AVOIDING ENVIRONMENATAL TOBACCO SMOKE IN PREGNANT WOMEN

PENNAPA BOONKAEWWAN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF NURSING SCIENCE
(COMMUNITY HEALTH NURSING)
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2007

Thesis

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Pennapa Boonkaewwan
Miss Pennapa Boonkaewwan
Candidate

Chounchom Charoenyooth
Assoc.Prof. Chounchom Charoenyooth,
Ph.D.(Population and Development)
Major-Advisor

Usaporn Chavalitnitikul
Assoc.Prof. Usaporn Chavalitnitikul,
M.P.H.(Public Health Nursing)
Co-Advisor

Nittaya Sinsuksai
Assist.Prof. Nittaya Sinsuksai,
Ph.D.(Nursing)
Co-Advisor

Prof. M.R. Jisnuson Svasti, Ph.D.
Dean
Faculty of Graduate Studies

Pornsri Sriussadaporn
Assoc.Prof. Pornsri Sriussadaporn,
M.Ed.(Educational Research)
Chair
Master of Nursing Science
Faculty of Nursing

Thesis

Entitled

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was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Nursing Science (Community Health Nursing)
On
March 8, 2007

Pennapa Boonkaewwan
Miss Pennapa Boonkaewwan
Candidate

Pornsri Sriussadaporn
Assoc.Prof. Pornsri Sriussadaporn,
M.Ed.(Educational Research)
Chair

Usaporn Chavalitnitikul
Assoc.Prof. Usaporn Chavalitnitikul,
M.P.H.(Public Health Nursing)
Member

Chounchom Charoenyooth
Assoc.Prof. Chounchom Charoenyooth,
Ph.D.(Population and Development)
Member

V. Bhumiswasdi
Mrs. Varabhorn Bhumiswasdi,
M.D.
Member

Nittaya Sinsuksai
Asst.Prof. Nittaya Sinsuksai,
Ph.D.(Nursing)
Member

Prof. M.R. Jisnuson Svasti, Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

Kobkul Phancharoenworakul
Assoc.Prof. Kobkul Phancharoenworakul,
Ph.D.(Nursing)
Dean
Faculty of Nursing
Mahidol University

ACKNOWLEDGEMENTS

The success of this thesis is attributed to the extensive support and assistance from my major advisor, Assoc. Prof. Chounchom Charoenyuth who also taught me that distances didn't hinder study.

I wish to extend my gratitude to my co-advisors, Assist. Prof. Nittaya Sinsuksai and Assoc. Prof. Usaporn Chavalitnitikul and Assoc. Prof. Pornsri Sriussadaporn, chair of the thesis defend for their invaluable advice and guidance in this research.

I wish to express my deep appreciation to Dr. Varabhorn Bhumiswasdi, a physician and expert in the filed of tobacco smoking as external examiner for her comments and suggestions.

Finally, I would like to acknowledge my parents (Mr.Sompit and Mrs.Weerawan Boonkaewwan), my sister (Dr. Waraporn Boonkaewwan) and my brother (Dr. Chaiwat Boonkaewwan) who always support me with love and encouragement. I am also grateful to my relatives, Ubasika Somporn Noosud and her family for their kindness and moral support. I also would like to thank all my friends who always encourage and support me throughout the time of study in the master level. And the last, but not least, I express my gratitude to the pregnant women willing to join my research. I could not have accomplished this work without them.

Pennapa Bonkaewwan

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PENNAPA BOONKAEWWAN 4436999 NSCN/M

M.N.S. (COMMUNITY HEALTH NURSING)

THESIS ADVISORS: CHOUNCHOM CHAROENYOOTH, Ph.D., NITTAYA SINSUKSAI, Ph.D., USAPORN CHAVALITNITIKUL, M.P.H.

ABSTRACT

The Hazard of smoking directly affects to not only the smoker but also the persons exposed to environmental tobacco smoke (ETS). Inevitably, societies can not be free from smoking so there should be a smoke free environment made at the macro level, and ETS avoidance at the micro level. This descriptive research aims to investigate factors affecting the avoidance of ETS in pregnant women, by applying Pender's Health Promotion Model. The sample was 100 pregnant women visiting antenatalcare unit at Khanom Hospital and 5 health centers in Khanom District, Nakorn Sri Thammarat from July to October 2005. The sample was selected by purposive sampling according to inclusion criteria; pregnant women who were not ex-smokers, did not smoke, and who lived with their families. The research instruments were self-administered questionnaires. Data were analyzed by using means, standard deviations, Pearson's production moment correlation and multiple regression.

The results showed that the overall avoidance of ETS in pregnant women was at a low level. However, pregnant women had moderate levels of perceived benefits, perceived barriers, and perceived self-efficacy in avoiding ETS. Multiple regression revealed that no factors could explain the variance in avoiding ETS in pregnant woman. It was found that the mean birth weight of babies of mothers living with smokers was 3,121 grams and those of the mothers living with nonsmoker was 3,296 grams, a significant difference of $t=2.229$, $p<0.05$.However, confounding factors were not controlled.

The results of the study suggest that avoiding of environmental tobacco smoke should be emphasized especially in pregnant women together with promoting perceived benefit of the avoiding behavior. Moreover, further research should be done in heterogeneous samples with apropriate instruments for the Thai context.

KEY WORDS; ENVIRONMENTAL TOBACCO SMOKE / HEALTH PROMOTION

100 pp.

การหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ (AVOIDING ENVIRONMENTAL TOBACCO SMOKE IN PREGNANT WOMEN)

เพ็ญนภา บุญแก้ววรรณ NSCN/M 4436999

พย.ม. (การพยาบาลอนามัยชุมชน)

คณะกรรมการควบคุมวิทยานิพนธ์ : ชื่นชม เจริญยุทธ, Ph.D., นิตยา สินสุกใส, Ph.D., อุษา พรชวลิตนิธิกุล, M.P.H.

บทคัดย่อ

ภัยจากการสูบบุหรี่นอกจากมีผลโดยตรงต่อตัวผู้สูบแล้ว ยังส่งผลกระทบต่อคนข้างเคียงที่ได้รับควันบุหรี่ ในเมื่อไม่สามารถทำให้สังคมปลอดจากการสูบบุหรี่ได้ ก็ควรทำให้มีสิ่งแวดล้อมที่ดีสำหรับคนที่ไม่สูบบุหรี่ในระดับมหภาค และการหลีกเลี่ยงควันบุหรี่ในระดับจุลภาค การวิจัยเชิงบรรยายนี้ ศึกษาปัจจัยที่มีผลต่อการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ โดยใช้แนวคิดการส่งเสริมสุขภาพของเพนเดอร์เป็นกรอบแนวคิดของการวิจัย กลุ่มตัวอย่างเป็นหญิงตั้งครรภ์ซึ่งมาฝากครรภ์ที่โรงพยาบาลขนอม และสถานีอนามัยในอำเภอขนอม จังหวัดนครศรีธรรมราช จำนวน 100 ราย โดยการเลือกแบบเฉพาะเจาะจง คือ เป็นหญิงตั้งครรภ์ที่ไม่สูบบุหรี่และไม่เคยสูบบุหรี่ เก็บข้อมูลในระหว่างเดือนกรกฎาคม พ.ศ. 2548 ถึงเดือนตุลาคม พ.ศ. 2548 เครื่องมือที่ใช้ในการวิจัยเป็นแบบสอบถาม ผู้วิจัยเก็บรวบรวมข้อมูลด้วยตนเอง วิเคราะห์ข้อมูลโดยใช้ ค่าเฉลี่ย ค่าเบี่ยงแบนมาตรฐาน ค่าสัมประสิทธ์สหสัมพันธ์ของเพียร์สัน และการวิเคราะห์ถดถอยพหุคูณ

ผลการศึกษา พบว่า การหลีกเลี่ยงควันบุหรี่ของหญิงตั้งครรภ์อยู่ในระดับต่ำ การรับรู้ประโยชน์ของการหลีกเลี่ยงควันบุหรี่ของหญิงตั้งครรภ์อยู่ในระดับปานกลาง การรับรู้อุปสรรคในการหลีกเลี่ยงควันบุหรี่ของหญิงตั้งครรภ์อยู่ในระดับปานกลาง และการรับรู้ความสามารถในการหลีกเลี่ยงควันบุหรี่อยู่ในระดับปานกลาง เมื่อวิเคราะห์ด้วยสมการถดถอยเชิงพหุคูณ ไม่พบตัวแปรใดที่มีอำนาจทำนายการหลีกเลี่ยงควันบุหรี่ ทั้งนี้พบว่าน้ำหนักเฉลี่ยแรกเกิดของทารกในกลุ่มมารดาที่อาศัยกับผู้สูบบุหรี่มีค่า 3,121 กรัม และกลุ่มมารดาที่อาศัยอยู่กับผู้ไม่สูบบุหรี่มีค่า 3,296 กรัม ซึ่งแตกต่างอย่างมีนัยสำคัญ ($t = 2.229$, $p < 0.05$) อย่างไรก็ตามการศึกษานี้ไม่ได้ควบคุมตัวแปรอื่นที่อาจมีผลต่อน้ำหนักทารกแรกเกิด

ผลการวิจัยมีข้อเสนอแนะว่า ควรมีการหามาตรการในการส่งเสริมพฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ และส่งเสริมเกี่ยวกับการรับรู้ประโยชน์ของการหลีกเลี่ยงควันบุหรี่ นอกจากนี้ควรทำการศึกษาในกลุ่มตัวอย่างที่มีความแตกต่างกัน รวมทั้งการพัฒนาแบบสอบถามที่เหมาะกับบริบทของสังคมไทย

100 หน้า

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CHAPTER I
INTRODUCTION

Background and Significance of the Study

Tobacco smoke causes health problems to both smokers and nonsmokers who are exposed to it. It contains more than 4,000 types of chemical substances and toxicants that have effects on the functioning of various body organs in the form of cytological toxicities. It also has effects of immunological suppressants. Among these substances, approximately 40 types are found to be carcinogenic (WHO, 2002).

Passive smokers, or people who do not smoke but are exposed to environmental tobacco smoke (ETS), are also affected. People of all ages can develop health problems from tobacco smoke. The health impacts from exposure to environmental tobacco smoke, however, depend on the period of exposure. A brief exposure to tobacco smoke causes eyes, nose and throat irritations, headache and nausea, as well as annoyance, stress and mood swings (Lompong, 1999). Long-term exposure to tobacco smoke leads to chronic and acute respiratory diseases, including bronchitis, pneumonia, asthma, lung cancer and cardiovascular disease (WHO, 2000; Fonthamm, et al., 1994; U.S. DHHS, 1986; Glanz & Parmley, 1991).

Statistical records in many countries report mortality from exposure to environmental tobacco smoke as follows: 4,000 – 5,000 per year in the US; 500 per year in Canada; 300 – 500 per year in Norway; and 100 per year in the UK (WHO, 2002). In 1992, the US Environmental Protection Agency reported that 3,000 adults had died of lung cancer during the year and that 150,000 – 300,000 children younger than 18 months suffered from bronchitis and pneumonia (WHO, 2002). Furthermore, smoking affects pregnancy, as the incidence of low-birth-weight infants related to maternal smoking has been found to be 9,700 – 18,000 per year (Windham, Behren, Waller, & Fenster, 1995) while sudden infant death syndrome was 1,900 – 2,700 per

year (Klonoff – Cohen et al., 1995). The exposure of environmental tobacco smoke in pregnant women has a significant impact on the fetus, causing low birth weight (Rubin,1986; Haddow,1998; Rebagio,1995; Wongsurirat, 1996), and increasing the risk of neonatal death (Ahiborg & Bocin, 1999), miscarriage (Ahiborg , Bocin, & Windham, 1992), and sudden infant death syndrome (Dwyer, Ponsonby, & Couper, 1999). Infant death results in a wasted pregnancy, which is further related to economic loss because substantial costs are incurred throughout pregnancy to delivery e.g., expenses for foods and transportation for antenatal care and absence from work or decreased work hours which contribute to lowering income. Moreover, miscarriage and neonatal death, as well as low-birth-weight infants, require special care, thus further increasing expenses (Walsh, 1990).

In many countries in Asia and the Pacific region, the populations that are inevitably exposed to tobacco smoke in daily life are children and women (WHO, 1999). The survey of smoking and national health in the nonsmoker population in China revealed that women inhaled more environmental tobacco smoke than men with the highest prevalence of exposure in women in the reproductive age range. The most common places of exposure to environmental tobacco smoke are the home, workplace and public places respectively (Yang et al., 1996 cited in Jonathan & Soon-Young Yoon, 2000; Loke et al., 2000). This is in accordance with a report of exposure to tobacco smoke in pregnant women, which states that the most common place of exposure to tobacco smoke is the home, the workplace, and public places (Rebagliato, Florey, & Bolumar 1995). In Japan, approximately 62 percent of pregnant women are exposed to tobacco smoke from people close to them with 82 percent from husbands and 18 percent from other family members (Ogawa et al., 1991). In Thailand, there are approximately one million pregnant women each year and about 600,000 of them have smoking husbands (Vatisathoggit , 1994). Thus, the number of pregnant women being exposed to tobacco smoke from husbands is as high as 600,000 each year. A survey study of 2,844 pregnant women in Bangkok, suburban areas, and other regions showed that the close acquaintances of more than 50 percent of these women were smokers. Of all the women, 75 percent were exposed to environmental tobacco smoke at home, 10 percent at work and five percent at public places (Panamphai, 2001).

Because of the harmful effects of environmental tobacco smoke on pregnancy, to both the mother and the fetus, pregnant women should live in smoke-free environments or try to avoid exposure to tobacco smoke. Avoiding environmental tobacco smoke is a preventive behavior, which is a health promotion behavior. The World Health Organization's concept of health promotion emphasizes the promotion of one's efficacy in adjusting and controlling the environment to enhance healthy conditions and the collaboration of all parties concerned to encourage personal interest in improving the environment for personal health, thus covering both individual and social levels of health promotion.

Therefore, environmental control to prevent one's exposure to the toxicants of tobacco smoke is essential. A significant measure for the prevention is smoking cessation, which is difficult because the number of smokers is uncontrollable. In 1993, the World Health Organization estimated that a third of the worldwide adult population, or approximately 1.1 billion people, are smokers and more than 70 percent of these smokers are in developing countries. During the past 4 – 5 years, the number of smokers in Thailand was approximately 10 – 12 millions wherein approximately 10.6 million people were regular smokers (Office of National Statistics, 2001). It is apparent, then, that total elimination of smoking in society would be difficult because smoking is a continual additive behavior that is socially acceptable and quitting smoking is a difficult task. According to the 2001 report from the Office of National Statistics on attempts to quit smoking among regular smokers in Thailand, 33.2 percent of regular smokers never thought of quitting; 36.5 percent thought of quitting but never made an effort to quit smoking; and only 30.3 percent attempted to quit smoking once or twice, but finally returned to their smoking habit. The report also shows that 88.5 percent of Thai smokers usually smoke at home when they are with other family members despite numerous campaigns about the harm and impact of smoking and exposures to tobacco smoke. This information indicates that these smokers are not aware of the harm from exposure to tobacco smoke to themselves and to other family members (Office of National Statistics, 2001).

The Thai government is well aware of the harmful effects of tobacco smoke and recognizes the importance of reducing exposure to tobacco smoke; thus,

preventive action to protect the health of the population has been taken. Anti-smoking campaigns, including the no-smoking home/school/offices program, have been introduced. Other significant measures include legislation and regulations e.g. Section 5,11 of the Tobacco Product Control Act 1992 and Section 4(1),(2) of The Non-Smokers' Health Protection Act 1992 (Vathisathoggit, 2002). Violations of these laws will result in legal punishment. Legislation and regulations raise awareness of the harmful effects of tobacco smoking while protecting non-smokers' rights in having healthy environmental air. In addition, they help to reduce cigarette smoking, in terms of both quantity and frequency because smokers have less available places to smoke. Nevertheless, cigarette smoking remains noticeable everywhere i.e. in restrooms, public piers for passenger boats, restaurants, entertainment complexes, etc. One survey has shown that most people (75.9%) thought that the present no-smoking measures are not strict enough. They expressed doubts about the effectiveness of no-smoking measures in some areas due to inefficient application of the laws, people's negligence toward the regulations, lack of cooperation from Thai smokers, lack of awareness, lack of public announcements and belief that smoking is a personal right (ABAC Poll Research Center, Assumption University, 2002). Therefore, another important action to prevent health impacts for non-smokers is avoiding the tobacco smoke of individuals. A person can avoid tobacco smoke by refusing to enter smoking areas or controlling exposure to smoke by asking smokers to stop smoking. People who cannot leave areas filled with tobacco smoke must try to minimize the exposure to that smoke (Martinelli, 1998).

The aforementioned studies lead to a question about behavior in avoiding tobacco smoke among pregnant women in Thailand, where the total number of smokers is 12 million (Office of National Statistics, 2001). Among these 12 million smokers, 10.6 million are regular smokers, approximately 10 million are men and 600,000 are women. Moreover, the number of smokers has increased from the year 1999, when there were 10.2 million smokers. In fact, the number of smokers increases at an average rate of 400,000 per year. In 1996, the Office of National Statistics conducted a survey on smoking behavior during pregnancy in 848,000 women whose youngest child was younger than five years. It was found that 56,100, or 6.61 percent of these women, smoked cigarettes during pregnancy. Another survey in 2001 found

1,442,330 regular smokers in the southern region of Thailand: 1,365,800 men and 54,500 women. In Nakhon Sri Thammarat, there were 285,300 smokers, 275,900 (96.7%) which were men and 9,400 (3.29%) were women. Furthermore, most smokers reported smoking cigarettes at home in the presence of other family members. For the most part, the smokers who usually smoke at home were in the age range between 40 and 45 years. Thus, pregnant women are likely to be exposed to tobacco smoke at home, leading to health problems in both the women and their fetus.

The high tendency of pregnant women to be exposed to tobacco smoke from family members leads to a question about their action to avoid tobacco smoke. The researcher conducted a pilot survey with 50 pregnant women in the Khanom District, Nakhon Sri Thammarat Province from February to March 2004 and found that, among the 50 women, three of them were smokers; 2 were ex-smokers; and 32 lived with family members who were smokers, most of which were their husbands, followed by close relatives such as siblings and fathers. The chance that these women would be exposed to tobacco smoke from their close acquaintances was as high as 50 percent. Thus, it was interesting to find out how pregnant women would avoid tobacco smoke and what factors are related to the avoidance of tobacco smoke.

A review of studies in avoiding tobacco smoke revealed that gender, health behavior performance, perceived general self-efficacy and self-efficacy in avoiding ETS and living with smokers are factors which directly affect one's behavior in avoiding ETS (Martinelli, 1999). This is consistent with a report from studies on exposure to ETS, which found that living with smokers and perceived self-efficacy in avoiding ETS have effects on one's exposure to ETS (Martinelli, 2002; Strecher, 1993).

Research questions

1. How are pregnant women's behavior in avoiding tobacco smoke?

2. What are the contributions of personal factors (comprising age, educational level, income, living with a smoker in the family), perceived benefits, perceived barriers and perceived self-efficacy to avoiding tobacco smoke?

Purpose of the Study

1. To assess environmental tobacco smoke avoidance in pregnant women

2. To examine the relationships and predictive power of personal factors (including living with a smoker in the family), perceived benefits of action, perceived barriers to action and perceived self-efficacy in avoiding tobacco smoke on the avoiding tobacco smoke behavior of pregnant women.

Hypothesis

Personal factors (age, education level, family income), perceived benefits, perceived barriers, and perceived self-efficacy in avoiding tobacco smoke and living with smokers can predict pregnant women's behavior in avoiding environmental tobacco smoke

Conceptual Framework

This research was based on Pender's health promotion model. According to Pender, two factors influence a person's health promoting behavior: 1) individual characteristic and experiences and 2) behavior-specific cognitions and affect.

1) Individual characteristics and experiences consist of two variables: personal factors and prior related behavior;

2) Behavior-specific cognitions and affect consist of six variables: perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, situational influences and interpersonal influences. In addition, this component also involves two more variables: commitment to a plan of action and immediate competing demands and preferences.

This research investigated the contribution of individual characteristics and experiences and behavior-specific cognitions and affect, on a specific behavioral outcome. For personal factors, the variables included were age, education level, and family income (Nirattharadon, 1996; Leetheeragul, 1998; Thanomroop, 2000). For the behavior-specific cognitions and affect components, four factors were included in the study: perceived benefits of action, perceived barriers to action, perceived self-

efficacy and situational influences. A number of previous studies used Pender's Health Promotion Model as a conceptual framework to investigate factors influencing specific health promoting behavior such as health-promoting lifestyles, exercise, hearing protection, nutrition and exposure to environmental tobacco smoke in various populations. It was found that perceived benefits of action, perceived barriers to action and perceived self-efficacy could predict health promoting behavior. Perceived self-efficacy and perceived barriers to action were found to have high predictive power whereas perceived benefits of action had medium predictive power. Lastly, situational influences were found to have both direct and indirect effects on health promoting behavior with statistical significance (Pender et al., 2002).

The variables that were not investigated in this study comprised of activity-related affect and immediate competing demands and preferences due to the dynamic nature of these variables and testing difficulty. The study of these variables requires further development of an effective and reliable instrument. The behavioral outcome, or health-promoting behavior in this study, is defined as pregnant women's behavior in avoiding environmental tobacco smoke.

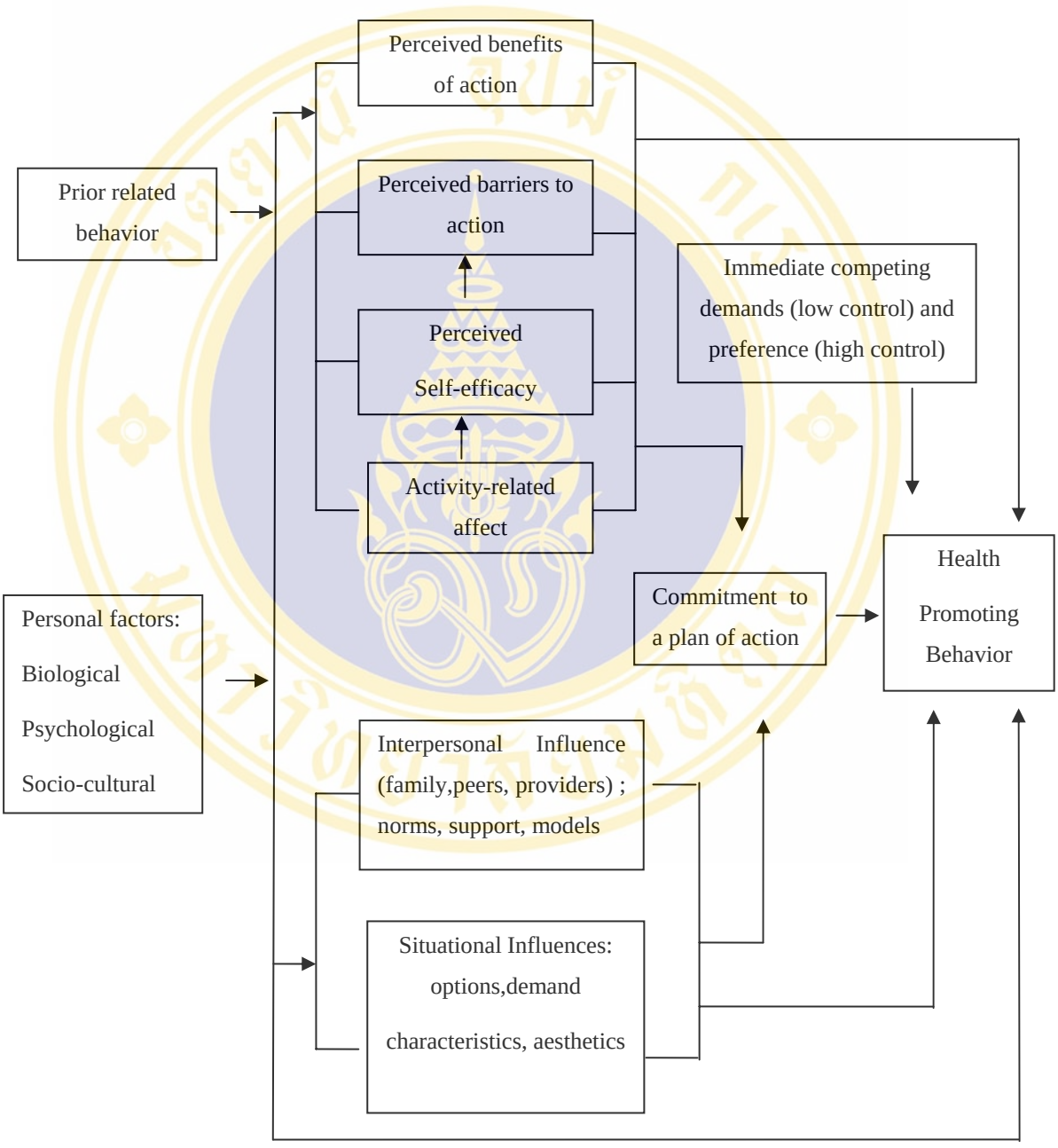

Figure 1 Health Promotion Model (revised) (Pender et. Al., 2000: 60)

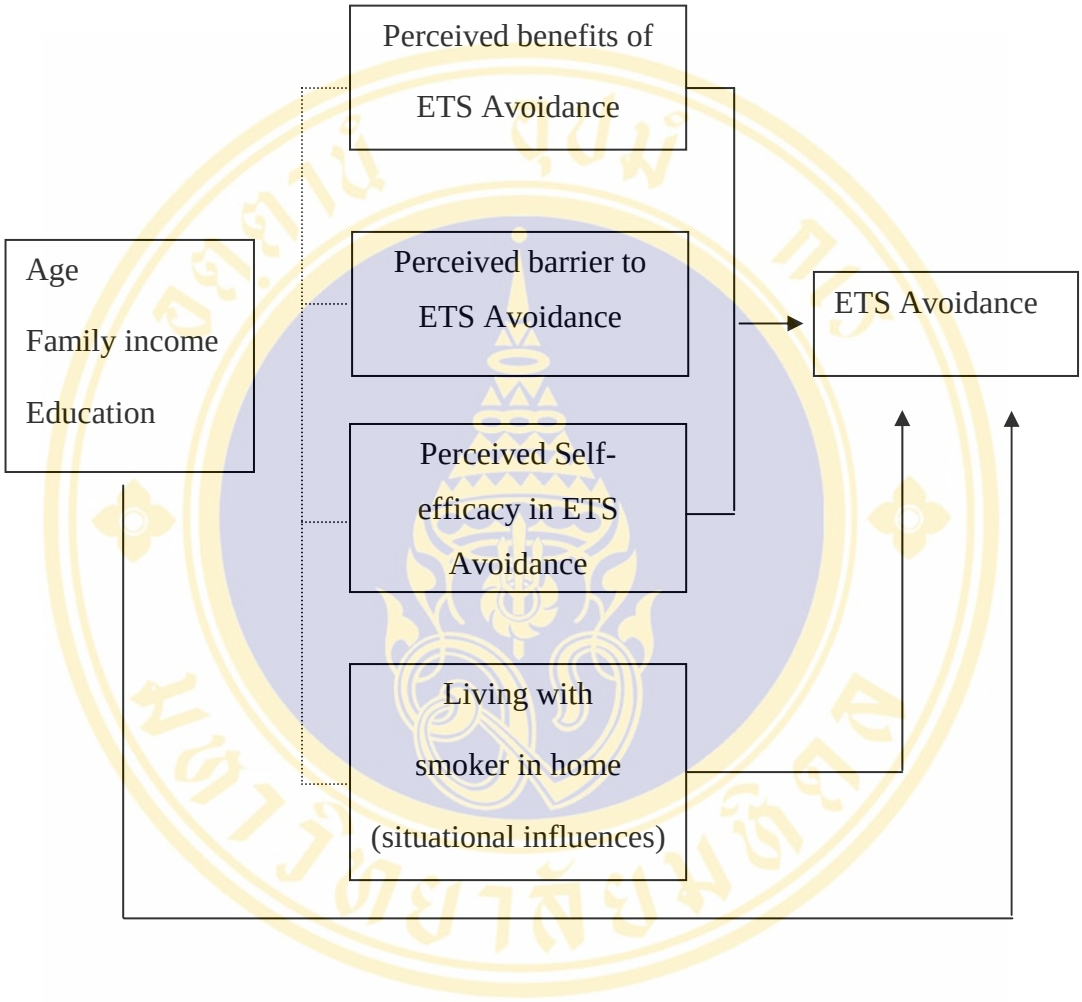

Figure 2 Conceptual framework of the study

Scope of the Study

This research is a study of pregnant women's behavior in avoiding tobacco smoke and factors affecting the behavior. The study was conducted with 100 pregnant women who received antenatal care services at Khanom Hospital and at five healthcare centers in Khanom District, Nakhon Sri Thammarat Province.

Definition of Terms

Age refers to the pregnant women's age in full years, from birth to the day of the study, and excluding an extra period of less than six months.

Education level refers to the highest level of formal education that the pregnant women received as counted in full years.

Family income refers to the monthly earnings in baht of both husband and wife or either of them if the other one was unemployed.

Perceived benefits of avoiding tobacco smoke refers to the pregnant women's feeling, belief and understanding about the physical and mental benefits of avoiding tobacco smoke, assessed with the measurement of perceived benefits of avoiding tobacco smoke in pregnant women.

Perceived barriers to avoiding tobacco smoke refers to the pregnant women's feeling, belief and understanding about the barriers of or obstacles to avoiding environmental tobacco smoke, assessed with the measurement of perceived barriers of avoiding environmental tobacco smoke in pregnant women.

Perceived self-efficacy in avoiding environmental tobacco smoke refers to the pregnant women's confidence in their capability to avoid environmental tobacco smoke, assessed with the measurement of perceived self-efficacy in avoiding environmental tobacco smoke in pregnant women.

Living with smokers refers to the presence or absence of smokers in the pregnant women's house.

Behavior in avoiding environmental tobacco smoke refers to the pregnant women's practice in avoiding environmental tobacco smoke, assessed with the

measurement adapted from the Avoidance of Environmental Tobacco Smoke Scale designed by Martinelli (1998).

Expected Outcomes

1. Information about pregnant women's behavior in avoiding tobacco smoke should enhance knowledge about the seriousness of problems from exposure to tobacco smoke in pregnant women.

2. Knowledge about factors affecting pregnant women's behavior in avoiding environmental tobacco smoke could be used as basic information for developing programs to prevent future health problems from exposure to environmental tobacco smoke in pregnant women.

CHAPTER II
LITERATURE REVIEW

Related research and literature were reviewed for this study, as presented in the following topics:

1. Cigarettes
2. Smoking behavior of Thai people
3. ETS indoor air pollution and pregnant women
4. Health effects of exposure to ETS on pregnant women and children
5. Behavior in avoiding ETS
6. Factors affecting behaviors in avoiding ETS

Cigarettes

A cigarette is a slim rolled object composed of shredded tobacco wrapped in thin paper and used for smoking. The common length of cigarettes is 70 mm (about 2.8 inches). In 1939, however, a manufacturer introduced 85-mm long cigarettes (about 3.4 inches) into the market and a cigarette of this size is commonly known as a king size. Longer cigarettes were later manufactured in 1966 with a length of 100 mm, or about 4 inches (Boonpruek, 1981).

A cigarette is made of tobacco leaves from the plants with botanical name Nicotiana *Tabaccum*. The leaves are finely chopped into tobacco shreds and wrapped in dried banana leaves, atap-palm leaves or paper. Some smokers may put tobacco shreds in a smoking pipe and puff smoke through the pipe (Udom, 1996).

The Tobacco Act B.E. 2509 defines a cigarette as tobacco or prepared tobacco shreds, either mixed with dried or pressed tobacco leaves or not, which are

rolled up in paper or any prepared material to replace paper, or in a dried or pressed tobacco leaf.

According to the Non-smokers' Health Protection Act B.E. 2535, "cigarette" means a cigarette, cigar, other cigarettes, tobacco or modified tobacco pursuant to the law on tobacco.

Tobacco in cigarettes is an addictive substance. Referring to the World Health Organization, addictive substances are drugs or any chemical substances that have addictive effect after they are continuously consumed by eating, smoking, puffing, or any other method, for a certain period of time. Addictive substances also have effects on the users' physical and mental condition, causing constant craving and need for an increasing amount. Abstinence from addictive substances induces withdrawal symptoms and long-term use of additive substances usually leads to impaired health condition (Udom, 1996).

Cigarette components

The components of cigarettes can be identified in two parts: cigarette and environmental tobacco smoke.

A cigarette is composed of the following components (Hundee, 1999):

1. Paper - The paper used for rolling up a cigarette mostly contains cellulose.

2. Tobacco leaves - The tobacco shreds used for making a cigarette contain about 20 mg of nicotine. For a smoking pipe, the tobacco shreds have 25 gm of nicotine; and for a cigar, the tobacco shreds contain 100 mg of nicotine.

3. Other components include sugar, carbohydrate, fat, phenol, fatty acids, and minerals from the soil of cultivated tobacco plants.

Environmental Tobacco smoke (ETS)

ETS is generated from the burning of tobacco shreds, paper and some substances that are added into the cigarette. The temperature of an actively burning cigarette is about 884 degrees Celsius and more than 4,000 different substances are

emitted from ETS, either in form of small particles, gases or tar. ETS can be classified into two types, as detailed below.

1. Mainstream smoke refers to the smoke of a burning cigarette that the smoker inhales during puff drawing and exhales to the environment. The exhaled smoke contains very small particles that are invisible to the eyes with a size of 0.1-0.6 microns and are released at the rate of about 6,000 million particles per second.

2. Side-stream smoke refers to the smoke emitted from a smoldering cigarette between puffs or when the cigarette is left in an ashtray. Side-stream smoke is also known as second-hand smoke. It contains particles that are smaller than the particles in mainstream smoke, with a size of about 0.1 microns. These particles can penetrate through the epithelial cells of respiratory tracts.

Toxic substances in ETS and their actions

Toxic substances - The following toxic substances are found in ETS

1. Nicotine and nor-nicotine - These two substances constitute about 7 – 8 percent of tar from tobacco smoke. They are water-soluble alkaloids and are toxin to insects, worms and pets. Moreover, oral consumption of 40-mg nicotine can cause instant death in humans. Nicotine can be absorbed into the body through the epithelial tissues of the mouth, skin and lungs. Nor-nicotine is vaporized and oxidized less than nicotine and also has lower toxicity. These two substances can combine with nitrite and transform to N-nitrosonicotine and N-nitronornicotine, which can stimulate mutation and contribute to the development of cancer. Lastly, nicotine is an additive substance and major contributor to the addictive properties of tobacco.

2. Phenols. Phenols - constitute about 8.8 – 1.6 percent of tobacco smoke. They are fatty acids with molecular length ranging from C1 to C13 and can change into gaseous form. Phenols may be saturated or unsaturated fatty acids and also have keto-acids such as pyruvic acid. Phenols and polyphenols have strong acidic properties that cause irritation to the epithelium while affecting mucociliary function in the nostrils. The components that have co-carcinogenic effects include chlorogenic and rutin, which also weaken the capillaries. Most cigarettes contain 1 mg of phenols and may also have alkyphenol, napthols and hydroquinone.

3. Aldehydes and ketone - The most common aldehydes in tobacco smoke are aldehydes with low molecular weight such as formaldehyde, acetaldehyde, ponepiondehyde, acetonemethylketone and glyoxal. These substances are irritants to the epithelium of respiratory tracts.

4. N-nitrosamines. The combustion during cigarette smoking produces three types of N-nitrosamine: volatile, nonvolatile and tobacco-specific compounds. The first group is most commonly found in the reaction between ammines and nitrogen oxide. These substances are N-nitrosodimethylamine and N-nitropyrrolidine, which have been found to be carcinogenic in experimental animals. They are irritants to the epithelial tissue of the respiratory tracts. The name and amounts of various nitrosamines in tobacco smoke are listed in Table 1.

Table 1 Concentration of nitrosamines in tobacco smoke emitted from a cigarette

Nitrosamines	Peak concentration (nanogram/cigarette)	
	Filtered	Unfiltered
N-Nitrosodimethylamine	20.0	19.0
N-Nitrosomethylethlamine	2.7	2.5
N-Nitrosodiethylamine	2.8	7.6
N-Nitrosopyrrolidine	110.0	30.0
N-Nitrosonornicotine	950.0	310.0
N-Nitrosoanatabine	990.0	370.0

5. Terpene and isopene - The isopenes found in tobacco smoke are mostly dimer to hexamer compounds. Squalene, which is a triterpene, is also found in tobacco smoke.

6. Squalene - This substance may be bonded and transforms to cholesterol. It can be oxidized and becomes a derivative of hyperoxide from stigmasterol, beta-sitosterol, and gamma-sitosterol in tobacco smoke and also has carcinogenic effects.

7. Polycyclic aromatic hydrocarbons (PAHs) - The PAH that is most commonly identified in tobacco smoke is benzo [a, h] anthracene (4 microgram in 1,000 cigarettes). Other PAHs include dibenzo [di] pyrene, benzo [c] phenanthrene, di-benzo [a, j] acrydene, and 7-dibenzo [ziji] carbazone, which are all carcinogenic. Benzo [a] pyrene has the strongest carcinogenic effect among the PAHs in tobacco smoke. PAHs are not constituents of tobacco leaves or of any other components of cigarettes, but they are by-products from the burning of sterol in tobacco leaves during the combustion while smoking.

8. Other gases - Cigarette smoke contains several gases including carbon dioxide, carbon monoxide, methane, ethane, propane, butane, acetylene, propylene, methanol, ammonia, ethylnitrite, hydrogensulphide, hydrogencyanide and methylchloride. All these substances have cytological toxicities.

9. Toxic substances contaminating cigarettes - Toxic substances that might be left on tobacco leaves and subsequently contaminate either cigarettes or tobacco smoke are insecticides such as DDT, endrine, dialdrene, gluthyon, chlordane, malathyon and parathyon. Metalloids such as arsenics, nitrates, nitrites, or nitrosamines are also identified in tobacco leaves and tobacco smoke. In addition, cigarettes may also have radioactive substances such as radium, thorium and polonium.

Actions of toxic substances in cigarettes and ETS

1. Nicotine

Nicotine enters the body through the mouth, nose and lungs. When it is absorbed into the bloodstream, nicotine directly affects the brain and adrenaline glad, triggering the release of various chemical substances such as nor-adrenaline, dopamine and serotonin. Nicotine has both stimulant and suppressant effects as well as a sedative effect on the central nervous system. It also has a direct effect on the heart, causing increased heart rate and arterial constriction. This impairment in the

blood circulation system leads to hypertension. Moreover, nicotine also stimulates neurons to release excess glutamate neurotransmitter, which is an excitatory transmitter, thus the neurotransmission is strengthened. Because of these actions, nicotine induces alertness and improves short-term memory.

2. Tar

Tar is a carcinogen causing lung cancer, as well as cancers of the bronchial tubes, esophagus, kidneys, bladder and other organs. It has been found that 50 percent of tar from tobacco smoke identified from stains on the lung cause irritation, which is a cause of chronic coughing and sputum.

3. Carbon monoxide

Carbon monoxide can bond to red blood cells or hemoglobin by replacing oxygen and form into carboxyhaemoglobin. This action impairs oxygen transportation to various body cells, resulting in decreased oxygenated cells in the body. In response, the heart will work harder and beat faster with an attempt to pump adequate blood to various bodily organs. The affected person will then feel dizzy, easily exhausted and have slow decision-making. Blood carbon monoxide higher than 30 percent is harmful to the body and a level of 60 percent can be life-threatening.

4. Hydrogencyanide

This gas can destroy ciliated cells in the upper respiratory tract. Ciliated cells are natural barriers to dust, moisture and microorganisms in the air; the body loses its natural barriers when these cells are damaged. As a result, dirty particles or pathogens in the air can attach to the bronchial tubes, causing ulcers and bronchitis with symptoms of chronic cough and increased sputum.

5. Nitrogen dioxide

Nitrogen dioxide destroys the epithelium of the alveoli and alveolar walls which are subsequently stretched and become thinner. Several alveoli will then disintegrate and transfer into larger alveoli but in smaller amounts, leading to the development of pulmonary emphysema. Moreover, the distended alveoli will press on the lung tissues that are still in good condition, causing reduced oxygenation. Persons with emphysema may have symptoms such as tightness in the chest, chronic cough

and shortness of breath. They may also be unable to exercise. These symptoms are chronic and incurable; thus the patients will suffer from them for the rest of their lives. In patients with ruptured emphysema, the air leaks into the pleural cavity and the lung is compressed. This condition causes severe chest pain and may eventually lead to death.

6. Ammonia

Ammonia irritates tissues, making the eyes and the nose feel sore. The irritation may also cause bronchitis, coughing and increased sputum production.

7. Radioactive substances

Tobacco smoke contains the alpha-emitter, polonium-210, which is a cause of lung cancer. Second-hand smoke is a significant carrier of this radionuclide through the airborne particles to non-smokers who are exposed to environmental air with this radioactive substance.

Smoking behavior of Thai people

Thai people smoke cigarettes of various types and brands, including filtered and unfiltered cigarettes manufactured by the Thailand Tobacco Monopoly, hand-rolled cigarettes wrapped with dried banana leaves or atop palm leaves, cigars and imported cigarettes. According to a national survey of smoking behavior conducted by the National Statistical Office in 2001-2004, people older than 15 years of age (12 million people) were smokers and 9.6-10.6 million of them were regular smokers. The smoker-nonsmoker ratio in each house is 1:2, and it has been found that most regular smokers smoke cigarettes at home, in the presence of other family members at a high percentage of 88.5.

Smokers report smoking cigarettes after meals, in bathrooms, while drinking, when stressed, when working or relaxing at home, at a party, with friends, or when they are alone (Punvadee, 1996; Ranoi, 1993).

ETS indoor air pollution and pregnant woman

Indoor sources and occurrence of ETS

People spend most of their time at home, making it potentially the most important location of ETS exposure for people living with regular smokers (Klepeies, 1999). The workplace is second only to the home as the location where adults spend most of their time and smoking in the workplace has been a major contributor to total ETS exposure. The National Human Activity Pattern Survey (NHAPS), conducted from 1992-1994, interviewed 9,386 randomly chosen U.S. residents about their activity and exposure to ETS. For those persons reporting ETS exposure of at least one minute, the average daily duration of the exposure and the percentage of respondents who reported an exposure in each indoor locale were as follows: 305 minutes in the home (58%), 363 minutes in the office or factory (10%), 249 minutes at school or public buildings (6%), 143 minutes in bars or restaurants (23%), 198 minutes in malls or stores (7%), 79 minutes in vehicles (33%), and 255 minutes in other indoor locations (6%) (Klepeies, 1999; Klepeies, 2001)

The sole source of ETS is the combustion of tobacco products. Nearly ubiquitous in most societies, ETS exposure occurs in indoor air wherever there is smoking in the home, vehicles or public places. The degree of exposure depends on the number of smokers and the amount of tobacco smoked, as well as the size and ventilation characteristics of the indoor space and duration of exposure (Leader, 1991 cite in WHO, 2000).

Few studies have examined ETS in environment such as public places and houses. The most widely used markers compound for assigning the presence and concentration of ETS in indoor air are vapour-phase nicotine and respiratory suspension particle (RSP) mass (Leader, 1991 cite in WHO, 2000). Nicotine has been used to measure the quantity of tobacco smoke in the environment. However, a potential drawback is that it has a high affinity for interior surfaces and, under certain circumstances, measurement could lead to an underestimate of the level of other ETS constituents which have been removed from the ETS level and correlate well with other indoor exposure such as RSPs and reported number of smokers (Leader, 1991 cite in WHO, 2000).

In the United States, nicotine concentration in homes with smokers typically ranges from less than 1 µg/m^3 to over 10 µg/m^3; Hong Kong homes reported 0.3 µg/m^3 and Chinese homes 0.1 µg/m^3 (US EPA, 1992; Hammond, 1999). Concentrations in offices where smoking occurs typically range from near zero to over 30 µg/ m^3; Levels in restaurants, especially in bars come to 10-11 or higher. The measure of ETS-associated RSPs in homes where smoking occurs ranges from a few µg/ m^3 to over 500 µg/ m^3 while the level in offices is generally less than 100 µg/ m^3; and those of restaurants can exceed 1 mg/ m^3. In countries with higher smoking prevalence, the average ETS level could be high. Biological markers of ETS exposure provide evidence of the quantities of ETS constituent uptakes by nonsmokers (smoke-free Canada, 2001).

Smoke-free Canada (2001) found that various important chemicals of ETS in the workplace were calculated assuming 10 smokers per 300 m^2 area during 8 hours, each smokes 2 cigars per hour in the standard ventilation rates. The finding reveal that the chemicals people would inhale directly were carbon monoxide 5606 µg, tar 3128 µg, nicotine 678 µg, acetaldehyde 207 µg, nitric oxide 190 µg, formaldehyde 54 µg, benzene 36 µg, and so on, all of which are known carcinogens. Among these lists are irritants, mutagents, toxins and substances that increase blood pressure, promote tumors, affect the central nervous system, damage the lungs and cause kidney malfunction. Whether ETS is encountered at work, at home, at school, at bus terminals or in restaurants, it is a proven health threat to the young and old, from the womb through all walks of life (smoke-free Canada, 2001).

While various ETS-related compounds can be measured above background levels in indoor environments (e.g. PAHs and carbon monoxide), most are not practical markers of ETS. there are many sources of ETS, however, they are difficult or expensive to measure. The most widely used marker compounds for assigning the presence and concentration of ETS in indoor air are vapour-phase nicotine and respiratory suspension particle (RSP) mass.

The most widely used biomarker of human ETS exposure is cotinine, the major metabolite of nicotine. Cotinine is specific to tobacco, can be measured in saliva, blood or urine. It eliminated half life is about a day or longer in saliva, blood or

urine. In children, and its levels in bodily fluids reflect exposure over the last 2 or 3 days (US EPA, 1992).

A person can be exposed to environmental tobacco smoke in various places. Most pregnant women are exposed to ETS from their husbands (44.1%), from other family members (13.7%), in the workplace (39.6%) and in public vehicles or public places (6.1%) (Rebagliato, Florey, & Bolumar, 1995). In Thailand, there is not yet a survey especially on pregnant women's exposure to ETS. Rather, most studies are concerned with smoking habits, smoking cessation or abstinence from smoking. These studies, however, may include or concern exposure to ETS among pregnant women. For instance, a study on the impacts of smoking on pregnant women conducted by Punumpai (2001) found that more than 50 percent of pregnant women lived close to smokers; of these, more than 75 percent were exposed to ETS at home, more than 10 percent were exposed to ETS in the workplace, and more than 5 percent were exposed to ETS in public places.

There are some studies of ETS revealing dose-responses of paternal smoking by examining categorizations of cigars per day (referring to quantity of smoke exposure) and the effects on prenatal health (Shaw et al., 1996; Wasserman et al., 1996; Zhang et al., 1992; Seidman et al., 1990). For example, Olsen (1991) analyzed non-smoking women (without a history of infertility treatments) and exposure to ETS from the father, categorizing paternal smoking as 1-9, 10-19 and 20 or more cigars per day and calculating the OR for duration since pregnancy of more than 6 and more than 12 months. There were increased risks for both time outcomes and the greatest risks were at exposures of 10-19 cigars per day for more than 6 months and 12 months.

Studies have measured ETS concentrations in homes (Leader & Hammond, 1991; Hammond et al., 1993; Marbury, Hammond, & Haley, 1993; O' Connor et al., 1995), finding that concentrations of ETS exposure components are higher at the time that the cigars are smoked compared with a few hours later. Measurements taken only during periods of smoking document higher concentrations than samples measured during both smoking and nonsmoking periods. Muramatsu, Umemura, Okada and Tomita (1984) measured both nicotine and particulate matter

sequentially for 10 hours in an office, finding that 30 minute nicotine samples ranged from 2-26 µg/m^3 during the workday while most values ranged between 5-15 µg/m^3 and the 10 hour average concentration was 10 µg/m^3, which was based on a shorter time period than used by other studies to obtain stable estimates. Most studies have measured concentrations averaged over longer periods of time, which include periods with and without smoking.

Other studies have demonstrated a high correlation between nicotine concentrations measured in family rooms and kitchens ($r = .74$, $p<0.001$) (Emmons et al., 2001) as well as between concentrations in the activity rooms and bedrooms ($r= .91$) for homes of smokers ($r= .90$) (Marbury, Hammond, & Haley, 1993).

Health effects of exposure to ETS

Overall effects on the average person

Physical effects: short-term physical effects of ETS include irritation to the nose, eyes and throat. ETS may cause headache, coughing, nausea and discomfort. It may also cause exacerbations of symptoms in people with allergies, asthma and chronic obstructive pulmonary disease. The symptoms may worsen to the extent of breathing difficulties or shortness of breath. People with heart disease may suffer from recurring symptoms of ischemic heart disease upon being exposed to ETS (U.S. EPA, 1992; Glantz & Parmly, 1991). In the long term, women who are exposed to ETS for longer than three hours daily are at threefold higher risk of throat cancer than those who are not exposed to ETS, and twofold higher risk of cancer of other organs. A study in Japan showed that women exposed to ETS from heavy-smoking husbands (smoking more than 20 cigars per day) were at higher risk of lung cancer by twofold, in comparison with other women. In Germany, female non-smokers with lung cancer were found to be married to male smokers at a rate of three times more than females without lung cancer. Apart from lung cancer, medical research has substantial evidence that exposure to ETS also causes cancer in other body parts including the larynx, oral cavity, esophagus, kidneys and stomach (Vateesatokgit, 2000). Moreover, there are also psychological effects of ETS exposure. A study on average people conducted by Lompong (1999) found that cigarette smoking has emotional effects on

non-smokers, as it causes annoyance, irritable mood swings and stress, as well as lack of concentration at work.

Effects of ETS on pregnant women, the fetus and infants

ETS accounts for infertility, spontaneous abortion, perinatal death, neonatal death, preterm delivery, low birth weight, congenital malformations and physical and cognitive development. These effects are the result of exposure to tobacco smoke during preconception, pregnancy and postnatal period (Surgeon General, 2006).

Infertility

ETS exposure may have adverse potential effects throughout the reproductive and developmental processes. During the preconception period (before formation of a zygote by the union of sperm and ovum), maternal exposure to ETS can potentially affect female fertility by altering the balance of hormones that affect oocyte production, including growth hormone, cortisol, luteinzing hormones and prolactin, or by reducing motility in the female reproductive tract (Surgeon General, 2006).

Some studies specifically addressed maternal exposure to ETS in relation to infertility (Chung et al., 1997; Hull et al., 2000). They found that a higher proportion of active smokers had anovulation and required significantly higher amounts of human menopausal gonadotropins (HMG) to stimulate ovulation than nonsmokers. Nonsmoking women with any ETS exposure (at the workplace and in the home) increase risk of conception delay of more than six months compared with unexposed nonsmoking (Hull et al., 2000; Olsen, 1991).

Spontaneous abortion

ETS increase risk of spontaneous abortion or interfere with the developing fetus through growth restrictions or congenital malformations (WHO, 1999). During gestation, windows of susceptibility exist when the developing embryo or fetus is vulnerable to various intrauterine conditions or exposure. Organogenesis occurs mainly during the embryonic period (weeks 3-8 of gestation), which is also the time when major malformations are most likely to develop. During weeks 9-38 of

gestation, susceptibility decreases and it may lead to minor malformations or functional defects (Sadler, 1990). It is similar to the health impacts of active cigarette smoking during pregnancy including increased risk of miscarriage, and perinatal and postnatal hemorrhage at twice the risk of non-smoking pregnant women. Moreover, smoking pregnant women are at an increased risk of premature rupture of the membranes and placenta previa. There is evidence in studies which found spontaneous abortions in pregnant women from ETS exposure (Koo et al., 1988; Windham et al., 1992; Ahlborg & Bodin, 1991; Lindbohm et al., 1991; Windham et al., 1999).

SIDS (Sudden Infant Death Syndrome or the sudden, unexplained, unexpected death of an infant before one year of age),

Prenatal and postnatal exposure to nicotine and to other toxicants in tobacco smoke may affect the neuroregulation of breathing, apneic spells and risk for sudden infant death. Stick et al. (1996) observed newborns in hospital and reported reductions in respiratory function among infants of smokers compared with infants of nonsmokers. Anderson and Cook (1997) proposed that mechanisms for postpartum reductions in respiratory function have included irritation of the airways by tobacco smoke, susceptibility to respiratory infections increasing the risk of SIDS (Sudden Infant Death Syndrome or the sudden, unexplained, unexpected death of an infant before one year of age), and a change in the ventilation responses to hypoxia attributable to nicotine. This finding points to a causal relationship between SIDS and postnatal exposure to tobacco smoke from fathers or other live-in smokers that can also increase the risk of SIDS (Klonoff-Cohen et al., 1995).

Preterm delivery

Active maternal smoking is directly associated with preterm delivery (McCann et al., 1992 cited in Surgeon General, 2006; Prokopczy et al., 1997; Fortier et al., 1994; Ahlborg & Bodin, 1991; Ahluwalia et al., 1997; Windham et al., 2000). Although its biological pathway is not clear, the evidence for this association is strong enough to infer that maternal second-hand smoke exposure may also lead to preterm delivery. Jaakkola et al. (2001) found that nonsmoking women exposed to ETS were at higher risk for preterm delivery compared to un-exposed women. Moreover,

significantly increasing risks of preterm delivery were indicated in nonsmoking mothers being exposed to tobacco smoke for at least 7 hours per day (Hanke et al., 1999).

Low birth weight

Exposure of tobacco smoke also affects low birth weight. Fetal growth is greatest during the third trimester and a number of researchers have postulated that the limitation of fetal growth from active maternal smoking comes from reduced oxygen to the fetus, which is directly attributable to CO exposure and nicotine-induced vasoconstriction leading to reduced uterine and umbilical blood flow (Werler, 1997; Andres & Day, 2000). Otherwise, elevated nucleated red blood cell counts, a marker of fetal hypoxia, were found among neonates of women who smoked during pregnancy (Yeruchimovich et al., 1999) and among pregnant women exposed to tobacco smoke (Dollberg et al., 2000). Additionally, elevated levels of erythropoietin, the protein that stimulates red blood cell production and another indicator of hypoxia, were found in the umbilical cord blood of newborns whose mothers had smoked during pregnancy (Gruslin et al., 2000).

It can be concluded, therefore, that maternal second-hand smoke exposure, specifically to nicotine, may lead to LBW through a pathway of fetal hypoxia (Colak et al., 2002 cited in Surgeon General, 2006). Infants are more likely to be small for gestational age and they are also at increased risk for premature birth and stillbirth. A number of studies explored the effects of exposure to ETS that caused 10 – 200 grams of decrement in infant birth weight. (Martin et al., 1986; Rubin et al., 1986; Lazzaroni et al., 1990; Ogawa et al 1991; Mathai et al., 1992; Roquer et al.,1995; Ahluwalai 1997; Haddow et al., 1998;). Similarly, in Thailand, Wongsurat and Silalai (1996) investigated the effects of exposure to ETS during pregnancy on infant birth weight in 368 pregnant women who gave birth at Rajvithi Hospital. The sample was divided into experimental and control groups with 184 women in each group. It was found that the infants of mothers who were indirectly exposed to ETS during pregnancy had lower birth weights than the infants of mothers who were not exposed to ETS.

Cognitive malformation; Physical and Cognitive development

Exposure to tobacco smoke affects tobacco smoke reduces mental development, and causes neurological system disorders of the fetus as well as congenital malformations. Some studies suggest that susceptibility to certain malformations may depend in part on the presence of genes increasing susceptibility to tobacco smoke (Wyszynski et al., 1997 cited in Surgeon General, 2006). Seidman and Mashiach (1991 cited in Surgeon General, 2006) proposed mechanisms including the teratogenic effects of high concentrations of carboxyhemoglobin and nicotine, or malformations that are the result of exposure to some yet unidentified component of the tobacco plant shown to be teratogenic if ingested by animals.

The evidenced studies have revealed both association and non-association between exposure to tobacco smoke and infant malformation (Savitz et al., 1991; Seidman et al., 1990; Zhang et al., 1992) and the mechanisms by which exposures to tobacco smoke may lead to compromised physical and cognitive development. The postpartum period could affect the developing infant and child, resulting in a number of adverse health outcomes. In addition, the developmental processes of infants and children are considered to be more vulnerable to the effects of ETS than those of adults (Goldman, 1995; Dempsey et al., 2000). Mechanisms that could lead to compromised physical and cognitive development as a result of exposure to ETS may be similar to the processes affecting fetal development, such as hypoxia (USDHHS 1990; Lambers & Clark, 1996) due to carbon monoxide causing fetal hypoxia because the fetus cannot make physiological adjustment to compensate for the lack of oxygen. Nicotine further impairs uteroplacental perfusion and can pass through the placenta to the fetus, affecting the fetal cardiovascular system, gastrointestinal system and central nervous system (Stillman et al., 1986 cited in Surgeon General, 2006). Others constituents of cigarette smoke such as toluene and cadmium can cause fetal growth deficits (Dona et al., 1991 & OEEHA, 1996 cited in Surgeon General, 2006).

Some mechanism may be similar to those proposed for maternal smoking during pregnancy, such as hypoxia or the potentially teratogenic effects of tobacco smoke (Lambers & Clark, 1996; Werler, 1997). For cognitive development, there were a number of effects on CNS development from smoking in general and nicotine in particular. First, the fetus might suffer from hypoxia as a result of reduced blood

flow or reduced oxygen levels (USDHHS 1990; Lambers & Clark, 1996). Alterations in the peripheral autonomic pathways may lead to an increased susceptibility to hypoxia-induced, short-term and long-term brain damage (Slotkin, 1998 cited in Surgeon General, 2006).

There were also adverse effects of nicotine exposure on neural function by altering enzyme activity and affecting brain development while altering molecular processes that affect neurotransmitter systems and lead to permanent neural abnormalities of fetus (Ernst et al., 2001). Additionally, exposure to tobacco smoke during pregnancy can affect the skill of pregnant women in terms of speech, language, intelligence and visual perception and spatial processing of involuntary smoking during pregnancy (and controlled for potential confounders such as maternal education, maternal age and family income. The findings indicated significant differences in skill between the exposed and unexposed groups (Makin et al., 1991). Other reports revealed associations with cognitive development (Rantakallio, 1983; Bauman et al., 1989 cited in Surgeon General, 2006) and mental retardation; tobacco smoke exposures to pipe and cigar smoke during pregnancy and in the first six months of the infant's life were associated with an increased risk for mental retardation (Roeleveld et al., 1992). Moreover, tobacco smoke rather than reduces mental development and causes neurological system disorders of the fetus, infants whose mothers inhale tobacco smoke are at greater risk of cancer than those of nonsmoking mothers. In addition, these infants are also at risk for cardiovascular and respiratory diseases (Chitanon, 1991; Grady, 1992 cited in Surgeon General, 2006).

Avoiding Environmental Tobacco Smoke

Avoid - According to the American Heritage Dictionary of the English Language (2000), means 'to get or stay away from persons or things. Avoidance always involves an effort to keep from what is considered to be a source of danger or difficulty.'

Concept of aversion - Aversion refers to an internal feeling of not liking somebody or something on account of external conditions. Aversion therapy can

induce behavioral changes with the objective of inducing the client to dislike something, leading to avoidance behavior.

The concept of avoidance involves avoiding behavior, which is behavior that may be conducted in relation to aversion or not. Persons may avoid something on account of a belief of its danger. Therefore, they conduct and control the behavior with the expectation of a positive outcome (Martinelli, 1998).

The following factors contribute to a person's practice of behavior in avoiding ETS:

1. Predisposing factors, referring to the factors may cause a person to avoid ETS.

1.1 Perceived threat to health or well-being from ETS

1.2 Perceived need to avoid ETS

1.3 Perceived self-efficacy in avoiding ETS

1.4 Belief that the exposure to ETS is an outcome of one's action

1.5 Belief in self-efficacy in avoiding ETS

2. Action for avoiding ETS

2.1 Refuse to participate in the events or ETS by asking smokers to stop smoking

2.3 Minimize exposure to ETS when unable to leave the place, e.g. cover the nose and mouth with clothes, sit upwind of the smoke, do not inhale the smoke, wave the smoke to other directions, etc.

Factors affecting behavior in avoiding ETS

1. Personal factors

A few studies investigated behavior in avoiding ETS with an emphasis on personal factors. The following review, therefore, has included literature concerning health promoting and health protecting behaviors.

Age: Age distinguishes each individual in terms of opinions, experiences and behavior. It is an index of maturity and experience that contributes to persons' different responses to certain circumstances (Orem, 1985). Studies on health promoting behavior found that age is a factor accounting for different health behaviors in pregnant women. One study found that pregnant women aged 35 years demonstrated better health behavior than those who were younger than 20 years (Boonsom, 1997). Another study on the reduction of children's exposure to ETS smoke found that young mothers were less able to reduce children's exposure to ETS, in comparison with mothers at older ages (Strecher, 1993).

Educational level: Education is influential to a person's health care behavior, enhancing a person's ability to consider and comprehend information. Thus, people with higher education levels have more opportunities to seek for beneficial resources that will facilitate healthcare practice than those with lower education (Pender, 1996). Pungbangkradi (1997) studied the perceived health condition and self-care behavior of pregnant adolescents and found an association between education level and self-care behavior wherein pregnant adolescents with high education levels tended to perform better self-care behavior than those with lower education levels. It was also found that education level and perceived health condition could predict self-care behavior by 18.8 percent ($p < .05$). One study on the reduction of children's exposure to ETS found that mothers who were educated higher than the secondary level demonstrated higher expectation in their ability and in the outcome of reducing their children's exposure to ETS than those with lower education levels with statistical significance (Strecher, 1993). Thus, it could be concluded that pregnant women with better educational levels are more active and assertive as well as likely to take action against passive smoke, but those with lower education are more passive toward smoking and risk (Lock et al., 2000).

Family income: Family income is another important factor that could satisfy the basic needs of family members and raise or lower standards of living. Pender (1982) pointed out that wealthy people have more chances to acquire beneficial things that facilitate their health. Furthermore, the study of Nirattharadon (1996) showed that women with high income had proper health promotion. This

finding was concurrent with the study of Suwan (1983) who found that women with high socio-economic status with high income and gain tend to care for themselves better than those with low socio-economic status. This finding was contrary to Bunsom's finding (1997) that the differing incomes of pregnant women had no effect on health behavior.

2. Behavior-specific cognitions and effect

Perceived benefits of avoiding ETS

According to Rosenstock (1974), persons will perform a certain health behavior to reduce the risk of illness when they believe that such behavior is beneficial in reducing the risk of illness or the severity of a disease.

Regarding perceived benefits of action, Pender (2000) stated that persons performing health promoting behavior usually expect the benefits and outcomes of their performance. Perceived benefits of action will motivate these persons to conduct that behavior and the benefits may be either internal or external. For example, internal perceived benefits include increased eagerness, decreased tiredness and improved health; external benefits include reward and improved social interaction.

Khainil (1994) found that perceived benefits of self care were associated with self-care behavior in pregnant women with diabetes. Rattana's study in pregnant women with HIV positive revealed that perceived benefits of self-care practice were related to the women's behavior in preventing and controlling complications. Suwapharp (1999) found a positive relationship between perceived benefits of health promoting behavior and the practice of health promoting behavior among pregnant factory workers. Pregnant women who were aware of the benefits of health promoting behavior to themselves and the fetus took good care of themselves and practiced appropriate health promoting behavior (Nirattharadon, 1996), including abstaining from alcoholic beverages and cigarette smoking during pregnancy.

Previous studies on the perceived benefits of not smoking / smoking cessation clearly present positive outcomes in terms of physical, psychological, emotional and economic aspects (Muangnoo, 2001; Narkrak, 1997). Referring to the review of related research and literature, including the definition of perceived benefits

of action, this study defines the perceived benefits of avoiding ETS as the feelings and beliefs of pregnant women about the benefits of avoiding ETS in both physical and psychological aspects.

Perceived barriers of avoiding environmental tobacco smoke

Referring to Pender (2000), perceived barriers of actions have direct influence on inhibiting persons' performance of health promoting behavior, resulting in a lack of planning for behavioral practice. Perceived barriers of action are persons' anticipation, which may be real or unreal. The barriers may be inconvenience, difficulties and limited time of action. These factors may inhibit the practice of a certain behavior if people are not well prepared. If the perceived barriers of action are at a high level, the persons will not be able to conduct that behavior.

A study on perceived barriers of action in pregnant women revealed that pregnant women who demonstrated high levels of perceived barriers of action felt that the performance of health-promoting behavior was difficult or they might perform inappropriate health-promoting behavior (Niratthradorn, 1996).

Referring to a review of related literature and the definition of perceived barriers of action, this study defined the perceived barriers of avoiding ETS as pregnant women's feelings and beliefs about difficulties in avoiding ETS that made them unable to practice avoidance behavior.

Perceived self-efficacy in avoiding ETS

The concept of perceived self-efficacy states that behavior is derived from a causal structure (Bandura, 1997). Perceived self-efficacy refers to one's judgment of his or her ability to conduct an action in a certain situation. Perceived self-efficacy is a person's expectation of personal capability, which varies according to the task, the activity and that particular circumstance.

Bandura wrote that a person's performance of certain behavior depends on the following two factors:

1. Outcome expectancies refer to expectancies of the outcome after they perform that action. The outcome may have effects in three ways, as follows:

1.1 Physical effects. The effects could be either positive e.g. comfort; or negative e.g. pain and discomfort.

1.2 Social effects. Positive social effects include social acceptance or attention, fame, power or reward. Negative effects include social rejection, inattention or punishment.

1.3 Self-evaluative reaction to one's own behaviors. For example, self-satisfaction, pride and perceived self-value; or, on the contrary, dissatisfaction toward one's self, self-worthlessness, etc.

2. Efficacy beliefs refer to a person's feelings and perceptions that he or she is able to practice or conduct the required behavior. Efficacy beliefs induce behavioral changes. There are three types of efficacy beliefs, comprising belief in the ability to change usual habits, belief in motivation and perseverance to overcome obstacles until the behavior is successfully conducted and belief in the ability to maintain that behavior.

The relationship between efficacy beliefs and outcome expectation is presented in Diagram 2.

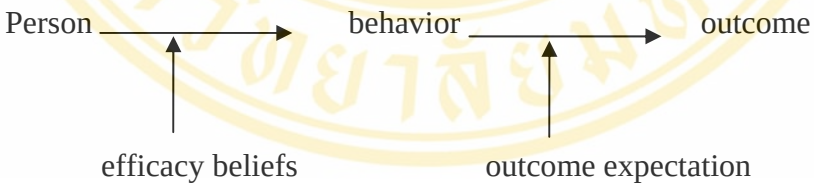

Diagram 2 Relationship between efficacy beliefs and outcome expectation (Bandura, 1997)

Perceived self-efficacy is a dynamic factor that constantly varies, depending on the characteristics of the activity, task, or the present circumstance. Factors affecting perceived self-efficacy are listed below:

1. Level of difficulty of the behavior or activity - Some people believe in their self-efficacy only when they are confronted with simple activity. When the

activity becomes more difficult or requires more effort, their efficacy beliefs may lessen.

2. Strength of efficacy belief toward the present activity - People with strong belief in their self-efficacy will not easily give up their intention, even if the activityn is very difficult.

3. Generality of perceived self-efficacy from one situation to another - People may gain confidence from experience of prior success and can apply their efficacy to practice a similar activity in different circumstances.

At present, the legislation and regulations against cigarette smoking are issued and applied in numerous places in the public and private sectors. Nevertheless, the enforcement is ineffective in some areas and there are smokers, either adolescent or adult, everywhere in society. Perceived self-efficacy in avoiding ETS is expressed as an adjustment to protect one's self from factors influential to cigarette smoking. Thus, perceived self-efficacy is present as a balance modifier that protects people from ETS (Conrad, Flay & Hill, 1992). Furthermore, perceived self-efficacy has effects on the avoidance of ETS. For example, mothers' perceived self-efficacy can reduce children's exposure to ETS (Matinelli, 2002). Children of mothers who have demonstrated low expectation in their self-efficacy in reducing children's exposure to ETS are very likely to be exposed to ETS (Strecher, 1993). At present, there is no instrument for the measurement of perceived self-efficacy in avoiding ETS. Therefore, the measurement of perceived overall self-efficacy was applied with reference to behavior in specific circumstances. Perceived self-efficacy in avoiding ETS could predict that persons with higher levels of perceived self-efficacy would perform behavior in avoiding ETS more readily than those with low levels of perceived self-efficacy (Mattinelli, 1999).

Referring to the review of related literature including the definition of perceived self-efficacy, perceived self-efficacy in avoiding ETS in this research is defined as pregnant women's confidence in their ability to avoid ETS.

Living with smokers

Living with smokers had been found to have an adverse relationship with a person's avoidance of ETS. This is because those who live with smokers may not be aware of the danger of exposure to ETS, or may not know about illness or health impacts from ETS. Non-smokers who live with smokers tend to avoid ETS outside their home less than those who live with non-smokers. This is probably because persons who live with smokers cannot avoid the exposure to ETS at home; thus, they have less motivation to avoid ETS in other public places. In reality, even though we have legislation and regulations against smoking in public places and workplaces, the enforcement of these laws is variable or may not fully apply in some locations; therefore, cigarette smoking is still commonplace in society (Emmon, 1992; Emmon, 1994; Matinelli, 1999).

Studies related to avoiding environmental tobacco smoke

Avoiding ETS

Matinelli (1999) conducted a study on the avoidance of environmental tobacco smoke in 136 non-smoking undergraduate students recruited by the random sampling method in which it was found that, in males, the practice of health promoting behaviors, perceived general self-efficacy, perceived self-efficacy in avoiding environmental tobacco smoke, femininity and not living with smokers directly affected behavioral practice in avoiding environmental tobacco smoke. Femininity and perceived general self-efficacy also had indirect effects on the practice of behaviors in avoiding environmental tobacco smoke. Nevertheless, this study had limitationd with regard to using the perceived general self-efficacy scale instead of the scale for perceived self-efficacy in avoiding environmental tobacco smoke. The perceived general self-efficacy scale had only one inquiry about avoiding environmental tobacco smoke. Thus, smoking self-efficacy scale should be developed to measure indirect exposure to environmental tobacco smoke.

In 2002, Matinelli examined the patterns of exposure to environmental tobacco smoke among mothers and children who lived in army bases (n = 238). It was found that living with smokers, high concentrations of tobacco smoke in the

environment, tolerance to tobacco smoke and perceived self-efficacy in reducing children's exposure to environmental tobacco smoke were significantly related to mothers' and children's daily exposure to environmental tobacco smoke.

Reduction of exposure to ETS

Strecher (1993) conducted a study based on psychosocial theory with variables including outcome expectancies and expectation of self-efficacy, using an intervention for reducing children's exposure to ETS. The study was carried out with mothers at 18 days after delivery from 585 families in Alamancce County and Chatham County of the North Carolina State, divided into an experimental group of 292 families and a control group of 293 families. Families in the experimental group were interviewed about the possible health impacts of exposure to ETS on the infants and mothers' expectation about their efficacy in keeping a smoke-free environment. Four home visits were paid to families in the experimental group in six months with the provision of education and counseling services and the program was evaluated when the baby was one-year old. It was found that outcome expectancies and expectation of self-efficacy could predict the change and control of exposure to ETS. Children whose mothers demonstrated low levels of outcome expectancies and expectation of self-efficacy, in particular, were very likely to be exposed to ETS.

Studies on the impacts of cigarette smoking

Punumpai (2001) conducted a quantitative and qualitative study with 2,844 pregnant women in various environments in Bangkok, suburban areas and other regions. The sample of this study came from three different settings comprising public places, workplaces, and living places. The instrument was an interview questionnaire, record and question guidelines used for the collection of data concerning socioeconomic status, smoking environment, pregnancy and delivery, health condition and attitude toward cigarette smoking. It was found that 10 percent of the pregnant women smoked cigarettes during pregnancy; among these, 40 percent lived in Bangkok and suburban areas while more than 20 percent lived in the North, more than 10 percent lived in the Northeast, and more than 5 percent were scattered around other regions. More than 50 percent of the pregnant women reported that people close to them were smokers, of which more than 75 percent smoked cigarettes at home,

more than 10 percent smoked at work and more than 5 percent smoked in public places.

Lompong (1999) investigated the impacts of cigarette smoking outside the workplaces of nonsmokers in the Laem-Chabang Industrial Zone, Chonburi. The sample was composed of 400 nonsmokers, 53.5 percent of which were females and 46.5 percent of which were males with an average age of 27.4 years. The results showed that 48.5 percent of the sample had family members who were smokers, and 81 percent of them had smoking colleagues while 71.3 percent reported having a specific smoking area in their workplace. Most factories have regulations against smoking while working and inside the work area. Regarding exposure to environmental tobacco smoke from smoking colleagues and family members, 94.2 percent of the sample reported exposure to ETS while 48.4 percent reported being exposed to ETS in the workplace only and 3.5 percent reported being exposed to tobacco smoke from family members only; 48.1 reported being exposed to ETS at the workplace and at home. The setting leading to exposure to ETS is mostly in the workplace at 67.3 percent, followed by other places such as schools (23.6%) and at home (9.1%). It is evident, then, that most exposure to ETS occurs at work from smoking colleagues. Nevertheless, when considering the period of exposure to ETS throughout the day it has been found that exposure to ETS from family members averaged 6 hours per day, which is longer than the exposure in the workplace (estimated at 2 – 3 hours a day). For the sample's action when they had to contact or interact with smoking persons, 46.6 percent reported doing nothing and letting the persons continue smoking; 32.9 percent reported that they would not interact with the persons during such times, but would wait until the persons finished smoking; only 11.7 percent asked the smoking persons to stop smoking for a while; and 9 percent said that they did not want to offend the smoking persons and chose to sit upwind rather than inhale the smoke, or wave the smoke away. The sample mostly tried to avoid tobacco smoke, especially from their parents to whom they did not want to appear disrespectful. Some sample reported that they were not very close with the smoking family members and, thus, did not dare to ask or tell them to stop smoking.

Limiting smoking areas

The limitations of smoking areas have effects on the amount of cigarette smoking. Some smokers smoke fewer cigarettes due to limited time. Nevertheless, other smokers may increase their cigarette smoking during lunchtime or at other times (Chapman et al., 1997). In the United States and Australia, there are laws against cigarette smoking in almost all public places such as public buses, theaters, music venues, department stores and restaurants, etc. A survey at two years after the legislation against smoking in workplaces was issued revealed that the amount of cigarette smoking decreased from 5.2 to 3.2 cigarettes per person (Owen & Borland, 1997). It is evident, then, that setting no-smoking workplaces can enhance smoking cessation among smokers and reduce the amount of cigarette smoking even on holidays and weekends (Borland, 1990). The most common anti-smoking approach in workplaces is having no-smoking signs around the working area, followed by written announcements on notice boards, designated areas for smoking and circulars informing all workers about the regulations against smoking (Lompong., 1999).

In Thailand, the Ministry of Public Health amended regulations and conditions for the presentation of labels and information on cigarette packs in the Tobacco Products Control Act B.E. 2535, which has been effective since the 5th November 1991. The requirements are that the space given to health warning information must be increased from 25 to 33.3 percent of the space on the front and back of a cigarette pack and the warnings must be printed in white on a black background. Moreover, the number of warnings printed on cigarette packs have increased to 10, all concerning the health hazards of cigarettes e.g. cigarettes cause lung cancer, heart failure, etc. The warnings are: tobacco smoke can kill you; tobacco smoke is harmful to those near you; and tobacco smoke is harmful to the fetus.

The Ministry of Public Health also made a ministerial announcement against smoking (No. 10) 1992 with reference to the Non-smokers' Health Protection Act. The announcement has been effective since the 8th November 1992, with the following details about smoking and non-smoking areas:

1. All public places are non-smoking areas, including public buses, taxis, air-conditioned railway carriages, public boats, domestic flights, air-conditioned

resting areas for commuters of pubic vehicles including the waiting area for urban train passengers, elevators, public phone booths, school buses, theaters, libraries, barbershops, tailor shops, beauty salons, drugstores, air-conditioned internet service centers, air-conditioned fitness centers, medical clinics or health care centers without overnight stays, ceremonial areas of religious institutes, air-conditioned restaurants or food and drink shops, restrooms, public piers and bowling alleys.

2. Cigarette smoking is prohibited in the following places, except for private rooms or private offices of the staff: the whole area of schools or academic institutes of below higher education levels; cultural exhibition buildings; museums or art exhibition halls; hospitals; nurseries for preschool children; and indoor sport facilities.

3. The following places are non-smoking areas, except in private staff rooms or offices and areas specified as “smoking only areas” : buildings in universities or higher educational institutions, air-conditioned exhibition halls, government or state-enterprise offices, banks and financial institutes, air-conditioned buildings and airport buildings.

4. Non air-conditioned railway carriages are non-smoking areas, except the carriages that are specifically notified as smoking carriages which must contribute to less than 25 percent of all non air-conditioned carriages in that train.

Smoking in non-smoking areas is prohibited. Any person violating this regulation shall be subject to a fine not to exceed 2,000 baht. Owners or operators of the public or private places that do not provide a smoking area shall be subject to a fine not to exceed 20,000 baht. Any person obstructing or failing to facilitate the authority in inspection and supervision of the designated places shall be subject to an imprisonment not to exceed one month or a fine not not to exceed 2,000 baht, or both.

Studies on the protection of non-smokers’ health and rights have shown that most workplaces or service establishments issue regulations against cigarette smoking for four major reasons: 1) prevention of fire, 2) health condition of non-smokers, 3) support of anti-smoking campaigns, and 4) requests from clients.

One case study on business operators and average people in Bangkok (1992) explored opinions toward the announcement on the designation of names or types of places for smoking / non-smoking areas. The study was carried out with 300 owners/operators of restaurants and entertainment business and 1,254 average people older than 18 years of age. The results showed that 100 percent of all the owners / operators were aware of the danger of tobacco smoke to both smokers and non-smokers and most of them agreed with the regulations against cigarette smoking in restaurants and air-conditioned entertainment premises for the following reasons: 1) the staff's and customers' health would be improved; 2) the atmosphere and ventilation in the premises would be improved; 3) non-smoking clients would not be disturbed by cigarette smoke; 4) the places already had no-smoking rules; 5) most customers came with their families; and 6) others, e.g. the designated smoking areas helped make the places cleaner. Most restaurant owners believed that the customers would be pleased with the laws against smoking in restaurants and that the regulations could be effective in reality. On the contrary, most owners of entertainment places believed that most customers would not be pleased with the regulations on the designation of non-smoking areas and would not want to have entertainment premises as non-smoking areas. For average people, most of them expresses agreement with the legislation against smoking in general air-conditioned food shops/restaurants (not entertainment premises) and 95 percent of them were aware of the harmful effects of tobacco smoke to nearby persons. In response to an inquiry about their action toward smokers who smoked cigarettes in non-smoking areas, i.e. telling the smokers to stop smoking or to move to the smoking zone, only 43.8 percent of the sample reported having taken such action whereas 56.2 percent had never taken the action at all. However, 75.9 percent of average people thought that the present laws against cigarette smoking were not sufficiently enforced and many of them were not certain that the regulations against smoking in food shops/restaurants would be effectively applied for the following reasons: 1) law enforcement in Thailand is not strict and the control of regulations is not serious; 2) average people may not cooperate with the regulations very well; 3) business owners will have trouble from having fewer customers; 4) Thai smokers were unlikely to follow the regulations; 5) others, e.g.

lack of social conscience among Thais, inadequate public relations, personal rights, etc. (ABAC Poll Research Center, Assumption University, 2002).

Referring to the review of literature concerning health promotion in pregnant women, health responsibility is another significant factor for health-promoting behavior. The responsibility includes learning about self-care practice to maintain a healthy condition and observing abnormal symptoms. General self-care practice in pregnant women involves clothing, diet, exercise, resting and relaxation, antenatal care, working and abstinence from cigarette smoking, as well as alcoholic beverages and drugs. Another prevention of danger to prenatal health is environmental control, such as avoiding toxic substances or environmental pollution. ETS is also a pollution that is harmful to persons' health and should be avoided.

CHAPTER III
METHODOLOGY

This study employed a descriptive research design to investigate factors contributing to ETS avoidance in pregnant women. The methods described were population and sampling, research instrument, data collection, protection of human subjects, and data analysis as follow:

Population and Sampling

Population

Population were not ex-smoker and non-smoker pregnant women who came to visit antenatal care unit at Khanom hospital and five health centers in Khanom District, Nakhon Sri Thammarat Province

Sampling

The purposive sampling was used for this study. The criteria included pregnant women who were nonsmoker and not smoking during pregnancy.

Sample size was estimated by using Cohen's table (Cohen, 1998), by setting *p* value at 0.05 (two-tail test), the effecting size as moderate (r = 0.3) with a power of 0.80. From the table, the sample size should be at least 85 subjects. However, the sample size was increased by adding 15% more subjects to protect data loss. Therefore, there were 100 pregnant women who joined this study.

Setting

The study was conducted in The antenatal care unit at Khanom hospital and five health centers, Tha Chan, Ban Pred, Tha Noi, Bang Khu and Khao Hua Chang which were primary care unit and governed by the hospital.

The antenatal care unit at Khanom hospital was opened to provide treatment for pregnant women every Wednesday from 8.30-12.00 a.m., the

appointments were made in antenatal care books, the queue cards were provided to them.

Before getting health service from nurses such as measuring body weight and blood pressure, pregnant women were health educated. Only pregnant woman with the first gravidity and her husband got an appointment for health education and blood check every Wednesday on the third week of a month. Referring to the doctor for consultation in the case of first gravidity, high risk pregnancy and underlining disease i.e. diabetes, thalassemia. Service process of health center was similar to the hospital, pregnant women were referred to the hospital for consulting the doctor. Each year, there were 200-300 pregnant women getting health service at the hospital. In 2005, there were 250 pregnant women.

Research Instrument

The Questionnaires used in this study were divided into 5 parts.

Part I Questionnaire asking about their individual profile including age, educational level, income, gravidity and gestational age and number of smoker in their house.

Part II Avoidance of ETS Scale which were constructed and modified from the evaluation form of ETS avoidance in the environment originally described by Martinelli (1998). This form was used to evaluate ETS avoidance behavior in adult with 20 questions. Reliability was .09. It was modified and translated into Thai to make it suitable and convenience for this study. Two questions (16 and 20) was modified to be suitable for pregnant women. There were 4 answer choices of Likert's scale, including ; almost always true, usually true, usually not true and almost never true.

Meaning

almost always true – the participants always did this behavior all the time.

usually true- the participants usually did this behavior most of the time.

usually not true- the participants sometimes did this behavior.

almost never true- the participants never did this behavior.

There are positive meaning in question number 1, 4, 6, 11, 13, 14, 15, 16 and 18 , in contrast 2, 3, 5, 7, 8, 9, 10, 12, 17, 19 and 20 are negative meaning.

Scoring

	Positive meaning	Negative meaning
almost always true	4	1
usually true	3	2
usually not true	2	3
almost never true	1	4

Range of score was between 20-80. The high score meant that they had a good ETS avoidance behavior whereas the low score meant that they had a poor ETS avoidance behavior.

The ETS avoidance behavior can be divided into 3 levels.

High	>Mean + SD
Moderate	Mean ± SD
Low	< Mean – SD

Part III Perceived benefits of ETS avoidance questionnaire. It was developed by the researcher according to literature review. It was comprised of 7 items, 3 for physical and 4 for mental aspects. There were positive questions about perception, believe, thinking and understanding the advantages of smoking avoidance in pregnant women. There are 4 answer choices of Likert's scale: almost always agree, usually agree, disagree and strongly disagree.

Meaning

almost always agree – the participants always agree with this statement.

usually agree- the participants usually agree with this statement.

disagree- the participants sometimes disagree with this statement.

strongly disagree- the participants never agree with this statement.

Scoring

almost always agree	4
usually agree	3
disagree	2
strongly disagree	1

The range of score was between 7-28. The high score meant that they perceived high benefits of ETS avoidance behavior whereas the low score meant that they perceived less benefits of ETS avoidance behavior.

The perceived of benefits in ETS avoidance of pregnant women could be divided into 3 levels

Level	Perceived benefit
High	>Mean + SD
Moderate	Mean ± SD
Low	<Mean – SD

Part IV Perceived barriers to avoid ETS of pregnant women in ETS avoidance questionnaire, it was developed by the researcher. It involved perception, believe, thinking, and understanding of pregnant women to trouble or obstacle in smoke avoidance. There were 11 items, and 4 answer choices of Likert's scale: almost always agree, usually agree, disagree and strongly disagree.

Meaning

almost always agree – the participants always agree with this statement.

usually agree- the participants usually agree with this statement.

disagree- the participants sometimes disagree with this statement.

strongly disagree- the participants never agree with this statement.

Scoring

almost always agree	4

usually agree	3
disagree	2
strongly disagree	1

The range of score was between 11-44. The high score meant that they perceived high barriers to ETS avoidance whereas the low score meant that they perceived less barrier of ETS avoidance behavior.

The perceived barriers to pregnant women to avoid ETS could be divided into 3 levels.

Level	Perceived barrier
High	>Mean + SD
Moderate	Mean ± SD
Low	< Mean - SD

Part V Perceived self-efficacy of pregnant women in ETS avoidance questionnaire. It was developed by the researcher using Bandura model (1997). There were 11 items asking about confidence to avoid ETS. The researcher asked the respondents to rate their confidence in smoke avoidance behavior between 0-100% in each items.

The range of score was between 0-100%. The high percentage meant that they had a high confidence in their ability to avoid ETS whereas the low percentage meant that they had low confidence to avoid ETS.

Perceived self-efficacy of pregnant women to avoid ETS could be divided into 3 levels

Level	Perceived self-efficacy
High	>Mean + SD
Moderate	Mean ± SD
Low	< Mean – SD

Validity and Reliability of the Instruments

1. Content Validity

All instruments forms was proved and corrected by five persons as follow; A physician who is an expert in the field of tobacco smoke, Health consultant from foundation of smoking inhibition, Instructors from community health nursing, health and behavioral science, and gynecology and obstetrics. Evaluation forms were corrected according to all comment and suggestion from five persons as mentioned previously.

2. Reliability

After corrected all instruments, the researcher used these forms with 30 pregnant women, data was collected and analyzed by using computer software to figure out the reliability. In addition, Cronbach's alpha coefficient was also calculated by using the equation below:

$$\alpha = \frac{n}{n-1}\left(\frac{1-\sum S_i^2}{S_t^2}\right)$$

α = coefficient

n = number of question

$\sum S_i^2$ = summation of standard deviation

S_t^2 = total standard deviation

Reliability of these instruments forms are:

Avoidance ETS	= .70
Perceived benefits of ETS avoidance	= .94
Perceived barrier to ETS avoidance	= .79
Perceived self-efficacy in ETS avoidance	= .85

Data collection

The processes for data collection were as follows:

1. The letter of recommendations and request for permission to collect data issued by the Dean of Faculty of Graduate Studies, Mahidol University was submitted to the director of Khanom Hospital, Nakhorn Sri Thammarat Province, asking for the permission and cooperation in data collection.

2. After the request had been approved, the researcher contacted the head of antenatal care unit including 5 health centers which located in Khanom District to explain the study procedures and data collecting processes.

3. Data collection was scheduled as follow; Monday, 1-4 pm. at Tha Chan health center, Wednesday, 8-12 am. at Khanom hospital, Wednesday, 1-4 pm. at Ban Pred health center, Thursday, 8-12 am. at Khao Hua Chang health center, Friday, 8-12 am. at Bang Khu health center and Friday, 1-4 pm. at Tha Noi health center. Pregnant women who qualified as the subjects were approached while they were waiting for the health care provider. The researcher approached the subjects and described the objectives of this study. Then the researcher invited them to be in the study. If each potential subject agree, she was asked to sign the consent form (appendix D).

4. After the subjects agreed to participate in this study, the self administer process was performed in order, starting from personal information questionnaire, avoiding in ETS exposure, perceived benefits, perceived barriers, and perceived self-efficacy to avoid ETS questionnaires. The duration of self administer to complete questionnaires was 30-40 minutes. Data collection was done during July – October 2005.

Protection of Human Subjects

In order to protect the human subjects, pregnant women were informed about the objectives, the data collection process, length of time for completing the instruments, and the right to refuse to be in the study. The acceptance or refusal to participate in this study would not affect the health care provided. Moreover, they

could withdraw from the study at any time without any effect on health service. They were also informed that their names would not be identified, and the information obtained from the questionnaires would be kept strictly confidential and reported as a whole group.

Data analyses

All data were analyzed by using computer software. P value is 0.05. Analyzing processes were as follow:

1. Demographic data including age, marital status, educational level, income, occupation, gravidity, gestational age, having smoker in family, number of smokers, smoking in the house, and number of smoking were analyzed by using percentage.

2. Smoke avoidance behavior, perceived benefit, perceived barrier, and perceived self-efficacy were calculated for the mean score and standard deviation.

3. Pearson's product moment correlation coefficient was used to generate correlation coefficient among these variables including age, education, income, ETS avoidance behavior, perceived benefit, perceived barrier, and perceived self-efficacy.

4. Multiple regression was used to examined the contribution of age, education, income, perceived benefit, perceived barrier, and perceived self-efficacy on ETS avoidance**.**

CHAPTER IV
RESULTS

This research studied behavior in avoiding environmental tobacco smoke in pregnant women in Khanom District, Nakhon Sri Thammarat Province from July to October 2005. There were 100 participants who joined the study. Result of this study obtained from the self-administered questionnaires were presented by tables and the description respectively, as follows.

Part 1 Characteristics of the sample

Part 2 ETS avoidance, perceived benefits of ETS avoidance, perceived barriers to ETS avoidance and perceived self-efficacy in ETS avoidance in pregnant women

Part 3 Factors affecting ETS avoidance in pregnant women

Part 1 Characteristics of the samples

Table 2 Number and percentage of the sample categorized by the demographic characteristics (n =100)

Demographic Characteristics	Number	Percentage
Ages (years)		
< 20	26	26
20-24	22	22
25-29	30	30
30-35	14	14
> 35 ปี	8	8
Range = 16- 40 mean = 25 SD = 5.82		
Marital status		
Married	94	94
Single	6	6
Education (years)		
2-6	41	41
7-9	38	38
10-12	15	15
>12	7	7
Rang 2-16 Mean = 8.4 SD = 2.8		
Income (baths/month)		
< 5,000	25	25
5,001-10,000	49	49
10,001-20,000	6	6
20,001-30,000	20	20
≥ 30,001 baht	2	2
Range = 3,000-50,000 Mean = 10,707 SD = 7984.27		

Table 2 Number and percentage of the sample categorized by their demographic characteristics (n =100) (Continued)

Demographic Characteristics	Number	Percentage
Occupation		
Housewives/ unemployed	49	49
Employee	17	17
Merchant / Business	8	8
Government Service	1	1
Agriculturist/Fisherman	25	25
Gravidity		
First	51	51
Second or more	49	49
Gestational age		
1 st trimester	27	27
2 nd trimester	22	22
3 rd trimester	51	51
Living with Smokers		
Yes	81	81
No	19	19
Smokers		
Husbands	28	34.57
Husbands'father/pregnant women's father	51	62.96
Sibling	2	2.47
Smoking in the house		
Yes	56	69.14
No	25	30.86

Table 2 Number and percentage of the sample categorized by their demographic characteristics (n =100) (Continued)

Demographic Characteristics	Number	Percentage
Number of smoking cigarettes/day		
1-10	45	55.6
11-20	33	40.74
> 20	3	3.70

Table 2 showed that an average age of the subject was 25 years old (SD = 5.82). Years of education ranged from 2 to 16 with a mean of 8.4 years (SD = 2.80), of all the subjects, 40% had 6 years of education. An average income was 10,707 baht (SD = 7,984.27). About a half of them was housewives (49%). Of all the subjects, 51% was the first pregnancy, 81% had smokers in their house. Of these smokers, 34% were the subject's husband, 62% were their parents and husbands' parents. In addition, most of the smokers smoked in their houses (69%), 55%smoked 1-10 cigarettes and 40% smoked 11-20 cigarettes per day.

Part 2 ETS avoidance , perceived benefits of, and perceived barriers to and perceived self-efficacy in ETS avoidance in pregnant women

Table 3 Number, Percentages, Mean and Standard Deviation of the sample classified by level of ETS avoidance, perceived benefits, perceived barriers, and perceived self efficacy.

Characteristics	High	Moderate	Low	Range	Mean	SD	Interpretation
		%					
ETS avoidance	15	19	66	37-67	49.42	6.74	Low
Perceived benefits	10	90	0	7-28	10.86	4.31	Moderate
Perceived barriers	14	73	13	12-39	23.92	6.16	Moderate
Perceived self-efficacy	13	70	17	30-100	70.52	15.25	Moderate

Table 3 showed that majority of the subjects was at a low level in ETS avoidance. Perceived benefits of ETS avoidance was at a moderate level. Perceived barriers to ETS avoidance ETS was at a moderate level, and perceived self – efficacy of ETS avoidance was at a moderate level.

Part 3 Factors affecting behavior in avoiding ETS

The result of Pearson's product moment correlation revealed that significant correlation coefficients range from .15 to .21 ($p < .05$). Education was positively correlated to income ($r = .209$, $p < .05$) and negatively correlated to living with smoker in the family ($r = -.202$, $p < .05$). Perceived benefits was positively correlated with perceived barriers ($r = .212$, $p < .05$), Perceived self- efficacy was significant positively correlated to living with smoker in the family ($r = .215$, $p < .05$), and negatively correlated to perceived barriers ($r = -.148$, $p < .05$), as well as age ($r = -.215$, $p < .05$). However, behavior in avoiding ETS was significant positively associated with only income ($r = .173$, $p < .05$), as follow in table 4

Table 4 Correlation Matrix among studied variables

Variable	1	2	3	4	5	6	7	8
1. Age	1.00							
2. Family income	.102	1.00						
3. Education	-.080	.209*	1.00					
4. Living with smoker in family	.065	.074	-.202*	1.00				
5. Perceived benefits	-.029	-.131	-.505	.034	1.00			
6. Perceived barriers	.127	-.052	-.085	-.048	.212*	1.00		
7. Perceived self-efficacy	-.125	-.006	.102	.215*	-.044	-.148*	1.00	
8. ETS avoidance behavior	.034	.173*	.093	.065	-.037	.002	.076	1.00

*p< 0.05

Table 4 showed that, the highest correlation coefficients among all the independent variables was .215, and there was no correlation coefficients among the variable was higher than .65 (Burns & Grove, 1993). Thus, there was no multicollinearity among studied variables. Then, the multiple regression was performed

Multiple Regression was used to analyze the predictive power of age, family income, education, living with smoker, perceived benefits, perceived barriers and perceived self-efficacy on avoidance environmental tobacco smoke. Using enter technique, the independent variables were entered at the same time. The results of multiple regression equation revealed that all seven variables could explain only 4.3% of the variance in the pregnant women behavior in avoiding ETS, however, it is not significance.

Table 5 Multiple correlation coefficients of predicting factors and behavior in avoiding ETS, as analyzed with the multiple regression

Variable	B	Beta	T	Sig
Age	3.581E-02	.031	.291	.772
Family income	.168	.063	.632	.529
Education	6.38E-05	.151	1.413	.161
Living with smoker in family	.899	.053	.483	.631
Perceived benefits	3.110E-02	.017	.164	.870
Perceived barrier	3.042E-02	.028	.265	.792
Perceived self-efficacy	3.042E-02	.069	.630	.530
Constant =	42.662			
R = .207	R^2 = .043	Adjust R= -.030	Overall F = .588	

Due to independent variable could not predicted ETS avoidance. This finding did not support the hypothesis. Therefore the researcher decided to collect more data concerning the infant birth weight and compared them between two groups: living with smoker and living with nonsmoker.

Table 6 Comparison of infants birth weight from mother living with nonsmoker and living with smoker (n=100)

Living condition	Number	Range (gram)	Mean	SD	t	p
mother living with nonsmoker	19	2950-3800	3296.32	237.54	2.229	.028
mother living with smoker	81	2500-4100	3120.99	322.48		

Table 6 showed that birth weight of the mothers in both groups: Living with nonsmoker and living with smoker both groups were higher than 2500 grams. Comparing mean birth weight from pregnant women living with smoker (n = 81) and pregnant women living with non-smoker (n = 19) were 3121 and 3296 gram, respectively. The t-test revealed that mean birth weight of both groups were significantly different (t = 2.229, p = 0.028).

CHAPTER V
DISCUSSION

This descriptive study focused on the factors that affected behavior in avoiding environmental tobacco smoke in pregnant women. These factors include age, educational level, family income, living with smoker, perceived benefits of avoiding environmental tobacco smoke (ETS), perceived barriers to avoiding ETS, and perceived self-efficacy in avoiding ETS. There were 100 participants who came to antenatal care unit at Khanom hospital and 5 health centers in Khanom District, Nakhon Sri Thammarat.

Data analysis showed that an average age of the sample was 25 years old (SD = 5.82), most of them finished high school and elementary school which were 53% and 41%, respectively. An average income was 10,707 baht (SD = 7,984.27). About a half of them was housewife (49%) and the first pregnancy (51%) Interestingly, it was found that 81% of pregnant women had smoker in their houses. Twenty percent of the smokers were their husbands. Moreover, most of the smokers smoked in the houses (69%); 55% of smokers smoked 1-10 cigarettes per day and 40% smoked 11-20 cigarettes per day, and three percent smoked more than 20 cigarettes per day. All results are discussed according to the aims of this study as follows.

Objective 1. To asses pregnant women's behaviors in avoiding environmental tobacco smoke.

The results revealed that pregnant women had a low level of environmental tobacco smoke avoidance, with an overall mean score of 49.42 (SD = 6.78) (Table 3). Of all the sample, 15% was at a high level in ETS avoidance, 19% at a moderate level and 57% at a low level. The best way to avoid ETS was moving themselves from the area where smoking is present. For examples, they did not think

it was offensive to move away from smoking area. If they were with people who were smoking and they could not leave, they would ask the smoker to quit. They would leave the restaurant if they could not find the nonsmoking section. However, there were many situations that the sample felt difficult to avoid ETS. For example, the sample had conversation with their friends, relatives or husband while they were smoking. Friends or relatives smoked in the car or house. They were in the public transportation in which someone smoked (Appendix F).

Environmental tobacco smoke (ETS) avoidance behavior can be divided into two categories. First, avoiding smoke directly by leaving from the smoke area or asking the smoker to stop smoking. (Martinelli, 1998) However, this study showed that pregnant women were rarely to ask the smoker to stop smoking when they could not leave the smoking area. Furthermore, the sample still allowed the husband, relatives, friends to smoke inside the house.

In contrast, the study from Loke and coworkers (2000), found that 55% of pregnant women exposed to ETS from their family, relatives, or friends, and often moved away, 25% often advised the smoker to quit and 22% did not allow anyone to smoke in the house. According to the study of the effects of smoking outside workplaces on nonsmokers in Laemchabang Industrial Estate, Chonburi Province (Lompong, 1999), 46.6% of the workers always come and join the activities even though their coworkers were smoking, 11.7% avoided smoke by asking coworkers to stop or not to smoke in the office and 32.9% did not come and join the activities until their coworkers stop smoking.

Interestingly, this study found that 36% of the pregnant women usually hanged out and joined the activities even if their, husband, relatives or friends were smoking, 17% were sometimes sat and talked with them. Moreover, 55% and 46% of the pregnant women allowed their relatives and friends to smoke in the house. Regarding to Thai culture in which men always dominate, and women always consider another's feeling. Pregnant women dare not enough to ask their husband, relatives and friend to stop smoking. In addition, they also afraid that their husband, relatives and friends may object to them. This is congruent with Loke et al. (2000) revealed that Chinese culture did not encourage women to take more proactive action

targeted at another person, particularly if that person was the husband, or a dominating family member.

Objective 2 To examine the relationship and predictive power of personal factors (including living with smoker), perceived benefits of avoiding ETS, perceived barriers to avoiding ETS, and perceived self-efficacy in avoiding ETS on pregnant women's behavior in avoiding ETS.

The results of multiple regression revealed that all seven variables; age, income, education, living with smoker, perceived benefit, perceived barrier, and perceived self- efficacy could explain only 4.3% of the variance in the pregnant women behavior in avoiding ETS, however, it is not significance.

All seven variables could not predict ETS avoidance. A possible explanation may be the homogeneous of the subjects. About a half of them were housewives, therefore the expense in the family for these pregnant women was afforded by the husbands. Due to this situation, their lives were depended on the husbands. Thus the pregnant women may have less power to negotiate. The results was congruent to Publica et al. (2000), who found that homemakers and unemployed women were likely to be exposed to ETS than ever-employed subjects.

Moreover, culture may be another reason that makes the sample tolerate to ETS. Thai culture may encourage women to reconcile with the unpleasant surrounding people in order to keep the family in peace. Loke et al. (2000) found that some specific culture such as China did not encourage women to negotiate with another person to stop smoking or to move out from smoking, particularly if that smoking person was the husband, or a dominating family member.

Income had a significant relationship with ETS avoidance ($r=.173$, $p<.05$). It meant that the pregnant women who had low income were at a low level of ETS avoidance. However, the relationship was no longer exist when other variables were controlled. Nevertheless, there was no study to demonstrate the relationship between income and ETS avoidance directly. Forastiere et al. (1991 cited in Publica et al. 2000) indicated that in some instance, social class may be considered as an effect modifier because the harmful health effect of passive smoke are defected in families

of lower socioeconomic status whereas the proportion of exposed people and the intensity of exposure tobacco is high. Moreover, Pagano et al. (cited in Plubica et al. 2000) reported that smoking is more frequent in men of lower socioeconomic status, whereas the proportion of smokers is higher among women of higher social class. In 2004, the National Statistical Office, Thailand, reported that smoking usually occurs in low income family. In each family, an average of smoker was 1 person and 2 persons will be exposed to ETS (the National Statistical Office, 2004).

However, Bousom (1997) reported that even though the pregnant women had different income, they were still had the same health behavior. In contrast, Pender (1982) believed that people who were at high socio-economic status would have a better opportunity to seek useful things to take care of themselves better than those with low socio-economic status.

Education could not predict ETS avoidance behavior in pregnant women. It might be explained that most of the sample had quite low education of elementary level and lower - secondary level making less information accessibility. They would have little knowledge about ETS hazard and maybe less understand and less concern to avoid ETS.

Several studies demonstrated that subjects who had higher education will be have a good ETS avoidance behavior better than the lower one . Women with better educational level would be more active and assertive but those with lower education are more passive and at risk. Stretcher (1993) reported that mother who had high education than high school had a good ETS avoidance for their child better than the one that had lower education. Loke et al. (2000) found that women with higher educational level tended to take more preventive actions against ETS exposure at home and in public than those with lower educational level. The California EPA report recommends that educational effort for women who are pregnant (or plan to become pregnant) and their partner about avoiding ETS as warranted (Chen 1989 cited in Loke 2000). Pubblica et al. (2000) studied the characteristic of non-smoking women which exposed to ETS from their husband. They found that non-smoking women who had low education (< 6 years) usually had smoking husband, leading to a

high risk exposure to smoke more than non-smoking women who had high education (>13 year).

Age could not predict ETS avoidance behavior in pregnant women. However, there is no direct study of correlation between age and ETS avoidance in pregnant women. There is few studies of ETS avoidance related to age and another group. For example, Strecher (1993) found that the older mothers with higher-education, nonsmoking and living with nonsmoker could reduce infants' exposure to smoke better than the younger mothers. Additionally, other researches relate to age and health promotion behavior. For example, findings of Boonsom (1997), Unchana (1992), and Thanomroop (2000) showed that age significant correlate to health promotion behavior due to older pregnant women had better health promotion behavior than the younger maybe person with more maturity and previous life experience could seek good choice and proper decision in health care as well as got more responsibility for own self than the younger (Orem, 1980).

Living with smoker could not predict ETS avoidance behavior. In this study, 81% of the pregnant women having smoker in the family that may make them accustomed to tobacco smoke. Then they could not avoid ETS. It is not consistent to Martinelli (1998) who found that living with smoker was inversely associated with ETS avoidance ($r = -.19$, $p<.05$). It may be explained by two perspectives. First, the person who feel that ETS is irritating or a health hazard may be more likely to seek smoke free living arrangement. Second, those who live in a smoke free environment and are accustomed to smoke free. They may be more sensitive to ETS because their limited exposure of the physical adaptation that sometimes is required with chronic or long time ETS exposure, thus they can not stay in smoke area or move away from the smoke. (Glanz & Parmley 1995 cited in Martinelli 1998:240). Additionally, there was a significant path between living with smoker and avoiding ETS. A person who lives with a smoker may not see ETS exposure as harmful or may perceive themselves invulnerable tobacco-relate disease. For these people, tobacco use is accepted as part of their social environment. Furthermore, Living in a smoke-free setting also had a strong effect on ETS avoidance. Although smoking is banned in many public and

private setting, ETS in one's own living environment has not received the same degree of regulation (Emmon 1994 cited in Martinelli 1998; 240).

Perceived benefits of avoiding environmental tobacco smoke could not predict ETS avoidance in pregnant women. The results demonstrated that perceived benefits of avoiding environmental tobacco smoke in pregnant women was at a moderate level. The reason of avoiding smoke in pregnant women because they realized that smoke are dangerous to the baby as indicated in the responses. For example, the avoidance of tobacco smoke can protect the baby from dangerous toxins. This item had the highest score (mean=3.63, SD= 0.70).

The finding showed that of all the pregnant women, 90% perceive benefits of avoiding ETS at the moderate level, 10% at a high level. This may be influenced by information from media, and health care providers. Besides, the sample also knew that smoke was dangerous to themselves as well, as indicated in their responses. Pender (2000) states that a person performs health promoting behavior because he or she expects the benefits and outcomes of the performance. Perceived benefits of action can motivate the person to conduct that behavior. Additionally, motivation to make a person perceived benefit of health promoting behavior depends on direct experience towards practice. Suwapharp (1999), the positive relationship between perceived benefits of health promoting behavior and the practice of health promoting behavior among pregnant factory workers. Pregnant women who were aware of the benefits of health promoting behavior to themselves and the fetuses took good care of themselves and practice health promoting behavior (Nirattharadon, 1996), such as abstaining from cigarette smoking during pregnancy or avoiding smoke. Moreover, Panyapisit (2002) found the positive relationship between benefit of health promoting behavior and actual health promotion behavior ($r = .619$, $p<.001$) in pregnant women. However, the results in this study showed no relationship between perceived benefit of ETS avoidance and ETS avoidance behavior.

Perceived barriers to avoiding ETS in pregnant women is likely to perceived benefit of ETS avoidance. It could not predict ETS avoidance behavior. This study demonstrated that of all the pregnant women, 73% perceived barrier of avoiding ETS at a moderate level, 14% at a high level, and 13% at a low level. Thus

it is quite difficult to avoid ETS because the level of perceived barrier. It is congruent to Nirattharadon (1996) who demonstrated high level of perceived barriers to action was negatively associated with health promoting behavior.

The items that showed high level of perceived barrier was " It was difficult to ask their family member to quit smoking" and "You get bored to tell surrounding people who smoke about the dangerous of toxins from smoke to you and your baby." In addition, pregnant women did not want to tell their guest to smoke out side the house and also do not want to tell anyone they did not know about the dangerous of smoke to the baby and the pregnant women. According to reasons mentioned above and maybe because of being considerate of another's feeling resulted in the difficulty in avoiding of smoke. It is congruent with a report of "smoke free house", qualitative data in which it showed that a father was angry when he was asked to stop smoking. He smoked wherever he wanted, such as, in the car while his children were sitting, in the house near children (TRC, 2006). It may be explained that according to Thai society, people feel that it is not polite to ask someone being not familiar to quit smoking, and smoking is personal right.

Perceived self-efficacy in avoiding ETS in pregnant women could not predict avoiding ETS behavior. This study showed that of all the pregnant women, 70% perceived self-efficacy of avoiding ETS at a moderate level, 17% at a low level, and 13% at a high level. 49% of them were second or third (or more) parity who had previous experience with pregnancy obtaining information on health education or watching T.V., or V.D.O. that was related to self conduct making them build up their confidence for their own self-efficacy. It may due to the increase in their perceived self- efficacy from enactive attainment or performance accomplishment experience. (Bandura, 1986:399-409)

The mean confidence overall of items for avoiding smoke in pregnant women was (mean=60.58, SD = 20.05) which is moderate in the confidence level, the highest mean of item, goes to the ability of themselves that can avoid from smokers (mean=81.55, SD=14.59). The lowest mean of item, goes to making their house free from tobacco smoke (mean=49.90, SD = 29.66) which correlated behavior in avoiding environmental tobacco smoke. Pregnant women can avoid to face directly

to smoke by leaving from smoke area however, they not brave enough to asking smoker to quit smoking or stop smoking when they can't leave from that area.

There are some studies support that self-efficacy influences on ETS. avoidance. If there is high self-efficacy, it is showed that person can avoid ETS better than low self- efficacy. Martinelli's finding (1998) showed that general self- efficacy had greatest on ETS avoidance, and ETS avoidance efficacy also influenced on ETS. avoidance. For young adult samples, self-efficacy appears to act as buffer that protect them from potential influence to smoke. Therefore, self-efficacy may also act a buffer that protect young people from ETS. Martinelli (1993) studied the role of outcome and efficacy expectation in an intervention design to reduce infants' exposure to ETS. It reveled that mother had both low outcome and low efficacy expectation tend to have infants with highest level of ETS exposure. Strecher (1993) studied efficacy to reduce an infant's ETS exposure in mother who smoked but not in nonsmoker, and found that mothers who reported low efficacy at baseline had infants with greater ETS exposure than mothers with greater efficacy. Martinelli (2002) studied mother having less self- efficacy to resist ETS, and having greater self-efficacy to reduce the child's exposure. There was significant, positive relationship ($r = .51$, $p < .01$) between the mother's and child daily ETS exposure. However, there is no direct study about self-efficacy and ETS avoidance in particular group such as pregnant women.

The result of the study revealed that the independent variables could not predicted ETS avoidance. Therefore, the finding did not support the hypothesis. Then, more data focusing on birth weight were collected to see the effect of ETS on birth weight comparing between the two group: a group of subjects living with smoker ($n=81$) and another group living with nonsmoker ($n=19$). The result revealed that there were no case of low birth weight less than 2,500 grams in both groups. However, the t-test revealed that mean birth weight between the two groups were significantly different ($t=2.229$, $p<0.05$). An average birth weight of the newborn in the group that mothers living with smoker was 3,121 grams while that of the mother living with nonsmoker was 3,296 grams. However, the potential confounding factors such as duration of exposure, number of cigarettes, antenatal care visits and SES were not controlled in this study.

This result was supported by many studies which showed the significant of the infant mean birth weight from pregnant women who expose and did not exposed to ETS. Wongsuryrat (1996) found that infant mean birth weight from pregnant women who did not exposed to ETS was higher than infant mean birth weight from pregnant women who exposed to ETS. Ogawa(1991) found that the decrement of infant mean birth weight was 10 gram from pregnant women who exposed to ETS while Mathai (1992) reported that infant mean birth weight from pregnant women who exposed to ETS was 65 gram decrease, Haddow (1998) found that there was 107 gram decrease in infant mean birth weight of pregnant women who exposed to ETS. Regarding to the studied of Rohuer (1995), 192 gram decreased in infant birth weight was found in pregnant women who exposed to 20 cigars per day, moreover, Ahluwalai (1997) reported that infant mean birth weight from pregnant women who were older than 30 years and exposed to ETS, was 90 gram lower than infant birth weight from pregnant women who did not exposed to ETS.

However, some studies revealed that the exposure to ETS in pregnant women had no significant effect on infant mean birth weight that was congruent with Zhang (1999) found that there was no significant decrease in infant mean birth weight (26 g) of pregnant women who exposed to ETS. In addition, Henke (2004) found that there was no significant relation between the decrement in infant mean birth weight and the exposure to ETS in pregnant women.

CHAPTER VI
CONCLUSION

Summary of the Study

This descriptive research aims to investigate factors that affected environmental tobacco smoke avoidance in pregnant women, by applying Pender's health promotion model. The sample was 100 pregnant women attending antenatal care at Khanom Hospital and 5 health centers in Khanom District, Nakorn Sri Thammarat from July to October 2005. The sample was selected by purposive sampling. The inclusion criteria were pregnant women who were not nonsmoker, never smoked, had no underlying disease, living with family and willing to join this study. The instrument used in collecting data were 5 self-administered questionnaires: The demographic data, The avoidance of ETS, The perceived benefit of ETS avoidance, The perceived barrier to ETS avoidance, The perceived self-efficacy in ETS avoidance. The content validity of four questionnaires were verified by five experts. They were tried out with 30 pregnant women who had the same characteristics as the sample. The Cronbach's Alpha coefficient was calculated to ensure the reliability of the questionnaires, which was .70, .94, .79 and .85, respectively. The Data were analyzed using Multiple Regression Analysis.

Finding of the study can be summarized as follows:

1. Demographic characteristics of the sample

The sample was 100 pregnant women. Their ages ranged between 16-40 years old with an average age of 25 years old. Of all the sample, 30% was 25-29 years old, 26% less than 20 years old and 22% was between 20 – 24 years old. Most of them (94%) lived with the husbands. Of all the sample,53% finished high school and 41% finished elementary school (41%). Almost a half (49%) was housewife, 25%farmers , 17%employee and 8% merchant/business. The income ranged from 3,000 to 50,000 baht/month, with an average income of 10,707 baht. Most of them (81%) had smoker in the house, of these smokers, 34.5% was the husband, 62.9%

was husbands' father/pregnant woman's father. About 69% always smoke in the house, 55% smoked 1-10 cigarettes and 40% smoked 11-20 cigarettes per day.

2. The perceived benefits of ETS avoidance, perceived barriers to ETS avoidance, perceived self-efficacy in ETS avoidance were found at moderate level.

3. Family income was significantly and positively associated with behavior in avoiding ETS. ($r = .173$, $p < .05$).

4. The results of multiple regression revealed that all seven variables; age, income, education, having smoker in house, perceived benefit, perceived barrier, and perceived self- efficacy could explain only 4.3% of the variance in the pregnant women behavior in avoiding ETS, however, it is not significance.

Implications and Recommendations

Implication for nursing practice

1. This study demonstrated that pregnant women had low ETS avoidance behavior, Even though, they had moderate perceived benefits and perceived self-efficacy on ETS avoidance. Perceived barriers was moderate as well, there were 8 from 11 statements that pregnant women strongly agree as barriers and it were difficult for them to practice. The result suggested nurses and health care providers should encourage pregnant women to be more confidence and encourage them to avoid ETS because the adverse effect of ETS to their fetus and newborn even in the situation that they perceived as barriers. The holding of maternal class in antenatal care clinic should ask about family member smoking to provide health education about smoke, effect of smoke, and how to avoid ETS exposure not only for pregnant women but also for other persons in the family. Besides, communication skill such as asking bargain and refusing should be provided to the pregnant women who live with smoker in order to negotiate for ETS avoidance by asking their husband or relatives to quit or stop smoking in the house.

2. Special campaign to show all people in the village or community about the dangerous and harmful effect of smoke and how to avoid smoke by using brochures, posters or local community radio. In addition, the creation of a special

project such as “The Smoke free’s house” should be done by starting from the house that pregnant women living with smoker. However, nurses who have more knowledge should take into action for counseling and suggestion particularly to smoker who live with pregnant women. Therefore, nurses have to give health education smoker about the harmful and dangerous of smoke to pregnant women and baby, importantly, empowerment a smoke-free home should be done.

Implications for further study

1. The independent variables could not predict ETS avoidance behavior from this study. It may be due to the homogeneous of the subjects therefore, further study should be done in the heterogeneous subjects in term of educational level, occupation and lifestyle (urban and rural).

2. The other important variables such as duration and intensity of ETS should be considered including the number of cigarette smoked in the house, the duration that pregnant women exposed to smoke or hour of exposure per day at home during the past 7 days. Otherwise, it should be studied long term effect such as infant birth weight comparing between pregnant women who exposed and non-exposed to tobacco smoke.

3. According to the gravidity, results showed that pregnant women were in the first and second or more. However, researcher did not do the comparative study between the first and second gravidity to see the differences in ETS avoidance. Possibly, pregnant women who were in the second or more gravidity and knew the danger or harmful of ETS to their baby from the first pregnant, they would have a good ETS avoidance behavior. Further study may compare ETS avoidance between pregnant women in nulliparous and multiparous. However, ETS avoidance behavior also depended on their knowledge and attitude. According to Loke et al. (2000) they found that pregnant women who had more knowledge about smoking and tobacco smoke, they would have better ETS avoidance than the ones who had less knowledge. Suggesting knowledge about smoke hazard is one important factor should take into consideration on ETS avoidance behavior in Thai society. The others factor for instances; interpersonal influence (family, peers, health provider) should take into consideration as well.

4. Further qualitative study should be done to find out other factors for example; the study of the effect of socio-cultural context on ETS avoidance by doing a group discussion in pregnant women, their husband, relatives and friends. This study will be provided the underlying reason, why do pregnant women not avoid ETS in each situation, moreover, more information will be obtained about their thinking and attitude regarding to smoke and smoking avoidance in Thai society.

Limitation of the study

There were not many pregnant women living with nonsmoker in the family (n=19) comparing to pregnant women living with smoker (n=81). In addition, this study did not cover variables such as gravidity that may influence ETS avoidance because of past experience of ETS exposure and effect on fetus. Moreover, instruments used in this study may not sensitive enough to classify the sample. Otherwise, To assess ETS avoidance behavior, it is needed to observe by the researcher to get real answer of practice rather than the answers from pregnant women that may be depending on knowledge or social expectation; The instrument for measuring perceived self-efficacy is not sensitive, some items did not assess self-efficacy, but the ability. For example, when a smoker is surrounding you, you can avoid from him or her; and when a smoker is surrounding you, you can avoid from him or her.

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APPENDIX

APPENDIX A

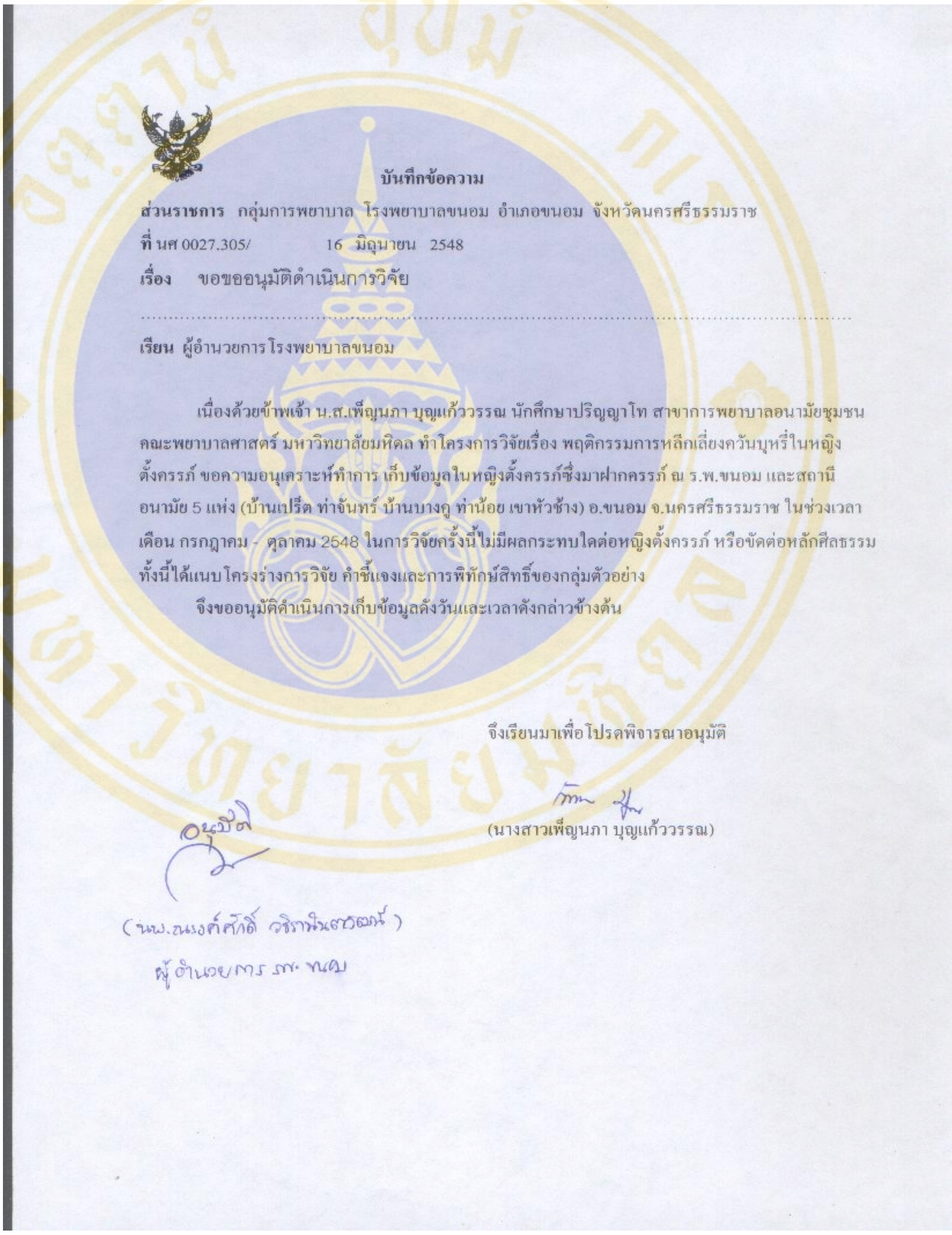
List of Content Validators

The content validity of the questionnaires used in this study were assured by five content validators. Name list of content validators was as follows:

1. Asst. Prof. Dr. Nantawan Suwonnaroop
   Department of Public Health
   Faculty of Nursing, Mahidol University
2. Asst. Prof. Dr. Yaowalak Serisathien
   Department of of Obstetric and Gynecologic Nursing
   Faculty of Nursing, Mahidol University
3. Dr. Nithat Sirichotrat
   Department of Health Education and Behavioral Sciences
   Faculty of Public Health, Mahidol University
4. Asst. Prof. Krongjit Vateesatokit
   Quit Line Counsellor, Action on Smoking and Health Foundation
5. Varabhorn Bhumiswasdi, MD
   Director of Priest's Hospital
   Ministry of Public Health

APPENDIX B

The permission for collection



บันทึกข้อความ

ส่วนราชการ กลุ่มการพยาบาล โรงพยาบาลขนอม อำเภอขนอม จังหวัดนครศรีธรรมราช

ที่ นศ 0027.305/ 16 มิถุนายน 2548

เรื่อง ขอขออนุมัติดำเนินการวิจัย

เรียน ผู้อำนวยการ โรงพยาบาลขนอม

เนื่องด้วยข้าพเจ้า น.ส.เพ็ญนภา บุญแก้ววรรณ นักศึกษาปริญญาโท สาขาการพยาบาลอนามัยชุมชน คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล ทำโครงการวิจัยเรื่อง พฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ ขอความอนุเคราะห์ทำการ เก็บข้อมูลในหญิงตั้งครรภ์ซึ่งมาฝากครรภ์ ณ ร.พ.ขนอม และสถานีอนามัย 5 แห่ง (บ้านเปร็ต ท่าจันทร์ บ้านบางคู ท่าน้อย เขาหัวช้าง) อ.ขนอม จ.นครศรีธรรมราช ในช่วงเวลาเดือน กรกฎาคม - ตุลาคม 2548 ในการวิจัยครั้งนี้ไม่มีผลกระทบใดต่อหญิงตั้งครรภ์ หรือขัดต่อหลักศีลธรรม ทั้งนี้ได้แนบโครงร่างการวิจัย คำชี้แจงและการพิทักษ์สิทธิ์ของกลุ่มตัวอย่าง

จึงขออนุมัติดำเนินการเก็บข้อมูลดังวันและเวลาดังกล่าวข้างต้น

จึงเรียนมาเพื่อโปรดพิจารณาอนุมัติ

(นางสาวเพ็ญนภา บุญแก้ววรรณ)

อนุมัติ

ผู้อำนวยการ รพ. ขนอม

APPENDIX C

The permission to use instrument

วันที่ : Tue, 28 Oct 2003 09:11:51 -0500

จาก : "Martinelli, Angela" <Angela.Martinelli@dhs.gov>

ถึง : '"g4436999@student.mahidol.ac.th"' <g4436999@student.mahidol.ac.th>, '"poopenna@yahoo.com"' <poopenna@yahoo.com>

สำเนาถึง : "Martinelli, Angela" <Angela.Martinelli@dhs.gov>

หัวข้อ : Avoidance of Tobacco Smoke Scale

DearMs.Boonkaewwan:

I was very pleases to receive your request to use the "Avoidance of Environmental Tobacco Smoke Scale that I published in the Journal of Nursing Measurement, Vol. 6 , No. 1, 1998.

You letter finally made its way to me.
I suggest that you use the 10 item scale on page 83 of the manuscript, has a reliability coefficient of .86.
If you feel that you need a longer instrument, I suggest that you use the 20 items on page 80 and test for redundancy.
You have my permission to use either of these instruments.

Best of luck in your research and in your studies.
Thank You,

Email: amartinelli@osophs.dhhs.gov Website: http//oep.osophs.dhhs.gov/ccrf
Angela Martinelli, DNSc, RN
CDR, USPHS
Commissioned Corps Readiness Force
Office of the Surgeon General
12300 Twinbrook Parkway, Room 520K
Rockville, MD 20857
Phone 301.443.3090; Fax 301.443.3119

APPENDIX D

Informed Consent Form

คำอธิบายสำหรับผู้เข้าร่วมการวิจัย

ดิฉัน นางสาวเพ็ญนภา บุญแก้ววรรณ นักศึกษาหลักสูตรพยาบาลศาสตรมหาบัณฑิต สาขาการพยาบาลอนามัยชุมชน คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล กำลังศึกษาวิจัยเกี่ยวกับพฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ โดยมีวัตถุประสงค์เพื่อใช้เป็นแนวทางในการวางแผนส่งเสริมสุขภาพของหญิงตั้งครรภ์ ท่านเป็นบุคคลสำคัญอย่างยิ่งที่จะให้ข้อมูลที่เป็นประโยชน์ ดังนั้นดิฉันจึงขอรบกวนเวลาของท่านในการตอบแบบสอบถาม เกี่ยวกับพฤติกรรมการหลีกเลี่ยงควันบุหรี่ การรับรู้ประโยชน์ในการหลีกเลี่ยงควันบุหรี่ การรับรู้อุปสรรคในการหลีกเลี่ยงควันบุหรี่ และการรับรู้ความสามารถในการหลีกเลี่ยงควันบุหรี่ ซึ่งจะใช้เวลาประมาณ 40-50 นาที โดยขอให้ท่านตอบให้ตรงความเป็นจริงมากที่สุด

การตอบแบบสอบถามจะเป็นไปตามความสมัครใจของท่าน การปฏิเสธที่จะตอบแบบสอบถามจะไม่เกิดผลกระทบใดๆต่อการรักษาของท่าน หากมีข้อคับข้องใจ หรือรู้สึกอึดอัดไม่อยากตอบคำถาม ท่านสามารถกระทำได้โดยไม่มีข้อแม้ใดทั้งสิ้น และข้อมูลที่ได้ครั้งนี้จะเก็บเป็นความลับ การวิเคราะห์และการนำเสนอผลการวิจัยจำเสนอเป็นข้อมูลของหญิงตั้งครรภ์โดยรวม

ดิฉันขอขอบคุณท่านที่ได้ให้ความร่วมมือ

ผู้วิจัย

นางสาวเพ็ญนภา บุญแก้ววรรณ

แบบยินยอมเข้าร่วมการวิจัย

การวิจัยเรื่อง พฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์

ชื่อผู้วิจัย นางสาวเพ็ญนภา บุญแก้ววรรณ นักศึกษาพยาบาลปริญญาโท คณะพยาบาลศาสตร์ มหาวิทยาลัยมหิดล

วันให้คำยินยอม วันที่.....เดือน.....พ.ศ.....

ข้าพเจ้า ..... ได้ทราบรายละเอียดของการวิจัยเรื่อง พฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ จากผู้วิจัยถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย รวมทั้งประโยชน์ที่จะเกิดขึ้นจากการวิจัยอย่างละเอียด และทราบจากผู้วิจัยว่าจะไม่เปิดเผยข้อมูลของข้าพเจ้าหรือผลการวิจัยเป็นรายบุคคลต่อสาธารณชน ถ้ามีปัญหาหรือข้อสงสัยเกิดขึ้นข้าพเจ้าสามารถถามผู้วิจัยได้ ข้าพเจ้ามีสิทธิที่จะบอกเลิกการเข้าร่วมโครงการวิจัยนี้เมื่อใดก็ได้ โดยที่ไม่มีผลกระทบต่อการได้รับบริการหรือการรักษาที่ข้าพเจ้ามีสิทธิได้รับแต่ประการใด

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว และมีความเข้าใจดีทุกประการ และได้ลงนามในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม..... ผู้ยินยอม

ลงนาม..... พยาน

ลงนาม.....พยาน

ข้าพเจ้าไม่สามารถอ่านหนังสือได้ แต่ผู้วิจัยได้อ่านข้อความในใบยินยอมนี้ให้แก่ข้าพเจ้าฟังจนเข้าใจดีแล้ว ข้าพเจ้าจึงลงนามหรือประทับลายนิ้วแม่มือขวาของข้าพเจ้าในใบยินยอมนี้ด้วยความเต็มใจ

ลงนาม.....ผู้ยินยอม

ลงนาม.....พยาน

ลงนาม.....พยาน

ในกรณีผู้ถูกวิจัยยังไม่บรรลุนิติภาวะ จะต้องได้รับการยินยอมจากผู้ปกครองหรือผู้อุปการะโดยชอบด้วยกฎหมาย

ลงนาม.....ผู้ปกครอง/ผู้อุปการะโดยชอบด้วยกฎหมาย

ลงนาม.....พยาน

ลงนาม.....พยาน

APPENDIX E

The Instruments

แบบสอบถามพฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์

คำชี้แจง: แบบสอบถามนี้ มีวัตถุประสงค์เพื่อการศึกษาพฤติกรรมการหลีกเลี่ยงควันบุหรี่ในหญิงตั้งครรภ์ ซึ่งประกอบด้วย 5 ส่วน ได้แก่

ส่วนที่ 1 ข้อมูลส่วนบุคคล

ส่วนที่ 2 แบบประเมินพฤติกรรมการหลีกเลี่ยงควันบุหรี่

ส่วนที่ 3 แบบประเมินการรับรู้ประโยชน์ในการหลีกเลี่ยงควันบุหรี่

ส่วนที่ 4 แบบประเมินการรับรู้อุปสรรคในการหลีกเลี่ยงควันบุหรี่

ส่วนที่ 5 แบบประเมินการรับรู้ความสามารถในการหลีกเลี่ยงควันบุหรี่

ส่วนที่ 1 แบบสอบถามข้อมูลส่วนบุคคลของหญิงตั้งครรภ์

คำชี้แจง โปรดใส่เครื่องหมาย √ ลงในช่อง () หรือเติมคำในช่องว่างให้ตรงกับความเป็นจริง

1. อายุ.....…….ปี

2.อายุครรภ์.....

3. ลำดับที่การตั้งครรภ์.....

4. สถานภาพสมรส () คู่

() ม่าย

() หย่า, แยก

5. ระดับการศึกษาสูงสุด

()ไม่ได้เรียน	() ประถมศึกษาที่.....
() มัธยมศึกษาที่.....	() ปวช
() ปวส	() อนุปริญญา
() ปริญญาตรี	() สูงกว่าปริญญาตรี

6. การประกอบอาชีพ

() ไม่ได้ประกอบอาชีพ () ประกอบอาชีพ ระบุ..……

7. ปัจจุบันครอบครัวท่านมีรายได้……บาท/เดือน

8. ในครอบครัวของท่านมีผู้สูบบุหรี่หรือไม่……. ถ้ามีระบุ …….

9. พฤติกรรมการสูบบุหรี่เป็นอย่างไร

- ปริมาณการสูบ.....มวน/วัน
- สถานที่/บริเวณที่สูบ.....

ส่วนที่ 2 แบบสอบถามพฤติกรรมการหลีกเลี่ยงควันบุหรี่

<u>คำชี้แจง</u> : แบบสอบถามนี้มีจำนวน 20 ข้อ มีวัตถุประสงค์เพื่อต้องการทราบเกี่ยวกับพฤติกรรมในการหลีกเลี่ยงควันบุหรี่ ให้ผู้ตอบพิจารณาข้อคำถามในแต่ละข้อว่าตรงกับการปฏิบัติของท่านมากน้อยเพียงใด โดยผู้ตอบทำเครื่องหมาย √ ลงในช่องที่ตรงกับความคิดเห็นของผู้ตอบมากที่สุด โดยมีเกณฑ์ในการเลือกคำตอบดังนี้

จริงมากที่สุด หมายถึง ท่านปฏิบัติดังข้อความนั้นเป็นประจำทุกครั้ง

จริงมาก หมายถึง ท่านปฏิบัติดังข้อความนั้นหรือเกือบทุกครั้ง

จริงบางครั้ง หมายถึง ท่านปฏิบัติดังข้อความนั้นเป็นบางครั้ง

ไม่จริงเลย หมายถึง ท่านไม่เคยปฏิบัติดังข้อความนั้นเลย

ข้อความ	จริงมากที่สุด	จริงมาก	จริงบางครั้ง	ไม่จริงเลย
1. เมื่อคุณต้องเผชิญหน้ากับผู้ที่กำลังสูบบุหรี่ คุณจะถอยห่างจนแน่ใจว่าไม่ได้หายใจเอาควันบุหรี่เข้าไป				
2. เมื่อคุณพบเพื่อนที่กำลังสูบบุหรี่ คุณยินดีจะนั่งคุยกับเขา (ขณะที่เขากำลังสูบบุหรี่)				
3. เมื่อคุณต้องอยู่ในกลุ่มคนและมีบางคนที่เริ่มสูบบุหรี่ คุณจะยังคงอยู่ในกลุ่มนั้น				
4. เมื่อคุณไปรับประทานอาหารร้านอาหาร หรือภัตตาคาร ถ้าไม่มีที่นั่งที่ปลอดจากการสูบบุหรี่ คุณจะไปรับประทานร้านอื่น				
5. คุณยอมให้สามีหรือญาติ หรือเพื่อน สูบบุหรี่ในบ้านได้				
:				
20.ในสถานที่มีควันบุหรี่ คุณรู้สึกว่าไม่ได้ถูกรบกวน จนทำให้ต้องเลี่ยงออกไป				

ส่วนที่ 3 แบบสอบถามการรับรู้ประโยชน์ในการหลีกเลี่ยงควันบุหรี่ของหญิงตั้งครรภ์

คำชี้แจง : แบบสอบถามนี้มีจำนวน 7 ข้อ วัตถุประสงค์เพื่อต้องการทราบความคิดเห็นของผู้ตอบที่มีต่อการรับรู้ประโยชน์ของการหลีกเลี่ยงควันบุหรี่ โดยผู้สัมภาษณ์ทำเครื่องหมาย √ ลงในช่องที่ตรงกับความคิดเห็นของผู้ตอบมากที่สุด โดยมีเกณฑ์ในการเลือกตอบดังนี้

เห็นด้วยอย่างยิ่ง หมายถึง ข้อความนั้นตรงกับความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์ทุกประการ

เห็นด้วยมาก หมายถึง ข้อความนั้นตรงกับความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์เป็นส่วนใหญ่

เห็นด้วยน้อย หมายถึง ข้อความนั้นตรงกับความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์เพียงบางส่วน

ไม่เห็นด้วย หมายถึง ข้อความนั้นไม่ตรงความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์เลย

ข้อความ	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
1.การหลีกเลี่ยงจากควันบุหรี่ทำให้คุณไม่เวียนศีรษะ				
2.การหลีกเลี่ยงควันบุหรี่ทำให้คุณไม่ระคายเคือง แสบตา				
3.การหลีกเลี่ยงควันบุหรี่ทำให้ลูกในท้องคุณไม่ได้รับอันตรายจากสารพิษในควันบุหรี่				
:				
7.การหลีกเลี่ยงควันบุหรี่สามารถลดความรำคาญ อึดอัด				

ส่วนที่ 4 แบบสอบถามการรับรู้อุปสรรคในการหลีกเลี่ยงควันบุหรี่ของหญิงตั้งครรภ์

คำชี้แจง : แบบสอบถามนี้มีจำนวน 11 ข้อ มีวัตถุประสงค์เพื่อต้องการทราบความคิดเห็นของผู้ตอบที่มีต่อการรับรู้อุปสรรคในการหลีกเลี่ยงควันบุหรี่ โดยผู้สัมภาษณ์ทำเครื่องหมาย √ ลงในช่องที่ตรงกับความคิดเห็นของผู้ตอบมากที่สุด โดยมีเกณฑ์ในการเลือกตอบให้ดังนี้

เห็นด้วยอย่างยิ่ง หมายถึง ข้อความนั้นตรงกับความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์ทุกประการ

เห็นด้วยมาก หมายถึง ข้อความนั้นตรงกับความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์เป็นส่วนใหญ่

เห็นด้วยน้อย หมายถึง ข้อความนั้นตรงกับความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์ เพียงบางส่วน

ไม่เห็นด้วย หมายถึง ข้อวามนั้นไม่ตรงความเชื่อ หรือความรู้สึกของหญิงตั้งครรภ์เลย

ข้อความ	เห็นด้วยอย่างยิ่ง	เห็นด้วยมาก	เห็นด้วยน้อย	ไม่เห็นด้วย
1.คุณคิดว่าเป็นเรื่องยากที่จะขอร้องสมาชิกในบ้านซึ่งติดบุหรี่ ให้หยุดสูบบุหรี่				
2. คุณรู้สึกเบื่อหน่ายที่จะบอกคนรอบข้างที่สูบบุหรี่ว่าควันบุหรี่เป็นอันตรายต่อตัวคุณและลูกในท้อง				
3.การที่จะบอกผู้สูบบุหรี่ว่า ควันบุหรี่เป็นอันตรายต่อตัวคุณและลูกในท้อง เป็นการล่วงเกินสิทธิส่วนบุคคล				
:				
:				
11.คุณไม่กล้าบอก สามีหรือญาติให้เขาสูบบุหรี่นอกบ้าน				

ส่วนที่ 5 แบบสอบถามการรับรู้ความสามารถของตนเองในการหลีกเลี่ยงควันบุหรี่ของหญิงตั้งครรภ์

คำชี้แจง : แบบสอบถามนี้มีจำนวน 11 ข้อ มีวัตถุประสงค์เพื่อต้องการทราบความมั่นใจของท่านในการหลีกเลี่ยงควันบุหรี่ ขอให้ท่านบอกระดับความมั่นใจจากบัตรที่แสดง ค่าระดับความมั่นใจจาก 0-100%

วิธีการตอบจากมาตรวัด ขอให้ท่านพิจารณาระดับความมั่นใจของท่าน โดยให้ท่านบอกตัวเลขที่แสดงถึงระดับความมั่นใจในข้อความที่ผู้วิจัยอ่านให้ฟัง

0 10 20 30 40 50 60 70 80 90 100

ไม่มั่นใจเลย มั่นใจปานกลาง มั่นใจมากที่สุด

ตัวอย่าง

ก. ท่านมั่นใจว่าท่านเลิกสูบบุหรี่ขณะตั้งครรภ์ **100**

จากคำตอบในตัวอย่างแสดงว่าท่าน มีความมั่นใจ 100% จะสามารถเลิกสูบบุหรี่ขณะตั้งครรภ์ได้

เมื่อท่านเข้าใจคำถามและพร้อมที่จะตอบคำถามแล้ว โปรดตอบคำถามดังต่อไปนี้

ข้อความ	เปอร์เซ็นความมั่นใจ
1.เมื่อคุณตัดสินใจหลีกเลี่ยงควันบุหรี่ไม่ว่าอยู่ในสถานที่ใด คุณสามารถทำได้ทันที	
2.คุณมั่นใจว่าสามารถบอกให้บุคคลในบ้าน ให้สูบบุหรี่นอกบ้านได้	
3.เมื่อมีผู้สูบบุหรี่อยู่ใกล้คุณ คุณสามารถนำตัวเองออกห่างจากผู้สูบบุหรี่ได้	
::	
11.คุณสามารถหลีกเลี่ยงการสัมผัสควันบุหรี่ ป้ายรถเมล์และสถานีขนส่งได้	

APPENDIX F

Descriptive Statistic of Each Instruments

Table 6 Percentage, mean, standard deviation and level of ETS avoidance of the sample on each item and overall (N=100)

ETS avoidance	Almost always true	Almost always true	Usually not true	Almost never true	Mean	SD	Interpretation
		%					
1.When I encounter someone …	0	47	29	24	2.23	.82	Moderate
2. If I encounter a friend ……	33	46	10	11	1.99	.94	Moderate
3. If I am with a group ……	42	43	10	5	1.78	.82	Low
4. When I am in a restaurant, I ……	17	63	12	8	2.89	.78	Moderate
5. I allow people ……	18	55	13	14	2.24	.93	Moderate
6. When I trip by bus or train, I ……	5	29	29	37	2.02	.93	Moderate
7. When relatives or friends…	48	37	10	5	1.72	.84	Low
8. If my husband, or friends….	30	51	13	6	1.95	.82	Moderate
9. I allow people to ……	29	51	16	4	1.95	.78	Moderate
10. I will sit in ……. ….	35	42	17	6	1.94	.87	Moderate
11. If I am with people who are …	16	45	33	6	2.71	.80	Moderate
12.I will sit in the smoking section ..	28	48	17	7	2.03	.85	Moderate
13.When at an outdoor function …	1	29	30	40	1.91	.85	Low
14. When I am in a restaurant, I …	3	17	35	45	1.78	.83	Low
15.When exposed to ……	17	55	17	11	2.78	.86	Moderate
16. I find it unpleasant to ……	5	19	32	44	1.85	.90	Low
17. I routinely associate with …	9	36	17	38	2.84	1.04	Moderate
18. When dining out, I ……	1	34	30	35	2.01	.86	Moderate
19. I frequent places where ….	18	39	15	28	2.53	1.09	Moderate
20. Places where smoke is present, I	0	8	33	59	3.31	.64	High
The overall ETS avoidance					**2.23**	**.31**	**moderate**

Table 7 Percentage, mean, standard deviation and level of perceived benefits of ETS avoidance of the sample on each item and overall (n=100)

Perceived benefits of ETS avoidance	almost always agree	usually agree	disagree	strongly disagree	Mean	S.D.	Interpretation
	%						
1.The avoidance of ETS can be ……	62	23	8	7	3.63	.70	High
2.The avoidance of ETS makes you ..	61	29	6	4	3.48	.75	High
3.The avoidance of ETS feel…..…	72	23	1	4	3.47	.78	High
4. The avoidance of ETS makes no …	60	32	4	4	3.46	.80	High
5. The avoidance of ETS does not ...	61	29	5	5	3.40	.91	High
6. The avoidance of ETS doesn't make …	49	42	6	3	3.37	.73	High
7. The avoidance of ETS can help …	47	41	9	3	3.32	.76	High
The overall perceived benefits					**3.45**	**.78**	**Moderate**

Table 8 Percentage, mean, standard deviation and level of perceived barrier to ETS avoidance of the sample on each item and overall (n =100)

Perceived barrier to ETS avoidance	almost always agree	usually agree	disagree	strongly disagree	Mean	S.D.	Interpretation
	%						
1.You think that it is quite difficult …	39	34	17	10	2.69	.96	Moderate
2.You get bored to tell ……..	12	30	35	23	2.69	1.00	Moderate
3.Tellimg the smoker ……	25	25	33	17	2.42	1.04	Moderate
4.You feel uncomfortable to …	14	28	33	25	2.28	1.04	Moderate
5.You don't brave enough ……	27	37	22	14	2.23	1.00	Moderate
6.You feel suffering to avoid ...	36	34	25	5	2.00	.93	Moderate
7.Avoidance of tobacco smoke makes …….	43	33	21	3	1.99	.90	Moderate
8.It is diffused for you to ……	44	32	21	3	1.98	.98	Moderate
9.When you try to avoid ……	39	33	20	8	1.97	.95	Moderate
10.Avoidance of tobacco smoke makes …	30	26	30	14	1.84	.86	Moderate
11.You don't brave enough to ask …	35	38	19	8	1.83	.86	Moderate
The overall perceived barrier					**2.17**	**.96**	**Moderate**

Table 9 Mean and standard deviation and level of perceived self – efficacy of ETS avoidance in each item and overall

Perceived self-efficacy of ETS avoidance	Mean	S.D.	Interpretation
1.When a smoker is surrounding you, you can….	71.30	16.43	Moderate
2.When you make a decision …, you can ….	67.00	21.76	Moderate
3.You can avoid tobacco smoke ….	81.55	14.59	Moderate
4.You feel confident to ask your family ….	67.70	14.48	Moderate
5.When someone in your house start….	60.90	16.50	Moderate
6.You sure isolate from friends or relatives …	51.20	19.70	Low
7.You can avoid the tobacco smoke at ….	57.00	20.62	Moderate
8.When your friends, relatives, ….	61.00	23.06	Moderate
9.When your friends, relative, ...	46.90	29.66	Low
10.You sure that you can avoid ….	65.20	24.00	Moderate
11.You sure you can make your house ….	58.70	19.83	Moderate
The overall perceived self- efficacy	**62.58**	**20.05**	**Moderate**

BIOGRAPHY

NAME	Pennapa Boonkaewwan
DATE OF BIRTH	November 9, 1971
PLACE OF BIRTH	Nakhon Sri Thammarat, Thailand
INSTITUTION ATTENDED	Boromararchonani Nakhon Sri Thammarat Nursing College , 1990-1994 Equivalent to degree of Bachelor of Science (Nursing and Midwifery) Mahidol University, 2001-2007 Master of Nursing Science (Community Health Nursing)
POSITION AND OFFICE	: Register Nurse : Kanhom Hospital, Kanhom District Nakhon Sri Thammarat, Thailand E-mail : srimakala_b@hotmail.com
HOME ADDRESS	485 Moo 6, Taria, Muang, Nakhon Sri Thammarat Thailand 80290