่จะเลิกสูบบุหรี่ใน 6 เดือนข้างหน้า

   □ ไม่ใช่ ฉันยังไม่เคยคิดที่จะเลิกสูบบุหรี่เลย

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ส่วนที่ 3 การรับรู้ความสมดุลในการตัดสินใจเลิกสูบบุหรี่ (ผลดี/ผลเสียของการสูบบุหรี่)

คำชี้แจง ข้อความที่เกี่ยวข้องกับการสูบบุหรี่ต่อไปนี้ มีความสำคัญต่อท่านมากน้อยเพียงใด โปรดทำเครื่องหมาย ✓ ลงในช่องที่ตรงกับระดับความสำคัญตามความคิดเห็นของท่านจากข้อความที่กำหนดให้

ข้อความ	สำคัญมากที่สุด	สำคัญมาก	สำคัญปานกลาง	สำคัญน้อย	ไม่สำคัญ
1. การสูบบุหรี่ทำให้เกิดความพึงพอใจ					
2. ฉันชอบมาดของคนที่สูบบุหรี่					
3. ฉันรู้สึกผ่อนคลายเมื่อได้สูบบุหรี่					
4. ถ้าฉันพยายามหยุดสูบบุหรี่ จะทำให้ฉันหงุดหงิด กระวนกระวายและรู้สึกไม่สบาย					
5. ครอบครัวและเพื่อนของฉันพอใจที่เห็นฉันสูบบุหรี่มากกว่าเห็นฉันทุกข์ทรมานจากการเลิกสูบบุหรี่					
6. ฉันรู้สึกดีขึ้นเมื่อฉันสูบบุหรี่					
7. การสูบบุหรี่ทำให้ฉันหายเหนื่อยจากการฝึกหรือการทำงานในหน่วย					
8. การสูบบุหรี่ช่วยลดความเครียด					
9. การสูบบุหรี่ทำให้สมองปลอดโปร่งสามารถคิดแก้ปัญหาได้					
10. การสูบบุหรี่ทำให้ฉันมีเพื่อนมาก					
11 การสูบบุหรี่ของฉัน มีผลกระทบต่อสุขภาพของคนอื่น .					
12. บุคคลใกล้ชิดของฉัน จะรู้สึกทุกข์ใจถ้าฉันป่วยจากการสูบบุหรี่					
13. คนที่รู้จักฉันไม่คิดว่าฉันจะเลิกสูบบุหรี่ได้					
14. การสูบบุหรี่เป็นอันตรายต่อสุขภาพของฉัน					
15. ฉันรู้สึกละอายใจที่สูบบุหรี่					
16. การสูบบุหรี่ของฉันรบกวนผู้อื่น					
17. ครอบครัวหรือคนใกล้ชิด บ่นว่าเมื่อเห็นฉันสูบบุหรี่					
18. การสูบบุหรี่ของฉันทำให้คนใกล้ชิดไม่พึงพอใจ					
19. ฉันไม่ฉลาดเลยที่เพิกเฉยต่อคำเตือนเรื่องพิษภัยของการสูบบุหรี่					
20. ร่างกายของฉันจะแข็งแรงขึ้นถ้าฉันไม่สูบบุหรี่					

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ส่วนที่ 4 การรับรู้ความสามารถของตนเองในการควบคุมการสูบบุหรี่

คำชี้แจง ท่านมีความ**มั่นใจเพียงใดที่จะไม่สูบบุหรี่** เมื่ออยู่ในสถานการณ์ที่กระตุ้นให้อยากสูบบุหรี่ กรุณาใส่ เครื่องหมายถูก (✓) ลงในช่องที่ตรงกับความ เป็นจริงของตัวท่าน

ความมั่นใจที่จะควบคุมตนเองไม่ให้สูบบุหรี่ในสถานการณ์ต่อไปนี้	มั่นใจมากที่สุด	มั่นใจมาก	มั่นใจปานกลาง	มั่นใจน้อย	ไม่มั่นใจ
1. เวลาที่ฉันไปดื่มสุรา					
2. เมื่อฉันมีความต้องการสูบบุหรี่					
3. เมื่อรู้สึกคับข้องใจที่บางสิ่งบางอย่างไม่เป็นไปตามที่ฉันต้องการ					
4. เมื่ออยู่กับผู้ที่สูบบุหรี่					
5. เมื่อมีการโต้เถียงหรือขัดแย้งกับเพื่อนทหารเกณฑ์					
6. เมื่อมีการฉลองในงานเลี้ยง					
7. เมื่อรู้สึกไม่พอใจกับการฝึกและหรือการปฏิบัติงานในหน่วย					
8. เมื่อถูกผู้บังคับบัญชาว่ากล่าวหรือทำโทษ					
9. เมื่อเห็นผู้อื่นสูบบุหรี่อย่างมีความสุข					
10. ระหว่างการพูดคุยในกลุ่มเพื่อนที่สูบบุหรี่					
11. เมื่อฉันได้กลับไปพักที่บ้าน					
12. เมื่อมีปัญหายุ่งยากใจต้องแก้ไข					
13. เมื่อตื่นนอนในตอนเช้า					
14. เมื่อฉันมีเวลาว่าง					
15. เมื่อฉันอยู่ในระหว่างเข้าเวรยาม					
16. เมื่อฉันอยู่กับเพื่อนในงานเลี้ยงสังสรรค์					
17. เมื่อฉันปฏิบัติงานพัฒนาหน่วย					
18. เมื่อฉันรู้สึกคิดถึงครอบครัว ภรรยาหรือคู่รัก					
19. เมื่อฉันมีความวิตกกังวลหรือมีความเครียด					
20. เมื่อรู้สึกว่าไม่ได้สูบบุหรี่มาระยะหนึ่งแล้ว					

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ส่วนที่ 5 แบบประเมินการได้รับแรงสนับสนุนทางสังคมจากครอบครัว/ คู่สมรส

<u>ตอนที่ 1</u> กรุณาเขียนเครื่องหมาย ✓ ลงในช่องว่างที่เป็นความจริงและตรงกับความคิดเห็นของท่าน

1. ใครมีความสำคัญกับตัวท่านในการเลิกบุหรี่

   ☐ ภรรยา / คู่รัก ☐ มารดา ☐ บิดา ☐ ญาติพี่น้อง ☐ เพื่อน

2. จากข้อ 1 บุคคลที่มีความสำคัญกับท่านสูบบุหรี่หรือไม่

   ☐ ไม่สูบ ☐ สูบ

3. บุคคลนั้นตามข้อ 1 กำลังพยายามเลิกสูบบุหรี่เหมือนท่านใช่หรือไม่

   ☐ ไม่ใช่ ☐ ใช่

<u>ตอนที่ 2</u> กรุณาเขียนเครื่องหมาย ✓ ลงในช่องว่างตามที่บุคคลในข้อ 1 ปฏิบัติต่อท่าน

หมายเหตุ ไม่เคยปฏิบัติ = 0 ครั้ง/ สัปดาห์ ค่อนข้างบ่อยครั้ง = 3-4 ครั้ง /สัปดาห์
น้อยมาก = 0-1 ครั้ง / สัปดาห์ ปฏิบัติเป็นประจำ = มากกว่าหรือเท่ากับ 5 ครั้ง/ สัปดาห์
บางครั้ง = 1-2 ครั้ง / สัปดาห์

บุคคลที่ระบุในตอนที่ 1 ปฏิบัติต่อท่านในเรื่อง การสูบบุหรี่อย่างไรบ้าง	ไม่เคยปฏิบัติ	น้อยมาก	บางครั้ง	ค่อนข้างบ่อยครั้ง	เป็นประจำ
1. แสดงความชื่นชมถ้าท่านไม่สูบบุหรี่					
2. บอกกับท่านว่าการสูบบุหรี่เป็นสิ่งไม่ดี					
3. พูดคุยกับท่านให้เลิกสูบบุหรี่					
4. เตือนท่านให้มีความตั้งใจจริงที่จะเลิกสูบบุหรี่					
5. เตือนว่า ในบ้านมีกลิ่นบุหรี่					
6. ไม่ยินยอมให้ท่านสูบบุหรี่ในบ้าน					
7. แสดงความยินดีกับท่านเมื่อท่านตัดสินใจเลิกสูบบุหรี่					
8 ช่วยเหลือท่านคิดหาวิธีทดแทนการสูบบุหรี่ เช่น ฟังเพลง เล่นกีฬา					
9. พูดถึงการสูบบุหรี่ของท่านรบกวนบุคคลในบ้าน					
10. บอกกับท่านว่าทุกคนในครอบครัวดีใจหากท่านตัดสินใจเลิกสูบบุหรี่					
11. ตำหนิการสูบบุหรี่ของท่าน					
12. สอบถามปัญหาต่างๆในขณะที่ท่านอยู่ในหน่วยทหาร					
13. แนะนำวิธีทำให้ท่านผ่อนคลายเมื่อท่านรู้สึกเครียดหรือวิตกกังวล					
14. สนับสนุนการปฏิบัติตัวของท่านในระหว่างการเลิกบุหรี่ เช่น จัดอาหารประเภทผัก หรือผลไม้ที่มีรสเปรี้ยวให้รับประทาน					
15. ให้ข้อมูลหรือคำแนะนำในการปฏิบัติตัวเพื่อเลิกบุหรี่					
16. แสดงความมั่นใจว่าท่านสามารถเลิกสูบบุหรี่ได้					
17. แนะนำท่านในการปฏิบัติตัวเมื่อมีความอยากบุหรี่					
18. กระตุ้นเตือนเมื่อเห็นว่าท่านมีความคิดจะกลับไปสูบบุหรี่อีก					
19. ช่วยหากิจกรรมให้ทำ เพื่อไม่ให้ท่านนึกถึงบุหรี่					
20. ไต่ถามท่านเกี่ยวกับการเลิกสูบบุหรี่					

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ส่วนที่ 6 แบบวัดพฤติกรรมในการเลิกสูบบุหรี่

คำชี้แจง กรุณาทำเครื่องหมาย ✓ ลงใน [ ] เพียงช่องเดียวของข้อความแต่ละข้อที่ตรงกับการปฏิบัติตัวของท่านมากที่สุด และตอบให้ครบทุกข้อ

หมายเหตุ ไม่เคยปฏิบัติ = 0 ครั้ง/ สัปดาห์ ค่อนข้างบ่อยครั้ง = 3-4 ครั้ง /สัปดาห์
น้อยมาก = 0-1 ครั้ง / สัปดาห์ ปฏิบัติเป็นประจำ = มากกว่าหรือเท่ากับ 5 ครั้ง/ สัปดาห์
บางครั้ง = 1-2 ครั้ง / สัปดาห์

การปฏิบัติตัวในการเลิกสูบบุหรี่	ความถี่ของการปฏิบัติ				
	ไม่เคยปฏิบัติ	น้อยมาก	บางครั้ง	ค่อนข้างบ่อยครั้ง	เป็นประจำ
1. ท่านซื้อบุหรี่					
2. ท่านพกไม้ขีดไฟหรือไฟแช็ค					
3. ท่านขอบุหรี่จากผู้อื่นมาสูบ					
4. ท่านรับบุหรี่จากเพื่อนมาสูบ					
5. ท่านหลีกเลี่ยงเครื่องดื่มที่กระตุ้นให้อยากสูบบุหรี่ เช่น ชา กาแฟหรือเครื่องดื่มที่มีแอลกอฮอล์					
6. ท่านรับประทานผัก ผลไม้และดื่มน้ำมากขึ้น					
7. ท่านบ้วนปากหรือแปรงฟันทุกครั้งหลังรับประทานอาหารเสร็จ					
8. ท่านหากิจกรรมอย่างอื่นทำแทนการหยิบบุหรี่มาสูบ เมื่อรู้สึกอยากสูบบุหรี่ เช่น คีบปากกาหรือดินสอแทน					
9. ท่านสูดลมหายใจเข้าออกลึกๆ เมื่ออยากสูบบุหรี่จนรู้สึกผ่อนคลาย					
10. ท่านหาเวลาออกกำลังกาย					
11. ท่านหาผลไม้รสเปรี้ยวหรือของขบเคี้ยวที่ไม่หวานรับประทานแทนการสูบบุหรี่					
12. ท่านปรับเปลี่ยนกิจวัตรประจำวันเพื่อหลีกเลี่ยงการสูบบุหรี่ เช่น อ่านหนังสือขำขันแทนระหว่างการเข้าห้องน้ำ					
13. ท่านหลีกเลี่ยงการอยู่ใกล้กับผู้ที่สูบบุหรี่					
14. ในเวลาว่าง ท่านหางานอดิเรกทำเพื่อไม่ให้คิดถึงบุหรี่ เช่น ฟังเพลง ดูโทรทัศน์ อ่านหนังสือ					
15. ท่านลดจำนวนบุหรี่ที่สูบลง					
16. ท่านหยุดสูบบุหรี่					
17. เมื่อรู้สึกเครียด ท่านพูดคุยกับครอบครัว/ คู่รักหรือเพื่อน					
18. ท่านบอกหรือเตือนตนเองว่าจะเลิกสูบบุหรี่					
19. ท่านหลีกเลี่ยงหรือปฏิเสธการไปสังสรรค์กับเพื่อน					
20. ท่านจดบันทึกการสูบบุหรี่หรือความอยากที่จะสูบในแต่ละวัน					

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ส่วนที่ 7 แบบสอบถามระดับการติดสารนิโคตินในบุหรี่

คำชี้แจง กรุณาใส่ เครื่องหมายถูก (✓) ลงในช่องที่ตรงกับความเป็นจริงของตัวท่าน

1. โดยปกติท่านสูบบุหรี่กี่มวนต่อวัน

☐ 10 มวนหรือน้อยกว่า ☐ 11-20 มวน

☐ 21- 30 มวน ☐ 31 มวนขึ้นไป

2. หลังตื่นนอนตอนเช้าท่านสูบบุหรี่มวนแรกเมื่อไร

☐ ภายใน 5 นาทีหลังตื่นนอน ☐ 6-30 นาทีหลังตื่น

☐ 31-60 นาทีหลังตื่น ☐ หลัง 60 นาทีขึ้นไป

3. ท่านสูบบุหรี่จัดในชั่วโมงแรกหลังตื่นนอน (สูบมากกว่าในช่วงอื่นของวัน)

☐ ใช่ ☐ ไม่ใช่

4. บุหรี่มวนไหนที่ท่านไม่อยากเลิกมากที่สุด

☐ มวนแรกในตอนเช้า ☐ ทุกมวน

5. ท่านรู้สึกลำบากหรือยุ่งยากใจที่ต้องอยู่ในเขตปลอดบุหรี่ เช่น ร้านอาหาร โรงภาพยนตร์

☐ รู้สึกลำบาก ☐ ไม่รู้สึกลำบาก

6. ท่านยังต้องการสูบบุหรี่แม้จะเจ็บป่วยหรือนอนรักษาตัวในโรงพยาบาล

☐ ใช่ ☐ ไม่ใช่

ส่วนที่ 8 แบบประเมินองค์กรในการดำเนินงานที่เกี่ยวข้องกับบุหรี่

รายการ	เกณฑ์ประเมิน		
	มีครบ 100%	มีไม่ครบ 100%	ไม่มี
โครงสร้างและกิจกรรมของหน่วย			
1. มีเจ้าหน้าที่รับผิดชอบในการดำเนินงานด้านบุหรี่ในหน่วย			
2. มีการกำหนดหน้าที่รับผิดชอบที่ชัดเจนของเจ้าหน้าที่ที่เกี่ยวข้อง เช่น เจ้าหน้าที่ประจำหน่วยตรวจโรค ผู้ฝึกหรือครูฝึกทหารใหม่ และอนุศาสนาจารย์			
3. แผนและตารางการฝึกอบรมทหารใหม่มีการสอดแทรกเนื้อหาเรื่อง พิษภัยของ บุหรี่และวิธีการเลิกสูบบุหรี่			
4. มีเจ้าหน้าที่รับผิดชอบโดยตรงในการให้ความรู้เรื่องนี้			
5. มีแผนงานการสำรวจสุขภาพอนามัยของกำลังพลที่เกี่ยวข้องกับเรื่องบุหรี่และช่วยเหลือในการเลิกสูบบุหรี่			
6. มีแผนงานหรือกิจกรรมภายในหน่วยที่เกี่ยวข้องกับการรณรงค์การลด ละ เลิก การสูบบุหรี่ เช่น การจัดให้ความรู้ทางเสียงตามสาย การจัดกิจกรรมในวันงดสูบบุหรี่โลก			
7. มีการสร้างแรงจูงใจหรือการชื่นชมกำลังพลที่สามารถเลิก สูบบุหรี่ได้			
8. มีการกำกับดูแลและประเมินผลโครงการดังกล่าวอย่างต่อเนื่อง			
การจัดสถานที่ทำงานและสิ่งแวดล้อมให้เป็นสถานที่ปลอดบุหรี่			
9. มีการติดป้ายห้ามสูบบุหรี่ในอาคาร ห้องประชุม ห้องสุขา ห้องที่ใช้เครื่องปรับอากาศและบริเวณ ทางเข้าออกอย่างชัดเจน ทุกอาคาร			
10. มีการติดป้ายกำหนดพื้นที่การสูบบุหรี่ชัดเจนบริเวณภายนอกอาคาร			
11. ในห้องทำงานหรือบนโต๊ะทำงาน ไม่มีอุปกรณ์การสูบบุหรี่ เช่น ที่เขี่ยบุหรี่			

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แบบทดสอบสำหรับครูฝึกและเจ้าหน้าที่พยาบาลประจำหน่วยตรวจโรค
เรื่อง ความรู้เกี่ยวกับบุหรี่และวิธีการเลิกสูบบุหรี่

กรุณาเขียนเครื่องหมาย × ทับลงบนตัวอักษรหน้าข้อความที่ถูกต้องที่สุดเพียงข้อเดียว (ทำในกระดาษคำตอบ)

1. ข้อใดเป็นสารพิษในบุหรี่
   ก. คาร์บอนไดออกไซด์ ข. นิโคติน
   ค. ทาร์หรือน้ำมันดิน ง. ถูกทั้งข้อ ข และ ข้อ ค
2. ลักษณะของนิโคตินเป็นอย่างไร
   ก. มีอยู่ในใบยาสูบตามธรรมชาติ
   ข. เป็นสารที่มีฤทธิ์เสพติด
   ค. ระยะหลังออกฤทธิ์กดระบบประสาท ทำให้รู้สึกเครียด
   ง. ถูกทั้ง 3 ข้อ
3. ข้อใดไม่ใช่ผลเสียของบุหรี่ต่อร่างกาย
   ก. มะเร็งกล่องเสียง ข. แผลในกระเพาะอาหาร
   ค. เสื่อมสมรรถภาพทางเพศ ง. ความดันโลหิตต่ำ
4. ข้อความใดไม่ถูกต้อง เกี่ยวกับพิษภัยของบุหรี่
   ก. บุหรี่ 1 มวนมีสารพิษกว่า 4,000 ชนิด
   ข. หญิงตั้งครรภ์ที่สูบบุหรี่ทำให้ทารกคลอดก่อนกำหนด
   ค. ทาร์มีผลเสียทำให้เส้นเลือดหัวใจตีบ
   ง. ร้อยละ 90 ของมะเร็งปอดมีสาเหตุจากการสูบบุหรี่
5. “ควันบุหรี่มือสอง” หมายความว่าอย่างไร
   ก. ควันที่สูบเข้าในร่างกายแล้วพ่นออกมา
   ข. ควันบุหรี่ที่ลอยอยู่ด้านนอกขณะที่ไม่มีการสูดควัน
   ค. ควันบุหรี่ที่ออกมาจากบุหรี่ที่เคยสูบแล้วนำมาสูบอีกครั้งหนึ่ง
   ง. ถูกทั้ง ข้อ ก และข้อ ข
6. ข้อใดไม่ใช่อาการที่เกิดขึ้นหลังจากหยุดสูบบุหรี่
   ก. หงุดหงิด เครียดโดยเฉพาะใน 2 ชั่วโมงแรกหลังเลิกสูบบุหรี่
   ข. ความรู้สึกรับรู้รสและกลิ่นไม่ดีหลังเลิกบุหรี่ 1 เดือน
   ค. มึนศีรษะ ง่วงนอน หลังเลิกสูบไปแล้วหลายชั่วโมง
   ง. เหนื่อยน้อยลง หายใจได้ดีขึ้น หลังหยุดสูบไป 3 สัปดาห์

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7. การปฏิบัติตนในข้อใดที่ช่วยให้เลิกสูบบุหรี่ได้สำเร็จ
   ก. ค่อยๆลดจำนวนการสูบบุหรี่ลงทีละน้อย
   ข. อมลูกอมหรือเคี้ยวหมากฝรั่งช่วงที่มีอาการอยากบุหรี่
   ค. ควรพักผ่อนให้มากๆ หลีกเลี่ยงการออกกำลังกาย
   ง. หลีกเลี่ยงการดื่มเครื่องดื่มที่มีแอลกอฮอล์
8. เมื่อรู้สึกอยากสูบบุหรี่ ท่านควรปฏิบัติอย่างไร
   ก. ดื่มน้ำหรือล้างหน้าทันที
   ข. สูบเพียงเล็กน้อยพอให้หายอยากแล้วทิ้งบุหรี่ไป
   ค. สูดลมหายใจเข้าออกลึกๆและช้าๆ 2-3 ครั้ง
   ง. ถูกทั้ง ข้อ ก และข้อ ค
9. ข้อใดไม่ควรปฏิบัติเมื่อมีอาการอยากบุหรี่
   ก. อมน้ำหรือบ้วนปาก
   ข. ทำกิจกรรมอื่นยืดเวลา 3-5 นาที
   ค. ดื่มชาหรือกาแฟทดแทน
   ง. รับประทานผลไม้ที่มีรสเปรี้ยว
10. สาเหตุที่ทำให้เลิกบุหรี่ไม่ได้ คือ ข้อใด
   ก. คิดว่าการสูบบุหรี่ทำให้คลายเครียด
   ข. คิดว่าจะเลิกเมื่อไรก็เลิกได้
   ค. คิดว่า การสูบบุหรี่ก้นกรองมีความปลอดภัย
   ง. ถูกทุกข้อ

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APPENDIX E
ETHIC CONSIDERATION AND CONSENT FORM
ETHIC CONSIDERATION

This study has been approved by the committee on Human Rights Related to Human Experimentation of Mahidol University, Bangkok.

Documentary Proof of Ethical Clearance
Ethics Committee for Human Research
Faculty of Public Health, Mahidol University

Proof Number	MUPH2009-098
Project Title	Ecological Model for Smoking Cessation Program among the Conscripts of the First Infantry Regiment, King's Royal Guard
Project Number	75/2552
Principal Investigator	Ltc. Pannee Pantaewan
Official Address	Doctor of Public Health (International Program) Faculty of Public Health, Mahidol University 420/1 Rajvithi Road, Bangkok, Thailand

The aforementioned project and informed consent have been reviewed and approved by Ethics Committee for Human Research, according to the Declaration of Helsinki.

P. Luksamijarulkul

(Assoc. Prof. Pipat Luksamijarulkul)
Chairman of Ethics Committee for Human Research

Phitaya Charupoonphol

(Assoc. Prof. Phitaya Charupoonphol)
Dean of Faculty of Public Health

Date of Approval : 18 June 2009
Date of Expiration : 17 June 2010

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หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัยโดยได้รับการบอกกล่าวและเต็มใจ

วันที่..... เดือน..... พ.ศ.....

ข้าพเจ้า.....อายุ.....ปี อาศัยอยู่บ้านเลขที่.....

ถนน.....ตำบล.....อำเภอ.....

จังหวัด.....รหัสไปรษณีย์.....โทรศัพท์ .....

ขอแสดงเจตนายินยอมเข้าร่วมโครงการวิจัย[1]เรื่อง...การวิจัยเรื่อง **แบบจำลองเชิงนิเวศสำหรับโปรแกรมการเลิกสูบบุหรี่ในทหารเกณฑ์ กรมทหารราบที่ 1 มหาดเล็กรักษาพระองค์**

โดยข้าพเจ้าได้รับทราบรายละเอียดเกี่ยวกับที่มาและจุดมุ่งหมายในการทำวิจัยรายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ประโยชน์ที่คาดว่าจะได้รับของการวิจัยและความเสี่ยงที่อาจจะเกิดขึ้นจากการเข้าร่วมการวิจัย รวมทั้งแนวทางป้องกันและแก้ไขหากเกิดอันตรายขึ้น โดยได้อ่านข้อความที่มีรายละเอียดอยู่ในเอกสารชี้แจงผู้เข้าร่วมการวิจัยโดยตลอด อีกทั้งยังได้รับคำอธิบายและตอบข้อสงสัยจากหัวหน้าโครงการวิจัยเป็นที่เรียบร้อยแล้ว

ข้าพเจ้าจึงสมัครใจเข้าร่วมในโครงการวิจัยนี้ :

หากข้าพเจ้ามีข้อข้องใจเกี่ยวกับขั้นตอนของการวิจัย หรือหากเกิดเหตุการณ์ที่ไม่พึงประสงค์จากการวิจัยขึ้นกับข้าพเจ้า ข้าพเจ้า จะสามารถติดต่อกับหัวหน้าโครงการวิจัยได้ตลอด 24 ชั่วโมง หมายเลขโทรศัพท์ 086-6629370

หากข้าพเจ้า ได้รับการปฏิบัติไม่ตรงตามที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถติดต่อกับประธานคณะกรรมการจริยธรรมการวิจัยในคนหรือผู้แทน ได้ที่สำนักงานคณะกรรมการจริยธรรมการวิจัยในคน สำนักงานอธิการบดี มหาวิทยาลัยมหิดล ถนนพุทธมณฑล สาย 4 ตำบลศาลายา อำเภอพุทธมณฑล จังหวัดนครปฐม 73170 หมายเลขโทรศัพท์ 02-849-6241-6, 02-849-6066 โทรสาร 02-849-6247

ข้าพเจ้าได้ทราบถึงสิทธิ์ที่ข้าพเจ้าจะได้รับข้อมูลเพิ่มเติมทั้งทางด้านประโยชน์และโทษจากการเข้าร่วมการวิจัย และสามารถถอนตัวหรือลดเข้าร่วมการวิจัยได้ทุกเมื่อ โดยจะไม่มีผลกระทบต่อการดำเนินชีวิตหรือการทำงานของข้าพเจ้า และยินยอมให้ผู้วิจัยใช้ข้อมูลส่วนตัวของข้าพเจ้าที่ได้รับจากการวิจัย แต่จะไม่เผยแพร่ต่อสาธารณะเป็นรายบุคคล โดยจะนำเสนอเป็นข้อมูลโดยรวมจากการวิจัยเท่านั้น

ข้าพเจ้า เข้าใจข้อความในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และหนังสือแสดงเจตนายินยอมนี้โดยตลอดแล้ว จึงลงลายมือชื่อไว้

ลงชื่อ ..... ผู้เข้าร่วมการวิจัย / วันที่.....

(.....)

ลงชื่อ ..... ผู้ให้ข้อมูลและขอความยินยอม/หัวหน้าโครงการวิจัย/ วันที่

(.....)

ลงชื่อ ..... พยาน/ วันที่.....

(.....)

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APPENDIX F
COMPARISON OF MEAN AND T-TEST AMONG THE VARIABLES AT BASELINE AND SIX MONTHS

Table F.1 Comparison of perceived pros and cons of smoking at baselineand six months

ผลดี/ผลเสียของการสูบบุหรี่	at baseline		6 months		t-value	p-value
	MEAN	S.D.	MEAN	S.D.		
1. การสูบบุหรี่ทำให้เกิดความพึงพอใจ	2.93	1.020	2.96	0.940	-.179	.859
2. ฉันชอบมาดของคนที่สูบบุหรี่	1.84	0.916	2.42	1.166	-4.090	.000**
3. ฉันรู้สึกผ่อนคลายเมื่อได้สูบบุหรี่	3.40	1.019	3.34	0.865	.592	.555
4. ถ้าฉันพยายามหยุดสูบบุหรี่ จะทำให้ฉันหงุดหงิด กระวนกระวายและรู้สึกไม่สบาย	2.76	1.243	2.99	1.163	-1.430	.156
5. ครอบครัวและเพื่อนของฉันพอใจที่เห็นฉันสูบบุหรี่มากกว่าเห็นฉันทุกข์ทรมานจากการเลิกสูบบุหรี่	1.53	0.827	2.39	1.267	5.436	.000**
6. ฉันรู้สึกดีขึ้นเมื่อฉันสูบบุหรี่	3.02	1.108	2.92	1.047	.773	.442
7. การสูบบุหรี่ทำให้ฉันหายเหนื่อยจากการฝึกหรือการทำงานในหน่วย	2.36	1.325	2.57	1.214	-1.382	.171
8. การสูบบุหรี่ช่วยลดความเครียด	3.38	1.061	3.09	0.949	2.396	.019*
9. การสูบบุหรี่ทำให้สมองปลอดโปร่งสามารถคิดแก้ปัญหาได้	2.44	1.234	2.75	1.009	-2.247	.027*
10. การสูบบุหรี่ทำให้ฉันมีเพื่อนมาก	2.09	1.062	2.53	1.139	-3.351	.001**
11. การสูบบุหรี่ของฉัน มีผลกระทบต่อสุขภาพของคนอื่น	3.71	1.160	3.65	1.099	.383	.703
12. บุคคลใกล้ชิดของฉัน จะรู้สึกทุกข์ใจถ้าฉันป่วยจากการสูบบุหรี่	4.09	1.193	3.74	1.039	2.190	.031*
13. คนที่รู้จักฉันไม่คิดว่าฉันจะเลิกสูบบุหรี่ได้	3.30	1.318	3.08	1.042	1.531	.129
14. การสูบบุหรี่เป็นอันตรายต่อสุขภาพของฉัน	3.90	1.077	3.73	1.074	1.177	.242
15. ฉันรู้สึกละอายใจที่สูบบุหรี่	3.03	1.201	3.25	1.003	1.591	.115
16. การสูบบุหรี่ของฉันรบกวนผู้อื่น	3.66	1.177	3.56	1.022	.690	.492
17. ครอบครัวหรือคนใกล้ชิด บ่นว่าเมื่อเห็นฉันสูบบุหรี่	3.75	1.161	3.55	1.023	1.422	.158
18. การสูบบุหรี่ของฉันทำให้คนใกล้ชิดไม่พึงพอใจ	3.61	1.104	3.44	0.929	1.277	.205
19. ฉันไม่ฉลาดเลยที่เพิกเฉยต่อคำเตือนเรื่องพิษภัยของการสูบบุหรี่	3.19	1.117	3.46	0.905	-1.992	.049*
20. ร่างกายของฉันจะแข็งแรงขึ้นถ้าฉันไม่สูบบุหรี่	4.03	1.434	3.87	1.170	.928	.356

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Table F.2 Comparison of perceived self-efficacy to control smoking behavior at baseline and six months

ความสามารถของตนเองในการควบคุมการสูบบุหรี่	At baseline		six months		t-value	p-value
	MEAN	S.D.	MEAN	S.D.		
1. เวลาที่ฉันไปดื่มสุรา	2.15	1.150	2.86	1.279	-4.283	0.000**
2. เมื่อฉันมีความต้องการสูบบุหรี่	2.39	0.937	2.87	0.894	-3.875	0.000**
3. เมื่อรู้สึกคับข้องใจที่บางสิ่งบางอย่างไม่เป็นไปตามที่ฉันต้องการ	2.43	0.865	2.76	0.917	-2.955	0.004**
4. เมื่ออยู่กับผู้ที่สูบบุหรี่	2.31	1.093	2.73	1.031	-2.876	0.005**
5. เมื่อมีการโต้เถียงหรือขัดแย้งกับเพื่อนทหารเกณฑ์	2.92	1.236	2.78	1.053	0.894	0.374
6. เมื่อมีการฉลองในงานเลี้ยง	2.45	1.216	2.99	1.143	-2.994	0.004**
7. เมื่อรู้สึกไม่พอใจกับการฝึกและ หรือการปฏิบัติงานในหน่วย	2.92	1.160	3.03	1.049	-0.660	0.511
8. เมื่อถูกผู้บังคับบัญชาว่ากล่าวหรือทำโทษ	2.99	1.292	3.06	1.091	-0.362	0.718
9. เมื่อเห็นผู้อื่นสูบบุหรี่อย่างมีความสุข	2.35	1.198	2.78	0.951	-2.701	0.008**
10. ระหว่างการพูดคุยในกลุ่มเพื่อนที่สูบบุหรี่	2.24	1.056	2.78	1.009	-3.556	0.001**
11. เมื่อฉันได้กลับไปพักที่บ้าน	2.63	1.219	2.93	1.136	-1.760	0.082
12. เมื่อมีปัญหายุ่งยากใจต้องแก้ไข	2.45	0.954	2.84	1.032	-2.928	0.004**
13. เมื่อตื่นนอนในตอนเช้า	2.66	1.233	2.76	1.061	-0.731	0.467
14. เมื่อฉันมีเวลาว่าง	2.62	1.182	2.78	0.988	-1.182	0.240
15. เมื่อฉันอยู่ในระหว่างเข้าเวรยาม	2.60	1.074	2.76	1.108	-1.104	0.273
16. เมื่อฉันอยู่กับเพื่อนในงานเลี้ยงสังสรรค์	2.44	1.234	2.75	1.161	-1.185	0.073
17. เมื่อฉันปฏิบัติงานพัฒนาหน่วย	2.96	1.177	2.98	1.000	-0.152	0.880
18. เมื่อฉันรู้สึกคิดถึงครอบครัว ภรรยาหรือคู่รัก	3.04	1.322	3.08	1.140	-0.188	0.851
19. เมื่อฉันมีความวิตกกังวลหรือมีความเครียด	2.42	1.085	2.81	0.999	-2.543	0.013*
20. เมื่อรู้สึกว่าไม่ได้สูบบุหรี่มาระยะหนึ่งแล้ว	3.03	1.210	3.06	0.817	-0.144	0.886

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Table F.3 Comparison of perceived social support to control smoking behavior at baseline and six months

บุคคลที่มีความสำคัญกับท่านปฏิบัติต่อท่านในเรื่องในเรื่องการสูบบุหรี่อย่างไร	At baseline		six months		t-value	p-value
	MEAN	S.D.	MEAN	S.D.		
1. แสดงความชื่นชมถ้าท่านไม่สูบบุหรี่	2.24	1.104	2.14	0.961	.663	0.509
2. บอกกับท่านว่าการสูบบุหรี่เป็นสิ่งไม่ดี	2.70	1.122	2.34	0.988	2.704	0.008**
3. พูดคุยกับท่านให้เลิกสูบบุหรี่	2.55	1.011	2.21	0.994	2.522	0.013*
4. เตือนท่านให้มีความตั้งใจจริงที่จะเลิกสูบบุหรี่	2.39	1.022	2.26	0.928	0.932	0.354
5. เตือนว่า ในบ้านมีกลิ่นบุหรี่	2.28	1.177	2.21	1.005	0.453	0.652
6. ไม่ยินยอมให้ท่านสูบบุหรี่ในบ้าน	2.27	1.165	2.15	1.183	0.816	0.417
7. แสดงความยินดีกับท่านเมื่อท่านตัดสินใจเลิกสูบบุหรี่	2.71	1.079	2.33	1.126	2.486	0.015*
8. ช่วยเหลือท่านคิดหาวิธีทดแทนการสูบบุหรี่ เช่น ฟังเพลง เล่นกีฬา	1.94	1.101	2.09	0.949	-0.966	0.337
9. พูดถึงการสูบบุหรี่ของท่านรบกวนบุคคลในบ้าน	2.22	1.136	2.35	0.898	-0.882	0.380
10. บอกกับท่านว่าทุกคนในครอบครัวดีใจหากท่านตัดสินใจเลิกสูบบุหรี่	2.20	1.160	2.20	0.991	0.000	1.000
11. ตำหนิการสูบบุหรี่ของท่าน	2.47	1.178	2.28	1.215	1.173	0.244
12. สอบถามปัญหาต่างๆในขณะที่ท่านอยู่ในหน่วยทหาร	1.84	1.107	2.20	1.013	-2.293	0.024*
13. แนะนำวิธีทำให้ท่านผ่อนคลายเมื่อท่านรู้สึกเครียดหรือวิตกกังวล	1.97	1.102	1.98	0.988	-0.083	0.934
14. สนับสนุนการปฏิบัติตัวของท่านในระหว่างการเลิกบุหรี่ เช่น จัดอาหารประเภทผักหรือผลไม้ที่มีรสเปรี้ยวให้รับประทาน	1.74	1.133	1.91	0.913	-1.268	0.208
15. ให้ข้อมูลหรือคำแนะนำในการปฏิบัติตัวเพื่อเลิกบุหรี่	1.92	1.110	2.06	1.015	-0.843	0.402
16. แสดงความมั่นใจว่าท่านสามารถเลิกสูบบุหรี่ได้	1.98	1.076	2.02	1.000	-0.336	0.737
17. แนะนำท่านในการปฏิบัติตัวเมื่อมีความอยากบุหรี่	1.83	0.944	2.01	0.911	-1.339	0.184
18. กระตุ้นเตือนเมื่อเห็นว่าท่านมีความคิดจะกลับไปสูบบุหรี่อีก	2.10	1.129	2.16	0.916	-0.387	0.699
19. ช่วยหากิจกรรมให้ทำ เพื่อไม่ให้ท่านนึกถึงบุหรี่	1.55	1.158	1.90	0.989	-2.466	0.016*
20. ไต่ถามท่านเกี่ยวกับการเลิกสูบบุหรี่	1.97	1.162	2.06	0.921	-0.611	0.543

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Table F.4 Comparison of attempt to quit behavior at baseline and six months

พฤติกรรมในการพยายามเลิกสูบบุหรี่	At baseline		six months		t-value	p-value
	MEAN	S.D.	MEAN	S.D.		
1. ท่านซื้อบุหรี่	0.87	0.991	1.75	1.069	-5.975	0.000**
2. ท่านพกไม้ขีดไฟหรือไฟแช็ค	0.85	1.183	1.70	1.049	-5.562	0.000**
3. ท่านขอบุหรี่จากผู้อื่นมาสูบ	1.96	0.999	2.02	0.866	-0.516	0.607
4. ท่านรับบุหรี่จากเพื่อนมาสูบ	1.91	1.094	1.91	0.825	0.086	0.931
5. ท่านหลีกเลี่ยงเครื่องดื่มที่กระตุ้นให้อยากสูบบุหรี่เช่น ชา กาแฟหรือเครื่องดื่มที่มีแอลกอฮอล์	1.62	1.201	1.80	0.919	-1.253	0.213
6. ท่านรับประทานผัก ผลไม้และดื่มน้ำมากขึ้น	2.33	1.009	2.26	0.960	0.491	0.625
7. ท่านบ้วนปากหรือแปรงฟันทุกครั้งหลังรับประทานอาหารเสร็จ	2.34	1.107	2.33	1.069	0.000	1.000
8. ท่านหากิจกรรมอย่างอื่นทำแทนการหยิบบุหรี่มาสูบเมื่อรู้สึกอยากสูบบุหรี่ เช่น คีบปากกาหรือดินสอแทน	1.22	1.031	1.69	1.062	-3.126	0.002**
9. ท่านสูดลมหายใจเข้าออกลึกๆ เมื่ออยากสูบบุหรี่จนรู้สึกผ่อนคลาย	1.36	1.058	1.73	0.939	-3.011	0.003**
10. ท่านหาเวลาออกกำลังกาย	2.06	1.161	2.38	0.846	-2.327	0.022*
11. ท่านหาผลไม้รสเปรี้ยวหรือของขบเคี้ยวที่ไม่หวานรับประทานแทนการสูบบุหรี่	1.63	1.049	1.88	0.890	-1.929	0.057
12. ท่านปรับเปลี่ยนกิจวัตรประจำวันเพื่อหลีกเลี่ยงการสูบบุหรี่ เช่น อ่านหนังสือขำขันแทนระหว่างการเข้าห้องน้ำ	1.42	0.998	1.67	0.939	-2.231	0.028*
13. ท่านหลีกเลี่ยงการอยู่ใกล้กับผู้ที่สูบบุหรี่	1.64	0.991	1.79	0.885	-1.205	0.231
14. ในเวลาว่าง ท่านหางานอดิเรกทำเพื่อไม่ให้คิดถึงบุหรี่ เช่น ฟังเพลง ดูโทรทัศน์ อ่านหนังสือ	2.16	1.010	1.93	0.915	1.804	0.075
15. ท่านลดจำนวนบุหรี่ที่สูบลง	2.27	1.031	2.32	1.006	-0.311	0.757
16. ท่านหยุดสูบบุหรี่	1.52	1.056	1.89	1.027	-2.746	0.870
17. เมื่อรู้สึกเครียด ท่านพูดคุยกับครอบครัว/ คู่รักหรือเพื่อน	2.22	1.250	2.17	0.895	0.356	0.722
18. ท่านบอกหรือเตือนตนเองว่าจะเลิกสูบบุหรี่	2.11	1.071	2.28	1.011	-1.200	0.233
19. ท่านหลีกเลี่ยงหรือปฏิเสธการไปสังสรรค์กับเพื่อน	1.56	1.097	1.81	0.940	-1.845	0.068
20. ท่านจดบันทึกการสูบบุหรี่หรือความอยากที่จะสูบในแต่ละวัน	0.69	1.093	1.42	1.146	-4.994	0.000**

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Table F.5 Comparison of smoking behavior at six months and socio-demographic characteristics of the sample group

Socio-demographic characteristics	Smoking behavior at 6 months						Total	
	reduce		stable/increase		quit			
	(n)	%	(n)	%	(n)	%	(n)	%
1. Educational level								
≤ Secondary school	38	61.3	21	33.9	3	4.8	62	100.0
≥ High school	18	66.7	8	29.6	1	3.7	27	100.0
2. Marital status								
Single	46	63.9	22	30.5	4	5.6	72	100.0
Couple	10	58.8	7	41.2	0	0.0	17	100.0

Table F.6 Comparison of smoking behavior at six months in terms of history of smoking at baseline

History of smoking	Smoking behavior at 6 months						Total	
	reduce		stable/increase		quit			
	(n)	%	(n)	%	(n)	%	(n)	%
1. Age to start smoking								
10-15 years	29	59.2	20	40.8	0	0.0	49	100.0
≥ 16 years	27	67.5	9	22.5	4	10.0	40	100.0
2. Duration of smoking								
1-5 years	34	75.6	8	17.8	3	6.7	45	100.0
≥ 6 years	22	50.0	21	47.7	1	2.3	44	100.0
3. A number of cigarettes smoked per day								
1-10 cigarettes/day	34	66.7	17	33.3	0	0.0	51	100.0
11-20 cigarettes/day	17	54.8	11	35.5	3	9.7	31	100.0
21-40 cigarettes/day	5	71.4	1	14.3	1	14.3	7	100.0

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Table F.7 Comparison of smoking behavior at six months between change of pros and cons of smoking after program implementation

	Smoking behavior at 6 months						Total	
	reduce		stable/increase		quit			
	(n)	%	(n)	%	(n)	%	(n)	%
1. Pros of smoking								
same	34	64.2	19	35.8	0	0.0	53	100.0
increase	15	62.5	7	29.2	2	8.3	24	100.0
decrease	7	58.3	3	25.0	2	16.7	12	100.0
2. Cons of smoking								
same	24	66.7	10	27.8	2	5.6	36	100.0
increase	23	59.0	14	35.9	2	5.1	39	100.0
decrease	9	64.3	5	35.7	0	0.0	14	100.0

Table F.8 Comparison of smoking behavior at six months and change of perceived self-efficacy, perceived social support to control smoking behavior and attempt to quit behaviors after program implementation

	Smoking behavior at 6 months						Total	
	reduce		stable/increase		quit			
	(n)	%	(n)	%	(n)	%	(n)	%
1. Perceived self-efficacy (SE)								
Same	30	62.5	18	37.5	0	0.0	48	100.0
Increase	20	71.4	7	25.0	1	3.6	28	100.0
Decrease	6	46.2	4	30.8	3	23.1	13	100.0
2. Perceived social support (SS)								
Same	33	63.5	17	32.7	2	3.8	52	100.0
Increase	9	69.2	4	30.8	0	0.0	13	100.0
Decrease	14	58.3	8	33.3	2	8.3	14	100.0
3.Attemp to quit behaviors								
Same	45	63.4	23	32.4	3	4.2	71	100.0
Increase	8	72.7	3	27.3	0	0.0	11	100.0
Decrease	3	42.9	3	42.9	1	14.3	7	100.0

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Table F.9 Stage transitions from baseline to six months

Stages transition	Conscripts	
	(n)	(%)
1. Precont - precont	2	2.2
2. Precont - cont.	3	3.4
3. Precont - prep.	7	7.9
4. Cont. - cont.	15	16.9
5. Cont. - prep.	5	5.6
6. Cont. - precont.	3	3.4
7. Prep - prep.	21	23.6
8. Prep - cont.	21	23.6
9. Prep. - precont.	8	9.0
10. Prep – action	3	3.4
11.Cont. – action	1	1.1
Total	89	100.0

Table F.10 Comparison of the intervention and smoking behavior

Intervention	Smoking behavior						Total	
	reduce		stable/increase		quit			
	(n)	%	(n)	%	(n)	%	(n)	%
1. organization I+ SS I + package intervention	13	14.6	7	7.9	0	0.0	20	22.5
2. organization I + SS II+ package intervention	16	18.0	9	10.1	0	0.0	25	28.0
3. organization II + SS I+ package intervention	16	18.0	7	7.9	1	1.1	24	27.0
4. organization II + SS II+ package intervention	11	12.4	6	6.7	3	3.4	20	22.5
Total	56	62.9	29	32.6	4	4.5	89	100.0

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Table F.11 Comparison of the activities related to tobacco control and smoke free environments

Activities and Smoke free environment	Organizational support	
	Score	Percent
Baseline	2	9.0
6 month	12	54.5

Table F.12 Comparison of the activities for tobacco control in each company

Activity	HQ CO		HVY MORT CO		AT PLT		APC PLT		The CO under the 1st infantry division	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1. The company commander warned the conscripts not to smoke	√			√		√		√		√
2. Enhance the activities to reduce stress of the conscripts	√		√		√		√		√	
3. Setting the smoke free workplace	√		√			√		√		√
4. Setting smoking zone outside the building		√		√		√		√		√
Total Score	3	0	2	0	1	0	1	0	1	0

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CODEBOOKS OF DATA MINING

Attributes existing are all nominals and ordinals which display in Table F.13

Table F.13 Definition and description attributes in dataset

Attribute name	Description	Range (possible values)
IVTYPE	Types of organizational and intrapersonal intervention which consisted of four types	1 = fairly good organization + face to face discussion with booklet 2 = fairly good organization + telephone discussion with booklet 3 = good organization + face to face discussion with booklet 4 = good organization + telephone discussion with booklet
ORGANIZE	Types of organization	1 = fairly good organization 2 = good organization
SS	Types of social support	1 = face to face discussion with booklet 2 = telephone discussion with booklet
OUTPUTPR	The difference after categorized scores of pros of smoking (low, moderate,high) between baseline and six months	1 = Group that has difference of categorized scores at baseline and 6 months is the same = 0 2 = Group that has difference of categorized scores at 6 months is higher than at baseline = 1,2 3= Group that has difference of categorized scores at 6 months is lower than at baseline = -1,-2
OUTPUTCO	The difference after categorized scores of cons of smoking (low, moderate,high) between baseline and six months	1 = Group that has difference of categorized scores at baseline and 6 months is the same = 0 2 = Group that has difference of categorized scores at 6 months is higher than at baseline = 1,2 3= Group that has difference of categorized scores at 6 months is lower than at baseline = -1,-2

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Attribute Name	Description	Range (possible values)
OUTPUTSE	The difference after categorized scores of perceived self-efficacy to control smoking behavior (low,moderate,high) between baseline and six months	1 = Group that has difference of categorized scores at baseline and 6 months is the same = 0 2 = Group that has difference of categorized scores at 6 months is higher than at baseline = 1,2 3= Group that has difference of categorized scores at 6 months is lower than at baseline = -1,-2
OUTPUTSS	The difference after categorized scores of perceived social support to control smoking behavior (low,moderate,high) between baseline and six months	1 = Group that has difference of categorized scores at baseline and 6 months is the same = 0 2 = Group that has difference of categorized scores at 6 months is higher than at baseline = 1,2 3= Group that has difference of categorized scores at 6 months is lower than at baseline = -1,-2
OUTPUTBEH	The difference after categorized scores of attempt to quit behaviors (low,moderate,high) between baseline and six months	1 = Group that has difference of categorized scores at baseline and 6 months is the same = 0 2 = Group that has difference of categorized scores at 6 months is higher than at baseline = 1,2 3= Group that has difference of categorized scores at 6 months is lower than at baseline = -1
ORIGIN	Hometown of the conscripts	1 = Bangkok and Metropolitan area including central provinces 2 = North-eastern part and Southern part
MARITAL	Marital status	1 = Single 2 = Couple
EDURECOD	Education	1 = ≤ secondary school 2 = ≥ high school

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Attribute Name	Description	Range (possible values)
ALCRECOD	History of drinking alcohol	1 = no drinking or drink during social gathering 2 = drinking at least 1 time/week
STARTREC	Age to start smoking	1 = age ≤ 15 years old 2 = age ≥ 16 years old
DURARECO	Duration of smoking	1 = 1- 5 years 2 = ≥ 6 years
AMOUNTRE	A number of cigarettes smoked/day	1 = 1- 10 cigarettes/ day 2 = 11 -20 cigarettes/ day 3 = 21 - 40 cigarettes/ day
TYPESMOKE	Types of smoker	1 = daily smoker 2 = occasional smoker
ATTEMP	Experiences of attempt to quit smoking	1 = ever 2 = never
SOCBASE	Stages of change at baseline	1 = pre-contemplation 2 = contemplation 3 = preparation
SOC6	Stages of change at 6 months	1 = pre-contemplation 2 = contemplation 3 = preparation 4 = action
OUTCOME	Improve smoking behavior	1 = reduce and quit smoking 2 = stable or increase smoking

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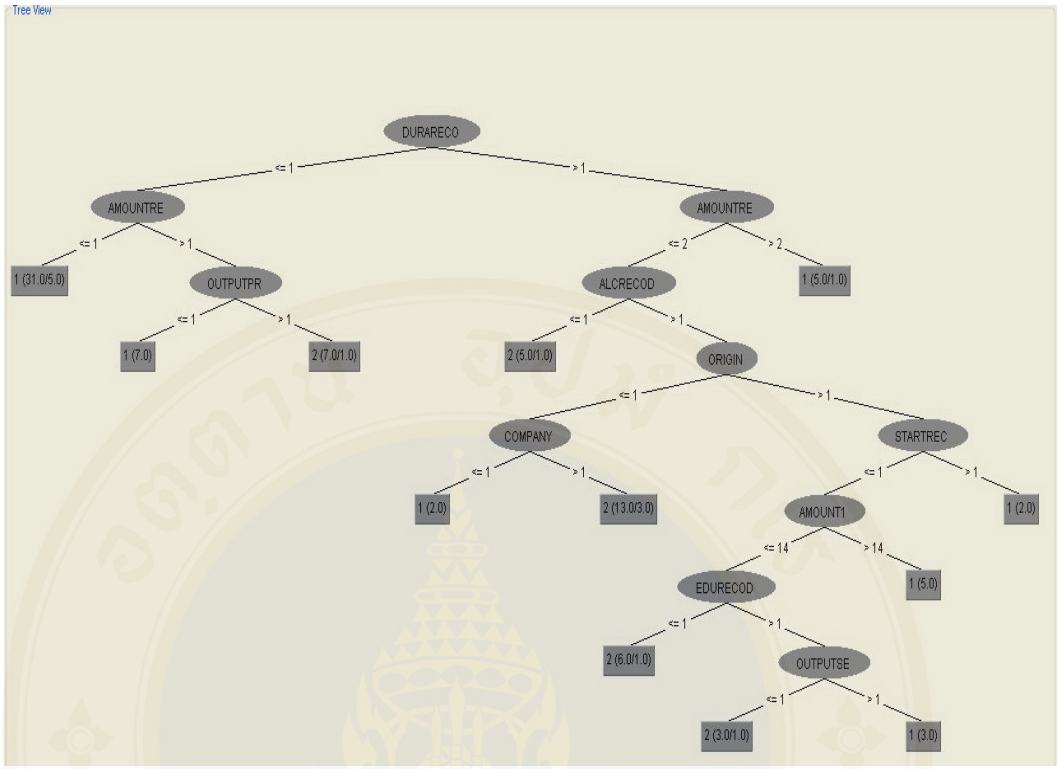

Figure F.1 Decision tree rules of 20 attributes

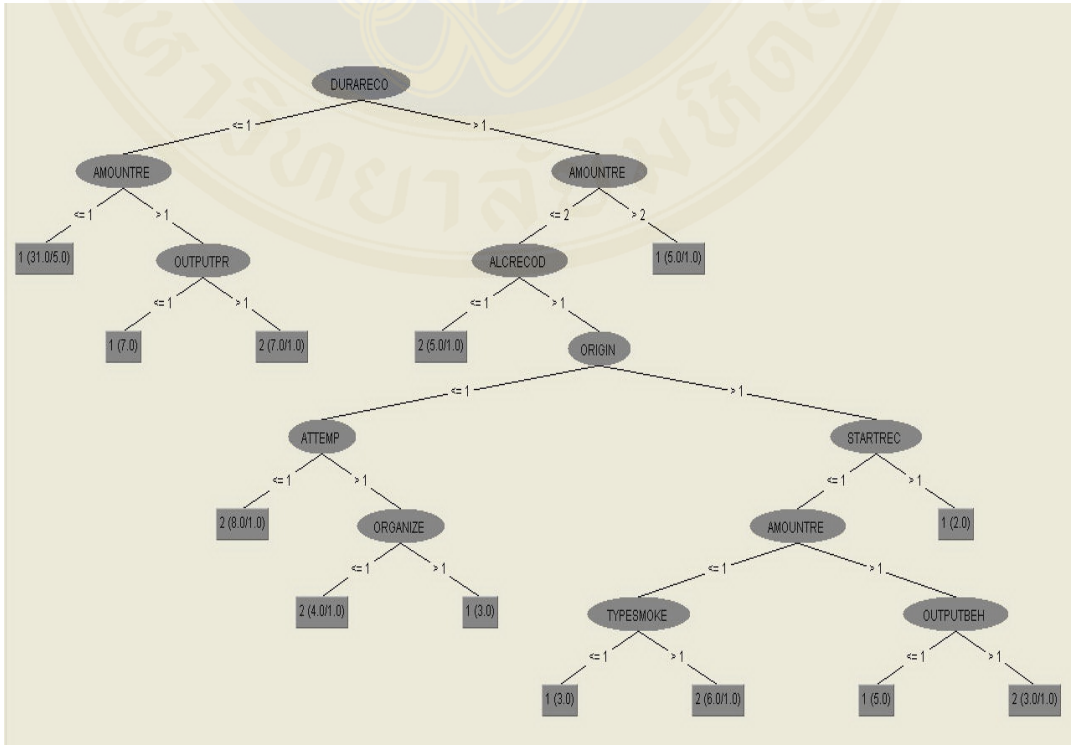

Figure F.2 Decision tree rules of 15 attributes

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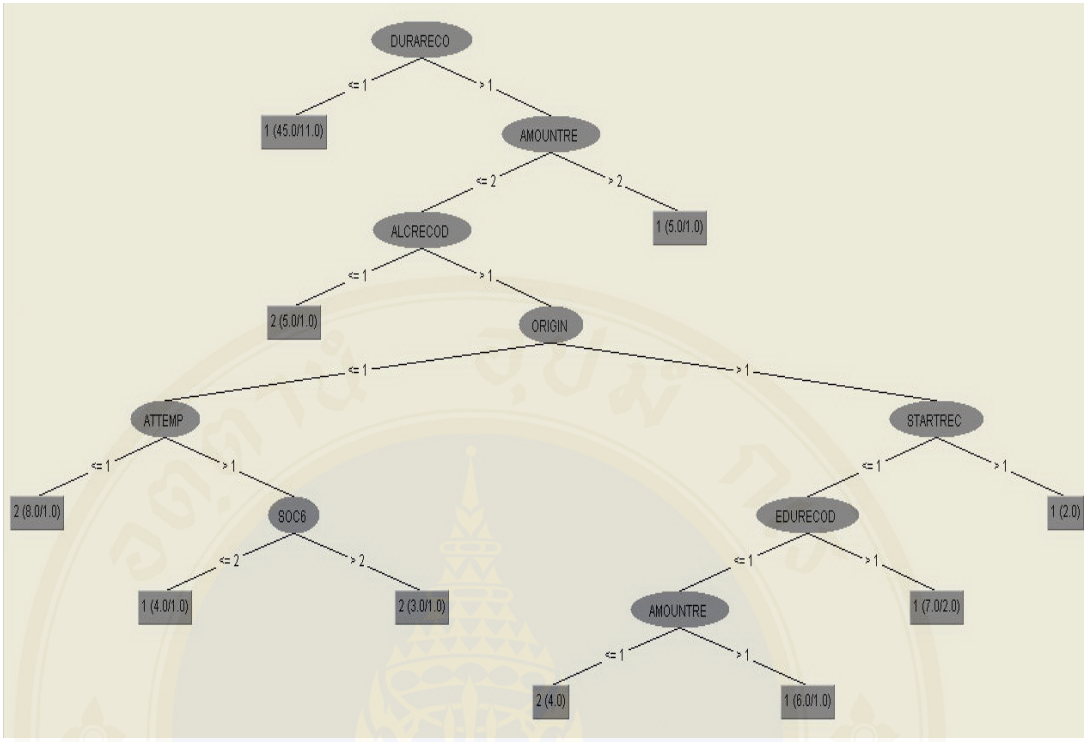

Figure F.3 Decision tree rules of 12 attributes

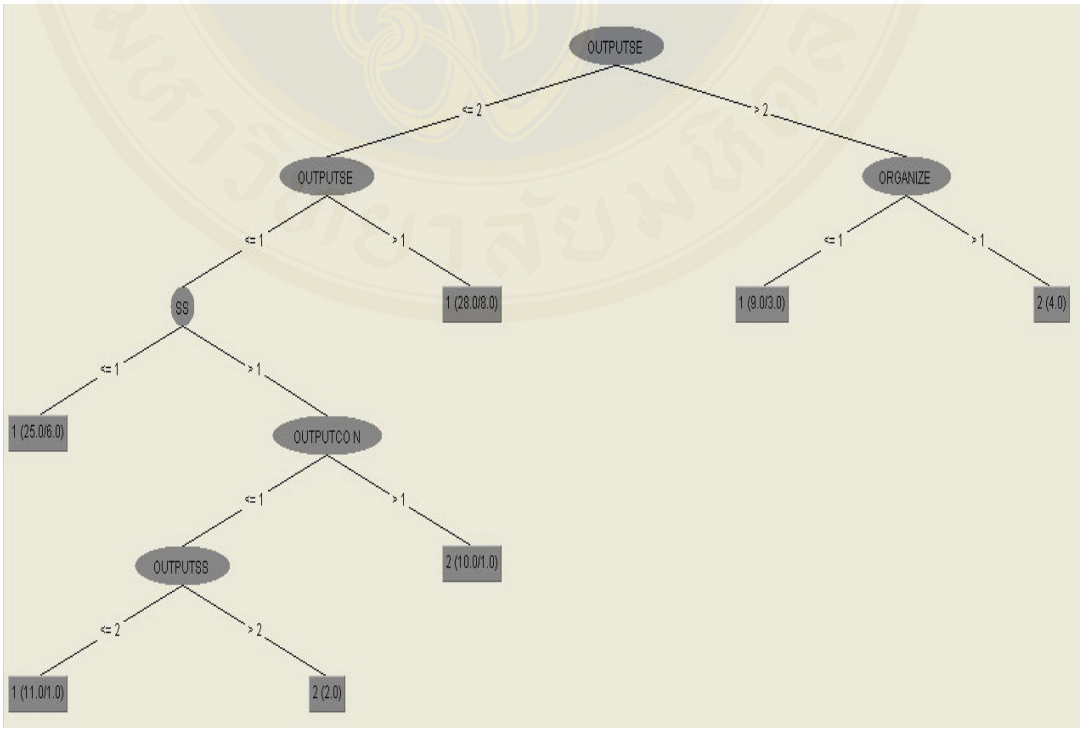

Figure F.4 Decision tree rules of 8 attributes

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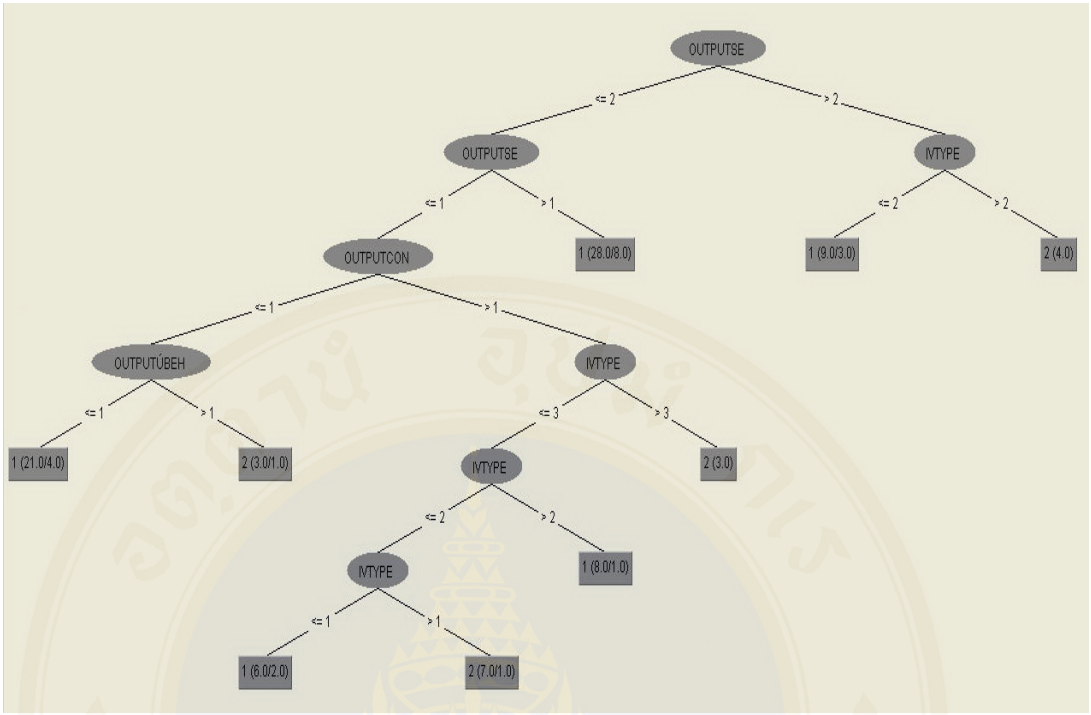

Figure F.5 Decision tree rules of 7 attributes

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APPENDIX G
LIST OF EXPERTS

There were six experts who had validated the research instrument ; questionnaires and the contents to conduct the intervention and the booklets for supporting the conscripts to quit smoking

1. Assist.Prof. Dr. Mondha Kengganpanich
   Department of Health Education and Behavioral Science
   Faculty of Public Health, Mahidol University
2. Assoc.Prof. Dr. Supreya Tunsakul
   Department of Health Education and Behavioral Science
   Faculty of Public Health, Mahidol University
3. Assist.Prof.Dr. Boosaba Sanguanprasit
   Department of Health Education and Behavioral Science
   Faculty of Public Health, Mahidol University
4. Col.Dr. Nongpimol Nimit-arnun
   Community Nurse Practitioner Division
   Christian University
5. Assoc. Prof. Dr. Surintorn Kalampakorn
   Department of Public Health Nursing
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APPENDIX H

INTERVENTION COMPONENT

Intervention Component

Level of Intervention	Organizational Level	Interpersonal Level	Intrapersonal Level
Organizational Level	- **Before baseline** • Policy of ban on smoking during BMT - **Wk 2-5** • Meeting with the commander and staff officers to inform the objective, the benefit and procedure of the study and give the information about the situations of smoking in the military • The researcher informed and facilitated the committee to set smoke free workplace • The regimental executive officer ordered the staff officer to reduce or stop smoking • The researcher shared the idea and discussed with the conscript's trainers about ban on smoking during BMT - **Wk 13-24** • The company commander brought the smoking policy to provide recreational activities and exercise for the conscripts	**Wk 3-4** • Family intervention + Booklet	**Week 2-5** • Meeting with the commander and staff officers to inform the objective, the benefit and procedure of the study and give the information about the situations of smoking in the military • The researcher informed the committee and gave the guideline to set smoke free workplace • Orientation with package intervention • Session 1 : consciousness raising &dramatic relief • Session 2 : increase motivation to quit • Session 3 : **Week 13-16** • Telephone counseling • The company commander brought the smoking policy to provide recreational activities and exercise for the conscripts
Interpersonal Level	**Wk 3-4** • Family intervention + Booklet	**Wk 3-4** • Family intervention + Booklet **Wk 9** • Booklet + mouth wash **Wk 10-11** • Family telephone counseling	**Wk 3-4** • Family intervention + Booklet • increase motivation to quit by using role model • self-reevaluation **Wk 9** • Booklet + mouth wash • advice for relapse prevention

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Intervention Component (cont.)

Level of Intervention	Organizational Level	Interpersonal Level	Intrapersonal Level
Intrapersonal Level	- **Week 2-3** • Meeting with the commander and staff officers to inform the objective, the benefit and procedure of the study • Give the information and the data about situation of smoking in the military • Orientation with package intervention • intervention related to consciousness raising and Dramatic relief • increase motivation to quit by using role model	**Wk 3-4** • Family intervention + Booklet • increase motivation to quit by using role model • self-reevaluation **Wk 9** • Booklet + mouth wash • advice for relapse prevention	- **Wk 2** : Orientation + intervention related to consciousness raising and Dramatic relief - **Wk3** : increase motivation to quit by using role model - **Wk4** : self-reevaluation - **Wk5** : self-liberation and teaching skills with self-help material - **Wk 6** : goal setting and stress management training - **Wk 7** : counter conditioning, stimulus control and reinforcement management - **Wk 8** : Meeting to the conscripts and ask about smoking behavior - **Wk 9** : advice for relapse prevention and self-control

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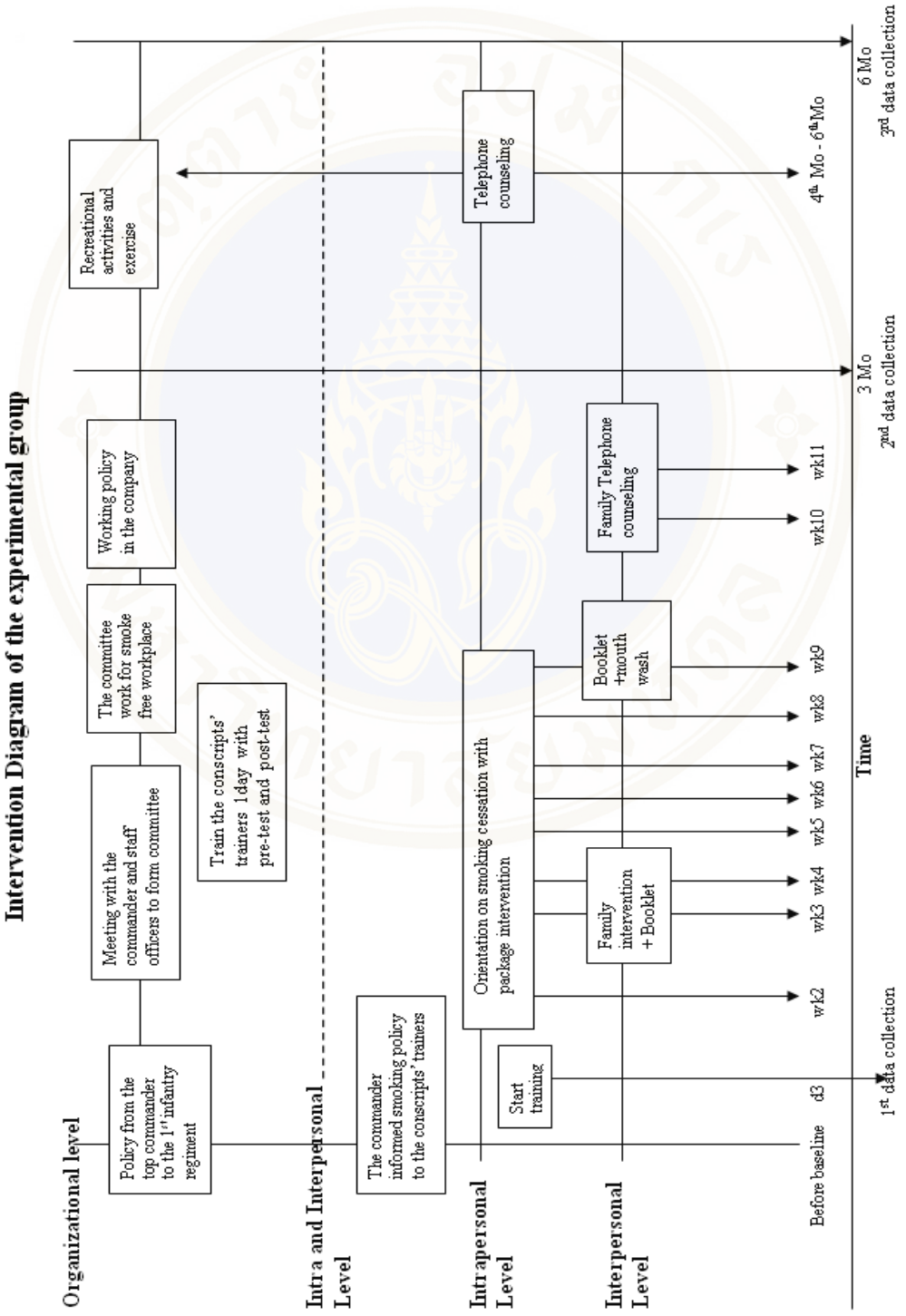
APPENDIX I
INTERVENTION DIAGRAM



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