FACTORS RELATED TO INTENTION TO SMOKE CIGARETTES IN SECONDARY SCHOOL STUDENTS

PAKAWADEE PROMNUCH

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FACTORS RELATED TO INTENTION TO SMOKE CIGARETTES IN SECONDARY SCHOOL STUDENTS)

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ABSTRACT

This study was descriptive correlational research which used the Theory of Planned Behavior proposed by Ajzen as the conceptual framework to determine the predictive power of demographic characteristic factors of age, grade point average, daily allowance, number of family members smoking and number of friends smoking, as well as, attitude toward smoking, subjective norm, and perceived behavioral control on the intention to smoke in the next month of early adolescents aged 10 to 17 years in Ranong Province. The sample consisted of 423 students and data were collected by means of a self-administered questionnaire developed by the researcher. Data collection took place in November and December 2005. Data were analyzed by means of Spearman's Correlation Analysis and Logistic Regression Analysis.

The findings revealed that age, grade point average, and number of friends smoking, as well as, attitude toward smoking, subjective norm, and perceived behavioral control were related to the intention to smoke within 1 month with statistical significance at the 0.01 level (r_s=.138, r_s= -.249, r_s=.328, r_s= .281, r_s =.479, and r_s= -.441, respectively). In addition, the Logistic Regression Analysis showed that all eight factors could explain the intention to smoke within 1 month by 23% to 39.5%. However, the number of friends smoking, subjective norm, and perceived behavioral control were the only three factors that had a statistically significant influence on the subjects' intention to smoke within 1 month. Thus, having one more friend who smoked increased the students' likelihood to intent to smoke within 1 month by 1.1 times. Also, having one more score on the subjective norm increased the students' likelihood to intent to smoke within 1 month by 1.6 times. And having one more score on the perceived behavioral control decreased the students' likelihood to intent to smoke within 1 month by 0.8 times.

In order to organize health education and smoking prevention programs in early adolescents, nurses should have more awareness on the participation of students' significant persons such as friends, parents, teacher, etc. In addition, adolescents' perception on their control over smoking should be encouraged.

KEY WORD: FACTOR / INTENTION TO SMOKE CIGARETTE / THEORY OF PLANNED BEHAVIOR / SECONDARY SCHOOL STUDENTS / ADOLESCENT

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ปัจจัยที่มีอิทธิพลต่อความตั้งใจที่จะสูบบุหรี่ของนักเรียนมัธยมศึกษาตอนต้น (FACTORS RELATED TO INTENTION TO SMOKE CIGARETTES IN SECONDARY SCHOOL STUDENTS)

ผกาวดี พรหมนุช 4637420 RAMH/M

พย.ม. (การพยาบาลสุขภาพจิตและจิตเวช)

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บทคัดย่อ

ในการวิจัยครั้งนี้เป็นการวิจัยเชิงบรรยายแบบวิเคราะห์ความสัมพันธ์ (Descriptive Correlational Design) เพื่อศึกษาอำนาจการทำนายของปัจจัยพื้นฐานซึ่งได้แก่ อายุ เกรดเฉลี่ยสะสม รายได้เฉลี่ย (ต่อวัน) จำนวนสมาชิกในครอบครัวที่สูบบุหรี่ จำนวนเพื่อนที่สูบบุหรี่ ทัศนคติต่อการสูบบุหรี่ บรรทัดฐาน และการรับรู้ความสามารถในการควบคุมที่มีต่อความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าของนักเรียนมัธยมศึกษาตอนต้น กลุ่มตัวอย่างเป็นนักเรียนมัธยมศึกษาชั้นปีที่ 1-3 อายุ 10-17 ปี ในจังหวัดระนอง จำนวน 423 คน เก็บข้อมูลโดยให้นักเรียนเป็นผู้ตอบแบบสอบถามด้วยตนเอง ระหว่างเดือนพฤศจิกายน-ธันวาคม พ.ศ. 2548 วิเคราะห์ข้อมูลโดยใช้สถิติสัมประสิทธิ์สหสัมพันธ์สเปียร์แมน และการวิเคราะห์การถดถอยโลจิสติค

ผลการวิเคราะห์โดยใช้สถิติสหสัมพันธ์สเปียร์แมน พบว่า อายุ เกรดเฉลี่ยสะสม จำนวนเพื่อนที่สูบบุหรี่ ทัศนคติต่อการสูบบุหรี่ บรรทัดฐานและการรับรู้ความสามารถในการควบคุมมีความสัมพันธ์กับความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าอย่างมีนัยสำคัญทางสถิติที่ระดับ.01 (r_s=.138, r_s= -.249, r_s=.328, r_s=.281, r_s =.479 และ r_s= -.441 ตามลำดับ) และผลการวิเคราะห์โดยใช้สถิติการวิเคราะห์ความถดถอยโลจิสติค พบว่า อายุ เกรดเฉลี่ยสะสม รายได้เฉลี่ย (ต่อวัน) จำนวนสมาชิกในครอบครัวที่สูบบุหรี่ จำนวนเพื่อนที่สูบบุหรี่ ทัศนคติต่อการสูบบุหรี่ บรรทัดฐาน และการรับรู้ความสามารถในการควบคุม สามารถร่วมกันอธิบายความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าของนักเรียนมัธยมศึกษาตอนต้นได้ 23% ถึง 39.5% หลังจากควบคุมตัวแปรอื่นๆ คงที่ จำนวนเพื่อนที่สูบบุหรี่ บรรทัดฐานและการรับรู้ความสามารถในการควบคุม เป็นปัจจัยที่มีความสัมพันธ์และมีอิทธิพลต่อความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าของนักเรียนมัธยมศึกษาตอนต้นอย่างมีนัยสำคัญทางสถิติที่ระดับ.001 โดยการมีจำนวนเพื่อนที่สูบบุหรี่เพิ่มขึ้น 1 คน จะเพิ่มโอกาสที่นักเรียนจะมีความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าถึง 1.1 เท่า (Odds ratio=1.1) การมีคะแนนของบรรทัดฐานเพิ่มขึ้น 1 คะแนน จะเพิ่มโอกาสที่นักเรียนจะมีความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าถึง 1.6 เท่า (Odds ratio=1.6) และการมีคะแนนของการรับรู้ความสามารถในการควบคุมเพิ่มขึ้น 1 คะแนน จะลดโอกาสที่นักเรียนจะมีความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าถึง 0.8 เท่า (Odds ratio=0.8)

การให้สุขศึกษาและการจัดโปรแกรมการป้องกันการสูบบุหรี่ พยาบาลควรตระหนักถึงการมีส่วนร่วมของบุคคลที่มีความสำคัญต่อวัยรุ่นตอนต้น เช่น พ่อแม่ อาจารย์ โดยเฉพาะอย่างยิ่งเพื่อน ซึ่งมีความสำคัญกับวัยรุ่นตอนต้นเป็นอย่างมาก นอกจากนั้น การรับรู้ความสามารถในการควบคุมพฤติกรรมการสูบบุหรี่ของวัยรุ่น ก็เป็นปัจจัยที่ควรให้ความสนใจ เพื่อลดโอกาสที่วัยรุ่นตอนต้นจะมีความตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้าและแนวโน้มที่วัยรุ่นตอนต้นจะสูบบุหรี่เป็นไปได้น้อยลง ซึ่งสามารถช่วยป้องกันการสูบบุหรี่ในวัยรุ่นตอนต้นในอนาคตข้างหน้าได้

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CHAPTER I

INTRODRUCTION

Background and significance of the study

Smoking is considered a significant problem for adolescents as eight out of ten teenagers start smoking when they are younger than 20 years old (World Bank, 2001). A review of studies conducted in Thailand has revealed that the mean age of adolescents when they start smoking is around 13-14 years old (Mala Rucksapram, B.E.2526; Adcharawan Sroythong, B.E.2542; Nitaya Pensirinapa, B.E.2542). The World Health Organization (1999) has reported that adolescents who begin to smoke at a young age and smoke regularly have as high as 50% chances to die from smoking (Foundation for Non-Smoking Campaign, cited in Smoking or Health, B.E. 2542: 2). Adolescent smoking leads to various health problems such as gingivitis, coughing, insomnia, stress, deteriorated health, fatigue, low immunity, and frequent illness (Wareeporn Pison, B.E.2542). In addition, smoking has an effect on nutritional intake and food consumption of school-aged adolescents as they tend to have lower total intake than those who are non-smokers even though they need more calories for their metabolism (Hatairat Suntornsuk, B.E.2542). Moreover, adolescents who smoke have statistically significantly lower body weight, height, and body mass index than adolescents who do not smoke (Chaowachuen Laosongkram, B.E.2542). Therefore, it can be concluded that smoking has an adverse effect on adolescents' health and growth and causes health problems.

More importantly, adolescents who smoke have ten times higher chances or more to use other drugs when compared to adolescents who do not smoke (Songkiat Piyaka & Wetin Sunsanewate, B.E.2540: 67). It has been found that adolescents who smoke regularly before they reach the age of 17 also use other drugs such as alcohol, cocaine, heroin, opium, and marijuana. Furthermore, about 10% of the adolescents who have tried alcohol for a period of time will become addicted to alcohol, but almost 100% of adolescents who have tried to smoke will become addicted to

cigarettes. Thus, it can be seen that smoking is much more addictive than alcohol. Research findings have suggested that more than 80% of the adults who are addicted to cigarettes began smoking before they were 20 years old (Foundation for Non-smoking Campaign/Chow Bann Foundation, B.E.2535, cited in Chanitta Thumaim, B.E. 2537: 2). In Thailand, a study related to factors influencing strong narcotic use of high school students who have used basic narcotics in school under the Ministry of Education, Education Region 5, showed that 150 students who used strong narcotics also used basic narcotics including stimulant drinks, alcohol, and smoking tobacco, while the strong narcotics they used were sleeping pills, amphetamines, and inhalants. Also, an in-depth interview showed that these students started from cigarettes and alcohol before progressing to stronger narcotics (Thanatus Thanathiti, B.E.2543: 132-133).

A review of literature has revealed that studies conducted both in Thailand and abroad to investigate different factors influencing smoking employed different theoretical frameworks such as Bandura's Social Theory, the PRECEDE Framework, the Reasoned Action, and the Planned Behavior Theory. These studies have discovered a number of factors that are related to smoking and that can be used to predict smoking behavior in adolescents. From the literature, factors being studied in relation to smoking in adolescents can be organized into two groups including demographic characteristics factors and psychosocial factors. Demographic characteristics factors found to be related to smoking in adolescents were sex, age, educational achievement, income, type of residence, smoking family members, leisure time, being athletic, and substance usage. Studies revealed that males are more likely to smoke than females (Orathai Limtrakul, B.E.2536; Acharawan Soithong, B.E.2542; Thanin Sutheeprasert, B.E.2544). The older the adolescents, both males and females, the more likely they smoke (Somchai Cheunta, B.E.2528; Thanin Sutheeprasert, B.E. 2544; Orathai Limtrakul, B.E.2536; Sasithorn Lertpiromluck, B.E.2547). Non-smokers are more likely to have better achievement in school (Somchai Cheunta, B.E.2528; Acharawan Soithong, B.E.2542; Orathai Limtrakul, B.E.2536; Urai Sumaritham, B.E.2535; Choochai Supawong, B.E.2540; Nittaya Pensirinapa, B.E.2542; Zapata et al. 2004). In term of income, adolescents who receive more allowances tend to smoke more as they have more money to buy cigarettes (Somchai

Cheunta, B.E.2528; Orathai Limtrakul, B.E.2536; Nittaya Pensirinapa, B.E.2542; Yuwaluck Khan-asa, B.E.2541). Most of the smokers live in a dormitory or rented house (Somchai Cheunta, B.E.2528; Orathai Limtrakul, B.E.2536). Furthermore, several studies showed that having a smoking family member, especially the father or mother, increases adolescents' chance of smoking (Somchai Cheunta, B.C.2528; Kattika Pongsiri, B.C.2536: 102; Acharawan Soithong, B.C.2542; Supawongse et al, 1998; Zapata et al., 2004; Parna et al., 2003). For leisure time, studies revealed that adolescents who spend their leisure time at a high-risk place have more opportunities to smoke (Thanin Sutheeprasert, B.E. 2544; Zapata et al., 2004). More interesting finding is that both female and male adolescents who play sports smoke less than those who do not play sports (Acharawan Soithong, B.E.2542; Tomori et al., 2001). And both male and female adolescents who smoke are more likely to drink alcohol and use illicit drugs such as stimulants (Tomori et al., 2001; Acharawan Soithong, B.E.2542). Psychosocial factors being studied and found to be related to smoking in adolescents were internal and external locus of control, smoking values, attractiveness of cigarette products, subjective norm, perceived behavioral control, peer pressure, attitude toward smoking, intention to smoke, suicide attempt, stress, self-esteem, and self-efficacy. In term of internal and external locus of control, research findings revealed that female adolescents who have a low level of internal locus of control of smoking are more likely to smoke and adolescents who have a low level of external locus of control tend to smoke more than those who have a high level of external locus of control (Yuwaluck Khan-asa, B.E.2541). For smoking values, adolescents with high smoking values tend to smoke more (Orathai Limtrakul, B.E.2536; Thanin Sutheeprasert, B.E.2544: 7; Yuwaluck Khan-asa, B.E.2541). In addition, attractiveness of cigarette products has a positive influence on smoking behaviors as most female smokers generally feel that packaging of cigarettes is highly interesting (Yuwaluck Khan-asa, B.E. 2541). In term of subjective norm, several research studies revealed that if people who are famous or highly regarded by society smoke, adolescents will be influenced to adopt the smoking habits themselves (Hanson, 1996; Hemchayat, 2003; Mala Raksabrahm, B.E.2526; Ua-kit, 2004). Perceived behavioral control also found to relate to smoking in adolescents. Adolescents who are not quite able to control their smoking behaviors have more intention to smoke and express

more smoking behaviors (Hemchayat, 2003; Ua-kit, 2004; Hanson, 1997; Higgins &Conner, 2003). Furthermore, if adolescents have a large number of friends who smoke, they will have more likelihood to smoke as well, indicating the influence of peer pressure on smoking behavior in adolescents (Nittaya Pensirinapa, B.C.2542: 75; Thiti Rattanachote, B.E. 2539: 86; Yuwaluck Khan-asa, B.E.2541; Orathai Limtrakul, B.E.2534: 112; Thanin Sutheeprasert, B.E. 2544; Urai Sumaritham, B.E.2535; Parna et al., 2003; Woodruff, Candelaria, Laniado-Laborin, Saltis & Villasenor, 2003; Lertpiromluck, 2004). For attitudes toward smoking, it was found that adolescents who have positive attitudes toward smoking, believing that smoking is good or beneficial for them, will initiate smoking behavior (Yuwaluck Khan-asa, B.E.2541; Mala Raksabrahm, B.E.2526; Kattiga Pongsiri, B.C.2536; Acharawan Soithong, B.C.2542; Thanin Sutheeprasert, B.E. 2544; Hemchayat, 2003; Hanson, 1996; Higgins &Conner, 2003; Ua-kit, 2004). In addition, intention to smoke is found to be an important factor which influences adolescents to perform smoking behavior as intention to smoke is a persuasive factor that motivate adolescents to perform the behavior (Hemchayat, 2003; Ua-kit, 2004; Higgins & Conner, 2003). Literature also showed that stress and suicide attempts are found to be statistically significantly related to smoking behavior (Tomori, Zalar, Kores Plesnicar, Ziherl & Stergar, 2001; Byrne & Mazanov, 2001; Acharawan Soithong, B.E.2542). For self-esteem, adolescents who have low self-esteem are more likely to smoke than do adolescents who have high self-esteem (Byrne & Mazanov, 2001). And for self-efficacy in smoking rejection, research revealed that adolescents who do not smoke tend to have a higher level of self-efficacy to reject smoking (Lertpiromluck, 2004).

However, literature on smoking in adolescents has indicated that various research have studied adolescents in different age groups such as early adolescents (11-14 years of age) (Hill et al., 1997; Higgins & Corner, 2003; Bothmer, Mattsson, & Fridlund , 2002; Zapata et al, 2004; Woodruff et al., 2003; Acharawan Soithong, B.E.2542; Lertpiromluck, 2004), middle adolescents (15-18 years of age) (Yuwaluck Khan-asa, B.E.2542; Ua-kit, 2004), and late adolescents (18-21 years of age) (Kattika Pongsiri, B.E.2536; Somchai Chuenta, B.E.2528; Orathai Limtrakul, B.E.2534; Hemchayat, 2003). Other studies divide adolescents differently, with early and middle adolescents ranging in age from 13-19 years (Nittaya Pensirinapa, B.E.2542;

Hanson, 1997; Tomori et al., 2001) and middle adolescents to early adulthood ranging from 14-24 years of age (Thanin Sutheeprasert, B.E.2544). In addition, there is a study which covered the entire adolescence, from 11 to 20 years of age (Thiti Rattanachote, B.E.2539), as well as studies that investigated only a specific age group such as students in Mathayom 3 (Urai Sumaritham, B.E.2535) or Mathayom 3 and Mathayom 6 (Mala Raksabrahm, B.E.2526).

In brief, studies investigating factors related to smoking behavior in adolescents have their foci on different age groups. In Thailand, most studies have been conducted with late adolescents, or high school students, ranging in age from 18 to 22 years. Only a few studies have been carried out with early adolescents as their sample. Although the past studies have shed some light on the problems of smoking among adolescents to a certain level, smoking problems persist and even increase. A survey of smoking behavior has shown that the percentage of the Thai adolescents aged between 15 and 19 years old who smoked increased from 6.3% in 1999 to 6.7% in 2001. In particular, the number of female adolescents who smoked had increased from less than 0.1% in 1999 to 0.3% in 2001 (National Statistical Office, 2001). However, a more recent survey of smoking behavior in Thailand has indicated that the number of regular smokers aged 15 to 19 years had decreased (National Statistical Office, 2004). Nevertheless, a study examining the factors that influence the intention to smoke of early adolescents still deemed interesting and important. This is because early adolescence is the period when individuals undergo numerous physical, psychological, social, and intellectual developments. As such, they have to deal with considerable adjustments and adaptations. In other words, this is the time when individuals encounter a number of difficulties and confusions, so they may find smoking as their solution.

In this study, the Theory of Planned Behavior as proposed by Ajzen (1991) was adopted to investigate the factors influencing the intention to smoke within 1 moth of early adolescents. The theory was designed to explain internal changes of individuals regarding thinking, evaluation, and influence of internal and external perceptions which affects their behaviors; hence a clearer and more systematic understanding of behaviors and underlying reasons for such behaviors (Ajzen, 1991). According to this theory, its major construction includes the attitude toward smoking,

subjective norm, perceived behavioral control, and intention to smoke. As a result, it is deemed an appropriate framework in an investigation of smoking behavior in adolescents. Even though there has been empirical evidence supporting the use of the Theory of Planned Behavior in predicting smoking behavior in late adolescents (18 -22 years of age), the use of the theory in a different age group of adolescents may lead to different results. This is because experiences, concepts, individuality, and intellectual and social development of adolescents at different periods vary greatly (Ruja Phupaiboon, B.E.2547: 53). In addition, the use of findings of the studies conducted in a foreign context to explain smoking behavior among Thai adolescents may not be sufficiently conclusive.

A review of literature has suggested a large number of factors that influence smoking behavior in adolescents. However, the researcher was interested in investigating the intention to smoke within 1 month of early adolescents to shed more light on their thinking and ideas before adopting smoking behavior as the early adolescence is the period when they are beginning to pay attention to smoking. In this study, the researcher studied a number of study variables related to behavior planning including attitudes toward smoking, subjective norms perceived behavioral control, and intention to smoke. In addition to these variables, demographic characteristic factors were also included. They were age, grade point average, income, number of smoking family members, and number of smoking friends. It was anticipated that these factors would help lead to a better understanding of smoking behavior in adolescents.

Conceptual framework of the study

Smoking is a significant and frequently found behavioral problem among adolescents. Smoking negatively affects their health, growth, and development. It also leads to other types of substance abuse. In the present study, the Theory of Planned Behavior (Ajzen, 1991) was used as the conceptual framework. The theory was specifically developed to study internal changes of individuals regarding thinking, evaluation, and influence of external or internal perceptions that affect individuals' behaviors; hence a clearer and more systematic understanding of the underlying reasons for such behaviors. It is composed of three constructs—attitudes

toward the behavior, subjective norms, and perceived behavioral control—which result in intention to express the behavior. The first factor is the attitude toward smoking, and this can be measured directly and indirectly. Generally, the direct attitude toward smoking is the feeling of adolescents about smoking, whether it is good or bad, or beneficial or harmful. On the other hand, indirect attitude toward smoking consists of belief about smoking and evaluation of smoking outcome. Secondly, the subjective norm can also be measured directly and indirectly. The direct subjective norm is the perception of adolescents whether most important individuals approve smoking or not; the indirect subjective norm consists of the normative beliefs and the motivation to comply. The last factor is the perceived behavioral control that can also be measured directly and indirectly. The direct perceived behavioral control is perceived difficulty or ease of smoking behavior, while the indirect perceived behavioral control comprises control beliefs and perceived power. Therefore, the attitude toward smoking, the subjective norm, and the perceived behavioral control can predict smoking behavior through the intention to smoke within 1 month.

If adolescents have positive attitudes toward smoking, important persons accept smoking, and adolescents have low perceived behavioral control, they will be influenced to develop an intention to smoke and actually perform the smoking behavior. In the present study, the researcher was interested in investigating the intention to smoke of early adolescents only. Other personal factors added as study variables were age, grade point average, income, number of smoking family members, and number of smoking friends. The conceptual framework of the study is shown in Figure 1 below.

Research Questions

What are the predictive factors of the intention to smoke within 1 month of early adolescents according to the Theory of Planned Behavior and demographic characteristic factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking?

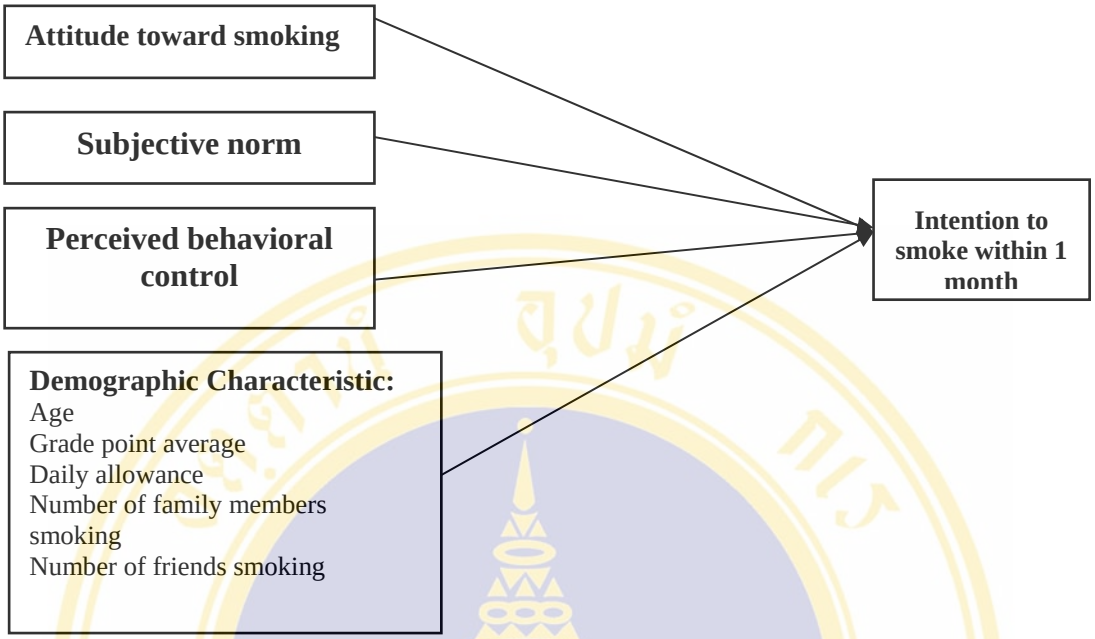

Figure 1 Conceptual Framework of the Study

Research Objective

To determine the predictive factors of demographic characteristic factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control on the intention to smoke within 1 month of early adolescents.

Research hypothesis

Demographic characteristic factors of age, grade point average, daily allowance, number of family members smoking, number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control could co-predict the intention to smoke within 1 month of early adolescents.

Scope of the study

This study aimed at determining the factors that influenced the intention to smoke within 1 month of early adolescents studying in the early secondary level in Ranong Province in the academic year 2005.

Expected outcomes and benefits

1. The findings of the study would shed light on the influence of different factors based on the Theory of Planned Behavior on early adolescents' intention to smoke within 1 month.

2. The study findings could also be used as a guideline in planning for appropriate measures to prevent early adolescents from smoking.

Definition of terms

Attitude toward smoking refers to feelings or beliefs about smoking behavior, which can be either positive or negative (Ajzen, 1991: 188). In this study, direct attitude toward smoking was evaluated by assessing early adolescents' feelings about smoking, whether it is good or bad, or beneficial or harmful, using the Direct Attitude toward Smoking Scale.

Subjective norm refers to the perceived social pressure to perform or not perform the behavior (Ajzen, 1991: 188). In this study, the direct subjective norm was measured using the Direct Measure of Subjective Norm Scale asking early adolescents to indicate how much the important persons thought that the adolescents should or should not smoke.

Perceived behavioral control refers to the perceived ease or difficulty of performing the behavior. It is assumed to reflect the past experience as well as anticipated impediments and obstacles (Ajzen, 1991: 188). In this study, direct perceived behavioral control was measured by assessing early adolescents' perception of how easy or difficult smoking was, using the Direct Measure of Perceived Behavioral Control Scale.

4. Intention to smoke within 1 month refers to the possibility that individuals will perform a behavior, which is immediate decision-making before performing such behavior (Ajzen, 1980). In this study, Intention to Smoke Scale was used to assess early adolescents' intention to smoke within 1 month.

CHAPTER II

LITERATURE REVIEW

This research employed a cross-sectional design to investigate factors influencing the intention to smoke within 1 month of early adolescents. The Theory of Planned Behavior was used as a conceptual framework of the study. In this chapter, a review of literature is conducted in the following topics:

1.Adolescence and Developments of Adolescents

2.Smoking and Effects of Smoking on Adolescents

3.Factors Influencing Smoking Behavior in Adolescents

4.The Theory of Planned Behavior.

1. Adolescence and Developments of Adolescents

1.1 Definition of Adolescent

Adolescence is derived from the Latin word '*adolescere*,' meaning 'to grow into maturity.' Steinberg (1993: 5) has defined adolescence as a period of transitions—physical, psychological, social, and cognitive. Therefore, adolescence is seen as a crucial point during which individuals leave childhood and enter adulthood. It is not easy to define adolescence according to physical or psychosocial developments because developmental stages tend to overlap. However, it is still important to recognize the differences caused by age and developmental stages. For example, early adolescence (aged 10 to 14 years) is characterized by physical changes caused by puberty, while middle adolescence (aged 15 to 17 years) is characterized by intense interests in peer relationships, comparison of self and others, and the opposite gender. Finally, late adolescence (aged 18 to 21 years) is characterized by interest in school, educational achievement, and plans for future career after entering young adulthood (Millstein, 1993, cited in Sper & Kulbok, 2001).

1.2 Developments of Adolescents

It is necessary to understand developmental stages of adolescence so as to better understand their behaviors. Major developments of adolescents are divided into four aspects as follows:

1.2.1 Physical development

Adolescence is characterized by growth spurt. In other words, adolescents grow rapidly due to the excretion of the growth hormone, thyroid hormone, and androgen, leading to a fast increase in both weight and height. The change of the reproductive system is more apparent, and secondary sex characteristics are shown. For example, female adolescents will develop breasts and hips, and they will experience the onset of menstruation in girls, whereas male adolescence will begin to have moustache and beard, hoarse voice, and ejaculation, even tough males develop about one to two years slower than females do. It is believed that these changes result from the growth of the endocrine gland which produces hormones that cause both biological and psychological changes. Some of the changes may not be clearly seen, and they can affect adolescents' behaviors. For instance, female adolescents may become shy and try to hide their newly developed figure under baggy clothes; male adolescents may be afraid to talk to others as they are embarrassed of their husky voice and may avoid socialization.

1.2.2 Psychological development

Both internal and external changes and growth affect the emotional status of adolescents. They can be emotionally unstable, easily confused, and extremely sensitive. The expression of emotions varies depending on individual adolescents' personal characteristics that manifest in the forms of hot temper, impatience, anxiety, or sensitive. Sometimes, their emotional status is called 'storm and stress,' and this includes the feelings of love, hatred, confusion, or short-temper. Any type of emotion can be intense and fluctuating. Such mood swings can be caused by different reasons such as biological changes and adaptation to new environments. This is because entering adulthood means learning about new, appropriate behaviors such as social manners, dressing manner, responsibility, and search for new knowledge so as to be accepted by peers and other adults, all of which can make adolescents feel uneasy and unhappy.

1.2.3 Social development

When children become adolescents, they undergo all kinds of changes related to their attitudes and social behaviors. They tend to isolate themselves from their parents and family, and their peers become more important. Thus, they love to hang out with their peers, and try to imitate them in the way they dress, talk, and act. Hanging out with their peers make them happy and contented, and they need independence and freedom to be with their peers, as they are afraid that they might not be accepted by the peer group. Also, they begin to be more self-reliant, like to make their own decisions, and try to find their ego identity, to build self-confidence and to get ready for adulthood.

1.2.4 Cognitive development

Adolescence is the period of rapid growth of the brain, resulting in an extensive development of thinking ability, memory, and concentration. They are more able to understand the relationship among things, and they develop interests in their surroundings. In addition, they are more inquisitive, and they are able to solve problems approached from various aspects. However, since adolescents have recently passed their childhood, they tend to be impulsive and lack careful consideration about pros and cons when doing things despite their intelligence. Therefore, they may speak or act without cautiously think about the possible outcomes.

In summary, adolescence is the transition period in which individuals undergo considerable physical, psychological, cognitive, and social changes. In terms of physical changes, they experience rapid biological development. As for psychological changes, they become emotionally unstable and their emotions tend to be intense. Regarding social changes, adolescents like to be with their peers, and this may lead to improper behaviors on occasions. Finally, with regard to cognitive changes, it is the period when adolescents' brain development reaches its peak. In the present research, the researcher was interested in studying early adolescents aged 13 to 15 years. This was because early adolescence is generally believed to be the period when they begin to experiment with smoking (Mala Raksabrahm, B.E.2526; Acharawan Soithong, B.E.2542; Nittaya Pensirinapa, B.E.2542; Yuwaluck Khan-asa, B.E.2541; Kattika Pongsiri, B.E.2536:102; Supannee Pandee, B.E.2541), and the need to smoke may result from numerous changes that cause stress and from peer pressure

to smoke, have early sexual intercourse, and use illegal drugs (Siqueira, Rolnitzky, & Rickert,2001).

2. Smoking and Effect of Smoking on Adolescents

Smoking is a risk behavior has directly affects the health of adolescents (Langlie, 1976: 216). Cigarette is a type of narcotics that stimulate the central nervous system. The content of nicotine, a chemical substance found in tobacco, is around 9 to 13 milligrams per cigarette. If a smoker smokes one cigarette, he or she will receive about 1.8-3.25 milligrams or 20-25% of nicotine in their system. After inhalation, nicotine will be absorbed through cell walls in the respiratory system and enter the bloodstream. They will then affect different parts of the body such as the brain, heart, artery, digestive tract, and striated muscles. It takes about six seconds for nicotine from cigarette smoke to reach the central nervous system (faster than other drugs, including injected heroin). Nicotine stimulates the secretion of dopamine, making smokers feel happy and less stressed. It also makes them want to work more and decreases their appetite.

2.1 Smoking among Adolescents

Smoking behavior is one of the risk behaviors that begin in adolescence. Studies conducted with adolescents' beginning smoking can be used to explain why adolescents become regular or habitual smokers (Leventhal & Cleary, 1980). According to Mayhew et al. (2000: S62-63), the smoking process can be divided into six phases. First, the precontemplation phase is the phase during which adolescents who have never smoked have probably never thought about smoking or who have never had any desire to smoke in the near future do not realize about the good outcomes of smoking. They may have no interest in smoking or may even protest against smoking. Second, the contemplation phase or preparatory phase occurs when adolescents begin to think about smoking, and this leads to the formation of ideas and beliefs about smoking. They tend to develop positive attitudes toward smoking before actually trying to smoke. Sometimes they may have negative ideas about smoking which decrease due to the influence of commercials or closed persons who smoke. During this phase, adolescents develop their perception of duties and become aware of the increased social pressure to smoke. Third, the initiation/tried phase is when adolescents try their first few cigarettes. This stage is also characterized by

stronger peer influences than family influences. Improving one's self image is associated with initiation, and may be motivated by poor school performance, as well as low approval from the desired peer group. Fourth, the experimental phase is characterized by a gradual increase in the frequency of smoking and an increase in the variety of situations in which cigarettes are used. Adolescents in this phase become interested in the positive aspects of smoking; thus, it is the crucial time when they decide whether or not to continue smoking in the future. As for those who smoke regularly, they will perceive benefits of smoking. It is in this phase that the individuals may develop a self-image as a smoker. Smoking family members may increase the opportunity for obtaining cigarettes. Therefore, this phase is characterized by learning about the cigarettes. Fifth, the regular smoking phase is the time when adolescents progress from occasional smoking to smoking on a regular, yet infrequent, basis. Some may smoke every weekend or at a party or other gatherings, while others may smoke mostly on weekdays on the way to or from school. However, they do not smoke everyday and not in a large amount. Sixth, the established/daily smoking/dependent phase is when adolescents smoke daily, or almost every day. Adolescents in this phase may experience dependence or addiction and find it difficult to quit smoking. These adolescents have progressed beyond sporadic smoking and may develop cravings, heavy daily use of smoking cigarettes, and withdrawal symptoms.

Consequently, it can be seen that initiation of smoking in adolescents is a continuous process. An adolescent who just begin to smoke regularly may develop to the next phase. In fact, initiation is considered the first step of addiction, and categorization of smoking varies according to the amount, frequency, and duration of smoking of adolescents.

Statistics of Smoking among Adolescents

Smoking is the second leading cause of death. It is also the cause of at least 25 life-threatening diseases in human beings. WHO has estimated that the number of smokers will increase from 1,100 millions at present to 1, 640 millions in the next 25 years (World Bank, 2000). In addition, experts have estimated that there are 13,700 deaths per day or 570 deaths per hour all over the world. In Thailand,

there are 42,000 deaths in one year, or 115 deaths in one day, or five deaths in one hour that are caused by cigarette smoking.

As regards statistics of smoking in Thailand (1998), there were approximately 10.2 million regular smokers or 20.5% of the total population, and this increased to 10.6 millions or 20.6% in 2000 (National Statistical Office, 2000). Most of the smokers began smoking at a young age. To be more specific, eight out of ten smokers began smoking when they were younger than 20 years old (World Bank, 2001). In Thailand, 90.4% of smokers started before the age of 25, and as many as 9.3% started when they were younger than 14 years old (The Thai Health Promotion Foundation (Thai Health), Department of Excise, B.E.2547). A survey of smoking behavior and alcohol consumption in 2001 revealed that the group of population that smoked more at an alarming rate is those aged 15 to 19 years old, rising from 6.3% in 1999 to 6.7% in 2001. In particular, the number of female adolescents who smoked increased from 0.1% in 1999 to 0.3% in 2001 (National Statistical Office, B.E.2544). A review of previous studies has shown that the mean age of adolescents who smoke is 13 -14 years old (Mala Raksabrahm B.E.2526; Acharawan Soithong, B.E.2542; Nittaya Pensirinapa, B.E.2542). It can be clearly seen that the problem of smoking among school-aged youths continues to increase, and this becomes an issue that causes great concern, especially the problem of smoking among early adolescents. According to Dr. Prakit Wateesathokit (B.E.2547), if adolescents do not smoke until they are 25 years old; it is very unlikely that they will adopt the smoking habit later on.

Thus, smoking among adolescents is an important problem that deserves a great deal of interest. This is early adolescence is the period when they may try smoking. If they have actually experimented with smoking, they may then adopt the habit and become regular smokers who find it difficult to quit. Thus, they will carry on smoking, and the problem will unavoidably continue.

2.2 Effect of Smoking on Adolescents

Smoking has harmful effects on the health of adolescents. In addition to health problems, smoking can lead to other forms of substance abuses.

2.2.1 Effects of Smoking on Adolescents' Health

Weeraporn Pit-on (B.E.2542) conducted a study and found that adolescents who smoke have statistically significantly increased risks of health problems, which can be arranged based on importance as follows: gingivitis, gingival, bad breath, coughing, phlegm, back pain, faster heartbeat, cardiac palpation, wheezing, insomnia, stress, irritability, health deterioration, premature aging, facial wrinkles, body odor, brown staining of teeth and fingernails, shortness of breath, physical exhaustion, weakened physical condition, low immunity, frequent sickness, heartburn and indigestion, loss of appetite, frequent bouts of common cold, allergy, and running nose. In addition, smoking affects food consumption of adolescents. A study of Hatairat Soonthornsuk (B.E.2542) found that the total amount of food intake in three meals of smokers was lower than the food intake of non-smokers including fat intake and fruit consumption, yet they had a higher basal metabolic rate than that of those who did not smoke. Thus, it can be seen that as smoking affects the appetite and food consumption of smokers, their growth and developments can be adversely impacted. It has also been discovered that smoking affects physical growth of adolescents in terms of body weight, height, and body mass index (Chaowachuen Laosongkram, B.E.2542).

2.2.2 Smoking as the Cause of Other Substance Abuses

The Medicinal Research Institute of the United States of America has reported that nicotine addiction tends to be a stepping stone for other forms of substance abuse which are more serious. It has been found that adolescents aged 12 to 17 years who smoke have 4 times higher changes to become addicted to cigarettes, 100 times higher changes to use marijuana, and 32 times higher changes to use cocaine (Foundation for the Non-Smoking Campaign, B.E.2547). In Thailand, according to a study investigating the factors strongly influencing use of strong narcotics among secondary students in the Education Region 5 who used basic narcotics in school, the adolescents could be divided into three groups—those who did not do drugs, those who used basic drugs, and those who used strong drugs and who had history of use of basic drugs. The findings showed that those who used strong drugs with former use of basic drugs were most likely to drink alcohol, which was followed by stimulant drinks and cigarette smoking. (Thanayus Thanathiti, B.E.2543: 132-133). The most frequently used strong narcotic of this group of

adolescents was sleeping pills, followed by amphetamines and inhalants. An in-depth interview of five students about the development from their use of basic narcotics to strong narcotics revealed that they started with basic narcotics of cigarettes and alcohol due to curiosity before progressing to marijuana, amphetamines, and heroin. In other words, they started from easy-to-find drugs before trying those which were harder to acquire. A case study of drug habits among secondary students in Ubon Rajathani Province indicated that the subjects who started smoking and drinking in Mathayomsuksa 2 progressed to amphetamines in Mathayomsuksa 3 and that the use of amphetamines reached its peak in Mathayomsuksa 4 and 5 before declining in Mathayomsuksa 6. For most of the subjects, they started with alcohol and beer, which was soon followed by cigarette, all of which began in Mathayomsuksa 3. As for the factor influencing the use of amphetamines, almost all reported that they made their own decision to use it (Jirawat Moolasart, Intira Raungrit and Rutanee Werasutsawat, B.E.2543).

Therefore, smoking has an adverse effect on adolescents who undergo various physical, psychological, cognitive, and social changes. Short-term outcomes of cigarette smoke are different sicknesses and loss of appetite, which lead to long-term effects on growth including body weight, height, and body mass index. Finally, smoking brings about other forms of substance abuses which can cause further serious problems in the future.

3. Factors Influencing Smoking Behaviors in Adolescents

Previous studies have investigated different factors that influence smoking behaviors in adolescents using various conceptual frameworks which can be discussed as follows:

The Social Cognitive Theory (Bandura, 1986) explains the development of self-regulatory capability in adolescents. It is the result of learning based on the Learning Theory (Bandura, 1997, cited in Ruja Phupaiboon, B.E.2547: 45). It is believed those internal and external changes of behaviors result from learning as well as other influencing factors including environmental factors, internal personal factors, and behavioral factors. The social cognitive theory posits that individual's learning

occurs by teaching, modeling, and social persuasion. A review of literature has revealed the following factors:

1. Personal factors

Gender—males have 3.7 times higher chances to smoke than females because males like to face challenges, experiment with new things, and join peer groups, so they have more chances to be persuaded to smoke (Acharawan Soithong, B.E.2542).

Attitude toward smoking—adolescents that have positive attitudes toward smoking are 4.49 times more likely to smoke than those who do not (Kattika Pongsiri, B.E.2536: 102). According to Acharawan Soithong (B.E.2542), adolescents tend to believe that society accepts smoking as the production of cigarettes continues. They also tend to believe that smoking has long-term effects on health status.

Educational achievement—adolescents with low educational achievement occasion are 4.1 times more likely to smoke than those who have excellent educational achievement. In addition, adolescents with a fair, good, or excellent level of achievement do not differ when it comes to the chance of smoking (Acharawan Soithong, B.E.2542:99).

Being athletic—surprisingly, adolescents who are athletic have 1.4 times more changes to smoke. This may be because they are too enthusiastic about or disappointed with their games and become stressed and because they misunderstand that smoking can help relieve their stress. It may also be possible that they socialize after practices or games, so they have more chances to be persuaded to smoke and drink alcohol (Acharawan Soithong, B.E.2542: 99).

Alcohol drinking—adolescents who drinks have 8.5 times more likelihood to smoke (Acharawan Soithong, B.E.2542: 99).

2. Environmental factors

Place of residency—adolescence that live in the northern region have 1.8 times more chances to smoke when compared to those living in the south. There is no difference among adolescents who live in Bangkok, the northeast, the central, and the southern regions (Acharawan Soithong, B.E.2542).

Smoking family members—adolescents who live with family members who smoke have 1.73 times more chances to smoke than adolescents that do not have

a smoking family member. According to a study of Kattika Pongsiri (B.E.2536), adolescents whose parents smoke have 3.2 times more chances to smoke than adolescents who do not have any closed persons who smoke. Also, adolescents who have a smoking sibling or relative have 2.3 times more chances to smoke (Acharawan Soithong, B.E.2542: 99).

The PRECEDE Framework (Green et al., 1980, cited in Yuwaluck Khan-asa, B.E.2541) is an analysis of different factors that influence health behaviors of individuals, both internal and external factors. These factors are divided into three groups—predisposing factor, enabling factor, and reinforcing factor. First, the predisposing factor is a fundamental factor that motivates individuals to express behaviors or develop satisfaction, resulting from learning and manifesting in the form of knowledge, attitudes, values, etc. Next, the enabling factor means resources necessary in expressing individuals' behaviors and skills that enable individuals to perform such behaviors. Finally, the reinforcing factor shows how much practices or self-care behaviors are supported. This conceptual theory has been investigated in various studies investigating factors influencing cigarette smoking in early adolescents as follows:

1. Predisposing factor

Age—the older the adolescents, the more likelihood they smoke (Thanin Sutheprasert, B.E.2544).

Income—income has a positive influence on smoking behavior as adolescents who have higher income per month tend to smoke more (Thanin Sutheeprasert, B.E.2544). Likewise, Yuwaluck Khan-asa (B.E.2541) found that female adolescents who received a higher amount of money had enough money to buy cigarettes.

Attitude toward smoking—if adolescents have a positive attitude toward smoking, they tend to smoke (Thanin Sutheprasert,B.E. 2544). Similarly, a study of Yuwaluck Khan-asa (B.E.2541) revealed that female adolescents who have a positive attitude toward smoking tend to smoke, but those who have a negative attitude toward smoking are more likely not to smoke.

Smoking values—smoking values have a negative effect on smoking behavior in female adolescents. That is, female adolescents who have a high level of smoking values are more likely to smoke. On the other hand, if they have a low level of smoking values, they tend not to smoke. This may be explained that in a modern-day society, western cultures are accepted as part of daily living, leading to the changes in the roles of females in the Thai society. At present, females are as proficient as males, if not more. New ideas and values in society make female smokers acceptable or even interesting to males. Thus, the smoking values have increased especially among the peer group (Yuwaluck Khan-asa, B.E.2541: 106).

Internal locus of control—internal locus of control is found to have negative effects on smoking behavior. If female adolescents have a low level of internal locus of control, they have more chances to smoke. However, if they have a high level of internal locust of control, they are more likely not to smoke (Yuwaluck Khan-asa, B.E.2541: 106).

External locus of control (smoking laws)—external locust of control has positive effects on smoking behavior. Adolescents that have a high level of external locus of control tend to smoke more, and vice versa (Yuwaluck Khan-asa, B.E.2541: 106).

2. Reinforcing Factors

Attractiveness of products—attractiveness of products is found to have positive effects on smoking behavior. Female adolescents who have a positive image of cigarette smoking, or feel that certain brands or looks of cigarette are eye-cathcing, are more like to smoke. This is evidenced by the findings that most female smokers smoke the Marlboro brand of cigarettes (Yuwaluck Khan-asa, B.E.2541: 111-112).

Spending leisure time in a high-risk place—this has been found to be related to smoking behavior in adolescents (Thanin Sutheeprasert, B.E.2544).

3. Enabling Factor is including:

Peer pressure—peer pressure is found to have positive effects on smoking behavior. This is because naturally adolescents need to be accepted by their friends and to perform some behaviors to ensure their sense of belonging to the peer group (Thanin Sutheeprasert, B.E. 2544; Yuwaluck Khan-asa, B.E.2541: 113).

The Theory of Planned Behavior (Fishbein. & Ajzen, 1975) is an extension of the Theory of Reasoned Action (Fishbein & Ajzen, 1967). Both theories are based on the assumption that human beings are usually quite rational and make systematic use of the information available to them when making decisions (Ajzen & Fishbein, 1980: 5). The major factor which can be used to predict behavior is the intention, and the factors that determine the intention are attitude toward smoking, subjective norm, and perceived behavioral control, all of which can be directly or indirectly measured. The first factor that can be used to predict the intention to smoke is attitude toward smoking. Direct attitude toward smoking refers to a person's general feeling of favorableness or unfavorableness of smoking (Ajzen & Fishbein, 1975: 54), while indirect attitude toward smoking includes behavioral belief and outcome evaluations. The second factor is the subjective norm, which again can directly and indirectly be measured. Direct subjective norm refers to the perceived social pressure to perform or not perform the behavior (Ajzen, 1991: 188), while indirect subjective norm includes normative beliefs and motivation to comply. The last factor is perceived behavioral control, which can be directly and indirectly measured as well. Direct perceived behavioral control refers to the perceived ease or difficulty of performing the behavior and it is assumed to reflect past experience as well as anticipated impediments and obstacles (Ajzen, 1991:188). On the other hand, indirect perceived behavioral control refers to beliefs about control and perceived power. Moreover, perceived behavioral control can directly predict behavior directly through intention. According to the theory, individuals will perform a behavior only when they have an intention to do so and when they perceive that they are able to control the target behavior. This can be used to explain smoking behavior in adolescents as follows:

Direct attitude toward smoking

Direct attitude toward smoking is one factor to predict intention to smoke. A review of research studies conducted in Thailand has revealed a number of findings. For example, Hemchayat (2003) found that direct attitude toward smoking could predict intention to smoke with statistical significance ($\beta = .55$, $p < .001$). Likewise, a study of social and psychological factors predicting smoking intention among male secondary students conducted by Mala Raksabrahm (B.E.2526)

discovered that direct attitude toward smoking could significantly predict intention to smoke ($\beta = .27$, $p < .01$). In addition, Ua-kit (2004) investigated factors influencing cigarette smoking behavior among Thai adolescents in Bangkok and found that direct attitude toward smoking of both male and female adolescents could predict the intention to smoke with statistical significance ($\beta = .97$, $p < .001$; $\beta = 1.04$, $p < .001$; $\beta = .99$, $p < .001$, respectively). Similar findings have been found in studies conducted in a foreign country. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that direct attitude toward smoking of the samples could statistically significantly predict their intention to smoke ($\beta = .44$, $p < .001$; $\beta = .62$, $p < .001$; and $\beta = .55$, $p < .001$, respectively). Moreover, Higgins & Conner (2003) investigated the effectiveness of a prevention program of smoking and smoking behavior in adolescents. The findings indicated that direct attitude toward smoking could predict intention to smoke with statistical significance ($\beta = .30$, $p < .001$). Therefore, it can be summarized that direct attitude toward smoking can predict intention to smoke with statistical significance, and it should be considered one important factor to predict smoking behavior in adolescents.

Indirect attitude toward smoking

Indirect attitude toward smoking is another factor believed to influence intention to smoke. In Thailand, a number of studies have been carried out. For example, Hemchayat (2003) studied the predictors of Thai adolescent cigarette smoking and discovered that indirect attitude toward smoking could predict the intention to smoke with statistical significance ($\beta = .64$, $p < .001$). Similarly, Mala Raksabrahm (B.E.2526) investigated social and psychological factors predicting smoking intention of male secondary students and found that indirect attitude toward smoking could predict intention to smoke with statistical significance ($\beta = .17$, $p < .01$). Furthermore, a study of the factors influencing cigarette smoking behavior among Thai adolescents in Bangkok conducted by Noraluck Ua-kit (B.E.2547) has reported that indirect attitude toward smoking of overall and male adolescents could predict the intention to smoke with statistical significance ($\beta = .07$, $p < .001$; $\beta = .16$, $p < .001$, respectively), but indirect attitude toward smoking of female adolescents

could not statistically significantly predict their intention to smoke. In addition, studies conducted in a foreign country have also been reviewed. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that indirect attitude toward smoking of the samples could statistically significantly predict their intention to smoke ($\beta = .39$, $p < .001$; $\beta = .62$, $p < .001$; and $\beta = .55$, $p < .001$, respectively). Similarly, Higgins & Conner (2003) investigated the effectiveness of a prevention program of smoking and smoking behavior in adolescents. The findings indicated that indirect attitude toward smoking could predict intention to smoke with statistical significance ($\beta = .39$, $p < .001$). As such, it cannot be confidently summarized that indirect attitude toward smoking can predict intention to smoke as there is yet no clear statistical significance to support this conclusion.

Direct subjective norm

Direct subjective norm is a factor that can be used to predict the intention to smoke. A number of research studies carried out in Thailand have been reviewed. For example, Hemchayat (2003) investigated factors predicting smoking behavior among Thai adolescents and found that direct subjective norm could predict intention to smoke with statistical significance ($\beta = .13$, $p < .001$). Likewise, a study of social and psychological factors predicting smoking intention among male secondary students conducted by Mala Raksabrahm (B.E.2526) indicated that direct subjective norm could significantly predict intention to smoke ($\beta = .33$, $p < .01$). In addition, Ua-kit (2004) investigated factors influencing cigarette smoking behavior among Thai adolescents in Bangkok and found that direct subjective norm female adolescents could predict the intention to smoke with statistical significance ($\beta = -.10$, $p < .001$). However, direct subjective norm of overall and male adolescents could not predict the intention to smoke with statistical significance. Similar findings have been reported in studies conducted in a foreign country. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that direct subjective norm of female African-American adolescents could statistically significantly predict their intention to smoke ($\beta = .16$, $p < .001$) However, direct

subjective norm of non-Hispanic white and Puerto Rican female adolescents could not predict their intention to smoke with statistical significance. Moreover, Higgins & Conner (2003) investigated the effectiveness of a prevention program of smoking and smoking behavior in adolescents. The findings indicated that direct subjective norm smoking could predict intention to smoke with statistical significance (β= 1.26, p< .001). Therefore, it can be seen that direct subjective norm cannot predict intention to smoke with statistical significance in some groups of adolescents.

Indirect subjective norm

Indirect subjective norm is another factor that is believed to influences the intention to smoke. A number of research studies carried out in Thailand have been reviewed. For example, Hemchayat (2003) investigated factors predicting smoking behavior among Thai adolescents and found that indirect subjective norm could predict intention to smoke with statistical significance ($\beta = .61$, $p < .001$). Likewise, a study of social and psychological factors predicting smoking intention among male secondary students conducted by Mala Raksabrahm (B.E.2526) indicated that indirect subjective norm could significantly predict intention to smoke ($\beta = .40$, $p < .01$). Similar findings have been reported in studies conducted in a foreign country. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that indirect subjective norm of female African-American adolescents could statistically significantly predict their intention to smoke ($\beta = .40$, $p < .001$; $\beta = .49$, $p < .001$; $\beta = .55$, $p < .001$, respectively). However, contradictory findings have been reported by Ua-kit (2004) who investigated factors influencing cigarette smoking behavior among Thai adolescents in Bangkok and found that indirect subjective norm of overall, male, and female adolescents could not predict the intention to smoke with statistical significance. Therefore, it can be summarized that the predictive power of indirect subjective norm cannot be clearly concluded.

Direct perceived behavioral control

Direct perceived behavioral control is a factor believed to influence intention to smoke and smoking behavior. A review of research studies conducted in Thailand has revealed a number of findings. For example, Hemchayat (2003) examined factors

predicting smoking behaviors in Thai adolescents and found that direct perceived behavioral control could predict the intention to smoke with statistical significance (β = -.48, $p < .001$) and could also predict smoking behaviors in adolescents with statistical significance (β = -.22, $p < .01$). In addition, Ua-kit (2004) investigated factors influencing cigarette smoking behavior among Thai adolescents in Bangkok and found that direct perceived behavioral control could predict the intention to smoke of overall, male, and female adolescents with statistical significance (β = -1.00, $p < .001$; β = -.98, $p < .001$; β = -1.00, $p < .001$, respectively) and could also predict smoking behaviors in overall, male, and female adolescents with statistical significance (β = -1.00, $p < .001$; β = -.98, $p < .001$; β = -1.00, $p < .001$, respectively). Similar findings have been found in studies conducted in a foreign country. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that direct perceived behavioral control of the samples could statistically significantly predict their intention to smoke (β = -.48, $p < .001$; β = -.36 , $p < .001$; and β = -.43, $p < .001$, respectively). Moreover, Higgins & Conner (2003) investigated the effectiveness of a prevention program of smoking and smoking behavior in adolescents. The findings indicated that direct perceived behavioral control could predict intention to smoke before and after the intervention with statistical significance (β= -.40, $p < .001$ and β = -.14, $p < .001$, respectively). Therefore, it can be summarized that direct perceived behavioral control can predict intention to smoke with statistical significance, but there is no definite evidence that direct perceived behavioral control can smoking behavior with statistical significance.

Indirect perceived behavioral control

Indirect perceived behavioral control is a factor believed to influence intention to smoke and smoking behavior. A review of research studies conducted in Thailand has revealed a number of findings. For example, Hemchayat (2003) examined factors predicting smoking behaviors in Thai adolescents and found that indirect perceived behavioral control could predict the intention to smoke with statistical significance (β = -.20, $p < .001$). However, Ua-kit (2004) investigated factors influencing cigarette smoking behavior among Thai adolescents in Bangkok

and found that indirect perceived behavioral control could not predict the intention to smoke of overall, male, and female adolescents with statistical significance. Similar findings have been found in studies conducted in a foreign country. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that indirect perceived behavioral control of the samples could statistically significantly predict their intention to smoke (β= -.48, $p < .001$; β = -.34 , $p < .001$; and β = -.22, $p < .001$, respectively). Therefore, it can be summarized that indirect perceived behavioral control cannot predict intention to smoke with statistical significance.

Intention to smoke

Intention to smoke is a major factor that can be used to predict smoking behavior. A review of research studies conducted in Thailand has revealed a number of findings. For example, Hemchayat (2003) examined factors predicting smoking behaviors in Thai adolescents and found that intention to smoke could predict smoking behavior with statistical significance (β = .55, $p < .001$). In addition, Ua-kit (2004) investigated factors influencing cigarette smoking behavior among Thai adolescents in Bangkok and found that intention to smoke could predict smoking behavior of overall and male adolescents with statistical significance (β = .07, $p < .001$; β = .15, $p < .001$, respectively). Similar findings have been found in studies conducted in a foreign country. For instance, Hanson (1996) explored the intention to smoke of Africa-American, Puerto Ricans, and non–Hispanic white female adolescents living in the United States. The findings revealed that intention to smoke of the samples could statistically significantly predict their smoking behavior (β= .86, $p < .001$). However, contradictory findings have also been reported by Ua-kit (2004) who found that intention to smoke of female adolescents could not predict smoking behavior with statistical significance. Therefore, even though a definite conclusion about the predict power of intention to smoke can be made, it is still considered one of the interesting factor that should be further investigated.

In addition to this, there are a number of studies which did not employ any particular theory as their conceptual framework. A review of studies conducted both in Thailand and abroad has revealed a number of interesting factors as follows:

1. Basic factors

Gender—males have 3.3 times more chances to smoke than female (Orathai Limtrakul, B.E.2536; Nittaya Pensirinapa, B.E.2542).

Age—age was found to be positively correlated with smoking behavior with statistical significance ($r = .14$, $p < .01$). This means that smoking behavior increases with age (Lertpiromluck, 2004). The same finding was also reported by Parna et al. (2003: 354) who found that smoking increases in older male and female adolescents because they are more independent and self-confident. It is possible that when they socialize with friends or closed persons and see that adults also smoke, they follow their behavior. It is also probable that it is an accepted value that male adults should smoke (Somchai Chuenta, B.E.2528; Orathai Limtrakul, B.E.2534).

Level of education—adolescents who study in a higher level of education have more smoking behavior (Orathai Limtrakul, B.E.2534; Nittaya Pensirinapa, B.E.2542). Likewise, Zapata et al. (2004) investigated smoking behavior of adolescents in Florida, U.S.A. and found that those in Grades 7, 9, and 11 smoked 2.5 times more than those in Grade 6.

Education achievements—adolescents who smoke tend to have a lower grade point average than those who do not smoke (Choochai Supawongse, B.E.2540; Urai Sumaritham, B.E.2538: 54; Nittaya Pensirinapa, B.E.2542). Adolescents who have a low or moderate educational achievement have 1.7 and 1.5 times more chances to smoke, respectively, when compared to those who have a high educational achievement (Somchai Chuenta, B.E.2528). This is because they tend to believe that smoking increases their self-image, makes them cool, and can be used as a way to reduce stress related to their studies (Orathai Limtrakul, B.E.2534).

Monthly income—adolescents who have more incomes have more opportunities to smoke than adolescents who have low incomes because they have more money to buy cigarettes (Nittaya Pensirinapa, B.E.2542: 76; Orathai Limtrakul, B.E.2534). Moreover, adolescents who have high incomes tend to have more

freedom to hang out and socialize with their friends, so they have more opportunity to smoke (Somchai Chuenta, B.E.2528: 77).

Type of residence—type of residence is found to influence smoking behavior in adolescents. Adolescents who live in a dormitory have more freedom that those who live with their parents, relatives, monks, or those who live in a rented house (Somchai Chuenta, B.E.2528: 70). It has also been found that the majority of adolescents who smoke live in a dormitory or a rented house (Orathai Limtrakul, B.E.2534).

2. Intrapersonal factors

Suicide attempt—suicide attempt is related to smoking with statistical significance. When comparing smoking and non-smoking adolescents, it was found that female adolescents who smoked had three times more chances to entertain a suicidal attempt. As for male adolescents, they had three times higher chances to entertain a suicidal thought and 2.5 times higher chances to actually attempt suicide (Tomori et al., 2001: 145-147).

Stress—stress is related to smoking behavior with statistical significance ($r = .16$, $p < .001$) (Byrne & Mazanov, 2001; Acharawan Soithong, B.E.2542).

Self-esteem—self-esteem was found to be related to smoking behavior with statistical significance ($r = –.16$, $p < .01$). Adolescents who have low self-esteem are more likely to smoke than adolescents who have high self-esteem (Byrne & Mazanov, 2001: 107). In addition, Nebot et al. (2004) found that there is a significant relationship between low self-esteem of female adolescents and smoking behavior (OR = 0.92, 95% Cl, 0.88-0.97).

Self-efficacy to refuse smoking—it has been found that self-efficacy to refuse smoking is negatively related to smoking behavior with statistical significance ($r = -.42$, $p < .01$) (Sasithorn Lertpiromluck, B.E.2544). This means that adolescents who do not smoke are better able to refuse smoking than those who smoke. It can also be used to predict smoking behavior with statistical significance (OR = 0.995, 95% Cl = .994-0.997).

3.Environmental factors

Smoking family members—adolescents who come from a family whose members smoke have 1.5 times more chances to smoke themselves (Somchai Chuenta, B.E.2528 :50). The higher the number of family members who smoke, the more likelihood adolescents will smoke. Furthermore, a study has found that smoking behavior of mothers is more associated with smoking behavior of female offspring than male offspring (Choochai Supawongse, B.E.2540) In addition, Präna et al. (2003: 354) agree that smoking behavior of parents is more likely to be related to smoking behavior in female adolescents (OR = 1.7 95% CI = 1.4-2.1) than male adolescents (OR = 1. 3 95% CI = 1.0-1.6). Also, having a smoking sibling is statistically significantly more likely to be related to the smoking behavior of male adolescents (OR = 1.7 95% CI = 1.3-2.3) than female adolescents (OR = 1.5 95% CI = 1.3-2.3).

Smoking friend—having a friend who smokes can predict smoking behavior with statistical significance (OR = 4.661, 95% Cl = 2.625-8.277, p<. 01). It also increases the smoking behavior by 36.6 % (Sasithorn Lertpiromluck, B.E.2547). Also, the number of friends who smoke is associated with the likelihood to smoke (Thiti Rattanaprasert, B.E.2539: 86; Nittaya Pensirinapa, B.E.2542). Moreover, more than half of regular smokers have more than four friends who smoke (Orathai Limtrakul, B.E.2534: 112). This is because adolescents are interested in their friends and friends have a strong influence on their behavior (Urai Sumaritham, B.E.2538; Parna et al., 2003: 354; Woodruff, 2003). Therefore, having smoking friends is an important predictor of smoking behavior.

Substance abuse—a comparison between smokers and non-smokers has suggested that there is a correlation between substance abuse and smoking behavior with statistical significance. It was found that female adolescents who smoke have ten times chances to drink alcohol, more than seven times to use other illicit drugs, and more than three times chances to use stimulants, while male adolescents who smoke have more than three times chances to drink alcohol and more than four times chances to use stimulants (Tomori et al., 2001: 145-147).

Participation in sports activities—there is a significant relationship between smoking behavior and participation in sports. Both male and female adolescents who smoke have less participation in sports activities than those who do not smoke (Tomori et al., 2001: 145-147).

Based on a review of literature, it can be seen that many factors have an influence on smoking behavior in adolescents including basis factors, intrapersonal factors, and environmental factors. However, the conceptual framework has a different angle to approach and explain the behavior. Thus, the researcher was interested in applying the Theory of Planned Behavior as a conceptual framework of the present study because this theory has particularly been constructed to examine changes that take place within individuals in terms of thinking, evaluation, and influence of external and internal perceptions that affect their behaviors. It is believed that the theory would help shed light on the behaviors and the underlying reasons for such behaviors. In this study, factors influencing smoking intention including attitude toward smoking, subjective norm, and perceived behavioral control were investigated. In addition, other personal factors were included to co-predict intention to smoke including age, grade point average, income, number of family members who smoke, and number of friends who smoke in the hope that better understanding of factors related to smoking behaviors in early adolescents could be achieved.

4. The Theory of Planned Behavior

The Theory of Planned Behavior (Ajzen and Fishbein, 1988) was developed from the Theory of Reasoned Action (Fishbein & Ajzen, 1967). Both theories are based on the assumption that human beings are usually quite rational and they tend to make systematic use of the information available to them when making decisions (Ajzen & Fishbein, 1980: 5). The major factor which can be used to predict behavior is the intention, which clearly reflects individuals' attempt to take action as planned (Ajzen, 1991). The first factor that determines the intention is attitude toward the behavior consisting of individuals' beliefs about the behavior and its evaluation. The second factor is the subjective norm, or individuals' perception of social norms and motivations to comply with such norms. According to the theory, behavior can be predicted by considering individuals' intention (Fishbein & Ajzen, 1975). However, there is a restriction as there may be some behaviors that are not initially intended.

Thus, another factor was added; that is, perceived behavioral control (Ajzen, 1991). Theoretically, behavior consists of intention and perceived behavioral control, which refers to individuals' perceived self-efficacy to predict that a behavior is easy or difficult to perform. Perceived behavioral control has direct and indirect influence on behavior through intention. It is believed that in different situations and behaviors, intention and perceived behavioral control are significant. When a behavior or situation takes place, individuals are supposed to do their best to control such behavior. Thus, if even individuals have very little intention to do something, such intention can be used to predict their behavior (Ajzen, 1991).

According to the Planned Behavior Theory, each factor is defined as follows (Ajzen& Fishbein, 1980; Ajzen, 1991; Ajzen, 2002):

Attitude toward the behavior refers to the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question (Ajzen, 1991: 188**).** Attitude toward the behavior can be directly and indirectly measured. Indirect measurement (A) is a person's attitude which can be measured through beliefs which can be determined by the sum of the multiplication between beliefs about smoking (b) and evaluation of smoking outcomes (e), which then reflects individuals' indirect attitude toward smoking as shown in the following equation (Ajzen, 1991):

Behavioral beliefs refer to the belief of how the behavior affects individuals.

Outcome evaluation refers to the value or belief of the outcomes of the behavior.

$$A\alpha \sum b_i e_i$$

Subjective norm refers to the perception of social pressure to perform or not perform the behavior (Fishbien & Ajzen, 1975). Individuals who believe that people who are important to them think that they should perform the behavior, they are likely to do it. On the contrary, if they feel that people important to them do not accept such behavior, they will try to avoid it (Ajzen& Fishbein, 1988: 121). Subjective norm can be directly and indirectly measured. Indirect subjective norm can be determined with the sum of the multiplication between beliefs about the norm (n) and motivation to

comply (m), which then reflects individuals' indirect subjective norm as shown in the following equation (Ajzen, 1991):

$$SN \alpha \sum n_i m_i$$

Normative beliefs refers to the perceived behavioral expectations of important individuals or groups of individuals such as spouse, family, friends, colleagues, teachers, and physicians, depending on the study population and behavior of interest. It is assumed that beliefs about norm and motivation to comply of individuals can determine the norm. Thus, the motivation to comply is proportionately associated with norm, referring to individuals' belief that important persons think that they should do such behavior or not (Ajzen, 2002).

Motivation to comply refers to the perception of individuals that persons important to them want them to do the behavior or not and how much.

Perceived behavioral control refers to the perceived ease or difficulty of performing the behavior. It is assumed to reflect past experiences as well as anticipated impediments and obstacles (Ajzen, 1991: 188). If individuals believe that they have many opportunities and resources, and few obstacles or hindrances, they will have high perceived behavioral control (Ajzen & Fishbein, 1988: 135). Perceived behavioral control can directly and indirectly be measured. Indirect perceived behavioral control (PBC) is determined by multiplying belief about behavioral control (c) and perceived power (p), as shown in the following equation (Ajzen, 1991).

$$PBC \alpha \sum c_i p_i$$

Belief about control refers to individuals' perception of the factors that facilitate or obstruct performance of a behavior (Ajzen, 2002).

Perceived power refers to individuals' perception of their ability to control facilitating or obstructing behavior (Ajzen, 1991).

Intention refers to an indication of individuals' readiness to perform a given behavior, and it is considered to be the immediate antecedent of behavior. The intention is based on attitude toward the behavior, subjective norm, and perceived

behavioral control, with each predictor weighted for its importance in relation to the behavior and population of interest (Ajzen, 2002).

Behavior consists of target, action, context, and time (TACT). For example, "referring patients with back pain for a lumbo-sacral spine x-ray" has the patient as the target, referral as the action, back pain as the context, and consultation period as time (Francis et al., 2004).

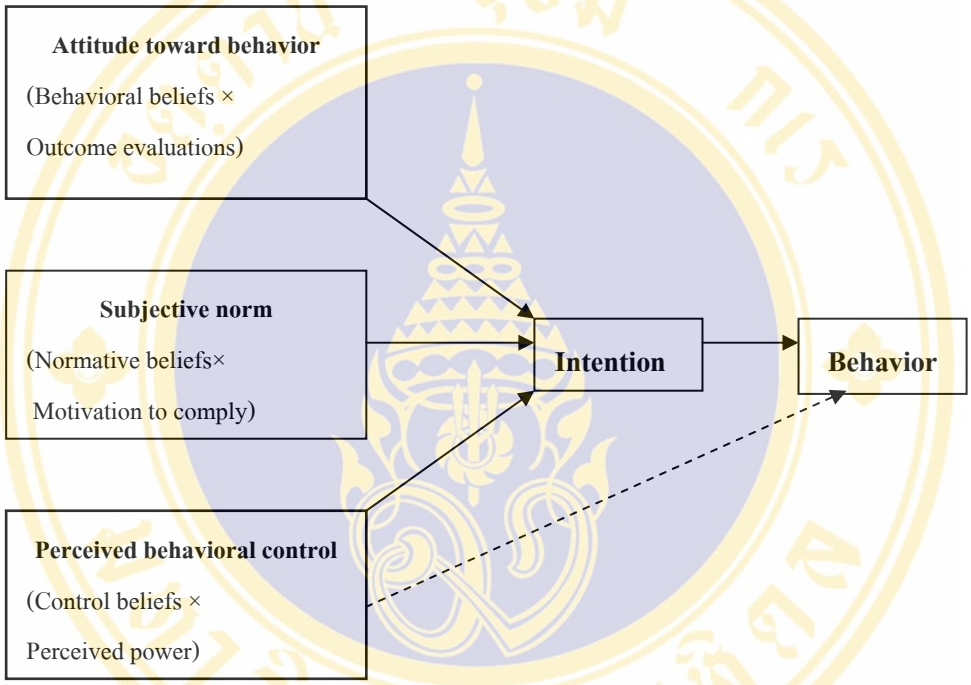

Figure 2 Theory of planned behavior (Ajzen, 1991)

A structural model of the theory of planned behavior is shown in Figure 2. According to Figure 2, attitude toward the behavior can directly and indirectly be measured. Indirect attitude toward behavior consists of behavioral belief and outcome evaluation which determine the intention to do the behavior. Then, subjective norm can directly and indirectly be measured as well. Indirect subjective norm consists of normative beliefs and motivation to comply which determine the behavioral intention. Finally, perceived behavioral control can also directly and indirectly be measured. Indirect perceived behavioral control consists of control belief and perceived power which determine the behavioral intention. Thus, the theory includes attitude toward the behavior, subjective norm, and perceived behavioral control, all of which influence intention and action. In other words, this theory posits that individuals will

perform an action when they have the intention and perception that they are able to control such behavior.

Previous studies of smoking behavior in Thai and foreign adolescents have employed these theories to explain smoking behavior. They are as follows:

Mala Raksabrahm (B.E.2526) applied the Reasoned Action Theory (Fishbein & Ajzen, 1967) to study social and psychological factors predicting smoking intention of male secondary students (grade 9 and grade 12). The findings showed that direct attitude toward smoking and direct subjective norm could predict intention to smoke with statistical significance ($\beta = .27$, $p < .01$ and $\beta = .34$, $p < .01$, respectively). Also, indirect attitude toward smoking and indirect subjective norm could predict intention to smoke with statistical significance ($\beta = 17$, $p < .01$ and $\beta = .40$, $p < .01$, respectively). Social factors including age, religion, monthly allowance, and the rate of smoking per day of fathers, brothers, fast friends, and those with whom the student were staying had no statistically significant influence on the intention to smoke of the students. Finally, the nine factors could explain intention to smoke in male secondary students by 21.15% and 37.97%, respectively.

Hemchayat (2003) investigated the predictors of cigarette smoking behavior of Thai adolescents in Chonburi Province. The subjects were 150 students ranging in age from 18 to 22 years old. It was found that intention to smoke could be explained by direct attitude toward smoking ($\beta = .55$, $p < .001$), direct subjective norm ($\beta = .13$, $p < .001$), and direct perceived behavioral control ($\beta = .48$, $p <. 001$). All three factors could predict the intention to smoke by 59%. Also, indirect attitude toward smoking, indirect subjective norm, and indirect perceived behavioral control could explain the intention to smoke with statistical significance ($\beta = .64$, $p < .001$; $\beta = .61$, $p < .001$, and $\beta = –.20$, $p <.001$, respectively). In addition, the factors which could predict smoking behavior were intention to smoke ($\beta = .33$, $p < .001$) and perceived behavioral control ($\beta = –.22$, $p < .001$) that could explain smoking behavior by 23%. Therefore, adolescents who expressed more favorable attitudes toward smoking, who perceived approval for smoking among their significant referents, and who perceived relatively little self-control over their own smoking behavior reported stronger intentions to smoke in the next month.

Ua-kit (2004) investigated the factors influencing cigarette smoking behavior among Thai adolescents. The subjects were 1,260 students in grades 10 to12 in public high schools in Bangkok. On the overall, the factors which could predict intention to smoke with statistical significance was direct attitude toward smoking ($\beta = .97$, $p < .001$) and direct perceived behavioral control ($\beta = -1.00$, $p < .001$), but direct subjective norm could not. In addition, indirect attitude toward smoking could predict intention to smoke with statistical significance ($\beta = .07$, $p < .001$), but indirect subjective norm and indirect perceived behavioral control could not. Also, the factors which could predict smoking behavior was intention to smoke ($\beta = .07$, $p < .05$) and direct perceived behavioral control ($\beta = -1.00$, $p < .001$). As for male adolescents, the factors that could predict intention to smoke were direct attitude toward smoking ($\beta = 1.04$, $p < .001$) and direct perceived behavioral control ($\beta = -.98$, $p < .001$). Likewise, indirect attitude toward smoking could predict intention to smoke with statistical significance ($\beta=.16$,$p<.001$), but indirect subjective norm and indirect perceived behavioral control could not. The factors that could predict smoking behavior were intention to smoke ($\beta = .15$, $p < .05$) and direct perceived behavioral control ($\beta=-.98$, $p <.001$). Finally, as regards female adolescents, it was discovered that the predictors of intention to smoke were direct attitude toward smoking ($\beta = .99$, $p < .001$), direct subjective norm ($\beta = -.10$, $p < .05$), and direct perceived behavioral control ($\beta = -1.00$, $p < .001$), with statistical significance. Moreover, indirect attitude toward smoking and indirect subjective norm could predict intention to smoke with statistical significance. However, only direct perceived behavioral control could predict smoking behavior with statistical significance ($\beta = -.98$, $p <.001$).

Hanson (1996) investigated the intention to smoke in three groups of female adolescents—African-Americans, Puerto Ricans, and non-Hispanic white Americans. The total number of subjects were 430, ranging in age from 13 to 19 years old. First, as for 141 African-American females adolescents, the significant predictors of intention to smoke were direct attitude toward smoking ($\beta = .44$, $p < .001$), direct subjective norm ($\beta = .16$, $p < .01$), and direct perceived behavioral control ($\beta = -.48$, $p < .001$). Likewise, indirect attitude toward smoking, indirect subjective norm, and indirect perceived behavioral control could predict the intention to smoke with

statistical significance ($\beta = .39$, $p < .001$; $\beta = .40$, $p < .001$, and $\beta = -.34$, $p < .001$, respectively). As regards 146 Puerto Ricans female adolescents, the significant predictors of intention to smoke were direct attitude toward smoking($\beta = .62$, $p < .001$) and direct perceived behavioral control ($\beta = -.36$, $p < .001$). On the contrary, direct subjective norm could not predict intention to smoke with statistical significance. Also, indirect attitude toward smoking, indirect subjective norm, and indirect perceived behavioral control could predict intention to smoke with statistical significance ($\beta = .30$, $p < .001$; $\beta = .49$, $p < .001$; and $\beta = -.30$, $p < .001$, respectively). Finally, in the third group of 143 non-Hispanic white female adolescents, the significant predictors of intention to smoke were is direct attitude toward smoking ($\beta = .55$, $p < .001$) and direct perceived behavioral control ($\beta = -.43$, $p < .001$). Similarly, indirect attitude toward smoking, indirect subjective norm, and indirect perceived behavioral control could predict intention to smoke with statistical significance ($\beta = .35$, $p < .001$; $\beta = .55$, $p < .001$; and $\beta = -.22$, $p < .01$, respectively). Therefore, adolescents who expressed more favorable attitudes toward smoking, who perceived approval for smoking among their significant referents, and who perceived relatively little self-control over their own smoking behavior reported stronger intentions to smoke in the next month.

Higgins & Conner (2003) conducted a study to determine the effectiveness of a prevention program of smoking and smoking behavior in adolescents (aged 11 to 12 years olds). The subjects in the experiment group were 250 adolescents that received an intervention in the form of a program about how, where, and when to be against smoking, while the subjects in the control group were 196 adolescents that received a program about how, where, and when they could finish all their work at school. The results indicated that the predictors of the intention to smoke were attitude toward smoking ($\beta = .18$, $p < .05$) and perceived behavioral control ($\beta = .40$, $p < .001$). Also, attitude toward smoking, subjective norm, and perceived behavioral control could explain 27% of the intention to smoke. At eight weeks after the intervention, it was found that the factors which could predict intention to smoke with statistical significance were attitude toward smoking ($\beta = .30$, $p < .001$), perceived behavioral control ($\beta = .14$, $p < .05$), and non-smoking behavior in the past ($\beta = .15$, $p < .05$). In

addition, attitude toward smoking, subjective norm, and perceived behavioral control could predict intention to smoke by 22.5%. Besides, the factors that could distinguish between the smoking and non-smoking groups were attitude toward smoking, subjective norm, perceived behavioral control, intention to smoke, and non-smoking behavior in the past, at 91%, but only intention to smoke, subjective norm, and non-smoking behavior in the past had statistical significance ($\beta = .86$, $p < .01$; $\beta = 1.26$, $p < .01$; and $\beta = 2.43$, $p < .01$, respectively). Thus, the findings seem to indicate that the best predictors of the intention not to smoke in the future of adolescents are positive intention not to smoke, perception that important referents do not want them to smoke, and lack of smoking experience in the past.

The review of literature of previous studies that employed the theory of planned behavior to investigate smoking behavior has revealed that the factors which could predict the intention to smoke with statistical significance are direct attitude toward smoking and direct perceived behavioral control. However, it is not conclusive yet that indirect attitude toward smoking, direct and indirect subjective norm, and indirect perceived behavioral control can predict intention to smoke with statistical significance. As regards smoking behavior, the factor that can predict smoking behavior with statistical significance is direct perceived behavioral control only. On the other hand, intention to smoke cannot clearly predict smoking behavior. Nevertheless, the theory assumes that the intention is a significant factor that influences performance of the behavior. Even if individuals have very little intention to perform the behavior, they will attempt to do so. This can also explain the thinking and tendency in performing the behavior of the individuals. Accordingly, the researcher was interested in applying the Theory of Planned Behavior to examine the factors influencing the intention to smoke in secondary school students including attitude toward smoking, subjective norm, and perceived behavioral control. Theoretically, the direct and belief-based measures of attitude, subjective norm, and perceived behavioral control are alternative ways of assessing the same underlying constructs. Either measure can therefore be used to predict the intention. However, because the intention is assessed directly, for the sake of consistency, the direct measures are usually preferred (Ajzen, 2004). Consequently, the researcher would use the direct measurement to assess attitude toward smoking, subjective norm, and

perceived behavioral control to predict intention to smoke of secondary school students.

CHAPTER III

MEATERIALS AND METHODS

Research Design

The present study was descriptive correlational research which used the Theory of Planned Behavior proposed by Ajzen (1991) as the conceptual framework to investigate the predictive power of demographic characteristic factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control on the intention to smoke within 1 month of secondary school students in Ranong Province.

Population and Sampling

The population of the study consisted of secondary school students in Ranong Province.

The sample referred to early secondary students (Mattayom 1-3) in Ranong Province.

The sample size was calculated based on the criteria of Yamane (1973: 727) as follows:

$$n = \frac{N}{1+Ne^2}$$

When n = number of samples

N = number of population

e = the level of precision or sampling error

Set N = 6,422

e = .05

Then, $$n = \frac{6,422}{1+6,422(0.05)^2}$$

$$n = 376.5$$

Thus, the sample size should be at least 377. However, to ensure completeness of data, the researcher decided to collect data from an additional 10% of the desired sample size (Lemeshow, Hosmer, Klar, & Lwanga, 1990). Thus, the sample size was at least 400.

In the present study, sample selection was carried out by means of multi-staged sampling as follows:

1. Randomly selecting the schools from the five districts in Ranong Province based on ratio of the number of schools in each district. Therefore, 4 schools from 12 schools from Muang district, 3 schools from 9 schools from Kraburi district, 2 schools from 6 schools from Kraper district, 1 school from 5 schools from La-un districts, and 1 school from 3 schools from Suksamran sub-district were chosen.

2. Randomly selecting the classes from selected schools from each district based on the number of classes in each level in each school, resulting in 15 classes from each year of Mattayom 1-3, totaling 45 classes chosen. (See Table 1)

3. Randomly selecting the students from these 45 classes based on their identification number. However, the number of students that were selected from each school was calculated based on the number of students from M.1-M.3 of each school. In addition, from each school, the equal numbers of student from each level (M1-M3) were chosen. Finally, the total of 423 subjects was recruited. (See Table 1)

4. The subjects selected from each class in each school are described in the table below.

Table 1: Populations and samples categorized according to districts in Ranong province

District /school	Number of schools	School	Number Of Classes			Number of Classes	Number of subjects/ school	Number of Subjects/ year		
			M.1	M.2	M.3			M.1	M.2	M.3
Muang/12	4	Satree Ranong M.1=12 classes M.2=10 classes M.3=10 classes Total =1,089 persons	4	4	4	12	144	48	48	48
		Baan Toong Ngow M.1=3 classes M.2=3 classes M.3=3 classes Total =135 persons	1	1	1	3	18	6	6	6
		Wat Had Som Pan M.1=1 class M.2=1 class M.3=1 class Total =63 persons	1	1	1	3	9	3	3	3
		Raja Grood Wittaya M.1=3 classes M.2=2 classes M.3=2 classes Total =217 persons	1	1	1	3	30	10	10	10
Kraburi/9	3	Kraburi Wittaya M.1=5 classes M.2=5 classes M.3=5 classes Total =600 persons	2	2	2	6	78	26	26	26
		Baan Had Jik M.1=1 class M.2=1 class M.3=1 class Total =81 persons	1	1	1	3	12	4	4	4

Table 1: Populations and samples categorized according to districts in Ranong province (Cont.)

District /school	Number of schools	School	Number Of Classes			Number of Classes	Number of subjects/ school	Number of Subjects/ year		
			M.1	M.2	M.3			M.1	M.2	M.3
Kraburi/ 9 (Cont.)		Nikom Songkrao M.1=2 classes M.2=2 classes M.3=2 classes Total =203 persons	1	1	1	3	30	10	10	10
Ka-Pur/6	2	Ka-Pur Wittaya M.1=3 classes M.2=3 classes M.3=3 classes Total =379 persons	1	1	1	3	48	16	16	16
		Baan Bang Hin M.1=1 classes M.2=1 classes M.3=1 classes Total =121 persons	1	1	1	3	15	5	5	5
La-un/5	1	La-un Wittaya karn M.1=2 classes M.2=2 classes M.3=2 classes Total =182 persons	1	1	1	3	24	8	8	8
Suksum-ran/3	1	Thairat Wittaya karn 67 M.1=2 classes M.2=2 classes M.3=2 classes Total =104 persons	1	1	1	3	15	5	5	5
Total=35	11	Total= 196 classes Total=3,194 persons	15	15	15	45	423	141	141	141

Research Instruments

The instrument used in this study was developed by the researcher based on the survey of beliefs of secondary school students in Ranong Province according to the theory proposed by Francis et al. (2004). It consisted of five parts and 23 items as follows:

Part I: Demographic characteristic questionnaire

This part consisted of 12 items to elicit personal information of gender, age, religion, level of study, grade point average, daily allowance (baths per day), the persons they were living with, number of family members smoking, number of friends smoking, and smoking behavior in the past 30 days.

Part II: Direct Measure of Attitude toward Smoking

This part of the questionnaire assesses the students' feelings about smoking whether it is good or bad, or beneficial or harmful. It was a five-interval semantic differential scale consisting of seven items. The scoring was based on the positive or negative adjectives, with higher scores given to positive adjectives and lower scores given to negative adjectives. The scores for each item ranged from 1 to 5, and the total scores ranged from 7 to 35 points.

Example of items and scoring:

Statement		Much	Little	Not either of them	Little	Much	
1. For me, smoking is…	bad	1	2	3	4	5	good

The scoring was as follows:

The response	1	=	1 point
	2	=	2 points
	3	=	3 points
	4	=	4 points
	5	=	5 points

As for the interpretation of scoring, higher scores indicated positive attitude toward smoking, while lower scores indicated negative attitude toward smoking.

Part III: Direct Measure of Subjective Norm

This instrument was used to assess the subjects' perception that most of the persons who were important to them thought that they should smoke or not and how much. It was a five-interval semantic differential scale consisting of three items. The scores for each item ranged from 1 to 5, and the total scores ranged from 3 to 15 points.

Example of items and scoring:

	1	2	3	4	5
1. If I smoke, most the people who are important to me will	strongly be unable to accept it	be unable to accept it	not sure	be able to accept it	strongly be able to accept it

The scoring was as follows:

The response 1 = 1 point
2 = 2 points
3 = 3 points
4 = 4 points
5 = 5 points

As for the interpretation of scoring, higher scores indicated that most people important to the students accepted their smoking, and vice versa.

Part IV: Direct Measure of Perceived Behavioral Control

This instrument was used to assess the subjects' perception of smoking whether it was easy or difficult to smoke. It was a five-interval semantic differential scale consisting of three items. The scoring was based on the positive or negative adjectives, with higher scores given to positive adjectives and lower scores given to negative adjectives. The scores for each item ranged from 1 to 5, and the total scores ranged from 3 to 15 points.

Example of items and scoring:

	1	2	3	4	5
1. How much do you you can control your smoking?	strongly be unable to control it	be unable to control it	not sure	be able to control it	strongly be able to control it

The scoring was as follows:

The response 1 = 1 point
2 = 2 points
3 = 3 points
4 = 4 points
5 = 5 points

As for the interpretation of scoring, higher scores indicated a high level of perceived behavioral control, while lower scores indicated a low level of perceived behavioral control.

Part V: Intention to Smoke Questionnaire

This instrument was used to assess the subjects' intention or need to smoke cigarettes within 1 month. It was a five-interval semantic differential scale consisting of three items. The scores for each item ranged from 1 to 5, and the total scores ranged from 3 to 15 points.

Example of items and scoring:

	1	2	3	4	5
1. I think I will smoke within 1 month.	very unlikely	unlikely	not sure	likely	very likely

The scoring was as follows:

The response 1 = 1 point
2 = 2 points
3 = 3 points
4 = 4 points
5 = 5 points

As for the interpretation of scoring, higher scores indicated that students had much intention to smoke, while lower scores indicated that students had little intention to smoke.

Validity and reliability of the instrument

The validity and reliability of the instrument was examined by a panel of three experts. The researcher revised and improved the instrument according to these experts' comments and suggestions to better suit early secondary students. The revised version of the questionnaire was tried out with a group of 30 subjects who shared similar characteristics with the subjects of the main study. The findings revealed that Cronbach's alpha coefficient ranged from 0.67 to 0.98. According to Burns & Grove (2001), the reliability of the developed and improved instruments should be equal to 0.80, while that of the newly constructed should be at least 0.70. As the instruments used in this study were newly constructed by the researcher, it could be concluded that their reliability ranged from acceptable to good, as shown in Table 2.

Table 2: Cronbach's alpha coefficient of the research instruments (n = 30)

Questionnaire	**Cronbach's alpha coefficien**
Direct attitude toward smoking	0.98
Direct subjective norm	0.66
Direct perceived behavioral control	0.67
Intention to smoke within 1 month	0.82

Data collection

The researcher collected data by herself. After a letter from the Graduate School, Mahidol University was sent to the directors of each school to ask for cooperation and permission to collect data, data collection, which took place from November to December 2005, proceeded in the following order:

1. The researcher presented the proposal to the administrators of the schools and explained the research procedures to ask for cooperation in data collection.

2. The researcher met the teachers of the selected classes and asked for cooperation in data collection. The researcher asked the teachers to set the date and time when data could be collected so as not to disrupt the regular teaching. Data were generally collected during study breaks or after school from 3:30 – 4:30 p.m.

3. The researcher introduced herself to the subjects in each school, explained the research procedures, asked for cooperation in data collection, and explained the protection of the rights of human subjects.

4. The researcher distributed the questionnaires, explained necessary steps in completing the questionnaire in detail, and gave the subjects the opportunity to ask questions for further clarification. The researcher collected the questionnaires back from the subjects after they had completed them, which took approximately 35 minutes. The researcher then checked the returned questionnaires to ensure completeness of data.

5. The researcher analyzed the data using statistical methods.

Protection of the rights of human subjects

The present research was approved by the Committee on Research Involving Human Subjects. The researcher explained the research objectives and data collection procedures to the students and their parents or guardians. They were informed that their participation was on a voluntary basis and their decision not to participate would not affect their school grades in any way. They were also reassured that the data collected from them would be kept strictly confidential and would be reported only as group data and that they could withdraw their participation in the study at anytime if they wished. After the students and their guardians agreed to participate in the study, they were asked to sign the informed consent form.

Data analysis

The Statistical Package was used in the analysis of data with the significance level set at the 0.05 level. Data analysis proceeded in the following order:

1. Descriptive statistics were used to explain each study variable in terms of frequency, percentage, mean, and standard deviation.

2. Pearson’s product moment correlation and Multiple Regression was planned as statistical technique to examine the relationships and predictive power of age, grade point average, daily allowance, the number of family members smoking, the number of friends smoking , attitude toward smoking, subjective norm, perceived behavioral control ,and intention to smoke within 1 month of secondary school

students. Before Pearson's product moment correlation and Multiple Regression analysis were performed, the following statistical analyses were conducted for testing assumption:

1. The normality of data was tested using the Kolmogorov-Sminov Test, the histogram, and normality of residuals.

2. Linearity between independent and dependent variables was tested from the scatter plot.

3. The autocorrelation was tested using the Dubin-Watson Test to determine whether the Dubin-Watson value was closed to 2 (ranging from 1.5 to 2.5) or not. If so, it meant no relationship existed.

4. The multicollinearity was examined by considering the simple correlation in the form of correlation matrix. If the correlation coefficient was higher than .90, VIF higher than 5.2, and Tolerance lower than 0.19, it meant that there was a strong relationship among the independent variables.

5. The homoscedasticity was tested by plotting the residuals against the predicted values and against the independent variables. For the assumption to be supported, "when the standardized predicted values are plotted against observe value, the data would form a straight line from the lower-left corner to the upper-right corner" (Munro, 2001:273).

The result showed that there was no autocorrelation and multicollinearity problem. However, some independent variables did not have normal distribution and the homoscedasticity of all variables was not consistent. Therefore, the data were not appropriate for the Pearson's product moment correlation and Multiple Regression Analysis (See Appendixes C, D, and E). As Such, in analyzing the relationships between the dependent variables and the independent variable, Spearman's correlation analysis, a non-parametric, was used to analyze the relationships among study variables. In addition, Logistic Regression Analysis was used to analyze the predictive power of the independent variables on dependant variable, intention to smoke within 1 month of secondary school students. Before Logistic regressions were performed. Initial agreements were examined and it was discovered that the data were in compliant with the initial agreements (See Appendix F).

In order to use Logistic Regression, the independent variables have to be dichotomous or categorical variable. Therefore, the intention to smoke within 1 month, the dependant variable, was organized into 2 groups which are the group that have intention to smoke within 1 month and the group that have no intention to smoke within 1 month. The researcher used only item 3 which asks the subject to indicate their intention to smoke within 1 month as an assessment of intention to smoke within 1 month in secondary school student. The subjects who responded “unlikely” and “very unlikely” were identified as having no intention to smoke within 1 month and coded 0. The subjects who responded “not sure”, “likely”, and “very likely” were identified as having intention to smoke within 1 month and coded 1.

CHAPTER IV

RESULTS

The present study was descriptive correlational research which used the Theory of Planned Behavior proposed by Ajzen (1991) as the conceptual framework to investigate the predictive power of demographic characteristic of age, grade point average, daily allowance, number of family member smoking, and number of friend smoking, as well as attitude toward smoking, subjective norm, perceived behavioral control to predict the intention to smoke within 1 month of early secondary students in Ranong Province. This chapter presents the findings of the study in which are divided into three parts as follows:

Part I: Demographic Characteristics of the Subjects

Part II: Results of Statistical Analysis of the Study Variables

Part III: Results of statistical analysis of the relationships among the study variables and the predictive power of personal factors of age, grade point average, daily allowance, number of family member smoking, and number of friend smoking, as well as attitude toward smoking, subjective norm, perceived behavioral control to predict the intention to smoke of secondary school students in Ranong Province within 1 month

Part I: Demographic characteristics of the subjects

Table3: Demographic characteristics of the subjects (n = 423)

Characteristics	Frequency (persons)	Percentage
Gender		
Male	228	53.9
Female	195	46.1
Age (years)		
10-14	299	70.7
15-17	124	29.3
(Mean = 13.87 years; SD = 0.963; Min = 10; Max = 17)		
Religion		
Buddhism	391	92.4
Christianity	32	7.6
Level of study		
M. 1	139	32.9
M. 2	143	33.8
M. 3	141	33.3
Grade point average		
≤ 2.00	92	21.7
2.01 – 3.00	218	51.6
3.01 – 4.00	113	26.7
(Mean = 2.672; SD = 0.619)		
daily allowance (baths/day)		
10 – 30	246	58.2
31 – 60	170	40.2
61-350	7	1.6
(Mean = 33.40; SD = 21.03; Min = 10; Max = 350)		

Table 3: Demographic characteristics of the subjects (n = 423) (Cont.)

Characteristics	Frequency (persons)	Percentage
Persons living with		
Father	22	5.2
Mother	48	11.3
Father and mother	308	72.8
Siblings	81	19.1
Relatives	66	15.6
Friends	4	0.9
Others	11	2.6
Persons living with who smoke		
Non	168	39.7
Father	200	47.3
Mother	19	4.5
Father and mother	28	6.6
Siblings	61	14.4
Relatives	18	4.3
Friends	5	1.2
Others		
Number of family members smoking (persons)		
Non smoking	140	33.0
1 person smoke	238	56.3
2 person smoke	38	9.0
3-4 person smoke	7	1.7
(Mean = 0.80; SD = 0.686)		

Table 3: Demographic characteristics of the subjects (n = 423) (Cont.)

Characteristics	Frequency (persons)	Percentage
Number of friends smoking (persons)		
Not smoke	220	52.0
1 – 10	174	41.2
11 – 20	25	5.9
21 – 50	4	0.9
(Mean = 3.18; SD = 5.797; Min = 0; Max = 50)		
Number of days smoking in the past 30 days		
Not smoke	382	90.3
1 – 10	13	3.3
11 – 20	5	1.2
21 – 30	22	5.2
(Mean = 0.27)		
Number of cigarettes smoked in the past 30 days		
Not smoke	382	90.3
1 – 10	31	7.1
11 – 20	5	1.2
21 – 30	6	1.4
(Mean = 0.19 cigarettes / day)		

According to the study findings, more than half of the subjects (54%) were male, their mean age was 13.8 years, and the majority of the subjects (92.4%) were Buddhists. In addition, the mean grade point average was 2.7, and their mean daily allowance was 34 Baht per day. The largest group of subjects lived with their father and mother, and the persons they were living with who smoked were their father. Also, the numbers of friend who smoked and who did not smoke were rather similar. They had three friends who smoked on average. As regards smoking habits, almost

all (90%) did not smoke in the past month, while only 10% did. Of these 10%, they smoked 0.19 cigarettes per day on average.

Part II: Results of statistical analysis of the study variables

Descriptive statistics which were used to analyze the main study variables were mean, standard deviation, range, skewness, and kurtosis.The dependent variable which was examined in this study was the intention to smoke within 1 month, whereas the independent variables were age, grade point average, daily allowance, number of family member smoking, and number of friend smoking, as well as attitude toward smoking, subjective norm, perceived behavioral control, as illustrated in Table 4 below.

Table 4: Mean and standard deviation of the study variables (n = 423)

Variables	Mean	SD.	Possible range	Actual range	Fisher's measure of Skewness	Fisher's measure of Kurtosis
1. Age	13.87	0.96	-	-	-2.0	-0.005
2. Grade	2.67	0.61	-	-	0.386	-3.14
3. Daily income	33.40	21.03	-	-	71.24	1513.47
4. Number of family member smoking	0.80	0.68	-	-	7.235	8.56
5. Number of friend smoking	3.18	5.79	-	-	29.62	77.87
6. Direct Attitude toward smoking	9.98	4.25	7-35	7-33	16.92	17.43
7. Direct Subjective norm	4.56	1.83	3-15	3-10	9.52	1.24
8. Direct Perceived behavioral control	11.79	2.97	3-15	3-15	-3.97	-4.185
9. Intention to smoke within 1 month	4.74	2.58	3-15	3-15	11.94	6.35

Table 5: Descriptive statistics of the study variables (n=423)

Variables	Mean	Possible range	Actual range
Direct Attitude toward smoking	1.43	1-7	1.00-4.71
Direct Subjective norm	1.52	1-5	1.00-3.33
Direct Perceived behavioral control	3.93	1-5	1.00-5.00
Intention to smoke within 1 month	1.58	1-5	1.00-5.00

As shown in Table 5, the findings revealed that the majority of subjects has rather bad attitude toward smoking, perceived that the persons who are significant to them did not accept their smoking behavior, thought that they have high control over their smoking behavior, and had less intention to smoke within 1 month.

Reliability of the instruments

Cronbach's alpha coefficient was used to examine the internal reliability of the instruments—which consisted of four parts eliciting data regarding attitude toward smoking, subjective norm, perceived behavioral control, and intention to smoke in the next month. The findings revealed that Cronbach's alpha coefficient ranged from 0.62 to 0.89. According to Burns & Grove (2001), the reliability of the developed and improved instruments should be equal to 0.80, while that of the newly constructed should be at least 0.70. As the instruments used in this study were newly constructed by the researcher, it could be concluded that their reliability ranged from acceptable to good, as shown in Table 6.

Table 6: Cronbach's alpha coefficient of the research instruments (n = 423)

Questionnaire	Cronbach's alpha coefficien
Direct attitude toward smoking	.889
Direct subjective norm	.651
Direct perceived behavioral control	.617
Intention to smoke within 1 month	.842

Part III: Results of statistical analysis of the relationships among the study variables and the predictive power of demographic characteristic factors of age, grade point average, daily allowance, number of family members smoking, number of friends smoking, attitude toward smoking, subjective norm, and perceived behavioral control to predict the intention to smoke of secondary school students within 1 month

Table 6: The relationships among study variables as analyzed by Spearman's correlation analysis (r_s) in the form of correlation matrix (n = 423)

Variables	1	2	3	4	5	6	7	8	9
1. Age	--								
2. Grade	-.101*	--							
3. Daily allowance	.022	-.106*	--						
4. Number of family member smoking	-.024	-.127**	-.053	--					
5. Number of friend smoking	.256**	-.202**	-.053	.130**	--				
6. Direct Attitude toward smoking	.141**	-.108*	.128**	.028	.124*	--			
7. Direct Subjective norm	.143**	-.136**	.068	.073	.218**	.334**	--		
8. Direct Perceived behavioral control	.044	.303**	-.100*	-.047	-.210**	-.261**	-.326**	--	
9.Intention within 1 month	.138**	-.249**	.043	.022	.328**	.281**	.479**	-.441**	--

*p < .05. **p < .01.

According to the Spearman's correlation analysis, it was found that age, the number of smoking friends, attitude toward smoking, and subjective norm were positively related to the intention to smoke within 1 month with statistical significance at the .01 level (r_s=.138 , r_s= .328, r_s= .281, and r_s = .479 respectively. On the other hand, grade point average and perceived behavioral control were negatively related to the intention to smoke within 1 month with statistical significance at the .01 level (r_s = -.249 ,and r_s = -.441, respectively), as depicted in Table 6.

Table 7: The intention to smoke within 1 month as analyzed by logistics analysis (n=423)

Variables	B	S.E.	Wald statistic	Odds ratio	95%CI. for odds ratio
1.Direct Attitude toward smoking	-.006	.036	.032	.994	.926-1.066
2.Direct Subjective norm	.493	.088	31.596 ***	1.637	1.379-1.945
3. Direct Perceived behavioral control	-.232	.059	15.626 ***	.793	.707-890
4.Age	.151	.178	.714	1.162	.820-1.648
5.Grade	-.524	.277	3.590	.592	.344-1.018
6.Daily allowance	-.006	.009	.506	.994	.976-1.011
7.Number of family members smoking	-.488	.258	3.576	.614	.370-1.018
8.Number of friends smoking	.076	.022	11.826***	1.079	1.033-1.127

*p < .05, **p < .01, ***p < .001, R^2 = .231- .395

The results of the Logistic Regression analysis showed all 8 factors can jointly explain the intention to smoke within 1 month by 23% - 39.5%. However, after the other variables were kept constant, the number of smoking friends, subjective norm, and perceived behavioral control were the factors that had a statistically significant relationship with the intention to smoke within 1 month at the 0.001 level. Result also revealed that having one more friend who smoked increased the students' likelihood to smoke within 1 month by 1.1 times (Odds ratio= 1.1). Also, having one score of the subjective norm higher meant the chance the students would intent to smoke within 1 month was increased by 1.6 times (Odds ratio= 1.6). Moreover, having one score of the perceived behavioral control higher meant chance the students would intent to smoke within 1 month was decreased by 0.8 times (Odds ratio=0.8) .The results also revealed that the equation could accurately predict the intention not to

smoke within 1 month 95.5%, which was higher than the intention to smoke within 1 month (36.8%).

CHAPTER V
DISCUSSION

The present study was descriptive correlational research which used the Theory of Planned Behavior proposed by Ajzen (1991) as the conceptual framework to investigate the intention to smoke within 1 month of early adolescents aged 10 to 17 years in Ranong Province in the academic year 2005. The study variables included the demographic characteristics factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control. The research instrument was constructed by the researcher based on the theory of Ajzen (1991). Data were analyzed by means of the statistical package with the significance level set at 0.05. The statistical formulas employed in this study were Spearman's Correlation Analysis and Logistic Analysis. In this chapter, the discussion of the study findings is divided into two parts as follows:

1. Demographic characteristics of the subjects
2. The factors influencing secondary school students' intention to smoke within 1 month including demographic characteristics factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control.

1. Demographic characteristics of the subjects

According to the study findings, more than half of the subjects (54%) were male, their mean age was 13.8 years, and the majority of the subjects (92.4%) were Buddhists. In addition, the mean grade point average was 2.7, and their daily allowance was 34 Baht. The largest group of subjects lived with their parents, and the persons they were living with who smoked were their father. Also, the numbers of the subjects who smoked and who did not smoke were rather similar. They had three friends who smoked on average. As regards smoking habits, almost all (90%) did not

smoke in the past month, while only 10% did. Of these 10%, they smoked 0.19 cigarettes per day on average. It can be seen that on the overall, only 10% of the subjects smoked and most of them did not have enough allowance to buy cigarettes. However, starting to smoke at an early age, having a large number of friends who smoke, and having the smoking father as their role model may increase the likelihood of adolescents to smoke cigarettes.

2. The factors influencing secondary school students' intention to smoke within 1 month including demographic characteristics factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control

Research hypothesis: Demographic characteristics factors of age, grade point average, daily allowance, number of family member smoking, and number of friend smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control could co-predict the intention to smoke within 1 month of early adolescents.

In the present study, the correlation between the study variables was determined by Spearman's Correlation Analysis. The findings revealed that age, the number of friends who smoked, attitude toward smoking and subjective norm were positively related to the intention to smoke within 1 month with statistical significance at the 0.01 level (r_s =.138, r_s = .328, r_s = .281, and r_s = .479, respectively). In addition, their grade point average and perceived behavioral control were negatively related to the intention to smoke within 1 month with statistical significance at the 0.01 level (r_s = -.249, and r_s = -.441, respectively). On the other hand, according to the study findings, daily allowance and number of family members smoking were not associated with the subjects' intention to smoke within 1 month.

Furthermore, Logistic Regression Analysis showed that among 423 subjects, age, grade point average, daily allowance, the number of family members smoking, the number of friends smoking, attitude toward smoking, subjective norm, and perceived behavioral control could co-predict the intention to smoke within 1 month

by 23% to 39.5%. However, only the number of smoking friends, subjective norm, and perceived behavioral control were only three factors that had a statistically significant influence on the intention to smoke within 1 month of secondary school students. Therefore, the research hypothesis was only partly supported, as discussed in detail below.

Demographic characteristic factors included age, grade point average, daily income, the number of family members smoking, and the number of friends smoking.

Age: The Logistic Regression Analysis showed that age did not have an influence on intention to smoke within 1 month. Similar findings have been reported by Mala Raksabhram (B.E.2526) that age was not associated with the intention to smoke of male students in Mathayomsuksa 3 and 6. This may be explained that the age range of the study sample was rather narrow as most of the subjects were between 13 and 15 years old (about 95%). For this reason, their intention to smoke within 1 month did not vary enough to reveal an influence on their intention to smoke within 1 month. However, results from correlation analysis revealed that age was related to their intention to smoke within 1 month with statistical significance. That is, when their age increases, the students' intention to smoke within 1 month also increases. As such, a smoking prevention campaign should be carried out among early adolescents who did not have much intention to smoke within 1 month as such campaign may help reduce their chance to smoke in the future.

Grade point average: Findings from Spearman Rho showed the negative relationship between grade point average and intention to smoke within 1 month in secondary school students. However, logistic regression did not revealed that grade point average contributed significantly to the prediction of the intention to smoke within 1 month in secondary school students. In previous studies, grade point average had been studied in relation to smoking behavior not intention to smoke. However, according to theory of planned behavior, intention to smoke is a significant antecedent to smoking behavior, therefore, result from this study were, to some extent, congruent with previous studies which found that grade point average was related to smoking behavior (Somchai Cheunta, B.E.2528; Acharawan Soithong, B.E.2542; Orathai Limtrakul, B.E.2536; Urai Sumaritham, B.E.2535; Chuchai Supawong, B.E.2540; Nittaya Pensirinapa, B.E.2542; Zapata et al., 2004). Findings from this study

suggested in some extent the important connection between students' grade point average and their intention to smoke. Student who have lower grade point average were more likely to intent to smoke within 1 month. Therefore, nurse, health care personal and teacher should pay more attention to students who did not do well in school since they may be at risk group to have intention to smoke, leading them to smoke in later time.

Daily allowance: The findings revealed that there was no relationship between daily allowance and the secondary school students' intention to smoke within 1 month. Also, the Logistic Regression Analysis suggested that daily allowance did not have an influence on the intention to smoke within 1 month. Thus, the research hypothesis was not supported. The findings of this study were consistent with those of a study carried out by Mala Raksabhram (B.E.2526) which reported that income did not have an influence on the intention to smoke. In this study, more than half of the subjects (58.2%) had a daily allowance ranging from 10 to 30 Baht, with the mean allowance of 34 Baht. This indicated that the subjects may not have had enough money to buy cigarettes. A study by Somchai Chuenta (B.E.2528: 58) pointed out that teenagers who smoked spent about 50 to 150 Baht per month to buy cigarettes, while those who ever used to smoke spent less than 50 Baht per month for cigarettes. Similarly, Acharawan Soithong (B.E.2542: 99) found that teenagers who smoked had an average daily allowance of 64.5 Baht, whereas those who did not smoke had about 50.9 Baht. At present, the price of cigarettes has also increased. However, the findings of this study which were incongruent with those of previous studies (Somchai Cheunta, B.E.2528: 77; Orathai Limtrakul, B.E.2536: A-B), may be explained that their subjects were between 16 and 22 years old with a consistent income in the form of monthly salary. For this reason, they were able to plan for their expenses and were also better able to buy cigarettes. However, in the present study, the subjects were younger than 18 years old, and it was illegal to sell cigarettes to this group of adolescents. It is possible then that the subjects were not able to buy cigarettes even though they may have had enough money. For this reason, the government's control over cigarette sales which prohibits the sales of cigarettes to adolescents under the age of 18 is effective to prevent smoking to a certain extent. In

addition, if parents give reasonable daily or monthly allowances to their adolescents, they may effectively reduce their chance to buy cigarettes.

The number of family members smoking: According to the findings, 56% of the subjects lived in a family in which one member smoked, while 33% lived in a family where nobody smoked. Spearman's Correlation Analysis revealed that there was no relationship between the number of smoking family members and the secondary school students' intention to smoke within 1 month. Also, the Logistic Regression Analysis suggested that the number of family member smoking did not have an influence on the intention to smoke within 1 month. The findings of this study were consistent with those of a study carried out by Mala Raksabhram (B.E.2526). In the present study, the subjects had less than one family member who smoked (0.80 person) and 48% had the father who smoked. It is possible that the subjects could easily imitate their parent's smoking behavior. However, as the subjects of this study were in their early adolescence, they were in a period when they needed freedom and independence and they tended to be closer to friends rather than family members. Thus, the number of smoking family members did not have an influence on the intention to smoke within 1 month. However, if there were more family members who smoked cigarettes, the adolescents may later develop an intention to smoke and adopt the smoking behavior.

The number of friends smoking: According to the findings, there was a statistically significant relationship between the number of friends smoking and the secondary school students' intention to smoke within 1 month ($r_s = .328$, $p < .01$). Also, the Logistic Regression Analysis suggested that the number of smoking friends had an influence on the intention to smoke within 1 month with statistical significance (OR = 1.079, $p < .001$). This means that having one more smoking friend increased secondary school students' intention to smoke within 1 month by 1.1 times. Therefore, the research hypothesis was supported. The findings of this study were congruent with those of a study carried out by Mala Raksabhram (B.E.2526). This may be because peer groups are very significant for adolescents who needed peer approval and acceptance. Moreover, Orathai Limtrakul (B.E.2536: 112) found that more than half of smokers had more than four friends who smoked. According to the natural characteristics of adolescents, they are in need of and in search for peer

acceptance and sense of belonging to the group. Adolescents tend to do whatever the friends in the group do to show that they are part of the group. In this study, close to half of the subjects (48%) had three friends who smoked on average. Likewise, Orathai Limtrakul (B.E.2536: 112) found that the subjects who had friends who smoked tended to have more smoking values. As most of the students were early adolescents who liked to do what their friends did, it was possible that they had an intention to smoke within 1 month. Consequently, friends are a significant factor in successfully organizing different activities to prevent smoking behaviors among early adolescents.

Theory of Planned Behavior

According to the Theory of Planned Behavior**,** individuals use reasons to make decisions and such reasons come from information or beliefs about the target behavior. The most important factor that determines and predicts behavior is the intention to perform the behavior, which reflects individuals' attempts or struggles to do what they have planned for (Ajzen, 1991). In this study, the Theory of Planned Behavior could partly predict the subjects' intention to smoke in the next month with statistical significance. Only were subjective norm and perceived behavioral control revealed to be significant factors that influence intention to smoke in early adolescents.

Attitude toward smoking: According to the findings, there was statistically significant relationship between attitude toward smoking and the secondary school students' intention to smoke within 1 month (r_s =.281, p<.01). This means that the subjects who had positive attitude toward smoking were more likely to have intention to smoke within 1 month. However, the Logistic Regression Analysis suggested that attitude toward smoking had no influence on the intention to smoke within 1 month. Therefore, the research hypothesis was not supported. The findings of this study were not congruent with those of previous studies (Mala Raksabhram, B.E.2526; Hemchayat, 2003; Ua-kit, 2004; Hanson, 1996; Higgins & Conner, 2003) which found that attitude toward smoking had a positive influence on the intention to smoke with statistical significance. One plausible explanation is that in the previous studies, most of the subjects were between 14 and 22 years old (Hemchayat, 2003; Ua-kit, 2004), but in this study, most of the subjects ranged from 13 to 15 years old.

Differences in age may result in differences in attitude toward smoking and may also impact on the influence of attitude toward smoking that may have on intention to smoke cigarette. The finding showed that friends and significant others had more influence on intention to smoke in secondary school student than adolescents' attitude toward smoking. Therefore, the finding supported that a smoking prevention campaign which disseminates knowledge and instill appropriate attitude toward smoking may not be sufficient.

Subjective norm: According to the findings, there was a statistically significant positive relationship between subjective norm and the secondary school students' intention to smoke within 1 month (r_s= .479, p < .01). Also, the Logistic Regression Analysis suggested that subjective norm had an influence on the intention to smoke within 1 month with statistical significance (Odds ratio = 1.637, p< .001). Result showed that having one more score of subjective norm increased secondary school students' intention to smoke within 1 month by 1.6 times (95% CI = 1.379 – 1.945). Therefore, the research hypothesis was supported. The findings of this study yielded support to those of previous studies (Mala Raksabhram, B.E.2526; Hemchayat, 2003; Ua-kit, 2004; Hanson, 1996; Higgins & Conner, 2003) which found that subjective norm could predict the intention to smoke with statistical significance. According to the Planned Behavior Theory, subjective norm refers to individuals' perception of the social pressure to do or not to do certain behavior (Ajzen, 1991: 188). Thus, if the subjects perceived that most of their significance persons accepted smoking, they could develop the intention to smoke within 1 month. One explanation is that in this study, most of the subjects were between 13 and 15 years old, which is the transition period from childhood to adulthood. Adolescents are searching for their roles and identity in the community and significant persons which could be their parents, family, teachers, and friends. In this study, almost all of them (72.8%) lived with their parents, and 56.3% had at least one family member who smoked. When a family member smoked, the subjects may have felt that their smoking behavior should also be accepted by other family members. Thus, they developed the intention to smoke within 1 month. Moreover, as the subjects had at least three friends who smoked on average, they may develop the smoking habit in the following month so as to gain acceptance from their peer group. This resulted in their

intention to smoke and have smoking behavior. It could be seen that social perception has a significant influence on adolescents' intention to smoke. For this reason, the non-smoking campaign should recognize the significance people in the adolescents including their parents, siblings, relatives, teachers, friends, or other close persons, as they have an influence on their intention to smoke.

Perceived behavioral control: According to the findings, there was a statistically significant negative relationship between perceived behavioral control and the secondary school students' intention to smoke in the next month (r_s = -.441, p <.01). Also, the Logistic Regression Analysis suggested that perceived behavioral control had influence on the intention to smoke within 1 month with statistical significance (Odds ratio = 0.793, p < .001). Result suggested that having one more score of the perceived behavioral control decreases the likelihood of the intention to smoke within 1 month of secondary school students by 0.8 times (95% CI =.707-.890) . Therefore, the research hypothesis was supported. The findings of this study were also congruent with those of previous studies conducted in Thailand and abroad (Hemchayat, 2003; Ua-kit, 2004; Hanson, 1996) which found that perceived behavioral control could predict the intention to smoke within 1 month with statistical significance. According to the Theory of Planned Behavior**,** perceived behavioral control refers to the perception of the difficulty or ease to perform a behavior. It reflects the past experience which may obstruct the performance of a behavior (Ajzen, 1991: 188). If individuals have a low level of perceived behavioral control, they will have more intention to smoke. On the contrary, if individuals have a high level of perceived behavioral control, they will have less intention to smoke. In this study, the mean score of perceived behavioral control was 3.93, indicating that the subjects had a rather good level of perceived behavioral control. Thus, they had a low level of intention to smoke. This could be explained by the obstruction factors on smoking behaviors of the subjects. For instance, the subjects spent most of their time at school which had the regulation prohibiting smoking. There were also teachers who paid close attention to them. When they were at home, almost all of them (72.8%) lived under their parents' supervision, so they did not have the freedom to smoke. Moreover, as more than half of them (52%) had a daily allowance ranging from 10 to 30 Baht, they did not have enough money to buy cigarettes. On the other hand, there

were also other factors that may encourage smoking behavior. For example, 48% of the subjects had friends who smoked, and they were early adolescents who tended to spend most of their time doing activities that would result in acceptance of the peer group. Thus, it was possible that they would develop the intention to smoke within 1 month. However, the Theory of Planned Behavior believes that if individuals perceive that they have a low level of resources and a high level of inhibiting or obstacles, they will have a good level of perceived behavioral control (Ajzen & Fishbein, & Fishbein, 1988: 135). In this study, when the subjects perceived more obstacles in their smoking behaviors than supporting factors, they had a rather low level of intention to smoke within 1 month and to adopt the smoking behavior. As a consequence, in a smoking prevention campaign, the factor that either obstruction or promote intention to smoke, including time, money, and opportunity, should be taken into account. If adolescents do not have a chance to hang out with smoking friends and are encouraged to join helpful activities such as sports or school services and if parents and teachers offer a good care and a close supervision to the adolescents, their intention to smoke and their adoption of the smoking behavior within 1 month can be significantly decreased.

CHAPTER VI
CONCLUSIONS

Summary of the Study

The present study was descriptive correlational research which used the Theory of Planned Behavior proposed by Ajzen (1991) as the conceptual framework to investigate the intention to smoke within 1 month of early adolescents aged 10 to 17 years in Ranong Province. The study variables included the demographic characteristics factors of age, grade point average, daily allowance, number of family members smoking, and number of friends smoking, as well as attitude toward smoking, subjective norm, and perceived behavioral control. The research instrument was constructed by the researcher based on the theory of Ajzen (1991). This self-administered questionnaire consisted of 23 items which were divided into the following five parts: 1) Demographic characteristic questionnaire, 2) Direct Measure of Attitude toward Smoking, 3) Direct Measure of Subjective Norm, 4) Direct Measure of Perceived Behavioral Control, and 5) Intention to Smoke Tobacco. The subjects were 423 secondary school students (Mathayomsuksa 1-3). Data were analyzed by using SPSS for Windows Program with the significance level set at 0.05. The statistical formulas employed in this study were Spearman's Correlation Analysis and Logistic Analysis. The findings of the study can be summarized as follows:

1. Demographic characteristics of the subjects

According to the study findings, more than half of the subjects (54%) were male, their mean age was 13.8 years, and the majority of the subjects (92.4%) were Buddhists. In addition, the mean grade point average was 2.7, and their mean daily allowance was 34 Baht. The largest group of subjects lived with their parents, and the persons they were living with who smoked were their father. Also, the numbers of the subjects who smoked and who did not smoke were rather similar. They had three friends who smoked on average. As regards smoking habits, almost all (90%) did not

smoke in the past month, while only 10% did. Of these 10%, they smoked 0.19 cigarettes per day on average.

2. Research findings

In the present study, the correlation between the study variables was determined by Spearman's Correlation Analysis. The findings revealed that age, the number of friends who smoked, attitude toward smoking and subjective norm were positively related to the intention to smoke within 1 month with statistical significance at the 0.01 level (r_s =.138, r_s = .328, , r_s= .281, and r_s= .479, respectively). In addition, their grade point average and perceived behavioral control were negatively related to the intention to smoke within 1 month with statistical significance at the 0.01 level (r_s=-.249, and r_s=-.441, respectively). On the other hand, daily allowance and number of family member smoking were not associated with the subjects' intention to smoke within 1 month. Furthermore, Logistic Regression Analysis showed that among 423 subjects, age, grade point average, daily allowance, the number of family members smoking, the number of friends smoking, attitude toward smoking, subjective norm, and perceived behavioral control could explain the intention to smoke within 1 month by 23% to 39.5%. However, only the number of smoking friends, subjective norms, and perceived behavioral control were only three factors that had a statistically significant influence on the intention to smoke within 1 month of secondary school students.

Recommendations

The findings of the present study provide significant information to nursing practice to further prevent smoking behaviors among adolescents. Based on the findings of the study, the following recommendations can be made:

1. Nurses should provide a health education program or a smoking prevention program among early adolescents in secondary schools.

2. Nurses should encourage individuals who have an influence on adolescents' decision to smoke to participate in the smoking prevention programs such as parents, teachers, and friends**.**

3. Nurses should disseminate knowledge and information among early adolescents regarding factors which may help prevent them from smoking cigarettes such as avoidance skills and beneficial leisure activities.

4. Nurses should arrange non-smoking campaigns in schools and communities to discourage early adolescents from smoking.

Recommendations for future research

1. Furthers studies should be conducted using the Theory of Planned Behavior to investigate smoking behaviors of adolescents to shed more light on the phenomenon.

2. Longitudinal studies should be carried out to determine the causal-comparative relationships among the study variables.

Limitations of this study

1. The subjects who participated in this study were early adolescents who were residing in Ranong Province. Thus, the study findings cannot be generalized to other groups of early adolescents living in other provinces in the country.

2. In this study, data were collected only once. As a result, the causal-comparative relationships among the selected study variables could not be determined or explained.

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APPENDIX

APPENDIX A

Subject rights to protect subject's participation

เอกสารคำอธิบาย/คำชี้แจงแก่ผู้เข้าร่วมการวิจัย

หัวข้อเรื่อง

ปัจจัยที่มีอิทธิพลต่อความตั้งใจที่จะสูบบุหรี่ของนักเรียนมัธยมศึกษาตอนต้น

วัตถุประสงค์และวิธีการวิจัย

ในการวิจัยครั้งนี้ต้องการทราบถึงปัจจัยที่มีอิทธิพลต่อความตั้งใจที่จะสูบบุหรี่ของนักเรียนมัธยมศึกษาตอนต้น รวมทั้งต้องการทราบความสามารถในการทำนายความตั้งใจที่จะสูบบุหรี่ของนักเรียนโดยใช้ทฤษฎีการวางแผนพฤติกรรม (Theory of planned behavior) โดยผู้วิจัยจะใช้แบบสอบถามเกี่ยวกับข้อมูลส่วนบุคคล ทัศนคติต่อการสูบบุหรี่ บรรทัดฐาน แบบสอบถามการรับรู้ความสามารถในการควบคุม และความตั้งใจที่จะสูบบุหรี่

เหตุผลที่เชิญชวนให้ท่านเข้าร่วมโครงการวิจัย

บุหรี่เป็นสารเสพติดชนิดหนึ่งที่บั่นทอนสุขภาพ และพฤติกรรมการสูบบุหรี่เป็นสาเหตุสำคัญของการป่วยด้วยโรคต่างๆ มากกว่า 25 โรค องค์การอนามัยโลกรายงานว่า มีผู้เสียชีวิตจากการสูบบุหรี่ปีละ 5 ล้านคนก่อนวัยอันควร โดยเฉพาะอย่างยิ่งจาก โรคหลอดเลือดหัวใจ โรคมะเร็งปอด และโรคถุงลมโป่งพอง รวมไปถึงโรคมะเร็งในส่วนต่างๆ ของร่างกาย ปัญหาการสูบบุหรี่มักเริ่มขึ้นตั้งแต่ช่วงวัยรุ่น การสูบบุหรี่ของนักเรียนก่อให้เกิดปัญหาสุขภาพของวัยรุ่น การบริโภคอาหารของเด็กนักเรียนวัยรุ่น และยังพบว่า ผู้ที่สูบบุหรี่จะมีน้ำหนัก ความสูง และดัชนีมวลกายต่ำกว่าเมื่อเทียบกับผู้ที่ไม่สูบบุหรี่อย่างมีนัยสำคัญทางสถิติ ดังนั้นจะเห็นได้ว่า การสูบบุหรี่มีผลสุขภาพ การเจริญเติบโต และทำให้เกิดปัญหาสุขภาพต่างๆ ตามมา และสิ่งที่สำคัญที่จะเกิดขึ้นกับวัยรุ่นที่สูบบุหรี่คือ มีโอกาสติดยาเสพติดชนิดอื่นๆได้มากกว่า เยาวชนที่ไม่สูบบุหรี่ ดังนั้นผู้วิจัยจึงมีความสนใจที่จะนำกรอบแนวคิดทฤษฎีการวางแผนพฤติกรรม (Theory of Planned Behavior) มาใช้ในการศึกษาในนักเรียนมัธยมศึกษาตอนต้น ซึ่งเป็นทฤษฎีที่ช่วยให้เข้าใจพฤติกรรมและสาเหตุของพฤติกรรมอย่างเป็นระบบและชัดเจน จึงนำมาใช้ในการศึกษาพฤติกรรมสูบบุหรี่ในนักเรียนเพื่อช่วยให้เข้าใจถึงปัจจัยที่เกี่ยวข้องกับการสูบบุหรี่ในวัยรุ่นตอนต้นได้ เพื่อเป็นข้อมูลเบื้องต้นในการนำความรู้มาใช้ในการป้องกันการสูบบุหรี่ของนักเรียนมัธยมศึกษาตอนต้นต่อไป

ระยะเวลาที่เข้าร่วมวิจัย

จะใช้เวลาในการตอบแบบสอบถามเป็นเวลาประมาณ 35 นาที

ประโยชน์ที่คาดว่าจะได้รับ

ข้อมูลที่ได้รับจะใช้เป็นแนวทางในการวางแผนและปฏิบัติการพยาบาลที่เหมาะสมและมีประสิทธิภาพยิ่งขึ้นเพื่อป้องกันการสูบบุหรี่ในนักเรียนมัธยมศึกษาตอนต้น

ความเสี่ยงหรือความไม่สบายใจที่อาจเกิดขึ้นกับผู้ที่เข้าร่วมในการวิจัย

ไม่มีความเสี่ยงหรืออันตรายใดๆในการเข้าร่วมวิจัย เนื่องจากการวิจัยครั้งนี้ไม่ได้กระทำการทดลองหรือปฏิบัติหัตถการใดๆที่มีการลุกล้ำร่างกาย แต่ในการตอบแบบสอบถามอาจทำให้สูญเสียความเป็นส่วนตัวบ้าง รวมทั้งต้องใช้เวลาในการอ่านและตอบแบบสอบถาม

ขอบเขตการดูแลรักษาความลับของข้อมูลต่างๆ

ผู้วิจัยจะเก็บข้อมูลไว้เป็นความลับ และข้อมูลที่เก็บรวบรวมมาได้ทั้งหมดจะเปิดเผยเฉพาะในรูปที่เป็นสรุปผลการวิจัย ทั้งนี้ด้วยเหตุผลทางวิชาการเท่านั้น และผู้ที่จะสามารถรับรู้ข้อมูลเหล่านี้ นอกจากผู้วิจัยและอาจารย์ที่ปรึกษาแล้วต้องได้รับความยินยอมจากผู้เข้าร่วมการวิจัยก่อน

สิทธิในการถอนตัวออกจากโครงการวิจัย

ในการเข้าร่วมการวิจัยครั้งนี้จะเป็นไปตามความสมัครใจของท่าน โดยที่ท่านสามารถยกเลิกการเข้าร่วมโครงการวิจัยนี้ได้ตลอดเวลา ซึ่งจะไม่มีผลกระทบใดๆต่อตัวท่านทั้งสิ้น

กรณีมีเหตุผลจำเป็นหรือมีปัญหาข้อสงสัยกรุณาติดต่อผู้วิจัย

นางสาวผกาวดี พรหมนุช
โรงพยาบาลระนอง
อำเภอระนอง
จังหวัดระนอง
โทรศัพท์ 077-812630-3 , 01-8917376
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PARTIPANTS' RIGHT PROTECTION FORM
แบบพิทักษ์สิทธิของผู้เข้าร่วมการวิจัย

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ดิฉัน ผกาวดี พรหมนุช เป็นพยาบาลวิชาชีพ ประจำโรงพยาบาลระนอง อำเภอเมือง จังหวัดระนอง ขณะนี้กำลังศึกษาในระดับปริญญาโท ที่คณะแพทย์ศาสตร์ โรงพยาบาลรามาธิบดี สาขาการพยาบาลสุขภาพจิตและจิตเวช มหาวิทยาลัยมหิดล และกำลังศึกษาเรื่อง ปัจจัยที่มีอิทธิพลต่อความตั้งใจที่จะสูบบุหรี่ของนักเรียนมัธยมศึกษาตอนต้น

ดิฉันจึงใคร่ขอเชิญนักเรียนเป็นผู้ให้ข้อมูลในการศึกษาครั้งนี้ เนื่องจากนักเรียนอยู่ในช่วงวัยรุ่น ถ้านักเรียนยินดีที่จะให้ข้อมูล นักเรียนจะเป็นผู้หนึ่งในจำนวน 318 คน ที่ได้รับเชิญในการศึกษาครั้งนี้

ถ้านักเรียนยินดีที่จะให้ข้อมูล ดิฉันขอความกรุณาให้นักเรียนตอบแบบสอบถามจำนวน 1 ชุด ซึ่งประกอบด้วย 5 ส่วน คือ 1) แบบสอบถามข้อมูลส่วนบุคคล 2) แบบสอบถามทัศนคติต่อการสูบบุหรี่ 3) แบบสอบถามบรรทัดฐาน 4) แบบสอบถามการรับรู้ความสามารถในการควบคุมพฤติกรรม 5) แบบสอบถามความตั้งใจที่จะสูบบุหรี่ โดยจะเวลาตอบทั้งหมดประมาณ 35 นาที ข้อมูลที่นักเรียนได้ให้นี้จะเป็นประโยชน์ในการจัดบริการเพื่อการดูแลกลุ่มวัยรุ่นต่อไป

ข้อมูลทั้งหมดที่ได้จากนักเรียนจะเก็บเป็นความลับ โดยจะรายงานผลการศึกษาในภาพรวมของนักเรียนผู้ให้ข้อมูลทุกท่าน ถ้านักเรียนมีข้อสงสัยใดๆ นักเรียนสามารถสอบถาม ดิฉันได้ตลอดเวลา หากนักเรียนรู้สึกไม่สะดวกใจ หรือมีข้อขัดข้องใดๆ นักเรียนสามารถยุติการตอบแบบสอบถามได้ทันที การยุติการตอบแบบสอบถามจะไม่มีผลกระทบใดๆต่อตัวนักเรียนทั้งสิ้น

ผกาวดี พรหมนุช
(นักศึกษาหลักสูตรพยาบาลศาสตร์มหาบัณฑิต มหาวิทยาลัยมหิดล)

.....

<u>สำหรับผู้ร่วมวิจัย:</u>

ข้าพเจ้าทราบรายละเอียดเกี่ยวกับการให้ข้อมูลและสิทธิในการให้ข้อมูลข้างต้นแล้ว มีความเข้าใจและสมัครใจที่จะให้ข้อมูลเพื่อเป็นประโยชน์ต่อการศึกษาครั้งนี้

.....
(ลายมือชื่อผู้เข้าร่วมในการวิจัย)
วันที่.....เดือน..... พ.ศ.....

No. 163/2005

Documentary Proof of Ethical Clearance
The Committee on Human Rights Related to Human Experimentation
Mahidol University, Bangkok

Title of Project: Factors Influence Intention of Smoking in Middle School in Ranong Province (Thesis for Master Degree)

Principle Investigator: Miss Pakawadee Promnuch

Name of Institution: Faculty of Medicine Ramathibodi Hospital

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman: .....
(Professor Dr.Srisin Khusmith)

Signature of Head of the Institute: .....
(Professor Dr.Pornchai Matangkasombut)

Date of Approval: 20 DEC 2005

Date of Expiration: 19 DEC 2006

APPENDIX B

แบบสอบถามปัจจัยที่มีอิทธิพลต่อความตั้งใจที่จะสูบบุหรี่ของนักเรียนมัธยมศึกษาตอนต้น

ส่วนที่ 1. ข้อมูลส่วนบุคคล

คำชี้แจง ให้ท่านทำเครื่องหมาย [X] ลงในข้อความหรือเติมคำตอบในช่องว่างที่กำหนดให้และโปรดตอบคำถามที่ตรงกับความจริงของท่านมากที่สุด

1.เพศ

ก. ชาย

ข. หญิง

2.ปัจจุบันท่านอายุ (.....) ปี(นับเต็มปี)

-
-
-
-

8.ปัจจุบันนักเรียนมีเพื่อนสนิทที่สูบบุหรี่จำนวน.....คน

9.ในช่วง 30 วันที่ผ่านมา นักเรียนสูบบุหรี่กี่มวน

ก. ท่านไม่ได้สูบบุหรี่ ในช่วง 30 วันที่ผ่านมา

ข. สูบจำนวนเฉลี่ย.....มวน/วัน

10.ในช่วง 30 วันที่ผ่านมา ท่านสูบบุหรี่เป็นเวลากี่วัน

ก. ท่านไม่ได้สูบบุหรี่ ในช่วง 30 วันที่ผ่านมา

ข. สูบบุหรี่เฉลี่ย.....วัน/เดือน

ค. สูบบุหรี่ทุกวัน

ส่วนที่ 2. แบบวัดทัศนคติต่อการสูบบุหรี่

คำชี้แจง โปรดพิจารณาเขียนเครื่องหมาย [X] ลงบนตัวเลขเพียงตัวเลขเดียวเท่านั้น ขอให้นักเรียนตอบให้ตรงกับความรู้สึกของนักเรียนมากที่สุดเพียงเครื่องหมายเดียวในแต่ละข้อ และโปรดตอบทุกข้อ

ข้อที่	*ข้อความ*		*มาก*	*น้อย*	*ไม่ใช่ทั้ง 2 อย่าง*	*น้อย*	*มาก*	
	สำหรับฉัน การสูบบุหรี่เป็นสิ่งที่...							
1.		**เลว**	**1**	**2**	**3**	**4**	**5**	**ดี**
2.		**เป็นโทษ**	**1**	**2**	**3**	**4**	**5**	**เป็นประโยชน์**
.								
•								
7.		**ทำให้ดูน่าเกลียด**	**1**	**2**	**3**	**4**	**5**	**ทำให้ดูดี**

ส่วนที่ 3.แบบสอบถามบรรทัดฐาน ประกอบด้วย คำชี้แจง โปรดพิจารณาเขียนเครื่องหมาย [X] ลงบนตัวเลขเพียงตัวเลขเดียวเท่านั้น ขอให้นักเรียนตอบให้ตรงกับความรู้สึกของนักเรียนมากที่สุดเพียงเครื่องหมายเดียวในแต่ละข้อ และโปรดตอบทุกข้อ

1.	**ถ้าฉันสูบบุหรี่ คนส่วนใหญ่ที่มีความสำคัญต่อฉัน น่าจะ**	**1 ยอมรับไม่ได้อย่างมาก**	**2 ยอมรับไม่ได้**	**3 ไม่แน่ใจ**	**4 ยอมรับได้**	**5 ยอมรับได้อย่างมาก**
2.	**ฉันรู้สึกถูกกดดันจากคนรอบข้าง ให้ฉันสูบบุหรี่**	**1 ไม่เห็นด้วยอย่างยิ่ง**	**2 ไม่เห็นด้วย**	**3 ไม่แน่ใจ**	**4 เห็นด้วย**	**5 เห็นด้วยอย่างยิ่ง**
3.	**ถ้าฉันสูบบุหรี่ คนส่วนใหญ่ที่มีความสำคัญต่อฉัน น่าจะคิดว่า**	**1 ฉันไม่ควรทำอย่างมาก**	**2 ฉันไม่ควรทำ**	**3 ไม่แน่ใจ**	**4 ฉันควรทำ**	**5 ฉันควรทำอย่างมาก**

ส่วนที่ 4.แบบสอบถามการรับรู้ความสามารถในการควบคุม ประกอบด้วย แบบสอบถามจำนวน 3 ส่วน ได้แก่

<u>คำชี้แจง</u> โปรดพิจารณาเขียนเครื่องหมาย [X] ลงบนตัวเลขเพียงตัวเลขเดียวเท่านั้น ขอให้นักเรียนตอบให้ตรงกับความรู้สึกของนักเรียนมากที่สุดเพียงเครื่องหมายเดียวในแต่ละข้อ และโปรดตอบทุกข้อ

1.	**ท่านคิดว่า ท่านสามารถควบคุมการที่จะสูบหรือไม่สูบบุหรี่ได้มากน้อยเพียงใด**	**1 ควบคุมไม่ได้อย่างมาก**	**2 ควบคุมไม่ได้**	**3 ไม่แน่ใจ**	**4 ควบคุมได้**	**5 ควบคุมได้อย่างมาก**
2.	**เป็นเรื่องง่ายสำหรับท่านที่จะ <u>ไม่</u> สูบบุหรี่ในช่วง 1 เดือนข้างหน้านับจากเวลานี้**	**1 ไม่น่าจะเป็นจริงอย่างยิ่ง**	**2 ไม่น่าจะเป็นจริง**	**3 ไม่แน่ใจ**	**4 น่าจะเป็นจริง**	**5 น่าจะเป็นจริงอย่างยิ่ง**
3.	**ท่านคิดว่า เป็นเรื่องง่ายหรือยากสำหรับท่านที่จะไม่สูบบุหรี่ในช่วง 1 เดือนข้างหน้านับจากเวลานี้**	**1 ง่ายมาก**	**2 ง่าย**	**3 ไม่แน่ใจ**	**4 ยาก**	**5 ยากมาก**

ส่วนที่ 5.แบบสอบถามความตั้งใจที่จะสูบบุหรี่

<u>คำชี้แจง</u> โปรดพิจารณาเขียนเครื่องหมาย [X] ลงบนตัวเลขเพียงตัวเลขเดียวเท่านั้น ขอให้นักเรียนตอบให้ตรงกับความรู้สึกของนักเรียนมากที่สุดเพียงเครื่องหมายเดียวในแต่ละข้อ และโปรดตอบทุกข้อ

1.	**ฉันคาดว่าจะสูบบุหรี่ในอีก 1 เดือนข้างหน้า**	**1 เป็นไปไม่ได้อย่างยิ่ง**	**2 เป็นไปไม่ได้**	**3 ไม่แน่ใจ**	**4 เป็นไปได้**	**5 เป็นไปได้อย่างยิ่ง**
2.	**ฉันต้องการจะสูบบุหรี่ในอีก 1 เดือนข้างหน้า**	**1 เป็นไปไม่ได้อย่างยิ่ง**	**2 เป็นไปไม่ได้**	**3 ไม่แน่ใจ**	**4 เป็นไปได้**	**5 เป็นไปได้อย่างยิ่ง**
3.	**ฉันตั้งใจที่จะสูบบุหรี่ในอีก 1 เดือนข้างหน้า**	**1 เป็นไปไม่ได้อย่างยิ่ง**	**2 เป็นไปไม่ได้**	**3 ไม่แน่ใจ**	**4 เป็นไปได้**	**5 เป็นไปได้อย่างยิ่ง**

APPENDIX C

Test Assumptions of Pearson Product Moment Correlation

The assumptions related to Pearson Product Moment Correlation Coefficient were examined including:

1. Normal distribution

"If the relationships are linear and the dependent variable is normally distributed for each value of the independent variable, then the distribution of the residuals should be approximately normal. This can be assessed by using a histogram showed the normal curve of the standard residuals. The result presented that Histogram of standard residual wasn't normal distribution (Figure 1, see Appendix E)

2. Homoscedasticity

Homoscedasticity was tested by plotting the residuals against the predicted values and against the independent variables. For the assumption to be supported, "when the standardized predicted values are plotted against observe value, the data would form a straight line from the lower-left corner to the upper-right corner" (Munro, 2001:273). The result presented relationship between residuals against the predicted values and against the independent variables. The plotted values fall close to zero. (Figure3,see Appendix) And the standardized predicted value was plotted against observe value, the data would from a straight line from the lower-left corner to the upper-right corner. They should tend to form an S curve (Figure 4, see Appendix E). In this analysis, variances of autocorrelation prediction factors were heteroscedasticity in independent variable. Therefore, this assumption wasn't met.

3. Linear relationships

The relationship between X and Y must be linear; when the true scores for each individual are graphed, they should tend to form a straight line. The points will not all fall on this line, but they should be scattered closely around it (Munro, 2001:266).In this analysis, this assumption was met (Figure 6-13, see Appendix E).

4.The sample must be representative of the population .The sample selection; samples were selected using multiple stage sampling.

APPENDIX D

Test Assumptions of Multiple Regression Analysis

The assumptions related to Multiple Regression Analysis were examined including:

1. Assumption concerning about residual(e):

1.1 Normal distribution

"If the relationships are linear and the dependent variable is normally distributed for each value of the independent variable, then the distribution of the residuals should be approximately normal. This can be assessed by using a histogram showed the normal curve of the standard residuals. The result presented that Histogram of standard residual wasn't normal distribution (Figure 1, see Appendix E)

1.2 Homoscedasticity

Homoscedasticity was tested by plotting the residuals against the predicted values and against the independent variables. For the assumption to be supported, "when the standardized predicted values are plotted against observe value, the data would form a straight line from the lower-left corner to the upper-right corner" (Munro, 2001:273). The result presented relationship between residuals against the predicted values and against the independent variables. The plotted values fall close to zero. (Figure3,see Appendix) And the standardized predicted value was plotted against observe value, the data would from a straight line from the lower-left corner to the upper-right corner. They should tend to form an S curve (Figure 4, see Appendix E). In this analysis, variances of autocorrelation prediction factors were heteroscedasticity in independent variable. Therefore, this assumption wasn't met.

1.3 Autocorrelation

The autocorrelations was examined using Dubin-Watson Statistical testing. Thus, Dubin-Watson value approaching 2 indicate the independence between residual (Kanlaya Vanichbuncha, B.E.2546; 340). The result presented that Dubin-Watson value was 1.885, indicating no autocorrelation problem.

2. Multicollinearity

To detect for multicollinearity, the correlation matrix was used to check for large correlation coefficients greater than .80 or .90 between independent variables (Munro, 1977).In addition, the tolerance diagnostic procedure was performed. Tolerance is “the proportion of the variance in an independent variable that is not accounted for by the other independent variable” (Munro, 1977:268).Tolerance value of zero indicates perfect collinearity. Moreover, the “variance inflating factor” (VIFs) was used to detect multicollinearity problem. The VIFs is the reciprocal of tolerance (Munro, 1977).A small value of VIFs indicates a small problem of collinearity. Stevens (1996) suggests that if VIF exceeds 10, it could be concerned. In this analysis, no correlation coefficient between independent variables was greater than .80. Also tolerance values of dependent variables ranged from .822 to .975 and VIF values ranged form .786 to .273. Therefore, multicollinearity among the predictors was not a problem for the study (As table5).

3. Linear relationships

The relationship between X and Y must be linear; when the true scores for each individual are graphed, they should tend to form a straight line. The points will not all fall on this line, but they should be scattered closely around it (Munro, 2001:266).In this analysis, this assumption was met (Figure 6-13, see Appendix E).

APPENDIX E

Test Assumptions of Multiple Regression Analysis

This plot showed that the assumptions the Multiple Regression Analysis were not met.

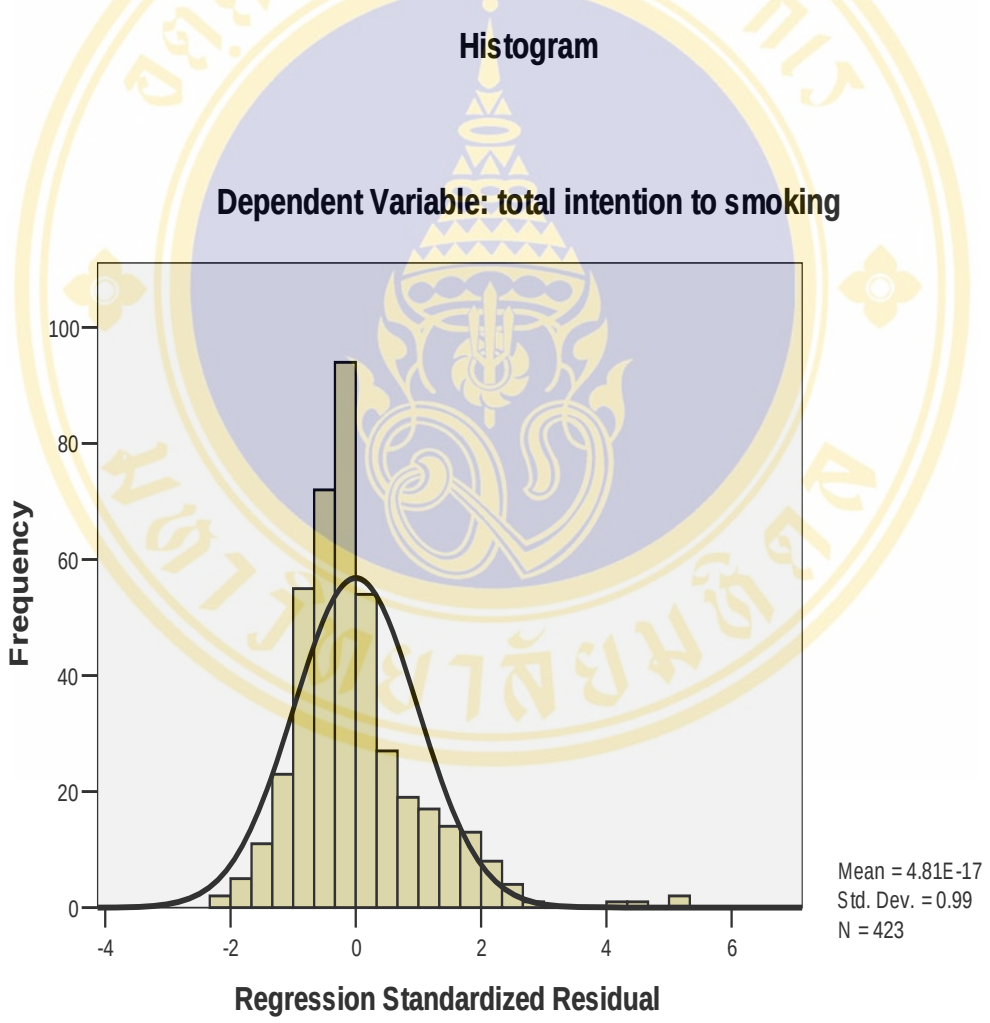

Figure 3: Histogram of Residual.

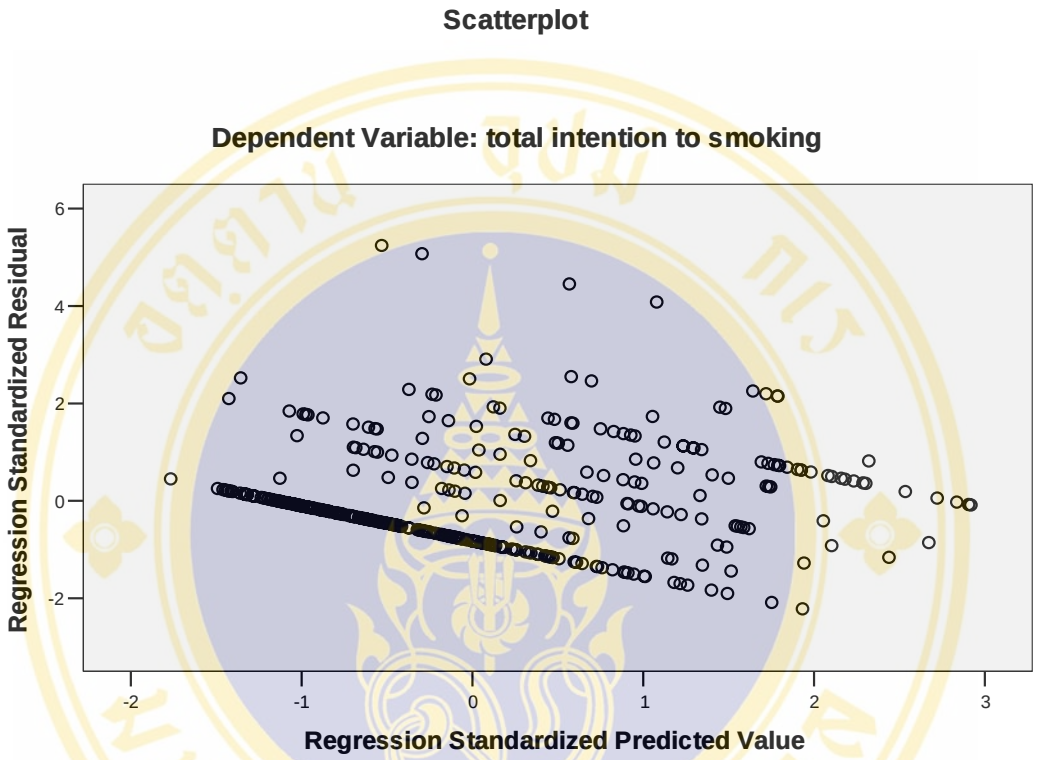

Figure 4: Plot of Residuals Against the predicted Values and against the Independent variables.

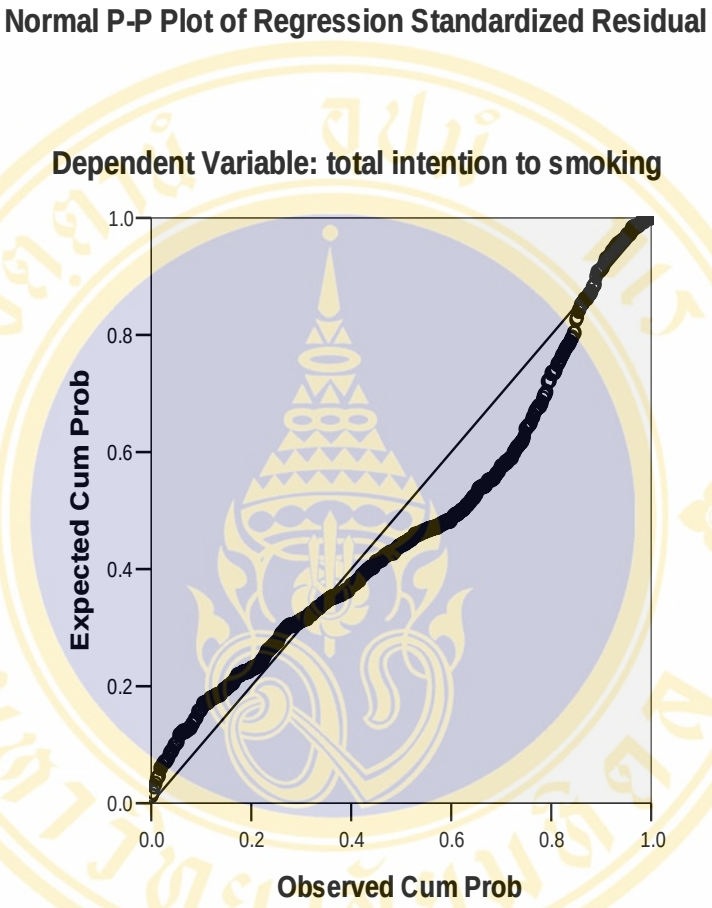

Figure 5: Normal probability plots

Table 7: the One-Sample Kolmogorov-Sminov to test the Assumption of Multiple Regression Analysis

One-Sample Kolmogorov-Smirnov Test

		age	grade	total family member's smoking	total friend's smoking	total attitude toward smoking	total subjective norm	total perceived behavioral control	total intention to smoking
N		423	423	423	423	423	423	423	423
Normal Parameters [a,b]	Mean	13.87	2.6728	.80	3.18	9.98	4.56	11.79	4.74
	Std. Deviation	.963	.61984	.686	5.797	4.253	1.832	2.972	2.587
Most Extreme Differences	Absolute	.189	.079	.286	.292	.242	.246	.183	.361
	Positive	.189	.079	.277	.252	.222	.246	.140	.361
	Negative	-.182	-.062	-.286	-.292	-.242	-.198	-.183	-.251
Kolmogorov-Smirnov Z		3.889	1.617	5.873	6.001	4.971	5.052	3.760	7.433
Asymp. Sig. (2-tailed)		.000	.011	.000	.000	.000	.000	.000	.000

a. Test distribution is Normal.

b. Calculated from data.

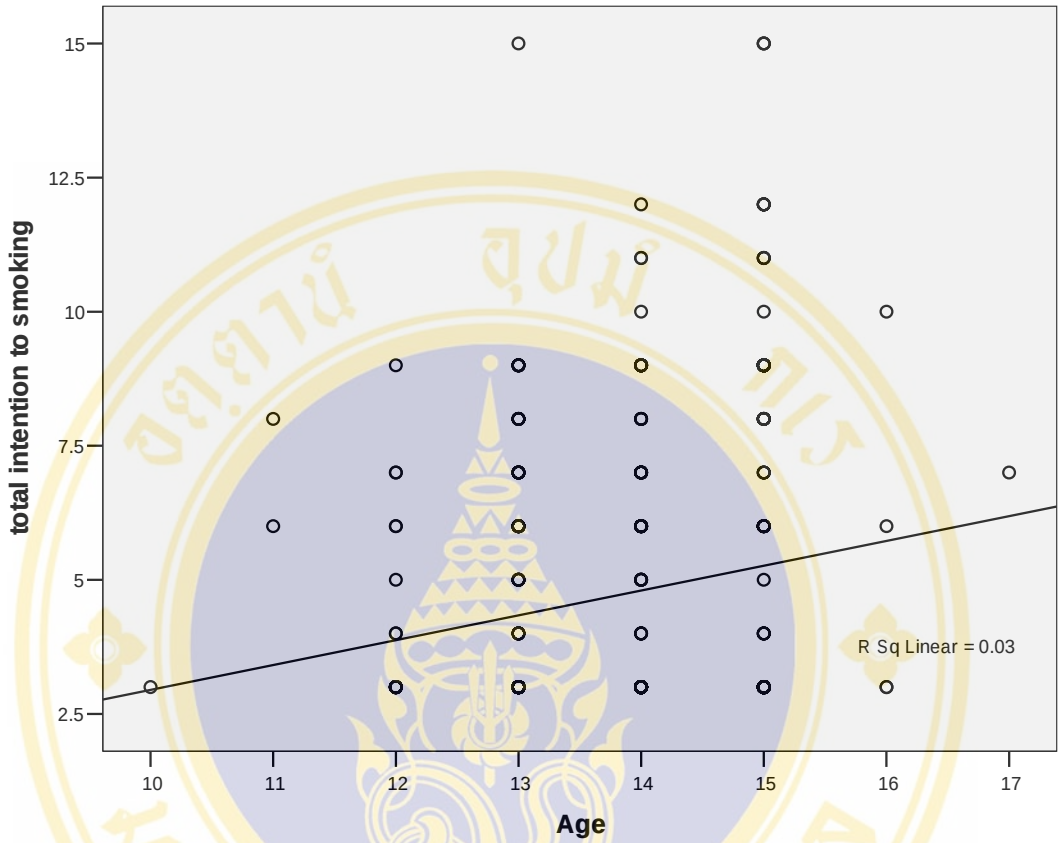

Figure 6: Linearity between age and intention to smoking

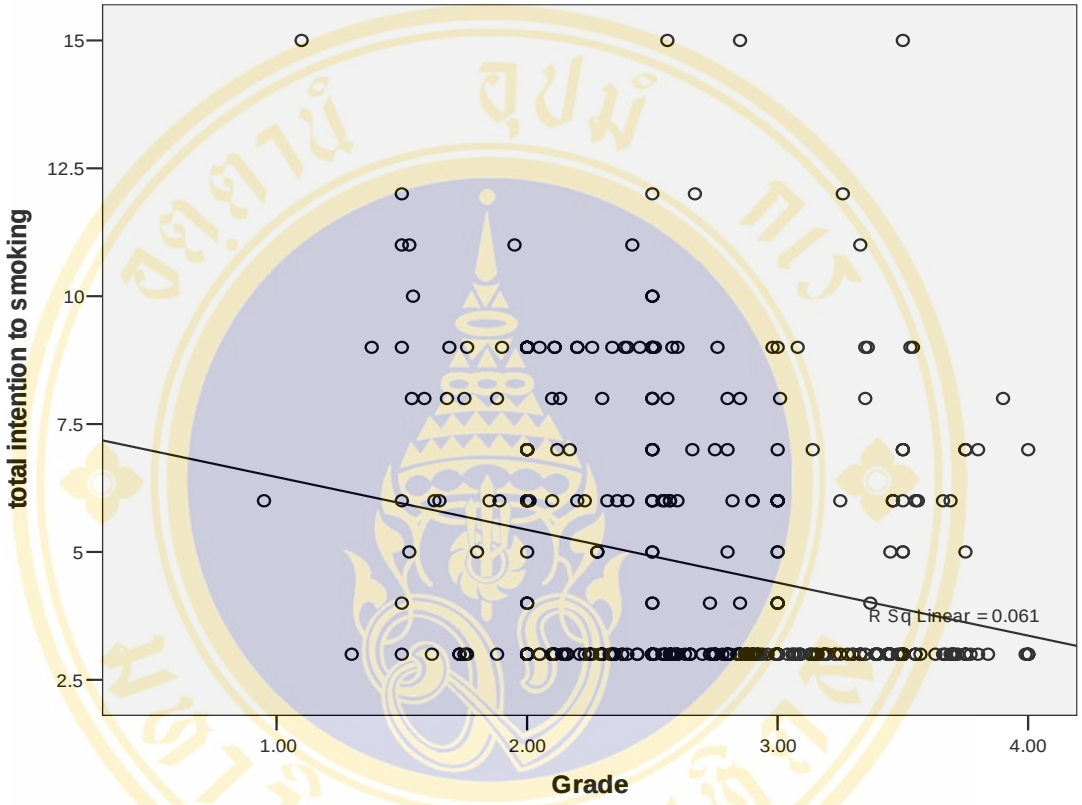

Figure 7: Linearity between grade and intention to smoking

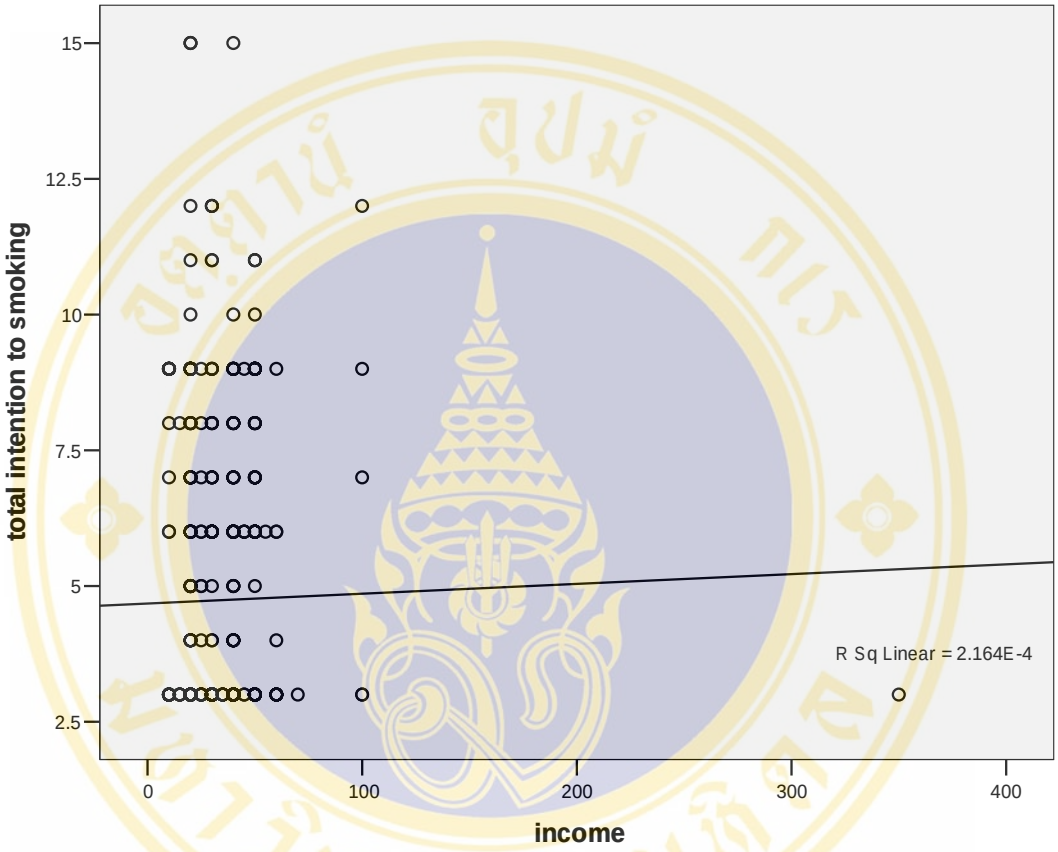

Figure 8: Linearity between income and intention to smoking

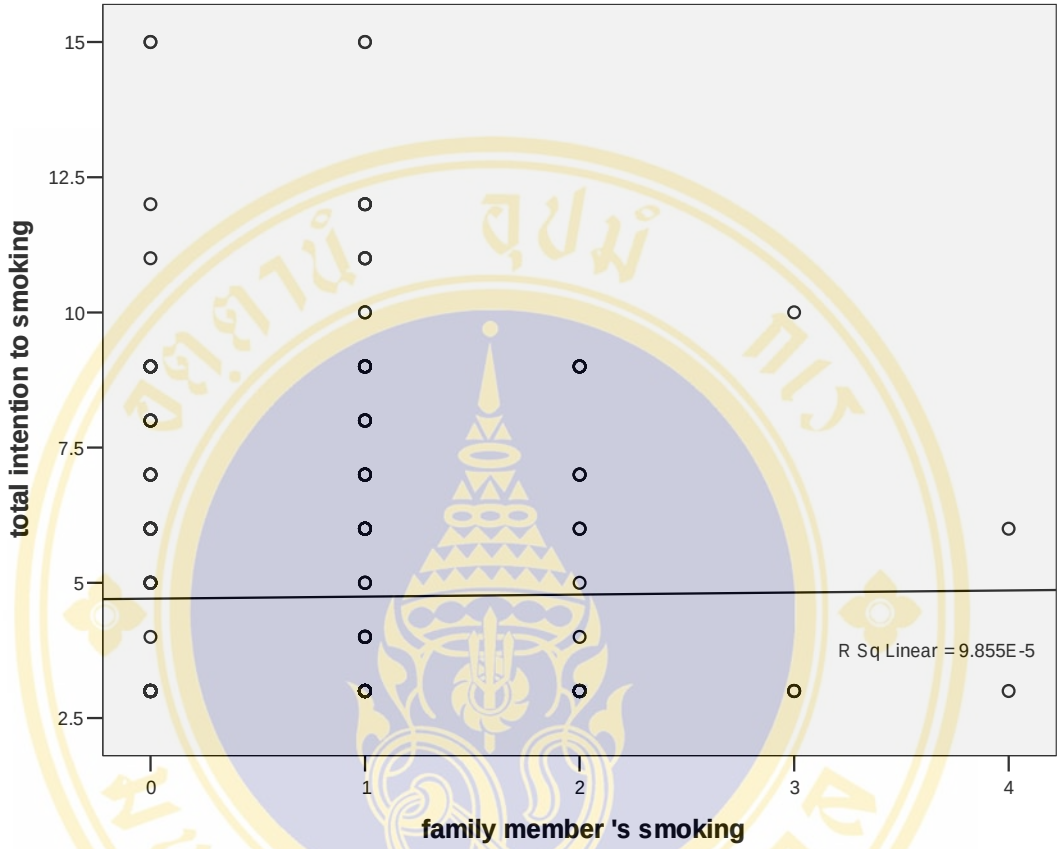

Figure 9: Linearity between family's member smoking and intention to smoking

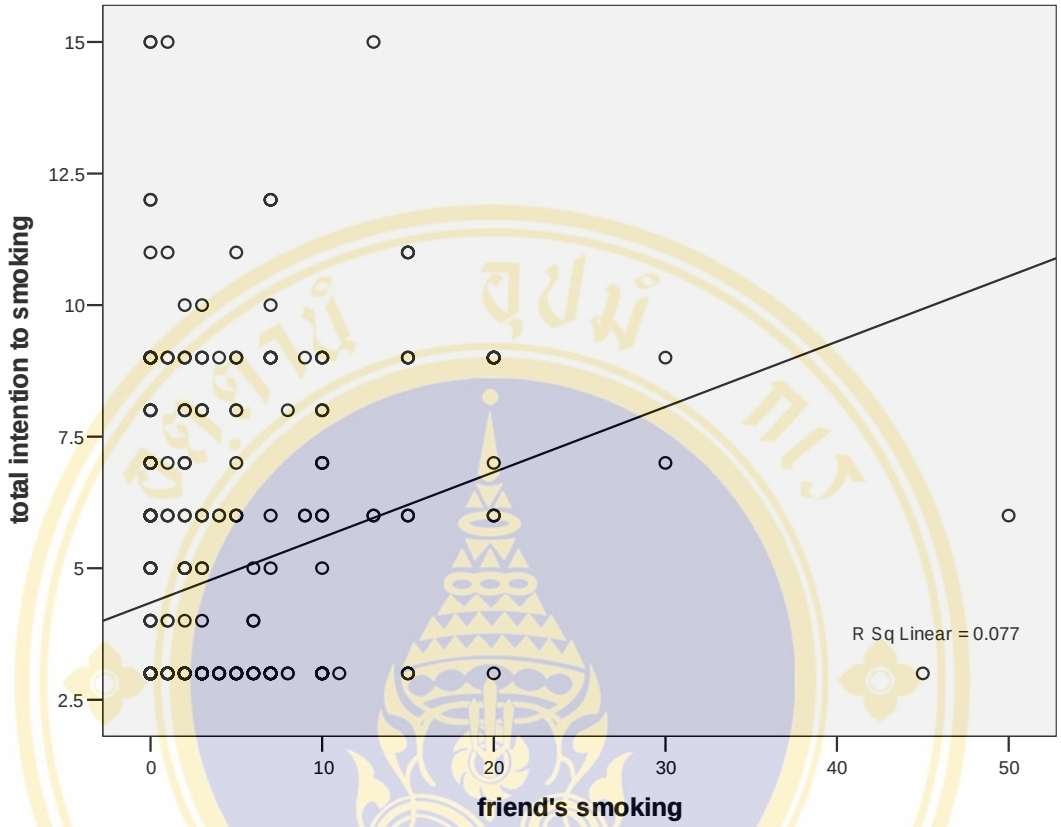

Figure 10: Linearity between friend's smoking and intention to smoking

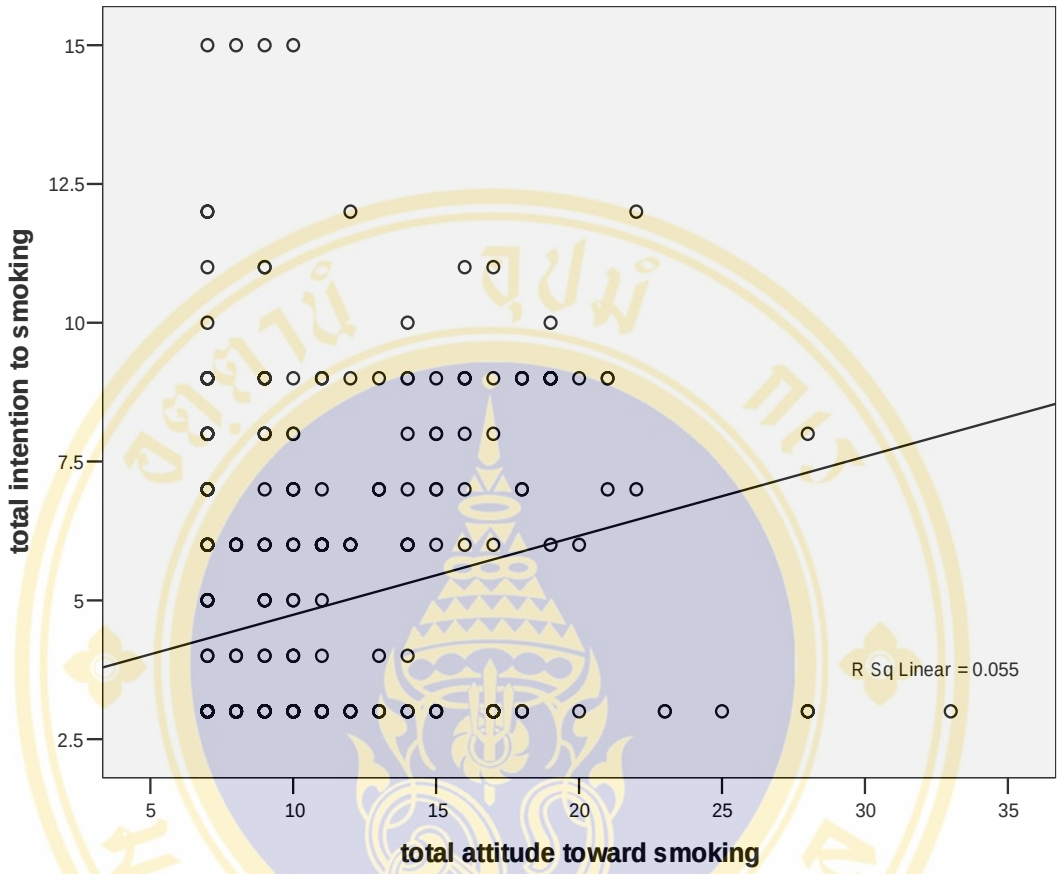

Figure 11: Linearity between attitude toward behavior and intention to smoking

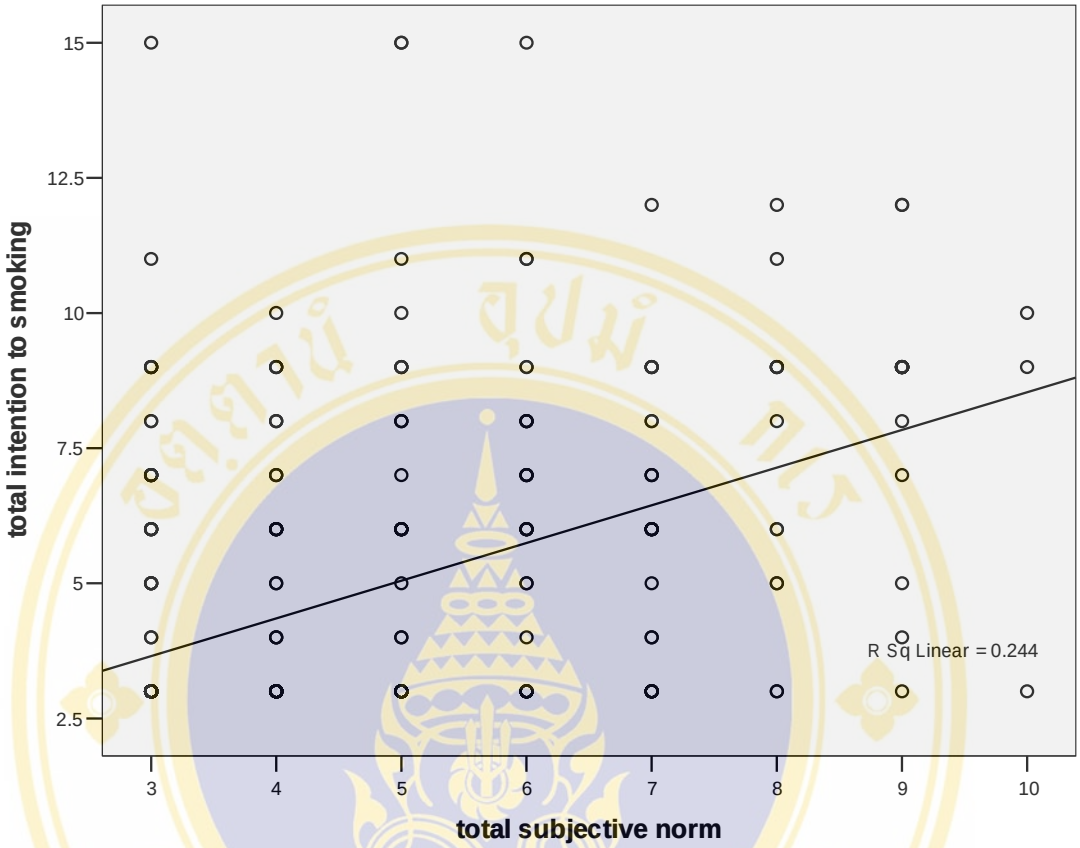

Figure 12: Linearity between subjective norm and intention to smoking

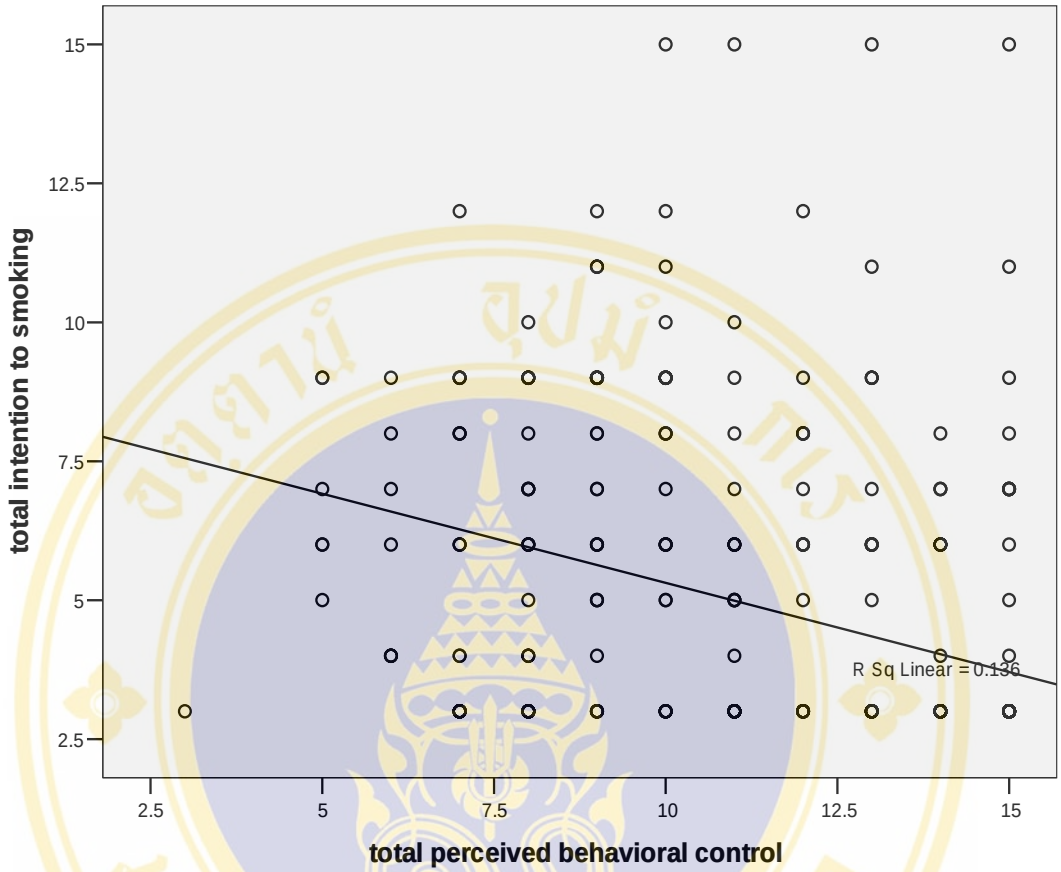

Figure13: Linearity between perceived behavioral control and intention to smoking

APPENDIX F

Test Assumptions of Logistic Regression Analysis

The assumptions related to Logistic Regression Analysis were examined including:

1. It is assumed that the random variable of interest, group member status, for example, is a dichotomous variable taking the value 1 with probability P_1 and the value 0 with probability P_0= 1- P_1. In this study, the sample group was divided into two groups. Having intention to smoke within 1 month group was coded as one. Having no intention to smoke within 1 month group was coded as zero.

2. The outcomes must be statistically independent. In other word, a single case can be represented in the data set only once. The independent condition is violate when more than one outcome is recorded for an individual, for example, when presence of a disease is recorded before and after a person receives medical treatment. If the outcomes are not independent, standard errors, hypothesis test, and confidence intervals may be inaccurate. In this analysis, the sample can respond the questionnaire once time.

3. The variables of this study applied from the theory of planned behavior including attitude toward smoking, subjective norm, perceived behavioral control and added the demographic characteristic factors .All variable used to predict intention smoking within 1 month.

4. The categories under analysis must be mutually exclusive and collectively exhaustive. In other words, a case cannot be in more than one category at time, and every case must be a member of one of the categories under analysis. In this study, the sample could select only one answer in the questionnaire of intention to smoking within 1 month.

5. To test hypotheses involving the logistic regression coefficients, larger samples are required than for linear regression analysis. This is because standard errors for maximum likelihood coefficients are large-sample estimates. For small samples, hypothesis tests may be inaccurate. For most applications, a minimum of 50

cases per predictor variable is sufficient. This study had 8 predictors. The sample size should be 400 and samples in this study were 423.

BIOGRAPHY

NAME	Miss.Pakawadeed Promnuch
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