TOBACCO USE AND FACTORS RELATED TOBACCO USE AMONG MIDDLE SCHOOL STUDENTS IN CHINA BASED ON ECOLOGICAL MODEL

YUE QING

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR
THE DEGREE OF DOCTOR OF PUBLIC HEALTH
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2011

Thesis
entitled

TOBACCO USE AND FACTORS RELATED TOBACCO USE AMONG MIDDLE SCHOOL STUDENTS IN CHINA BASED ON ECOLOGICAL MODEL

……..……
Mr. Yue Qing
Candidate

……..……
Asst. Prof. Lakkhana Termsirikulchai, Ph.D.
Major advisor

……..……..
Asst. Prof. Paranee Vatanasomboon, Ph.D.
Co-advisor

……..……..
Assoc. Prof. Dusit Sujirarat, M.Sc.
Co-advisor

……
Asst. Prof. Chanuantong Tanasugarn, Dr.P.H.
Co-advisor

……..….
Asst. Prof. Mondha Kengganpanich, Ph.D.
Co-advisor

……
Prof. Banchong Mahaisavariya, M.D., Dip Thai Board of Orthopedics
Dean
Faculty of Graduate Studies
Mahidol University

……..……
Assoc. Prof. Witaya Yoosook, D.Eng. (Process Engineering)
Program Director
Doctor of Public Health
Faculty of Public Health
Mahidol University

Thesis
entitled

TOBACCO USE AND FACTORS RELATED TOBACCO USE AMONG MIDDLE SCHOOL STUDENTS IN CHINA BASED ON ECOLOGICAL MODEL

was submitted to the Faculty of Graduates Studies, Mahidol University
for the degree of Doctor of Public Health
on
May 11, 2011

..
Mr. Yue Qing
Candidate

..
Mr. Chai Kittiyapichartkul
M.D.,Dip Thai Board
Chair

.. Asst. Prof. Paranee Vatanasomboon, Ph.D. Member	.. Asst. Prof. Lakkhana Termsirikulchai, Ph.D. Member
.. Asst. Prof. Mondha Kengganpanich, Ph.D. Member	.. Asst. Prof. Chanuantong Tanasugarn, Dr.P.H. Member
.. Assoc. Prof. Dusit Sujirarat, M.Sc. Member	.. Assoc. Prof. Somchart Torugsa, M.D., M.P.H. Member
.. Prof. Banchong Mahaisavariya, M.D., Dip Thai Board of Orthopedics Dean Faculty of Graduate Studies Mahidol University	.. Assoc. Prof. Phitaya Charupoonphol, M.D., Dip Thai Board of Epidemiology Dean Faculty of Public Health Mahidol University

ACKNOWLEDGEMENTS

I would like to respectfully express my gratitude and sincere appreciation for the guidance, supervision, constructive discussion, kindness and consistent encouragement throughout the study of Dr. Lakkhana Termsirikulchai, my Major-advisor.

I am very grateful to my co-advisor, Dr. Poranee Vatanasomboon, Associate professor Dusit Sujirarat, Dr. Chanuantong Tanasugarn, and Mondha Kengganpanich for their valuable suggestion, criticisms and the correction of this thesis.

I am very grateful to Dr. Kwanjai Amnatsatsue and Miss Chirayus Sutthinuntakan for their kindness and help in my study.

I am also very grateful to all lecturers and staff members of the Department of Health Education and Behavioral Sciences for valuable experiences and support.

Last but not least, I would like to thank my family for their loving support during this long study.

Yue Qing

TOBACCO USE AND FACTORS RELATED TOBACCO USE AMONG MIDDLE SCHOOL STUDENTS IN CHINA BASED ON ECOL0GICAL MODEL

YUE QING 4838751 HHPH/D

Dr.P.H.

THESIS ADVISORY COMMITTE: LAKKHANA TERMSIRIKULCHAI, Ph.D., PARANEE VATANASOMBOON, Ph.D., DUSIT SUJIRARAT, M.Sc., CHANUANTONG TANASUGARN, Dr.P.H., MONDHA KENGGANPANICH, Ph.D.

ABSTRACT

The purpose of this cross-sectional study was to identify tobacco use and ecological factors related to tobacco use among middle school students. 3,231 students 12-17 years old were selected by three stage stratified cluster sampling. The study was conducted during December 2009. The ecological model was applied to formulate the conceptual framework of the study. The data were collected by self-administered questionnaires, interviews and observation. Chi-square, multinomial logistic regression, and structural equation modeling were used for the data analysis.

Results revealed that the prevalence of current tobacco use was 10.6%, 16.2% among the males and 4.3% among the females respectively; the prevalence of ever having used tobacco was 19.7%, 25.3% among males and 13.4% among females respectively. The factors that had a significant statistical association with tobacco use were intrapersonal level factors: gender, age, knowledge, attitude, self esteem, life skill and self-concept; interpersonal level factors: parental smoking, parental attitude, friends smoking, friends attitude, peer pressure, family rules; organizational level factors: tobacco-free school environment, tobacco-free school policies and systems, anti-smoking campaign; community level factors: community tobacco control activity, minor's access and availability of cigarettes; public policy: tobacco control policy. A hypothesized model of the quantity of smoking cigarettes among secondary school students smokers was adequately fitted to the data.

These findings suggest that there are multiple levels of influence on tobacco use among middle school students. The intervention of tobacco use should focus on five levels: intrapersonal level, interpersonal level, organizational level, community level, and public policy.

KEY WORDS: TOBACCO USE/ ECOLOGICAL MODEL/ MIDDLE SCHOOL STUDENTS

183 pages

CONTENTS

CONTENTS (cont.)

CONTENTS (cont.)

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 Background and significance of the problem

Tobacco use is the important risk behavior and the most significant cause of public health problem. Tobacco use is a risk factor for six of the eight leading causes of death in the world (WHO 2008:9). The World Health Organization attributes approximately 5 million deaths a year to tobacco. The number is expected to exceed 8 million deaths by 2020, with approximately 70% of these deaths occurring in developing countries (Warren, Riley et al. 2000:868-76). Unless urgent action is taken, the number of smokers worldwide will continue to increase (Guindon GE, et al. 2003). The WHO projects that between 2000 and 2025 the number of smokers will rise from approximately 1.2 billion to more than 1.7 billion and the annual number of deaths from smoking will almost double in 20 years. Tobacco kills more than AIDS, legal drugs, illegal drugs, road accidents, murder and suicide combined (WHO 2004:6-7). Tobacco will kill over 175 million people worldwide between 2008 and 2030 (WHO 2008:17).

Most people begin using tobacco before the age of 18 years (U.S. Department of Health and Human Services 1994; WHO 2004:8). Nicotine is highly addictive. Once addicted, it is very hard to quit. The younger a person is when he or she initiates smoking, the more likely he or she will become a regular smoker. The more heavily a person smokes, the graver the harm that will result, and the lower the chance are of that person successfully quitting (Ministry of Health PRC 2008). The Global Youth Tobacco Survey shows that a disturbingly high number of school

children between the age of 13 and 15 are currently using or have tried tobacco. Recent trends indicate an earlier age of initiation and rising smoking prevalence rates among children and adolescents. If these patterns continue, tobacco use will result in the deaths of 250 million of the people who are children and adolescents today, many of them in the developing countries (Peto R et al. 1994: A101–103; Warren, Riley et al. 2000:868-76; Warren, Jones et al. 2008:1-28).

China is the world's biggest tobacco producer and consumer. Tobacco production has continued to grow along with the number of young people who are smoking. China has most massive smoking problem of any nation in the world. Nearly 30% of the world's smokers live in China (WHO 2004:8; WHO 2008:19). In recent years, the mortality rates of smoking-related diseases such as, lung cancer, stroke and coronary heart disease, have been rising rapidly. Addiction to lethal tobacco products has killed millions of Chinese people (Peter boyle et al. 2004: 224-25). According to the 3rd national survey on causes of death, mortality due to lung cancer alone has increased by 465% in the last three decades. Many smokers die in middle age when they would normally be most productive. Studies estimate that by 2025, deaths caused by tobacco will increase to 2 million each year, increasing to 3 million deaths per year by 2050. By the middle of the 21st century, the accumulated death toll will reach 100 million, with half of the deaths occurring in people between the ages of 35 and 69 years. At present, these people are children and youth (Ministry of Health PRC 2008).

In China, the rates of experimentation and current smoking among young people are increasing every year. It is estimated that 15 million of young people are current smokers. The age of smoking initiation is decreasing among smokers. In the survey of 2005, 66.8% of males and 68.2% of females smoked their first whole cigarette before the age of 13. Compared with the results of a 1998 survey, the percentage of people who have smoked one whole cigarette before age 13 has increased by 15% (JiCY. 2007; Ministry of Health PRC 2008). At present, 32.4% of young people have experimented with smoking, which is 44.1% among the young

males and 19.9% among the young females. The rate of smoking experimentation rises with age among both males and females. The rate rises most quickly during junior high school, and peaks among male students in the first year of senior high school. 11.5 percent of young people are current smokers. Current smoking rates are 10.9% and 2.7% among male and female junior high school students, and 28.9% and 4.9% among male and female senior high-school students, respectively. The male current smoking rate increases with age quickly. The greatest increase occurs between the third year of junior high-school and the first year of senior high-school（JiCY. 2007). A study at Hefei city, Huaibei city and Dangtu county in Anhui showed that the average smoking rate was 67.0% and 2.6% among males and females respectively. 30.4% smokers started smoking during 14 - 16 years old. The smoking rate was 42.7% among senior high school students. Compared with the results in previous survey, the smoking rate has increased (Hefei CDC. 2007)

At present, China has not a law or regulation specifically banning smoking in public places. Related stipulations appear in some provisions or detailed rules of relevant laws and regulations. Local law enactment to ban smoking in public places first began in 1993. At present, only 45.7% of cities and larger administrative regions have tobacco control regulations, while the remainders lack any regulations concerning tobacco control (Ministry of Health PRC 2007). In China, tobacco companies are free to advertise their deadly products at point of sale, through sponsored events, on billboards, online, and through extensive advertising of affiliated companies with the same names as tobacco brands. Low-end cigarette prices are subsidized by the tobacco industry in order to encourage use by low income consumers. Cigarettes are taxed through a hierarchical scheme that levies the highest taxes on the most costly brands, keeping economy cigarette prices low. More expensive cigarettes are taxed at a rate of 45% while less expensive cigarettes are taxed at rate of 30%. Taking into account both inflation and purchasing power, cigarettes have become more than twice as affordable in China since 1990. Smoking in

China is much less costly than in Thailand, Malaysia, and Singapore (Ministry of Health PRC 2007; Ministry of Health PRC 2008).

The WHO Framework Convention on Tobacco Control is a global public health treaty aimed at reducing the burden of disease and death caused by tobacco consumption. The Chinese government officially signed the WHO FCTC on November 10, 2003. The 10th People's Congress' Standing Committee of China considered and approved the Convention on August 28, 2005. The WHO FCTC officially went into effect in China in January 2006. The Chinese government has participated and pushed for the enactment of the WHO FCTC. Currently, various agencies in the State Development and Reform Commission and the Ministry of Health, which are Convention implementation coordinating bodies, are actively working on its implementation. China has committed to implementing effective measures to reduce tobacco use. These include smoke-free public places and workplaces, larger health warnings on cigarette packs, higher tobacco taxes, bans on tobacco advertising, promotions and sponsorship, and more public education about the dangers of tobacco use. Legislation and regulations are pending in China that would satisfy the country's requirements under the WHO FCTC (WHO 2008).

There are multiple influences on youth smoking. According to ecological models, the five ecological level factors: intrapersonal, interpersonal, organizational, community, and public policy level factors are associated with smoking behavior in adolescent. These factors affecting adolescent smoking behavior are likely to interact and work together. Many of the predominant theories or models of behavior focus on one dimension of health promotion, such as knowledge, attitudes, or skills. These one dimensional approaches do not necessarily result in desired behavioral change (McLeroy, Bibeau et al. 1988:351-77; Stokols 1992:6-22; Aguirre-Molina and Gorman 1996; 337-58). The ecological perspective is complex. There are numerous ecological levels and interconnected systems that influence behavior. Operating the general principles of ecological models for tobacco use is a challenging but essential step.

There are few smoking behavior studies which have been able to include ecological analysis and fewer still have been able to understand ecological levels well enough to create interventions to change them (Valente 2002:45-46). The research on tobacco smoking needs to use an ecological perspective to reflect how underlying determinants and their corresponding pathways interact. In order to deepening understanding of the complex and nested determinants that influence patterns of tobacco use among youths, the ecological model was used in this study.

Anhui province is situated in the northwest of East China. The Province covers an area of 139,600 square kilometers. The population of Anhui reached 66.76 million by the end of 2007. Anhui has 17 main cities (namely Hefei, Huaibei, Suzhou, Bozhou, Bengbu, Fuyang, Huannan, Chuzhou, Liuan, Maanshan, Chaohu, Wuhu, Xuancheng, Tongling, Chizhou, Anqing and Huangshan), 5 county-level cities and 56 counties. There are 17,240 primary schools, with 5,495,000 students, 3,264 junior high schools, with 3,217,000 students and 779 high schools, with 1,253,000 students. Anhui has not a regulation specifically banning smoking in public places cover a variety of public places. Only 9 cities in 17 main cities of Anhui have developed a rule or regulation banning on smoking in public places. Anhui has not a tobacco-surveillance system and the province-lever smoking behavior survey to monitor trends in youth tobacco smoking, find factors affecting smoking among youth and evaluate the tobacco policies. There are few studies on smoking prevalence and smoking-related knowledge, attitudes and behaviors among adolescents in some cities of Anhui in recent years. These studies findings have some limitations, especially for national and international comparison because of difference in definition and method. For example, there were differences in definition of tobacco use, survey methods, and standards of accuracy and reliability. Thus, the findings are not comparable with other tobacco smoking survey data at the global level. To address this deficiency in tobacco smoking data, Anhui need to conduct more effective tobacco use survey among youth.

Despite the high and increasing prevalence of tobacco smoking among

middle school students in China, little attention has been paid to the examination of influential factors of tobacco use, especially in Anhui province. There were some surveys about tobacco use among youth in China in recent year. However, these studies did not address some important ecological factors that may significantly correlate with tobacco use. For example, the GYTS is a school-based survey of a defined geographic site that can be a country, a province, a city, or any other geographic entity. It was conducted in the spring of 1999 in six cities and provinces of China, which did not include Anhui province. The GYTS includes questions on tobacco use, knowledge and attitudes regarding tobacco, secondhand smoke (SHS) exposure, pro- and anti-tobacco media and advertising exposure, desire for cessation, access and availability to obtain tobacco products, and having been taught in school about the harmful effects of tobacco use. The GYTS does not include many ecological factors that can prompt youth to begin using tobacco, such as some societal factors, public policies, laws and regulations. Moreover the GYTS only includes a narrow age band of 13-15 years. The cross-cultural differences also limit effectiveness of the GYTS in the international studies (Chen, Chiou et al. 2008:144).

After FCTC officially go into effect in China, China is still the world's largest tobacco producing and consuming country. China tobacco production and sales is still rapid growth. China has 130 million young people aged 13-18 years. The rate of smoking among young people is increasing every year. In recent years the tobacco policies and other ecological factors affecting youth smoking behavior have varied greatly. While the social and behavioral factors associated with tobacco use in high-income countries have been well researched and documented, comparable research in China has been limited. Identifying the smoking behavior and the factors affecting the smoking behavior among youth is particularly important in order to preventing youth smoking in China. From the information and situation presented above, the researcher is interested in study teenager tobacco use and the factors affecting teenager tobacco use using the ecological model to guide tobacco control among secondary school students in Anhui of China.

1.2 Research questions

1.2.1 What is prevalence of the tobacco use of secondary school students in Anhui?

1.2.2 What are the ecological factors that related to the tobacco use of secondary school students in Anhui?

1.2.3 What are the factors that related to amount of smoking cigarettes among student smokers during the past 30 days in secondary school of Anhui?

1.3 Research Objectives

1.3.1 To identify the tobacco use of secondary school students in Anhui;

1.3.2 To identify the relationship between tobacco use of secondary school students in Anhui and ecological factors: intrapersonal factors, interpersonal factors, organizational factors, community factors, societal factors and public policy;

1.3.3 To identify the factors that related to amount of smoking cigarettes among student smokers during the past 30 days.

1.4 Scope of the research

This study focused on ecological factors of tobacco use among students, in the secondary schools of Anhui Province, China. The research factors and variables

derived from the ecological model. The factors were grouped into five levels: intrapersonal level, interpersonal level, organizational level, community level, and public policy. In each level, some selected variables that were expected to affect the dependent variable, tobacco use, were studied.

1.5 Research Hypothesis

1.5.1 There are multiple influences on students' tobacco use, including factors at intrapersonal level, interpersonal level, organizational level, community level, and public policy.

1.5.2 The ecological factors have direct and indirect influences on amount of tobacco use..

1.6 Research variables

1.6.1 Independent variables

1.6.1.1 Intrapersonal level:

1.6.1.1.1 Age

1.6.1.1.2 Gender

1.6.1.1.3 Academic performance

1.6.1.1.4 Knowledge

1.6.1.1.5 Attitude

1.6.1.1.6 Life skills

1.6.1.1.7 Self-esteem

1.6.1.1.8 Self-concept

1.6.1.1.9 General characteristics

1.6.1.2 Interpersonal level:

1.6.1.2.1 Parental tobacco use

1.6.1.2.2 Parental attitude

1.6.1.2.3 Family rules

1.6.1.2.4 Friends' tobacco use

1.6.1.2.5 Friends' attitude

1.6.1.2.6 Peer pressure

1.6.1.2.7 Teachers' tobacco use

1.6.1.2.8 Teachers' attitude

1.6.1.3 Organizational level:

1.6.1.3.1 Tobacco-free school policies and systems

1.6.1.3.2 Tobacco-free school environment

1.6.1.3.3 School health education

1.6.1.3.4 Tobacco-free school project

1.6.1.3.5 Media and advertising

1.6.1.3.6 Anti-smoking campaign

1.6.1.4 Community level:

1.6.1.4.1 Community tobacco control activity

1.6.1.4.2 Minor's access and availability of cigarettes

1.6.1.4.3 Community custom

1.6.1.5 Public policy:

1.6.1.5.1 Tobacco-control policy

1.6.1.5.2 Leaf tobacco prices and subsidization policy

1.6.1.5.3 Cigarette price and taxation policy

1.6.2 Dependent variable

Tobacco use

1.7 Operational definitions of variables

1.7.1 The intrapersonal level factors: refer to individual characteristics that influence tobacco use. In this study the intrapersonal level factors include:

1.7.1.1 Knowledge: refers to the information and understanding related to tobacco use that students have gained through learning or experience. In this study, the definition is concerned with the students understanding about smoking consequences and its effect on health.

1.7.1.2 Attitude: is a favorable or unfavorable evaluative reaction toward something or someone, exhibited in ones beliefs, feelings, or intended behavior. In this study, it refers to the opinions and feelings of student towards tobacco use.

1.7.1.3 Life skills: are abilities of the student for adaptive and positive behavior that enable the student to deal effectively with tobacco use. In this study life skills include:

1.7.1.3.1 Communication skill: is the ability of a student to express himself, both verbally and non-verbally, in ways that are appropriate to common cultures and situations. This means being able to express opinions and desires. And it may mean being able to ask for advice and help in a time of need.

1.7.1.3.2 Coping with stress: is about recognizing the sources of stress in our lives, recognizing how this affects us, and acting in ways that help to control our levels of stress.

1.7.1.3.3 Interpersonal relationship skill: is the ability of a student to relate in positive ways with the people he interacts with.

1.7.1.3.4 Critical thinking: is an ability to analyze information and experiences in an objective manner.

1.7.1.4 Academic performance: refer to a grade or mark that a student was given for his or her performance last year in school.

1.7.1.5 Age: refer to the number of years student has lived, according to the Gregorian solar calendar.

1.7.1.6 Gender: the fact of being male or female.

1.7.1.7 Self-esteem: refer to the feeling of being satisfied with student own abilities and that student deserves to be liked or respected.

1.7.1.8 Self-concept: refer to the idea that students have of what their own character is like and what students understand about themselves

1.7.1.9 General characteristics: refer to a part of a person's character, appearance or behaviour; something typical of a place or thing. In this study, the definition is concerned with gender and age.

1.7.2 The interpersonal level factors: They are the social networks in which an individual lives. The interpersonal level factors in this study include:

1.7.2.1 Parental tobacco use: refer to father or mother only tobacco use, father and mother both tobacco use, and father and/or mother never use of tobacco.

1.7.2.2 Parental attitude: refer to parental opinions and feelings towards tobacco use.

1.7.2.3 Family rules: refer to the accepted principle of tobacco use at home and whether or not children can get cigarettes freely at home.

1.7.2.4 Friends' tobacco use: refer to tobacco use of four closest friends, or never use of tobacco.

1.7.2.5 Friends' attitude: refer to friend's opinions and feelings towards tobacco use.

1.7.2.6 Peer pressure: is the influence exerted by a peer group in encouraging a person to tobacco use in order to conform to the group.

1.7.2.7 Teachers' tobacco use: refer to current tobacco use, ever tobacco use, or never tobacco use of teacher.

1.7.2.8 Teachers' attitude: refer to teacher's opinions and feelings towards tobacco use.

1.7.3 The organizational level factors: refer to schools, health and media agencies. In this study the organizational level factors refer to schools, health service center and media center in the communities. The contents are composed of:

1.7.3.1 Tobacco-free school policies and systems: refer to the school has a tobacco-free policy, effective management and implement measures.

1.7.3.2 Tobacco-free school environment: refer to school classrooms, laboratories, libraries, conference rooms, teacher offices, student dormitories and other public places are tobacco-free places; the school stores do not sell tobacco.

1.7.3.3 School health education: refer to school has the health education teaching in the class about tobacco control.

1.7.3.4 Tobacco-free school project: refer to school takes part in creating smoke-free school program and activity.

1.7.3.5 Media and advertising: refer to advertisements for cigarettes on television, videos, newspapers or billboards.

1.7.3.6 Anti- smoking campaign: refer to 'World No Tobacco Day' anti-smoking campaign and anti-smoking intervention program in school.

1.7.4 The community level factors: refer to the community environment and public opinion. The community level factors in this study include:

1.7.4.1 Community tobacco control activity: refer to community mass media campaign and anti-tobacco use intervention.

1.7.4.2 Minor's access and availability of cigarettes: refer to whether students can get their cigarettes by buying them (in a store, shop or from a street vendor) or not; whether the students are refused purchase of cigarettes because of their age or not.

1.7.4.3 Community custom: refer to tobacco is traditional gift in festival and special occasion in the community.

1.7.5 Public policy: refer to a legislative environment, the policies that prohibit tobacco and the law adoption context favoring the implementation of tobacco control intervention. The public policies in this study include:

1.7.5.1 Tobacco control policy: refer to establishment of tobacco control policies and enforcement of existing policies.

1.7.5.2 Leaf tobacco prices and subsidization policy: refer to specific provisions for setting prices for leaf tobacco and relevant policies on substitution.

1.7.5.3 Cigarette price and taxation policy: refers to the cost increase of cigarette through taxation.

1.7.6 Tobacco use: It is the behavior that includes either the intake of tobacco smoke from cigarettes, cigars, and pipes by the individual smoking or the oral absorption of nicotine and related toxins through smokeless tobacco, measure as current use of tobacco, ever use of tobacco and never use of tobacco.

1.7.6.1 Current use of tobacco: Students who used tobacco products or tobacco-related products on at least 1 day during the month preceding the survey.

1.7.6.2 Ever use of tobacco: Students who gave up his or her use of tobacco products or tobacco-related product before past 30 days.

1.7.6.3 Never use of tobacco: Students who have never used tobacco products or tobacco-related products at all.

CHAPTER II

LITERATURE REVIEW

In implementing this research project the research has applied the related concepts, theories and research involved to develop the research conceptual framework, as follows:

2.1 Global tobacco use situation and negative health consequences for youth who smoke

2.2 Prevalence of tobacco use and adolescent smoking in China

2.3 Situation and measure of tobacco control in China

2.4 Concept of ecological model and related researches

2.5 Factors of influencing adolescents to smoke

2.6 Research conceptual framework

2.1 Global tobacco use situation and negative health consequences for youth who smoke

Cigarette smoking is the important risk behavior and the most significant cause of public health problem. Tobacco products cause approximately 30 per cent of all cancer death in developed countries. In spite of this, currently, there are an estimated 1.3 billion smokers in the world (World Bank 1999). Four-fifths of them live in low-or middle-income countries. Tobacco consumption continues to be the leading preventable cause of death in the world. The death toll from tobacco consumption is now 4.9 million people a year; if present consumption patterns continue, the number

of deaths will increase to 10 million by the year 2020. Many of these young smokers will eventually die from a smoking-related disease (Centers for Disease Control and Prevention 2004:126-502). Smoking was once predominant in the developed world, but this is changing rapidly. Now, 50% of males in developing countries smoke, compared with only 35% of males in developed countries. Comparable figures for females are 9% and 22%, respectively, although in addition, many women in South Asia chew tobacco. Three-quarters of all tobacco users are now in developing countries, and they consume nearly 60% of the 5700 billion cigarettes worldwide smoked each year (Landry and Raman 2008:126-8,4).

The highest youth smoking rates are found in Central and Eastern Europe, parts of India, and some of the Western Pacific islands. Current use of tobacco products ranges from 62.8% to 3.3%, with high rates of oral tobacco use in certain regions. Current cigarette smoking ranges frome39.6% to less than 1%. Nearly 25% of students who smoke admit to having smoked their first cigarette before the age of 10. Most current smokers want to stop smoking and have already tried to quit, although very few students who currently smoke have ever attended a smoking cessation programme. Exposure to advertising is high (75% of student had seen pro-tobacco adverts). Exposure to environment tobacco smoke is very high in all countries. In Bulgaria, Northern Mariana Islands, and selected cities in Burkina Faso, India, Indonesia and Mali, over 75% of young people surveyed indicated significant exposure to second-hand smoke in public places. Only about half of the students reported that they had been taught in school about the dangers of smoking during the year preceding the survey. Girls are smoking as much as boys in more than 30% of surveyed countries (Group 2002:252-70).

Tobacco use often begins before adulthood. The Global Youth Tobacco Survey (GYTS) shows that a disturbingly high number of school children between the ages of 13 and 15 are currently using or have tried tobacco. Nearly a quarter of those young smokers began before the age of 10 (Warren, Riley et al. 2000:868-76; Warren,

Jones et al. 2008:1-28). The global youth tobacco survey shows: Among the students who smoke, 72% said that they wanted to quit, but only 58% of them had tried to quit. Their reasons for trying to quit were because of the harmfulness of tobacco use to their health (66%), due to the opposition to smoke from parents and friends (16%), and to save money (Warren 2000:868-76). Of current smokers aged 15–19 in Canada, 64% reported one or more quit attempts in the 12 months before being surveyed (Health Canada 2002). In the United States, approximately 60% of current smokers in high school and middle school reported one or more quit attempts in the year before being surveyed (Centers for Disease Control and Prevention 2001:30). Although many youth think about and attempt to quit tobacco, many are unaware of or unable to access cessation services. Also, many youth do not think that quitting tobacco is difficult enough to warrant professional assistance, and they report not having much interest in participating in such interventions (Balch GI. 1998).

The grave, long-term effects of smoking include heart disease, chronic lung disease, and cancers of the lung, esophagus, larynx, pharynx, bladder, and mouth. Cigarettes also cause cervical, kidney, and pancreatic cancer. Pregnant women who smoke have a higher risk of pregnancy complications, and their babies have higher risks of low birth weight and sudden infant death syndrome. The most serious consequences of tobacco use appear later in adulthood. However, there are immediate adverse health effects of smoking that affect the growing number of young tobacco uses. Addiction to nicotine occurs faster in young smokers, and the risks of developing tobacco-related cancer and chronic heart and lung diseases are greater the younger one starts to smoke (Group 2002:252-270). The major tobacco-related diseases take decades to develop, but smoking also harms young people’s health in the short run; it reduces the rate of lung growth and lowers lung function. Teens who smoke are three times as likely to have shortness of breath and twice as likely to have phlegm as their nonsmoking peers. Young smokers have respiratory illnesses more often than nonsmokers and may also show early signs of heart disease and stroke. Their athletic

performance and endurance suffer, even if they have athletic training (U.S. Department of Health and Human Services 1994; Arday DR 1995:111-116).

Negative health consequences for youth who smoke include the following: Smoking hurts young people's physical fitness in terms of both performance and endurance, including those trained in competitive running. Smoking can hamper the rate of lung growth and the level of maximum lung function among youth. The resting heart rates of young adult smokers are 2–3 beats per minute faster than those of nonsmokers. Regular smoking is responsible for cough and increased frequency and severity of respiratory illnesses. The younger a person starts smoking, the more likely he is to become strongly addicted to nicotine. Most young people who smoke regularly continue to smoke throughout adulthood, leading to long-term health consequences. Teenagers who smoke are 3 times more likely than nonsmokers to use alcohol, 8 times more likely to use marijuana, and 22 times more likely to use cocaine. Smoking is associated with several other risk behaviors, such as fighting and engaging in unprotected sex. High school seniors who are regular smokers and who began smoking by grade 9 are 2.4 times more likely than their nonsmoking peers to report intervention. For this poorer overall health, 2.4–2.7 times more likely to report cough with phlegm or blood, shortness of breath when not exercising, and wheezing or gasping; and 3.0 times more likely to have seen a doctor or other health professional for an emotional or psychological complaint. Smoking may be a marker for underlying mental health problems, such as depression, among adolescents (U.S. Department of Health and Human Services 1994; Arday DR 1995:111-116).

2.2 Prevalence of tobacco use and adolescent smoking in China

There was no national picture on tobacco-use behavior before the 1984' national survey. In 1984 the first national survey on the prevalence of tobacco use was carried out by the National Patriotic Health Campaign Committee, which covered all

29 provinces, autonomous regions and municipalities. 519,600 persons aged 15 years and above surveyed by stratified random sampling. The average smoking rate among Chinese was 34.45 per cent, with 61.01 per cent for males and 7.04 per cent for females (Weng xinzhi 1987:886-92). The average number of cigarettes was 13 per day for males and 11 per day for females. The 1996 national prevalence survey on smoking behavior was conducted in all urban and rural areas of the Mainland China. The total sample size was 130,657 by three-stage probability sample. Overall prevalence rates for smokers were 66.9% for males and 4.2% for females, with an overall prevalence of 37.6% among China's population older than 15 years of age. Most smokers started smoking at the age of 20. Daily per capita consumption was 15 cigarettes (Yang, Ma et al. 2001:170-4).

In 2002' survey, 16,407 records had been completed with 16,056 used for analysis by multi-steps random sampling through questionnaires. Ever-smoking rates in males and females aged 15 and over were 66.0% and 3.1%. There were no obvious geographic differences seen among male, but big difference was seen in female smokers. Higher smoking rates were seen in the northeast and northern parts of the country (Yang, Ma et al. 2005:77-83). In 2004, a cross-sectional survey was conducted on a nationally representative sample of 15,540 Chinese adults aged 35-74 years. The prevalence of current cigarette smoking was much higher among men (60.2%) than among women (6.9%). Among nonsmokers, 12.1% of men and 51.3% of women reported exposure to ETS at home, and 26.7% of men and 26.2% of women reported exposure to ETS in their workplaces (Gu, Wu et al. 2004:1972-6).

In Zhejiang Province, overall 54% of the men and 1.8% of all women were current smokers (at least 1 cigarette per day) among low income workers in 2004. Smoking was least common in migrant men (51%), compared with 58% of urban workers and 64% rural inhabitants. Forty-nine percent of rural males smoke was more than 10 cigarettes/day, and 22% over 20/day. The prevalence of smoking increased with age (Hesketh, Lu et al. 2007:29). In the survey of 932 medical professionals from

3 hospitals, the smoking rate in male was 49.7%, and in female 0.2%; male smokers were mostly surgeons and medical technicians (Dong, Lan et al. 2005:709-12). Among physicians aged 50-54 years, smoking prevalence was 31.6% (Smith, Wei et al. 2006:66-71). Another study among 3,543 urban and 4,294 rural dwellers aged 15-65 years found the smoking rates were higher in the rural area (35.9%) than in the urban area (28.7%) (Zhou, Su et al. 2006:87-96).

The picture of cessation among Chinese smokers was different from western countries. Systematic large-scale research on cessation was not very plentiful, but the some surveys drew an outline of the cessation process among Chinese smokers (Yang, Ma et al. 2001:170-4). Only 16.76 per cent current smokers wanted to quit the habit, but without any plan. The proportion of quitting and relapse were almost equal. 9.5 per cent of ever smokers were quitting, another 10.6 per cent quit once but were smoking at the survey. Only 3.5 per cent among ever-smokers have currently quit successfully for at least 2 years (Peter Boyle 2004:345). Another survey showed overall 9% of the males had successfully quit smoking. Reasons for quitting were to prevent future illness (58%), current illness (31%), family pressures (20%) and financial considerations (20%). Thirteen percent of current smokers had ever tried to quit (cessation for at least one week) while 22% intended to quit (Hesketh, Lu et al. 2007: 29).

Cigarette smoking is prevalent among Chinese adolescents, especially males (Chen 1988:4739). This study of 16,996 students aged mostly 10 to 12, in 479 fourth- to sixth-grade classes from 122 Beijing elementary schools in China showed approximately 28% of boys and 3% of girls had smoked cigarettes (Zhu 1996:368-75). There was a slight increase of prevalence among middle school students in a later survey compared with earlier surveys; the smoking rate among male students was still significantly higher than that of the female students, but the smoking rate among female students in the big cities of China is increasing. Overall, the reported prevalence rates of experimenting were 47.8% for boys and 12,8% for girls aged

12-18; the corresponding figures for ever-smoking were 9.4% for boys and 0.6% for girls (Peter Boyle 2004). In the survey of 6,994 seventh- to ninth- grade students, Lifetime smoking prevalence was 47% among boys and 18% among girls. Past-30-day smoking prevalence was 16% among boys and 4% among girls. Established smoking prevalence was 2% among boys and 0% among girls. The prevalence of susceptibility to smoking was 31% among boys and 10% among girls (Unger, Yan et al. 2001:162-9). In another survey among 9,015 students in the middle schools, 29.4% of them had ever attempted cigarettes smoking while 6.6% of them tried tobacco in the 30 days before survey, 27.0% of the students with smoking behavior began smoking at the age of 9 or younger (Tian, Meng et al. 2007:229-32). A survey of 3,518 middle school students in Guangxi Zhung Autonomous region in China showed 20% students smoke, ranging from 15% of junior school students to 40% of senior school students. The youngest smoker was only 13 years old (Gu 2000). Another research of 13- to 18-year-olds students in Zhejiang Province, eastern China found 15.9% students (25.7% of the boys, 5.4% of the girls) were ever smokers. Only 0.3% students were regular smokers. Of the ever smokers, 41.9% had smoked before 10 years of age and 7.9% before 5 years of age (Hesketh 2001:1653-5).

The rate of smoking experimentation rises with age among both males and females, and the rate increases considerably faster among the former. The rate rises most quickly during junior high school, and peaks among male students in the first year of senior high school. At present, 32.4% of young people have experimented with smoking, that is 44.1% among the young males and 19.9% among the young females, with the male rate significantly higher than the female one (Ji CY. 2005). The prevalence of experimenting increased sharply with age for boys and the majority of 15-16-year-olds had experimented. While the prevalence of experimenting also increased with age for girls, less than 20% of 15-16-year-olds had experimented. By region, the prevalence rates of experimenting for boys were similar in the urban and rural locations (48.1% vs. 47.4% respectively). For girls, the prevalence rates for

experimenting were twice as high in the urban areas (15.6%) compared with the rural areas (7.6%). With regard to the age of initiation, about 6% of boys and 2% of girls took their first puffs by age 10 years, and 3% of boys and 0.3% of girls were smoking by age 15 years (Peter Boyle 2004:345-9).

According to the findings of a 2005 survey of young people who have ever smoked, 66.8% of males and 68.2% of females smoked their first whole cigarette before the age of 13. Compared with the results of a 1998 survey, the percentage of people who have smoked one whole cigarette before age 13 has increased by 15%, indicating that the age of smoking initiation is decreasing. China has 130 million young people aged 13-18 years. It is estimated that 15 million of these young people are current smokers, and no less than 40 million have attempted smoking (Ji CY. 2005).

In contrast, the current smoking rates among youth tend to decline in foreign countries which have advanced tobacco control efforts. 11.5 % of young people are current smokers in China. The rate of current smoking is 18.4% and 3.6% among males and females, respectively. Current smoking rates are 10.9% and 2.7% among male and female junior high school students, and 28.9% and 4.9% among male and female senior high-school students, respectively. The male current smoking rate increases with age quickly, but there are marked differences in the extent of increase between age groups. The greatest increase occurs between the third year of junior high-school and the first year of senior high-school. Smoking rates among females stays nearly constant at a low level without significant differences among age groups (Ji CY. 2005).

2.3 Situation and measure of tobacco control in China

2.3.1 FCTC ratification and law enactment for banning smoking in China

On May 21, 2003, the 56th World Health Assembly unanimously adopted WHO's 'Framework Convention on Tobacco Control'. On November 10, 2003, the Chinese government officially signed the Convention. The Convention officially went into effect in China in January 2006. The enactment of the Convention has provided a legal framework for global control of the harms of tobacco, and collective protection of the health of all human beings. The Chinese government has supported tobacco control measures of the international community, and has actively participated and pushed for the enactment of the 'Framework Convention on Tobacco Control'. Currently, various agencies in the State Development and Reform Commission and the Ministry of Health, which are Convention implementation coordinating bodies, are actively working on its implementation. China has committed to implementing effective measures to reduce tobacco use. These include smoke-free public places and workplaces, larger health warnings on cigarette packs, higher tobacco taxes, bans on tobacco advertising, promotions and sponsorship, and more public education about the dangers of tobacco use. Legislation and regulations are pending in China that would satisfy the country's requirements under the Framework Convention (WHO Report on the Global Tobacco Epidemic, China, 2008).

The Ministry of Health's 1991 Detailed Implementation Rules for the Public Place Hygiene Management Regulation stipulates that smoking is banned in thirteen types of public places: cinemas and theaters, video theaters, music halls, ballrooms, music tea rooms, recreational halls, sports arenas, libraries, museums, fine art galleries, shops, bookstores, and waiting rooms for public transport. In 1991, the National People's Congress passed two laws: the Tobacco Monopoly Law of the People's Republic of China, the general principles of this law stipulate that the State and society shall strengthen the publicity and education of the health hazards of smoking, and prohibit or restrict smoking in public transport and public places, and the Law on the Protection of Minors of the People's Republic of China, Its 27th article stipulates that no one should smoke in the classrooms, sleeping and activity rooms of

primary and middle schools, kindergartens, and childcare centers, as well as other rooms where minors convene. In 1994, the National People's Congress passed Advertising Law of the People's Republic of China. Its 18th article and 42nd article restrict tobacco advertising through radio, film, television, newspapers, or periodicals. Additionally, advertisements are prohibited in other public places, such as cinemas, theaters, waiting rooms, and at sports competitions. In 1997, the National Patriotic Public Health Campaign Committee, Ministry of Health, Ministry of Railroads, Ministry of Communications, Ministry of Construction, and Civil Aviation Administration enacted the Regulations on Prohibiting Smoking in Public Transport and Waiting Rooms. The Regulations for Hygiene Administration are under review and may be revised to place more restrictions on public smoking. The State Administration for Industry and Commerce also has revised the Interim Tobacco Advertising Management Rules. By 2011, all tobacco advertisements will be banned (WHO Report on the Global Tobacco Epidemic, China, 2008).

Local law enactment to ban smoking in public places first began in 1993. By the end of October 2006, 154 towns, cities, and districts in China had enacted regulations to ban smoking in public places. At present, only 45.7% of cities and larger administrative regions have tobacco control regulations in China, while the remainder lacks any regulations concerning tobacco control. There are a limited number of places where smoking is banned. Most local regulations set bans at medical entities, cinemas and theaters, music halls, video halls, childcare centers and kindergartens, schools, conference rooms, libraries, exhibition halls, public transport, as well as postal, telecommunications, and banking offices. Only Guangzhou and Shenzhen set bans on smoking at air-conditioned restaurants. In all the local regulations, workplaces such as offices are not included (WHO Report on the Global Tobacco Epidemic, China, 2008)

In conclusion, China does not have a law or regulation specifically banning smoking in public places. Only 45.7% of cities and larger administrative regions have tobacco control regulations in China. According to the World Health

Organization, China ratified the Framework Convention on Tobacco Control on October 11, 2005. Legislation and regulations are pending in China that would satisfy the country's requirements under the Framework Convention. Related stipulations appear in some provisions or detailed rules of relevant laws and regulations. But the content and restrictions is vague, operability is not strong and difficult to implement, while the law enforcement subjects are not unidentified and unclear on the regulations.

2.3.2 Action of tobacco control by the government

In order to effectively implement the Convention with concrete measures, the Ministry of Health established and set up an office for the Leadership Team for Implementing the Convention. As entrusted by the State Council, the Ministry of Health is revising the Public Place Hygiene Management Regulation, which will strengthen provisions on banning smoking in public places. In a little over a decade, China has continuously developed smoking bans for public places. In 1992, China began creating smoke-free schools, and by 2004, 12,094 schools have been named smoke-free. Under the leadership of the Ministry of Health, the China Association for Tobacco Control and China Association for Hospital Management organized the formulation of smoke-free Hospital Standards. Since 1999, many smoke-free Hospitals have reached the standards in Beijing, Shanghai, Guangzhou, Fuzhou, Dalian, and Shenzhen. (WHO Report on the Global Tobacco Epidemic, China, 2008).

2.3.3 Tobacco policy status in China

Tobacco Taxation and Prices: Low-end cigarette prices were subsidized by the tobacco industry in order to encourage use by low income consumers.

Smoke-free Environments: Chinese smokers were free to smoke almost anywhere they chose. Existing regulations focused on public transportation and enforcement is inadequate.

Treatment of Tobacco Dependence: Adequate counseling services for

smokers seeking to quit were unavailable.

Health Warnings on Tobacco Packages: Cigarette pack warnings did not meet requirements for effective tobacco product labeling. Warning labels were in small print and contain only the words, ‘Smoking harms health’, and appear only on one side of the packaging.

Bans on Advertising, Promotion and Sponsorship: Tobacco companies were free to advertise their deadly products at point of sale, through sponsored events, on billboards, online, and through extensive advertising of affiliated companies with the same names as tobacco brands.

Tobacco Prevention Funding: The Chinese government had not established tobacco control objectives nor allocated adequate funds to support tobacco control. The national tobacco control unit’s resources were inadequate for the world’s largest smoking population. The unit employed just eight full time staff (WHO Report on the Global Tobacco Epidemic, China, 2008).

2.3.4 The profiles of China about tobacco policies

2.3.4.1 Smoke-free Environments:

Health care facilities	No
Educational facilities, except universities	Yes
Universities	No
Governmental facilities	No
Indoor offices	No
Restaurants	No
Pubs and bars	No
Enforcement*	1/10

2.3.4.2 Treatment of Tobacco Dependence:

Quitline	Yes
Nicotine replacement therapies (NRT) sold	Yes
Counseling in health clinics	Yes, in some
Counseling in hospitals	Yes, in some
Counseling in offices of health professionals	…
Counseling in the community	Yes, in some

2.3.4.3 Bans on Advertising, Promotion and Sponsorship:

National TV and radio	Yes
International TV and radio	Yes
Local magazines/newspapers	Yes
Point of sale	No
Billboards/outdoor advertising	No
Internet	No
Free distribution	No
Promotional discounts	No
Non-tobacco products with tobacco brand names	No
Non-tobacco brand used for tobacco product	No
Appearance of tobacco products in TV and/or films	No
Sponsored events	No
Enforcement*	3/10

2.3.4.4 Price of Most Popular Brand:

In currency reported by country	4.00 CNY
USD at official rate	$0.50
International dollars	$1.92

2.3.4.5 Health Warnings on Tobacco Packages:

Laws or regulations banning misleading terms	No
% of principal display areas covered by warnings	Not mandated
Warnings are mandated and specific	…
Warnings appear in/on each package/label	…
Warnings describe harmful effects of tobacco use	…
Warnings are large, clear, visible and legible	…
Warnings rotate	…
Warnings are written in the principal language(s)	…
Warnings include a picture	…

2.3.4.6 Tobacco Prevention Funding:

Specific national government objectives	No
National agency or technical unit for tobacco control	Yes
Number of full-time equivalent staff	8.0

*Cumulative score (maximum of 10) from 5 experts who ranked enforcement as minimal (0), moderate (1), full (2). (...)Data not reported.

(WHO Report on the Global Tobacco Epidemic, China, 2008).

2.4 Concept of ecological model and related researches

The ecological model has a long history in the biologic, behavioral, social, and health sciences. Depending on the time and discipline, the model has taken different forms. Some forms of the model highlight the connections among biologic, behavioral, and social factors, while other forms emphasize the significance of the social and physical environments—the ‘context’ (Bronfenbrenner, 1979; McLeroy, Bibeau, Steckler, & Glanz, 1988:351-77; Glanz, K., 2002; Green & Kreuter, 2004).

Early ecological models were general statements that multiple levels of

variable influenced outcomes related to human health and welfare. Specific ecological models can guide research and interventions for different health behaviors. Over the last 15 years, a number of political and scientific organizations as well as public health analysts have pleaded for the adoption of the ecological approach to support more effective interventions aimed at maintaining and promoting the health of populations (Green 1999; McLeroy, Bibeau et al. 1988:351-77; Stokols 1992:6-22). The limitation to the ecological perspective is its complexity. There are numerous ecological levels and interconnected systems that influence behavior. Few studies have been able to include ecological analysis and fewer still have been able to understand ecological levels well enough to create interventions to change them. Clearly, it seems that designing and implementing ecological programs remains a challenge (Valente 2002:45-46).

Ecological models are unique in that they take into account the physical environment and its relationship to people at intrapersonal, interpersonal, organizational, community, and public policy levels. The models propose that behaviors are influenced by intrapersonal, sociocultural, policy, and physical-environmental factors. These variables are likely to interact, and multiple levels of environmental variables are described that are relevant for understanding and changing health behaviors. This perspective is based on the major philosophical construct of the social ecological model – behavior does not occur in a vacuum (Glanz, K., et al. 2002).

Ecological models address multiple layers of influence on behavior. This provides a comprehensive approach for health promotion initiatives. Many of the predominant theories and models of behavior focus on one dimension of health promotion, such as knowledge, attitudes or skills. Ecological models link health promotion strategies that target individual behaviors and environmental influences to behavior. Ecological models specific to health promotion are multifaceted, targeting environmental, behavioral, and social policy changes that help individuals make health

choices in their daily lives (M. Katherine Ott, et al. 2004: e11). They also have been used with success in worksite health promotion initiatives, food labeling requirements, roadway improvement campaigns, and smoking and alcohol prevention strategies (Green L, Richard L, Potvin L. 1996:270-281).

The proliferation of contemporary ecological model is based on a rich conceptual tradition in the behavioral and social sciences. Ecological models are comprehensive health promotion models. There are two kinds of design: models designed mainly to explain behavior and models designed mainly to guide behavioral interventions (Karen Glanz et.al. 2008). The contributions of these authors are summarized in table as follows:

Models designed mainly to explain behavior:

Urie Bronfenbrenner (1979)	Three level of environmental influence: ‘microsystem’ is interactions among family members and work groups; ‘mesosystem’ is physical family, school, and work settings; and ‘exosystem’ is the larger social system of economics, culture and politics.
Rudolph Moors (1980)	Four categories of environmental factors: physical settings – features of the natural (weather) and built environment (building); organizational settings – size and function of worksites and schools; the ‘human aggregate’ – sociocutural characteristics of the people in an environment, and ‘social climate’ – supportiveness of a social setting for a particular behavior.
Thomas Glass and Matthew McAtee (2006)	Conceptualizes hierarchies of influence on behavior within biology and society, which has social and physical environment dimensions. Structural contingencies provide opportunities and constraints, and biological processes regular expression of behavior

Models designed mainly to guide behavioral interventions:

Kenneth McLeroy (1988)	Five sources of influence on health behaviors: intrapersonal factors, interpersonal processes and primary groups, institutional factors, community factors, and public policy.
Daniel Stokols (1993, 2003)	Four assumptions: health behavior is influenced by physical environments, social environments, and personal attributes; environments are multidimensional, such as social or physical, actual or perceived, discrete attributes (spatial arrangements) or constructs (social climate); human- environment interactions occur at varying levels of aggregation (individuals, families, cultural groups, whole populations); and people influence their settings, and the changed setting then influence health behaviors.
Brian Flay and J. Petraities (1994)	Genes and environment are assumed to affect all behaviors, and three streams of influence on behavior are intrapersonal, social and sociocultural.
Deborah Cohen and other (2000)	Four categories of structural influences: availability of protective or harmful consumer products, physical structures (or physical characteristics of products), social structures and polices, and media and cultural messages.

The concept of level of influence is included in the ecological perspective. This perspective includes five levels of influence on health related behaviors and conditions: intrapersonal level; interpersonal level; organizational level; community level; and societal factors and public policy. In ecological model, patterned behavior is

the outcome of interest, and behavior is viewed as being determined by the following: (1) intrapersonal factors: characteristics of the individual such as knowledge, attitudes, behavior, self-concept, skills, etc. This includes the developmental history of the individual. (2) interpersonal processes and primary groups: formal and informal social network and social support systems, including the family, work group, and friendship networks. (3) institutional factors: social institutions with organizational characteristics, and formal (and informal) rules and regulations for operation. (4) community factors: relationships among organizations, institutions, and informal networks within defined boundaries. (5) public policy: local, state, and national laws and policies (Mcleroy K.R., et al. 1988:351-377).

The intrapersonal level of the social ecological model takes into account an individual's knowledge, attitudes, values, skills behavior, self-concept, and self-esteem. Strategies to intervene at this level include mass media campaigns, social marketing, and skills development. The interpersonal level includes an individual's social networks, social supports, families, work groups, peers, and neighbors. Intervention strategies at this level include enhancement of social supports and social networks, changing group norms, and increasing access. The organizational level includes norms, incentives, organizational culture, management styles, organizational structure, and communication networks. Strategies to intervene at this level include incentive programs, process consultation, coalition development, and agency linkage. The community level includes community resources, neighborhood organizations, social and health services, organizational relationships, folk practices, governmental structures, and informal and formal leadership practices. Intervention strategies at this level include community development, community coalitions, empowerment, conflict resolution, and mass media campaigns. The public policy level includes legislation, policies, taxes, and regulatory agencies. Strategies to intervene at this level include mass media campaigns, policy analysis, political change and lobbying (M. Katherine Ott, et al. 2004: e11; Health and education research 1992: 1-6).

Social ecology initiatives do not target individuals who are making specific health-significant decisions. Instead, to promote healthy behaviors, the social ecological model engages the social processes and agencies that have a major influence on these behaviors. The goal is to establish a health-promoting environment within the social space in which individuals make health-significant (Stokols D., 1992:6-22; Stokols D, Allen J, Bellingham RL. 1996:247-251; Wasserman C., 1998: 1674-1680). A major tenet of the social ecological model is reciprocal-determinism – the interaction between behavior and environment. Reciprocal determinism is a concept originally identified by Bandura in Social Cognitive Theory (Bandura A. 1991:248-285). Initially, the environment largely controls behavior. Over time, changing environmental variables lead to modification of behavior (Green L, Richard L, Potvin L. 1996:270-281).

Glanz listed the some principles of ecological frameworks: Multiple levels of factors influence health behaviors. Ecological models specify that intrapersonal factors, sociocultural factors, policies, and physical environments can influence health behaviors. The model should specify how these different variables interact. Multiple types of environmental influences affect health behavior. Behavior specific ecological models can be useful. Environmental variables are often behavior specific. Multilevel interventions may be most effective. Ecological models assume that single-level interventions are unlikely to have powerful or sustained effects. Multilevel interventions are most easily implemented by multisectoral groups. To evaluate ecological interventions, monitor implementation and change in mediators at multiple levels. Need periodic feedback on the extent to which each intervention component is being implemented / is useful. Political dynamics can limit ecological interventions. Political change is a necessary component for the success of many multilevel behavioral change interventions (Glanz, K., et al. 2002).

The ecological perspective recognizes that health behavior are part of the larger social system (or ecology) of behaviors and social influence, much like a river,

forest or desert is part of larger biological system (or ecosystem), and that lasting changes in health behaviors require supportive changes in the whole system, just as the addition of a power plant, the flooding of a reservoir, or the growth of a city in a desert produce change in the whole ecosystem (O'Donnell. 1996: 244). Figure 2.1 provides a visual representation of the ecological perspectives. For the ecological perspectives to be successful, the theory must be placed into practice in multiple environments, where research can be conducted to determine its effectiveness (Eng, E. 1997)

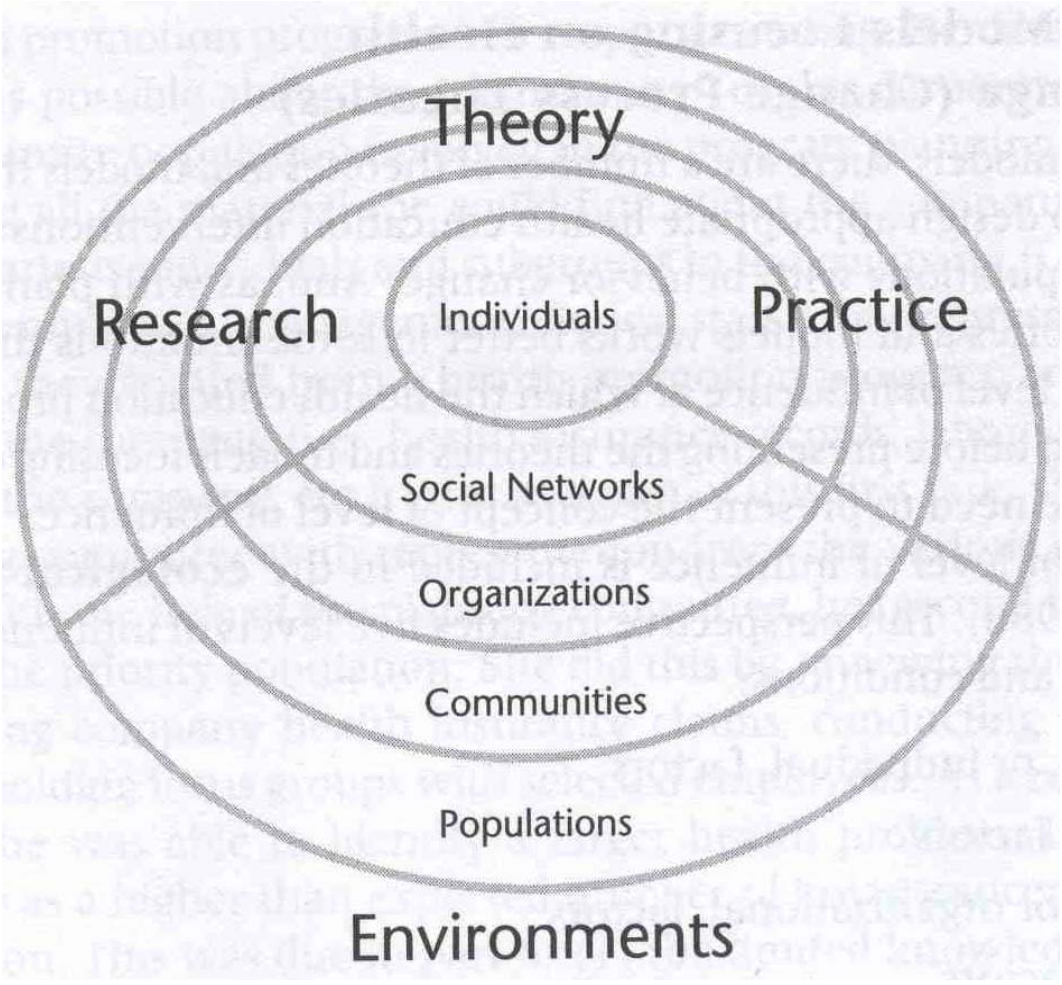


Figure 2.1 Social Ecological Framework

Ecological models have been proposed as a way to structure the consideration of health problems with increasingly complex etiologies. The ecological model has gained increased recognition in the field of health promotion and has been

applied to investigations of many different health issues. Some researchers have used ecological model to guide program development (Levy, Ross et al. 2007:59-67). The field of intervention research on tobacco control needs to use an ecological perspective to better reflect how underlying determinants and their corresponding pathways interact. The complexity of the ecological approaches and the intersectoral collaboration and costs involved in its operationalization are often offered as explanations for this situation (McLeroy, Norton et al. 2003:529-33; Sallis, Bauman et al. 1998:379-97) Contemporary tobacco control programs increasingly apply multi-level and multi-strategy approaches. These programs are consistent with our deepening understanding of the complex and nested determinants that influence patterns of tobacco use (Smedley and Syme 2001:147-66).

Social–ecological (SE) models are becoming more widely used in health behavior research. Applying SE models to the design of interventions is challenging because models must be tailor-made for each behavior and population, other theories need to be integrated into multilevel frameworks, and empirical research to guide model development is limited. The study describes a SE framework that guided the intervention and measurement plans for a specific study. The trial of activity for adolescent girls (TAAG) is a multi-center study of interventions to reduce the decline of physical activity in adolescent girls. The TAAG framework incorporates operant learning theory, social cognitive theory, organizational change theory and the diffusion of innovation model in a multi-level model. The explicit and practical model developed for TAAG has already benefited the study and may have elements that can generalize to other health promotion studies (John P. Elder. et al. 2007:155-165).

The California Tobacco Control Programme is based on an ecological model, in which individual behavior is changed by making changes in the environment. The researchers focus on the effects of smoking bans in the workplace on cigarette consumption. Results show a reduction of cigarette consumption by more than 25% (Trinidad, Messer et al. 2007:96-100). In Thailand, a cross-sectional data from Thai

GYTS 2005 was analyzed using the Socio-Ecological Model (SEM) to obtain prevalence of selected attributes and assess factors associated with current cigarette smoking. Current cigarette smoking was associated with male gender, smoking parents or closest peers. Perception that smoking was harmful to health was associated with less likelihood of being a current smoker (Rudatsikira, Muula et al. 2008:8). Another study in Canada discusses the value of environmental and policy interventions to control tobacco use and prevent cardiovascular disease using ecological model. Interventions include clean air acts, tobacco taxes to fund public health programs directed at smoking, and urging state and local health departments to collaborate with other entities. Interventions such as the clean air acts encourage change in individual behavior based on changes in the environment (Kunyk, Els et al. 2007:A30).

A research of using ecological model describes the effects that an urban environment might have on young children. The urban environment often presents a certain degree of neighborhood decline. Children in this type of surroundings typically develop certain patterns of risk behavior. The Ecological Model is applied to analyze the effects that the urban environment has had in these children. Furthermore, this study also presents a description of racial segregation and the consequences of it. Finally, the study describes the relationship among neighborhood characteristics and individual behavior (Coulton, C. J. 1996.5-33). Another study, The WellWorks intervention, was a worksite health promotion intervention based on the ecological model. The intervention targeted worksite change at individual and environmental levels. Worker participation and worker perception of managerial change were measured in the study. Results showed that blue-collar workers were less likely than white-collar workers to report participating in the program. Results also indicated that blue-collar participation in exposure-related activities versus nutrition activities may increase worker participation in worksite health promotion programming. Finally, when workers were aware of managerial intervention, they were more likely to participate in smoking and nutrition programs (Sorensen, G., et al. 1996:191-203).

In conclusion, the intrapersonal level is concerned with characteristics of the individual, their knowledge, skills, life experience, attitudes, and behaviors as they interface with the environment and society. The interpersonal level refers to the immediate physical environment and social networks in which an individual lives, their family, friends, and peers. The organizational level refers to commercial organizations, social institutions, associations and clubs, which have formal (and informal) structure, rules and regulations operating in the pursuit of specific objectives, and to the physical environment and social networks contained within the direct control of these organizations. A community may be defined in both structural and functional terms. Structurally, a community can be defined within geographic or political boundaries. Functionally, a community may share demographic, cultural, ethnic or social characteristics such that its members 'have a sense of identity and belonging, shared values, norms, communication and helping patterns'. Societies are larger systems, often defined along political boundaries, possessing the means to apportion resources and control the lives and development of their constituent communities. The ecological model for health promotion focuses attention on both individual and social environmental factors as targets for health promotion interventions. It addresses the importance of interventions directed at changing interpersonal, organizational, community, and public policy, factors which support and maintain unhealthy behaviors. The model assumes that appropriate changes in the social environment will produce changes in individuals, and that the support of individuals in the population is essential for implementing environmental changes.

2.5 Factors of influencing adolescents to smoke

Smokers and other tobacco users start and continue for different reasons. Children and young people can start smoking from curiosity, risk taking, rebellion, parental and sibling smoking, peer pressure, the desire for weight control, the desire to

look ‘grown up’, and the perception that tobacco use is normal or ‘cool’. Aggressive promotion by the tobacco industry and permissive environments that make tobacco products readily available and affordable play a major role in inducing young people to take up smoking. In certain cultures, oral tobacco use forms part of the social tradition, and can begin in early childhood. While tobacco use is prompted by several different factors, the continuation of tobacco use is largely fuelled by addition. Other factors that reinforce tobacco use include social and psychological pressure, lack of knowledge of the risk to health and difficulty in quitting (WHO 2004).

Some studies found: the factors were positively associated with smoking were adolescents who received pocket money; adolescents who had parents who smoked, chewed or applied tobacco; adolescents who said that boys or girls who smoke or chew tobacco have more friends; adolescents who said that smoking or chewing tobacco makes boys look less attractive; adolescents who said that there is no difference in weight between smokers and non-smokers; adolescents who said that smoking makes one gain weight; and adolescents who had most or all of their closest friends who smoked. The factors that were negatively associated with smoking were: adolescents who said that boys or girls who smoke or chew tobacco have less number of friends; adolescents who said that girls who smoke or chew tobacco are less attractive; and adolescents who had some of their closest friends who smoked (Siziya, S., A. S. Muula et al. 2008:1). Factors that were associated with reported non-smoking were discussing harmful effects of smoking cigarettes with their family; being taught that smoking makes teeth yellow, causes wrinkles and smokers smell badly; being taught that people of the respondent's age do not smoke; and having reported that religious organizations discouraged young people smoking. Exposure to a lot many antismoking messages at social gatherings was associated with smoking (Siziya, S., E. Rudatsikira, et al. 2008:6). Males and high-school students have higher odds of being susceptible to smoking compared with other non-smokers and higher odds of becoming established smokers. Exposure to parent, teacher, and peer smoking,

anti-tobacco curricula, cigarette promotions, and perceived ease of access to cigarettes are all significant predictors of being susceptible to smoking and established smoking (Ertas, N. 2007:155-61).

According to ecological models, the factors that are associated with smoking behavior in adolescence are reviewed and analyzed across five ecological levels: intrapersonal level, interpersonal level, organizational level, community level, and public policy.

2.5.1 The intrapersonal level factors:

Many individual level factors have been associated with adolescent smoking behavior. In this section, I review the recent literature associated with these factors.

2.5.1.1 Knowledge, attitudes and beliefs about tobacco:

Poor knowledge of the hazards of smoking and positive attitudes to smoking is independently associated with adolescent smoking (Lam, T.H. 1998: 217-23; Osaki 1999:254-260; Zhang 2000:415-22). Most smokers do not believe that smoking is harmful to health (Zhu 1996:368-75). Some studies showed knowledge about the long-term health consequences of tobacco use has not been shown to influence whether youth begin to use tobacco. However, knowledge about short-term consequences can influence such behavior. For example, yellow teeth, bad breath (U.S. Department of Health and Human Services 1994).

Youth who smoke are likely to have several misconceptions about tobacco use that should be addressed. For example, they tend to overestimate the prevalence of tobacco use among their peers (Pierce JP 1998:511-515; Biener L 2000:407-411) and underestimate the addictive potential of nicotine (U.S. Department of Health and Human Services 1994). If youth believe that others, particularly peers and family members, approve of tobacco use, they are more likely to use it themselves (U.S. Department of Health and Human Services 1994). Young

smokers are more likely than nonsmokers to have positive attitudes and beliefs about tobacco use, e.g., it makes them look more mature or reduces stress (Mayhew KP 2000:S61-S81). In the junior high school students of China, a smoker is likely to have favorable attitudes toward cigarette smoking, to continue smoking (Chen, Jew-Wu. 1988: 163).

Knowledge of the health risk of smoking plays a relatively small part in a child's decision about smoking and alone is insufficient to deter a child from smoking. There are several possible reasons for this. One is that most of the serious health risks such as lung cancer, heart disease, emphysema, and the like, are perceived to be too far in the future to have real personal relevance to children. Other reasons are that children do not understand the meaning of these diseases and, whilst acknowledging the risks verbally, might mentally reject them. Nevertheless, a foundation of knowledge upon which to base decision-making is essential and, in children, increased expressed knowledge of health risks has been shown to be one of the many factors associated with a decreased risk of trying smoking in the next few months (Royal college of physicians of London 1992).

2.5.1.2 Life skills:

Life skills are abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life. Described in this way, skills that can be said to be life skills are innumerable, and the nature and definition of life skills are likely to differ across cultures and settings. However, analysis of the life skills field suggests that there is a core set of skills that are at the heart of skills-based initiatives for the promotion of the health and well-being of children and adolescents. These are listed below: Decision making, Problem solving, Creative thinking, Critical thinking, Effective communication, Interpersonal relationship skills, Self-awareness, Empathy, Coping with emotions, Coping with stress (WHO 1994).

Decision making helps us to deal constructively with decisions about our lives. This can have consequences for health if young people actively make decisions about their actions in relation to health by assessing the different options, and what effects different decisions may have. Problem solving enables us to deal constructively with problems in our lives. Creative thinking contributes to both decision making and problem solving by enabling us to explore the available alternatives and various consequences of our actions or non-action. Critical thinking is an ability to analyze information and experiences in an objective manner. Critical thinking can contribute to health by helping us to recognize and assess the factors that influence attitudes and behavior, such as values, peer pressure, and the media. Effective communication means that we are able to express ourselves, both verbally and non-verbally, in ways that are appropriate to our cultures and situations. This means being able to express opinions and desires, but also needs and fears. And it may mean being able to ask for advice and help in a time of need. Interpersonal relationship skills help us to relate in positive ways with the people we interact with. Self-awareness includes our recognition of ourselves, of our character, of our strengths and weaknesses, desires and dislikes. Empathy is the ability to imagine what life is like for another person, even in a situation that we may not be familiar with. Coping with emotions involves recognizing emotions in ourselves and others, being aware of how emotions influence behavior, and being able to respond to emotions appropriately. Coping with stress is about recognizing the sources of stress in our lives, recognizing how this affects us, and acting in ways that help to control our levels of stress (WHO 1994).

Life skills on smoking prevention are included: Resist peer pressure to use tobacco (e.g., decision making, communication skills, coping with emotions); Resist pressure to use tobacco without losing face or friends (e.g., decision-making, communication skills, interpersonal relationship skills); Identify social factors that may influence them to use tobacco and to decide how they will

personally deal with those influences (critical thinking, problem-solving, decision making); Effectively request a smoke-free environment (communication skills); Identify and counter persuasive messages in tobacco advertisements and other promotional materials (critical thinking, communication skills, self awareness); Cope with tobacco use by parents and others (interpersonal relationship skills, coping with emotions, coping with stress, problem solving) Some young people may use tobacco because they lack the skills to deal with problems in a more positive manner. For example, they may use tobacco in an attempt to reach a particular goal, such as acceptance by peers or a temporary reduction in stress. However, youth can be taught skills to help them resist peer pressure to smoke. Enhancing young people's self-esteem, self-mastery, and decision-making skills can enable them to more easily adopt and maintain healthy behaviors such as not smoking (U.S. Department of Health and Human Services 1994).

Jennifer A. Epstein studied on rural adolescents and investigated a model of social and cognitive cross-sectional predictors of smoking. Data were collected during a class period in 36 junior high schools. Life skills were associated cross-section ally with smoking for girls. Life skills training can give adolescents the skill and strength to resist procigarette peer pressures and how to ask and refuse favors gracefully (Jennifer A. Epstein et al. 2003: 485-491). The life skills include personal self-management skills and social skills. These skills can enhance personal and social competence and to decrease motivations to tobacco use and vulnerability to social influences that support tobacco use (Gilbert J. Botvin at al. 2002).

In conclusion, the behavioral skills are important factors affecting smoking behavior of youth. Many students obtain their first cigarette from a friend and young smoker often associate with peer group. Refusing can go against the group norm and refusal skill need to be learned. Life skills training can give adolescents the skill to resist procigarette peer pressures.

2.5.1.3 Academic performance:

In general, research on the relationship between academic performance and adolescent smoking has produced similar findings. Smoking status was significantly related to poor school performance (Nawal Hassan Gholome Ali, et al. 2007: 330-334). Some studies show that youth who perform poorly academically (defined as having low grades, failing to graduate, being frequently truant, and lacking aspirations) are more likely to use tobacco (Flay BR 1998:A9-A18; Lewinsohn PM 2000:121-131). Other studies in China also showed that the prevalence of cigarette smoking among Chinese adolescents was associated with poorer self-perceived academic performance (Li Xiaoming 1999:621-625) and performing poorly in school (Zhu 1996:368-75).

Several researchers have reported a positive relationship between low grade point average (GPA) and increased smoking behavior in seventh through twelfth grade students (O'Byrne 2002:418-425; Ritchey 2001:386-394). In the six-year longitudinal study of adolescent smokers, the researchers found that heavy smoking in twelfth grade girls was predicted by low GPA in the seventh grade, low academic intentions (e.g. not planning to continue education past high school) were a significant risk factor for smoking during adolescence and young adulthood in males and females (Griffin 1999:271-284). In Whuhan of China, adolescents in lower grades are at higher risk of early smoking initiation (Chen, Xinguang et al. 2001:437-445).

2.5.1.4 Age and gender:

Cigarette smoking is prevalent among Chinese adolescents, especially males. Some studies found the prevalence of cigarette smoking among adolescents was higher among males, increased with age (Lam, T.H. et al. 1998; Li X., et al.1999:621-625; Zhang, L.W. et al. 2000:415-22). The research in Wuhan, China, found that the hazard of smoking initiation for boys was very low (<2%) before 7 years of age, increasing rapidly after age 10, and peaking at 14–15 years of age, the hazard for girls was below or around 1% until 12 years of age before it increased. The

hazard levels were similar for adolescents both in urban and in rural areas, but higher for those in grade 7 than in grades 8 and 9. The hazard pattern suggests that the best time for smoking prevention is between 10 and 15 years of age (Chen, X., et al. 2001:437-445).

The study sample consisted of 3,004 first-year junior high school students selected from different areas of China. The study found that more males (15.9%) than females (5.6%) had tried smoking (Chen 1988:4739). Other studies of middle school students in China showed that the prevalence of smoking among males was significantly higher than in females (Liu Zhimin, et al. 2001:247-250; Fang X. Z. et al 2000:244-250). A survey also found that gender differences in smoking prevalence among adolescents in China were larger than those among US teenagers, whereas the proximal risk factors for smoking were similar (Zhu 1996:368-75).

The Global Youth Tobacco Survey (GYTS) in Indonesia showed that the prevalence among boys (24.5%) was significantly higher than among girls (2.3%) (Aditama, Pradono et al. 2008). But other GYTS find the prevalence of current cigarette smoking was similar between genders (Baska, Sovinova et al. 2006:110-6). The prevalence of cigarette smoking and use of other tobacco products was similar between boys and girls, and susceptibility to initiate smoking among never smokers was similar among boys and girls (Warren, Jones et al. 2008:1-28).

2.5.1.5 Self-esteem and self-concept

A cross-sectional study with a sample of fourth and fifth grade students (N = 666), ages 8 through 12, and enrolled in five rural public schools in Georgia, found that being male was the most important factor associated with experimental smoking and that self-concept was also associated. Further studies are recommended to identify other contributing factors of tobacco use among rural preadolescents (Smith, Teresita Maria et.al. 2004:1-19). Another study among 1,513 eighth grade students in an urban tobacco producing county of North Carolina was

studied using the Tobacco Cigarette Smoking Questionnaire and the Rosenberg Self-Esteem Scale. Self-esteem and parental smoking behavior related significantly to adolescents' smoking behavior and future intention to smoke. Significantly more females intended to smoke and had lower self-esteem than males. Family involvement in the tobacco industry related significantly to adolescents' intention to smoke but not their smoking behavior. Overall, low self-esteem and parental smoking models may be important to developing the smoking habit among young adolescents. Prevention of smoking initiation should involve promotion of children's self-esteem and avoidance of parental smoking modeling prior to the eighth grade (Murphy NT, Price CJ 1988: 401-5).

In conclusion, through the review of some previous studies, knowledge, attitudes and beliefs about tobacco, life skills, academic performance, age and gender are intrapersonal factors affecting smoking behavior of youth. These risk factors and / or risk conditions can be prioritized using the 2×2 matrix by importance and changeability. In PRECEDE-PROCEED model, predisposing factors are antecedents to behavior that provide the rationale or motivation for the behavior (Green and Kreuter, 2005); they include individuals' knowledge, attitudes, belief, personal preferences, existing skill, and self-efficacy beliefs. In health belief model, modifying factors include knowledge, socioeconomics, age, gender, ethnicity and personality. Modifying factors may influence health perception. In the theory of reasoned action and the theory of planned behavior, direct determinants of individuals' behavioral intention is their attitude toward performing the behavior. According to these intrapersonal theories and field measurement condition, the knowledge, attitudes, life skills, academic performance, age, gender, self-esteem and self-concept are chosen as research variables in this study.

2.5.2 The interpersonal level factors:

Young people spend most of their time in school or at home. They are

most exposed to their teachers, peers and parents, whose smoking status is a key factor in shaping their smoking behavior. The main interpersonal level factors are friends, peers, family, parent and teachers.

2.5.2.1 Family/parent:

Some studies found that the family was a major factor for initial experimental smoking. Youth who have family members using tobacco are likely to have greater access and exposure to tobacco products and are more likely to smoke themselves (Lam, T. H., et al. 1998: 217-23; U.S. Department of Health and Human Services 1994). One large study found that youth who are exposed to both a family member and a best friend who smoke have a 90% greater chance of smoking than youth who are not in the same situation (Evans N 1995:1538-1545).

Many studies determined that children of parents who smoke were more likely to smoke than children of nonsmoking parents. A research of 13- to 18-year-olds students in Zhejiang Province, eastern China showed that parental smoking – especially of mothers – was the strongest predictor of smoking (Hesketh 2001:1653-5). The likelihood of tobacco use was significantly higher among those having mothers' smoking behavior (Zhang, L. et al. 2000: 415-22). Smoking is associated having parents who smoked (Zhu 1996:368-75). Children whose parents are both smokers are twice as likely to smoke as children whose parents are non-smokers (Can RX. 2007: 79-87; Duan JL. 2007: 115-119). Families are an important source of tobacco for young people. Some parents even offer cigarettes to their children (Li YJ, Zhang LC, Tian D, et al. 2007: 87-93; Xu Y, Zhang XW, Guo JX, et al. 2007:5-7; Beijing Patriotic Health Committee, Beijing Municipal commission of Education, Beijing Association of Smoking and Health. 2000: 294-298). In the study of the secondary school students, 13- to 18-year-olds, in eastern China, of the ever smokers, 75% obtained cigarettes from home, 4% obtained cigarettes from friends, and 10% purchased cigarettes themselves (Hesketh 2001: 1653-5).

Adolescence is a period of exploration. It is natural for teenagers to experiment with smoking, just as they do with other ‘adult’ behavior. They spend most of their time in the family and the school. Therefore, smoking patterns of family and peer members play a role in predisposing adolescents to use cigarettes. Of the factors associated with student tobacco use, mother and peer smoking were the strongest independent predictors (Zhang, Wang et al. 2005:1580-4). Tobacco use is a behavior typically influenced by family and peer attitudes and behaviors. The cigarette smoking of mothers, fathers, brothers, peer and supervising teachers increased the risk of experimental smoking.

Permissive parental attitudes concerning smoking have been linked to adolescent smoking behavior. In the focus group study with African-American and White adolescents of ages 14 through 17, the study reported ethnic differences in participants’ perceptions of parental permissiveness about smoking behavior (Gittelsohn 2001:211-225). Parental smoking and attitudes are critically important influences on whether a child will smoke. Children are seven times less likely to smoke if they perceived strong disapproval from their parents. Parental ant-smoking attitudes are strongly influential and have been shown to carry more weight than actual parental smoking (Royal college of physicians of London 1992).

The studies have reported a relationship between smoking behavior and family conflict. In the six-year longitudinal study of seventh through twelfth graders, the study found that high family conflict predicted regular smoking among the girls (Flint 1998:358-364). Another study reported that sixth through eighth grade girls were less likely to smoke if they experienced lower levels of conflict with their parents (Simons-Morton 1999:138-148). In the nationally-representative, cross-sectional study of fifth through twelfth graders, the study found that a history of abuse and violence within the family were associated with increased risk of smoking behavior among adolescent girls (Simantov 2000:1025-1050).

The parents with lower education level, older age are comparatively inactive in tobacco control among adolescents (Wen, Chen et al. 2007:323-6). In the children aged 8 to 17 years at Xuhui Distrct in Shanghai, the children whose fathers were less educated were more likely to experiment with smoking (Chen, Y. et al. 1992: 51-6). Smoking is also associated with lower parental socio-economic status (Zhu 1996:368-75).

The research studied the relationship between family factors and smoking behavior of junior middle school students in China. 322 7th-9th graders (181 males and 138 females; 135 7th graders, 100 8th graders, and 84 9th graders), were assessed with a series of questionnaires on smoking behavior, family, and parents. Smoking behavior was studied by gender and grade; the relationship between smoking behavior and family factors (parents' smoking behavior, family coherence, communication, conflict, parents' monitoring, family warmth, methods of discipline, and family structure) was studied with chi-square test and logistical regression analysis. The results show that 40 students (20%) smoked; the number of male smokers was significantly higher than female smokers. The chi-square test shows that mothers' smoking behavior and attitude, family warmth, family communication, cohesion, parents' monitoring, fathers' attitude toward smoking, penalty, rejection, and over interference were significantly related to smoking behavior. Logistical regression analysis reveals that only mothers' smoking behavior and attitude and family communication had significant effects on students' smoking behavior (Fang, Xiaoyi, et al. 2000: 244-250).

Research on the relationship between household smoking restrictions and teen smoking has produced mixed results. Biener L, et al. found no relationship between household smoking restrictions and teen smoking or between such restrictions and teen views of their parents' attitudes toward teen smoking (Biener L, et al. 1997:358-363). In contrast, Jackson and colleagues found that household smoking restrictions were related to smoking onset in children (Jackson C, et al.

1997:359-364).

In conclusion, many studies show that family influences are the important determinant of adolescent smoking. Parents are the sources of primary socialization and their influence is strong in the pre-school phase of children's lives. One or both parents' smoking is associated with smoking in their children. It is not that children smoke because their parents smoke but, for a number of reasons such as the accessibility of cigarettes, that they at increased risk of taking up the habit. Parental ant-smoking attitudes are strongly influential to youth smoking.

2.5.2.2 Friends/ peers:

Teens are most influenced by other kids close in age. Many researchers have reported a strong relationship between adolescent smoking behavior and having friends who smoke (Goodrow 2003:89-94; Osaki 1999:254-260; Unger 2002:476-484; The National Center on Addiction and Substance Abuse 2003; Zhang, L. et al. 2000: 415-22). Having close friends who smoked and being encouraged by close friends to smoke were strong risk factors for smoking (Zhu 1996:368-75). It is interesting to note that several researchers have noted that perceptions about friends' smoking behavior are more influential than friends' actual behavior in predicting adolescents' smoking behavior (Simons-Morton 1999:138-148). A survey of 3518 middle school students in Guangxi Zhung Autonomous region in China showed 53% students started to smoke because influence of their friends (Gu 2000). The Global Youth Tobacco Survey (GYTS) in Addis Ababa, Ethiopia showed having smoking friends was strongly associated with smoking after controlling for age, gender, parental smoking status, and perception of risks of smoking (OR = 33) (Rudatsikira, Abdo et al. 2007:176).

The study of a nationally-representative, school-based sample of seventh through twelfth graders found that adolescents who were involved in friendship groups in which more than half the members smoked were twice as likely to report current cigarette smoking as their peers who had friendship networks with fewer

smokers. Having best friends who smoked also resulted in a two-fold increase in risk of smoking. No gender interaction effects were noted. But results of this study do not allow the authors to conclude whether peer smoking was a result of peer influence or whether adolescents that were more likely to smoke selected friends that smoked (Alexander 1999). Another study found females who had a best friend that smoked were nearly seven times more likely to smoke than females who did not have a best friend that smoked. In addition, the more smoker friends that the male and female adolescents in the study had, the more likely they were to engage in smoking (Taylor 2004:190-196).

In general, research states that peer pressure is positively correlated with adolescent smoking, particularly in females. Moreover, the desire to be seen as popular or 'cool' is also positively correlated with adolescent smoking, especially in females. Peer pressure was positively associated with smoking. Students who had been offered a cigarette (peer pressure) were 1.78 times as likely to smoke as students who had not been offered these substances. Those with one friend who smoked were 2.73 times as likely to smoke and those with two or more friends who smoked were 9.46 times as likely to smoke as those with no friends who smoked (Bruce Simons-Morton, et al. 2001:95-107). Youth who use tobacco tend to overestimate the use of tobacco by their peers. Therefore, they may feel that 'everyone else' is using tobacco and that if they do not, they will not fit in. Peer pressure and a desire to be seen as 'cool' by their peers has often been cited as another important factor in determining adolescent smoking behavior (Urberg 1991:21-28). Many researchers conclude that pressure from peers is the single importance influence. One of the most consistent finding in research on adolescent smoking is that nonsmokers who have friends who smoke soon become smokers themselves (Services 1998:605-9). The majority of early smoking experiences occur in social settings with cigarettes obtained from a friend, often in the company of a best friend (Bauman 1984:11-36).

Several researchers suggest that girls are particularly

susceptible to peer pressure. The study of tenth grade students reported that the most common reasons for beginning smoking were social norms, offers to smoke, and desire. Significantly more females (15%) than males (9%) reported that pressure was the reason for beginning to smoke (Sarason 1992:185-190). In a self-report study of the reciprocal influence of cigarettes and alcohol, the study reported that peer pressure, along with having friends that drink increased the likelihood of becoming a smoker (and drinker) (Ritchey 2001:386-397). In a telephone survey conducted with adolescent fifth, eighth and twelfth grade girls and with senior girls in college, researchers found that girls' perception of pressure to smoke increased as the girls got older. In contrast to other studies, however, they reported that boys were more likely to feel peer pressure than were girls (The National Center on Addiction and Substance Abuse 2003). A longitudinal study demonstrated that becoming an experimental smoker was predicted by friends' smoking behavior, being offered cigarettes from friends, grades, and alcohol and marijuana use (Flay BR 1998:A9-A18).

The study reported that when discussing the influence of peers on smoking behaviors, female adolescents usually described interactions in which they wanted to smoke to gain acceptance by friends who were already smoking. These adolescent girls did not suggest that they were coerced into the behavior, but rather that they participated simply because they perceived that everyone else was doing it (Alexander 1999:245-257).

In the focus group study with African-American and White adolescents ages 14 through 17, the study reported ethnic differences in perceptions of why female adolescents smoke. The authors conclude that both African-American and White girls' smoking behavior was driven by their desire to fit in with their peer group while males were more coerced into smoking. The difference they found was that White girls choose to smoke to fit in with peers while African-American girls choose to not smoke in order to fit in with their peers, findings reflective of the differential prevalence rates of smoking between African-American and White females. Female

adolescents' smoking as a way to fit in was also reported by the study (Gittelsohn 2001:211-225).

Teens often seek approval and acceptance from their peers. A strong motivator to start smoking is a feeling of being left out, so teens start to smoke just to fit in with the crowd. Often they feel encouraged and pressured or even teased and taunted into smoking. Teens also want to fit in with peer groups they admire-the 'cool' kids-and many of them will do what 'cool' kids do. Some teens believe that smoking makes them more popular, 'cool', attractive, sexy or rugged. Peer smoking has a major impact on the smoking behavior of young people. Forty percent of young people are offered their first cigarette by one of their peers, and 55-65% smoke with their friends and classmates (The GTSS Collaborative Group 2006: ii4-ii19; Duan JL. 2007: 115-119).

The opinion of friends is important to children. The influence of friends is also linked with status. Children do not want to be seen by their friends as being 'wimp'. Non-smoker report that their friends made fun of them if they did not smoke. Many obtain their first cigarette from a friend and young smoker often associate with older peer group, boyfriends or girlfriends. Being offered a cigarette by friends is particularly important. Refusing can go against the group norm and refusal skill need to be learned (Royal college of physicians of London 1992).

In conclusion, although the family has the first impact on the child, as child grows older the influence of friends becomes extremely strong. Best friends' smoking behavior and attitude to smoking are one of the most important factors related to the uptake of youth smoking. The influence appears to operate in two ways, as peer influence and peer-bonding. In the first instance, children who smoke encourage, or even frighten, others into trying a cigarette, and secondly, young smokers often have much in common and tend to team up as peer groups.

2.5.2.3 Teachers:

Teachers' smoking builds a positive image of tobacco use

making them a negative or harmful role model for students. Teachers are important role models for students, particularly for those in the lower grades. Teachers' smoking can harm students by encouraging them to smoke. Approximately 48.4% of male teachers smoke (Yang GH 2005). Another study on seventh-grade students and teachers from twenty-three middle and junior high schools determined that the association between teacher attitudes, behavioral intentions, and smoking behavior and the prevalence of student smoking. Teacher attitudes toward smoking policies were found to be strongly related to the current smoking behavior of the teacher but not consistently related to student smoking. In addition, teacher likelihood of intervening showed a modest association with teacher smoking status, with current smokers generally indicating being the least likely to intervene for student possession or use of cigarettes. Teacher intentions to intervene were strongly associated with the prevalence of smoking among boys but not girls (de Moor, C., Cookson, K., Elder, J. P., et al. 1992:565-578).

Some studies showed that, as role models, teacher directly influences students' behavior and judgment. To a great extent, teachers who smoke have a significant association with students' smoking status. (Zhang, L. et al. 2000: 415-22). Whilst few children see their teachers as role models, most children probably view them as figures of authority. Thus a smoking teacher legitimises the habit and endorses its acceptability as an adult activity for the child. This may, of course, simply reflect a generally more permissive attitude to smoking in such school (Royal college of physicians of London 1992). There is no question that the family exerts the greatest of all influences upon children; but as they grow up, outside influence become stronger. Teacher is a another factor influencing adolescents to smoke (Zhu 1996:368-75). The likelihood of tobacco use among students was significantly higher among those having teachers who smoked (Zhang 2000:415-22). It can be concluded that teachers are the important factors influencing children to smoke.

2.5.3 The organizational level factors:

The main interpersonal level factors of influencing adolescents to smoke are schools. School policies permitting staff smoking have a significant effect on high school students' smoking behavior. Permitting staff to smoke also significantly influences students' attitude toward cigarette use. The school environment is an influential factor on smoking behavior of students (Lee, Albert, et al. 2001: 443-448). The characteristics of the school environment, including local norms and discipline, also play a considerable role. Being taught smoking-related knowledge, perceived anti-tobacco atmosphere and no-smoking signs in school were positively associated with regular smoker's attempt to quit, while supervising teacher's smoking, parents' and teachers' tolerance could delay it (Wen, Chen et al. 2007:323-6).

The study among grade 6 and 7 students in 57 elementary schools in Ontario, Canada found that students are at increased risk for smoking if they (a) often see students smoking near their school, (b) report that students at their school smoke where they are not allowed, and (c) attend a school with a relatively high senior student smoking rate. Each 1% increase in the smoking rate among grade 8 students increased the odds that a student in grades 6 or 7 was an ever smoker versus never smoker (odds ratio, 1.05; 95% confidence interval, 1.02-1.08). A low-risk student (no family or friends who smoke) was over twice as likely to try smoking if he/she attended a high-risk school (Scott T. et al. 2005: 1762-5)

School smoking prevention efforts have the potential to influence adolescent smoking in several ways. In the middle school of china, 31.8% students had learned how to refuse smoking from school education (Tian, Meng et al. 2007:229-32). Another important factor is the environment in which an intervention is delivered. For example, a school-based intervention may lose credibility if teachers are seen using tobacco on school grounds (whether inside or outside a building). A study from Australia indicates that many adolescents start smoking regularly at school (Hill 1991:181-5).

The school with no-smoking policy for both staff and students has less smoking among students (Royal college of physicians of London 1992). The implementation and enforcement of smoke-free school policies limits the opportunity for teens to smoke. Further, the existence and enforcement of these policies promote norms against smoking as an acceptable behavior for everyone, including teachers, who are important role models for adolescents. Finally, antismoking curricula can provide vital information on the health dangers and the addictive nature of cigarettes (Peter Boyle 2004). Another study on cigarette smoking among junior and senior high school students in Jiangxi province, China and Japan, in two samples of 57,566 Japanese students and 11,836 Jiangxi students, indicates that the smoking rate among middle school students was strongly influenced anti-smoking education in school (Osaki 1999:254-260).

Cigarette smoking was more prevalent among private school students than among public school students (private vs. public: 21.9% vs. 12.3% for susceptibility to smoking, 53.9% vs. 38.2% for ever smoking, 22% vs. 12.0% for 30-day smoking, 15.9% vs. 4.0% for 7-day smoking, 4.5% vs. 1.2% for established smoking) (Gong, Chen et al. 2006:117-21). Compared with students in public, factory schools and private schools, the lifetime smoking prevalence was also significantly different among 3 types of schools: 35.4% in private schools, 17.4% in public schools, and 13.2% in the factory school. The prevalence of students' weekly smoking was also higher in private schools (6.2%) than in public schools (4.9%) or the factory school (4.0%). Similar disparity was observed in the prevalence of daily smoking (3.9% private, 3.5% public, and 2.7% factory) (Wen, Chen et al. 2008:46-53).

2.5.4 The community level factors:

2.5.4.1 Accessibility and availability of cigarettes:

A large number of retailers still break the law which prohibits the sale of cigarettes to children under sixteen. Shops are by far leading source of

cigarette supply for child smokers. Almost three –quarters of children who smoke regular buy cigarette from a shop at least once a week (Royal college of physicians of London 1992). Chinese minors have easy access to purchasing cigarettes, especially in groceries and small markets (Wen, Huang et al. 2007:24-7). A study of youth, ages 12-15, showed that youth living in towns that had local tobacco sales ordinances (no selling to minors) were significantly less likely to become established smokers than were youth living in towns without an ordinance (Siegel 1999:334-342).

Readily accessible tobacco products make it easy for young people to smoke. Low priced tobacco products, venders near schools, selling of single cigarettes along with failure to 'forbid the sale of cigarettes to young individuals under the age of 18 years' allow the young people to attain tobacco products easily. Prices of tobacc products are low in China. The three most highly consumed cigarette brands are all priced at less than 5 Yuan/Pack. This is affordable to most young people. A survey conducted in 2007 indicated that young people are able to purchase single cigarettes from more than half of mobile venders and 30% of snack shops (Yang GH 2008).

In the study, an anonymous survey was administered to 133,794 public school students, grades 6, 9, and 12 in Minnesota. Results showed that even if access to cigarettes through retail outlets is restricted due to the law (no selling tobacco products to minors), students believe that they have many other ways to obtain cigarettes including, buying from stores willing to sell to minors, traveling to neighboring communities where laws are less strict, or having someone of age buy the cigarettes for them (Harrison 2000:39-48).

2.5.4.2 Advertising and mass media;

One of the factors which influence smoking in children is advertising. The tobacco industry asserts that it does not want children to smoke and that cigarette advertising is aimed at adult smokers to encourage brand switching. Nevertheless, children are very aware of cigarette advertisement. Non-smoking children with favorite cigarette advertisements have been shown to hold more positive

views about smoking than those with no favorite advertisement and children aged 12 who approve of cigarette adverting are twice as likely to become smokers within a year as children who disapprove of it. In addition, cigarette advertising has been found to encourage smoking in teenagers by reinforcing the adolescent's image of him- or herself as successful, witty, exciting and/or glamorous (Royal college of physicians of London 1992). Tobacco advertisement and promotion are closely associated with levels of tobacco consumption. A study of the relationship between tobacco advertisement and consumption in 102 countries showed that tobacco consumption tends to decrease drastically in countries where there is a total ban on tobacco advertisement (Prabhat J, and Frank C. 2000).

Tobacco advertisement, promotion and sponsorship take on numerous forms. There are many indirect tobacco advertisement and promotion forms. Some promotion has even appeared on school uniforms (Ministry of Health PRC 2008). Tobacco advertising campaigns, which are constantly updated and renewed, cause young people to over-estimate the smoking rates among their peers and the adults; By linking tobacco with sports, independence, success and sex appeal, tobacco advertisements and promotion cause young people to under-estimate the harm of smoking. The effect of indirect tobacco advertisement using the brand name of a tobacco product is very effective, particularly among youth. The impact of such advertising is three times greater among young people, as compared to the effect on adults (Pollay RW, Siddarth S, Siege1 M, et al. 1996:1-6).

Youth also are susceptible to tobacco advertising, and those who are exposed to frequent advertisements for tobacco are more likely to smoke than those who are not (Botvin GJ 1993:217-224). Tobacco advertising is an important risk factor that can be removed by banning all forms of tobacco promotion to young people (Lam, T.H. 1998: 217-23). The more exposed to tobacco advertising young people are, the more likely they are to use tobacco. The tobacco industry falsely associates use of its products with desirable qualities such as glamour, energy and sex appeal as well as

with exciting activities and adventure. Widespread tobacco advertising ‘normalizes’ tobacco use, portraying it as being no different from any other consumer product, and making it difficult for young people to understand the hazards of its use. Research has shown that U.S. youth who smoke buy the most heavily advertised brands of cigarettes (U.S. Department of Health and Human Services 1994).

This study examines some of the major forms of current tobacco marketing throughout the world and describes how they attract youth between the ages of 12 and 17 years to smoking. The types of advertising discussed include direct forms, such as in radio, magazine, television, billboards and promotions, and indirect forms, such as tobacco-sponsored sporting and entertainment events (Larson, A.J. et al. 2000: 171-6). Because sports events attract many young people as spectators and participants, their influence on the smoking behavior of young people is greater than that of other forms of tobacco advertisement arid sponsorship (Ministry of Health PRC. 2008). Ever-smoking was independently associated with participation in tobacco promotional activities (Lam, T.H. 1998: 217-23).

Counter-advertising also can play a significant role in reducing tobacco use by youth. Youth are very susceptible to the influence of tobacco industry advertisements. Mass media campaigns can counter that acceptable, thereby increasing the motivation to quit. Even when counter-advertising is aimed at preventing tobacco use among youth, it may benefit youth tobacco-use cessation by increasing interest in quitting (Hopkins DP 2001:16-66). There is good evidence that tobacco promotion bans do help reduce smoking. Norway introduced a ban on tobacco advertising as long as 1975. The prevalence of smoking in children had been increasing steadily over the previous two decides, but after the ban it decreased steadily (Royal college of physicians of London 1992)

Tobacco images in movies and television programs have a great influence on young people. Positive images of smoking in movies and television programs encourage young people to imitate this smoking behavior. Studies have

shown that young people who see tobacco images in movies or television are three times more likely to experiment with smoking. Even non-smoking youngsters are 16 times more likely to recognize cigarette brands if the figure they idolize smokes (James DS, Michael LB, Madeline AD, et al. 2001: 1394).

There was a strong, direct, and independent association between seeing tobacco use in films and trying cigarettes. Adolescents see film stars smoking in the context of sexuality, toughness, romance, and adolescent rebellion and as a way to relieve stress (McCool JP, et al. 2001: 1577-81). Cross sectional studies showed that smoking by adolescents' favorite film stars has been linked with smoking among adolescents (Distefan JM, et al. 1999:1-11; Tickle JJ, et al. 2001: 16-22) and seeing smoking in just one film may affect attitudes to smoking (Pechmann C, et al. 1999: 1-13).

In conclusion, tobacco advertisement and promotion are one of the most important factors which incite young people to start smoking. Tobacco advertisement, promotion and sponsorship link tobacco with sports, independence, success and sex appeal. They build an extremely potent positive image of tobacco, making it very attractive to young people. Positive images of smoking in movies and television programs encourage young people to imitate this smoking behavior.

2.5.5 The societal factors and public policy

Policies can influence the tobacco use and reverse the tobacco epidemic among youth. The extent to which smoking is allowed in public places is closely related to the social acceptability of smoking. As long as role models continue to smoke in public, young people will perceive that smoking is normal adult behavior (Royal college of physicians of London 1992). WHO has introduced six proven policies that may affecting youth smoking: Monitor tobacco use and prevention policies; Protect people from tobacco smoke; Offer help to quit tobacco use; Warn about the dangers of tobacco; Enforce bans on tobacco advertising promotion and sponsorship, and Raise taxes on tobacco (WHO 2008).

Increases in taxes on tobacco, which raise the overall cost, significantly reduce tobacco use by youth. Smoke-free policies in public places make tobacco use less socially acceptable, which also may help to prevent and reduce tobacco use by youth (Hopkins DP 2001:16-66). Price is one of the most important factors affecting cigarette consumption, at least in the short time. Some studies showed that a price increase results in a greater reduction in consumption in young people than in adults (Royal college of physicians of London 1992).

Strong voluntary and regulatory policies that deter tobacco use and protect youth from secondhand smoke are critical to helping youth quit. The Chinese National People's Congress ratified the WHO Framework Convention on Tobacco Control (FCTC) on 27 August 2005. The survey data were collected from two Chinese urban cities involving a sample of 3,003 residents to examine attitudes towards for WHO FCTC. 81.8% of the respondents in the study sample supported banning smoking in public places, 68.8% favored increasing the cigarette tax, 85.1% supported health warnings on cigarette packages, and 85.7% favored banning tobacco advertising (Yang, Wu et al. 2007:248). In the restaurants and bars surveyed, 27.9% had complete or partial smoking prohibiting rules (Kang, Jiang et al. 2007:738-41).

A survey at the 'No Smoking Day' on May 31, 2004 in China showed that over 73% of respondents do not think that human society will be able to get rid of the consumption of tobacco products. Although China has already made significant efforts with regard to tobacco control, it is still in the beginning of its 'long march' towards improving the population's health status by reducing tobacco consumption in China (Wang 2006:S140-7). Tobacco use and exposure to passive smoking were widely prevalent in the investigated schools, hospitals, county towns, and rural areas. Knowledge of the risks for passive smoking on health is lacking, especially in rural areas. Barriers to the control of tobacco use in public places include reluctance of administrators to implement tobacco control policies, lack of consistent policies, difficulties with regulations and enforcement, and reluctance of non-smokers to

exercise their right to clean air (Ma, Wang et al. 2007:420-5).

Tobacco law enforcement can affect the use of tobacco by youth (William C. Livingood, et al. 2001:733-747). With some exceptions the research states that there is not a significant decrease in adolescent smoking with active enforcement of tobacco laws that work to limit the availability of cigarettes to minors. Moreover, in terms of youths' perceptions, this study also concluded that there was no significant difference in youths' perceived access to cigarettes between youth living in towns with and without local tobacco sales ordinances (Siegel 1999:334-342).

In conclusion, tobacco policies and regulations are the important factors influencing youth smoking behavior. The tobacco policies have varied greatly after 'Framework Convention on Tobacco Control' officially went into effect in China in January 2006. There are some surveys of tobacco policy situation in China. However, the studies about influence of tobacco policies and regulations to youth smoking behavior are rare in China now.

2.6 Research conceptual framework

As mention above, there are multiple influences on youth tobacco use. The five ecological level factors: intrapersonal, interpersonal, organizational, community, and public policy level factors are associated with smoking behavior in youth. These factors affecting youth tobacco use are likely to interact and work together across these different levels. Many of the predominant theories or models of behavior focus on one dimension of approaches, such as knowledge, attitudes, or skills. Ecological models address multiple layers of influence on behavior and link health promotion strategies that target individual behaviors and environmental influences to behavior. Therefore, the framework based on the ecological model was used in the study in order to cover all the factors which may be associated with students' tobacco use.

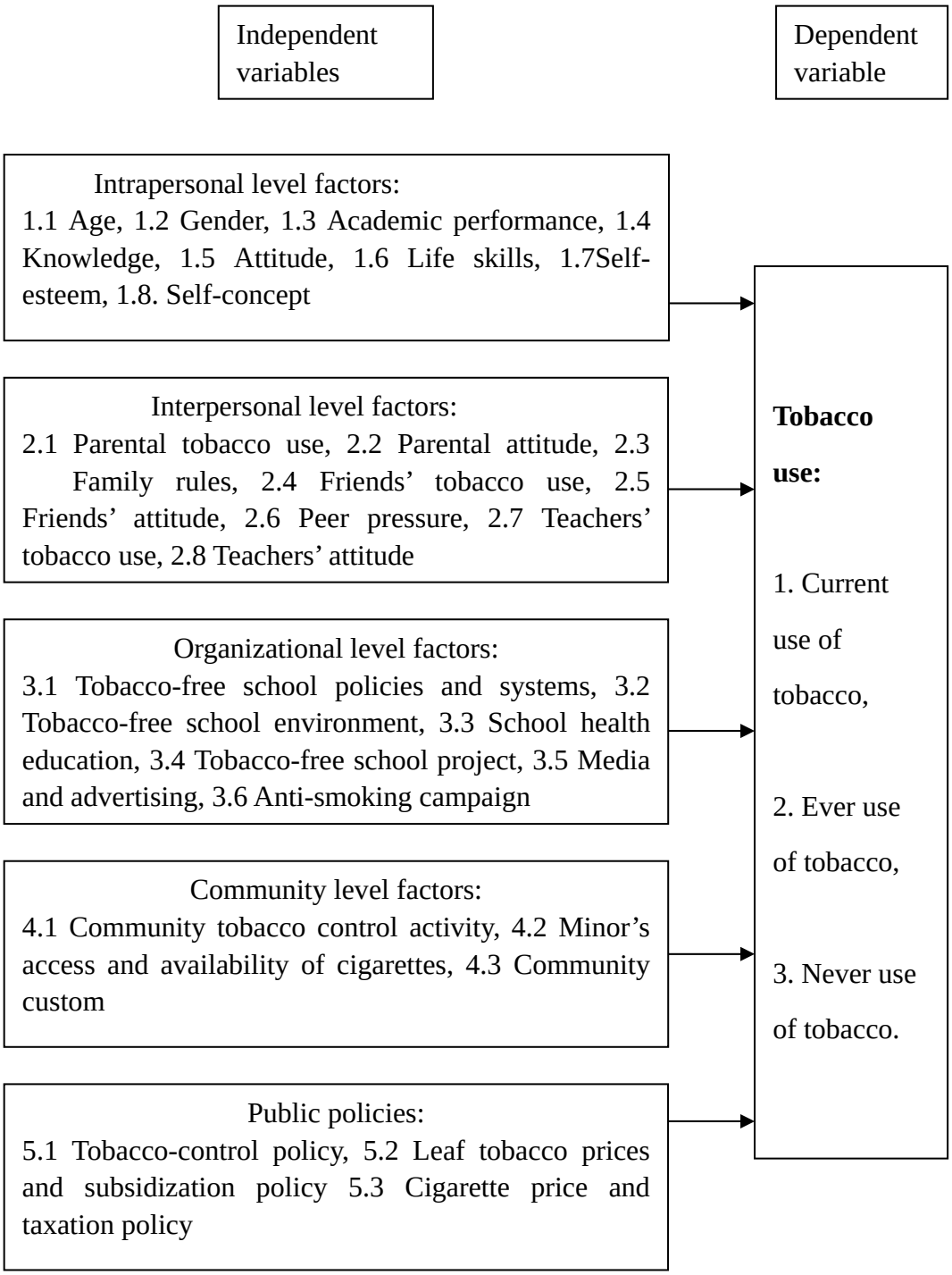


Figure 2.2 Conceptual framework

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents the research methodology. The research procedures are as follows:

3.1 Research design

3.2 Population and sampling method

3.3 Research instruments

3.4 Ethical considerations

3.5 Data collection and analysis

3.1 Research design

This research was a cross sectional descriptive research. The data were collected through three parts. First part was the survey on the full sample of students using a self-administered questionnaire. The second part was interviewing the people who managed the official documents concerning the related ecological factors using questionnaire and confirmed these documents by interview and observation. The third part was in-depth interview the people of the different ecological groups. The interviewee included five level ecological groups: students of middle school and their parents, principals and health education teachers of middle school, directors and officials of media center, directors and public health doctors of health service center, directors and members of community neighborhood committee and officials of related government department. The qualitative data helped to explain some of the findings from quantitative research.

3.2 Population and sampling method

The study population included in this study was students of age 12-17 years old in the middle schools in Anhui Province. The sample was randomly selected from the total population. Sampling method was a stratified three-stage cluster sampling design that produced samples of students in grades associated with students aged 12–17 years. Each sampling frame included all schools in a geographically defined area containing any of the identified grades. At the first stage, two cities were randomly selected use stratified random sampling from south and north of Anhui. At the second sampling stage, eight schools were randomly selected use stratified random sampling from junior and senior high school in urban and rural areas. At the third sampling stage, four classes were randomly selected in every grade of every sampled school use stratified random sampling. All enrolled students in selected classes were eligible to participate in the survey. Student participation was voluntary. The three-stage cluster sample is shown in figure 2.

In this study, the researcher used differences method to determine the sample size needed for analysis.

$$n = \frac{Z_{\alpha}^{2} pq}{d^{2}}$$

Where n is the sample size required, Z is the standard score for the corresponding confidence intervals, p is the estimated proportion of the variable, q is 1-p, and d is the degree of accuracy. Based on pilot test, p = 43%. d = 0.05, Z = 1.96. n = 383. Considering classifying analysis, sample size in every city was 383×4 = 1,532. Sample size was 3,064 in 2 cities.

3.3 Research instruments

There are three sets of data collection forms that collected quantitative and qualitative data.

3.3.1 Self-administered questionnaires for students

The self-administered questionnaires were used to collect information from students. The content of the student questionnaire included 172 questions based on core questionnaires of GYTS and ecological model. Every structured questionnaire had a different ID that integrate with classroom-level form, school-level form, community-level form, health service center-level form, media center-level form, local related government department-level form. Questionnaires for students included three parts as follows:

3.3.1.1 General characteristics and intrapersonal level factors

General characteristics and intrapersonal level factors included: Age, Gender, Knowledge, Attitude, Life skills, Academic performance, Self- esteem and Self-concept.

3.3.1.1.1 Knowledge of student about tobacco use: Ten items were administrated to measure smoking-related knowledge. The answering format was dichotomous (true versus false). The score was assigned 1 for correct answer and 0 for incorrect answer. The questions were summed to form one knowledge index (range 0-10), 0 indicating that all items were answered inappropriately, 10 indicating that all the questions were answered correctly. The level of knowledge was classified into three categories. If the total score was more than or equal to 8, the respondent was noted as having high level of knowledge, 6 or 7 was noted as moderate level of knowledge and less than 6 was noted as low level of knowledge. The questionnaires were tried out in 223 students of preliminary survey. It was calculated for reliability using Cronbach’s Alpha coefficient method. (Cronbach’s Alpha coefficient = 0.834, Questionnaire No. 41-50)

3.3.1.1.2 Attitude of student about tobacco use: Attitude towards tobacco use was measured by six items. In this study, the response was measured in 3 categories i.e. agree, uncertain, disagree. For the positive question, the score was assigned 3 for agree, 2 for uncertain and 1 for disagree, and vice versa for negative questions. The scores of each were summed up. If the summed score of respondent was more than or equal to 80% of total score, the respondent was noted as having favorable attitude, 60 to 79% was noted as moderate attitude and less than 60% was noted as unfavorable attitude. The questionnaires were tried out in 223 students of preliminary survey. It was calculated for reliability using Cronbach's Alpha coefficient method. (Cronbach's Alpha coefficient = 0.714, Questionnaire No. 51-56)

3.3.1.1.3 Life skills: Life skills were measured by forty-six items. The questionnaires were tried out in 223 students of preliminary survey. It was calculated for reliability using Cronbach's Alpha coefficient method. Life skills in this study include:

Critical thinking and communication skill: 15 items were administrated to measure critical thinking and communication skill respectively. Respondents were asked to report how true each statement was about them using a five-point likert-scale. Negatively worded items were reverse scored. Sum the scores for the 30 items. If the total score was more than or equal to the mean was termed as having 'high level' of critical thinking and communication skill, and less than the mean was termed as having 'low level' of critical thinking and communication skill. (Cronbach's Alpha coefficient = 0.864, Questionnaire No.83-112)

Coping with stress and interpersonal relationship skill: 8 items were administrated to measure coping with stress and interpersonal relationship skill respectively. For the positive question, the score was assigned 1 for true, 0 for false, and vice versa for negative questions. Sum the scores for the 16 items. If the total score was more than or equal to the mean was termed as having 'high level' of coping with stress and interpersonal relationship skill, and less than the mean was

termed as having ‘low level’ of coping with stress and interpersonal relationship skill. (Cronbach’s Alpha coefficient = 0.883, Questionnaire No.67-82)

3.3.1.1.4 Academic performance: It was classified into four levels by average grade. If the average grade more than or equal to 80, the respondent was noted as good academic performance, 70-79 was noted as moderate academic performance, 60-69 was noted as poor academic performance and less than 60 was noted as failure academic performance.

3.3.1.1.5 Self-esteem: It was measured by using the Rosenberg self-esteem scale. The scale was a ten-item Likert scale with items answered on a four-point scale, from strongly agree to strongly disagree. For the positive question, the score was assigned 4 for strongly agree, 3 for agree, 2 for disagree and 1 for strongly disagree, and vice versa for negative questions. Sum the scores for the 10 items. If the total score was more than or equal to 30, the respondent was noted as having high self-esteem, 20 to 30 was noted as moderate self-esteem and less than 20 was noted as low self-esteem. The questionnaires were tried out in 223 students of preliminary survey. It was calculated for reliability using Cronbach’s Alpha coefficient method. (Cronbach’s Alpha coefficient = 0.769, Questionnaire No. 57-66)

3.3.1.1.6 Self-concept: It was measured by using the Taiwan Ling Jia Ping Self-Concept Scale which adapt from Tennessee Self Concept Scale (Fitts & Warren, 1996). The scale was a sixty-item. Respondents were asked to report how true each statement was about them using a six-point likert-scale. Negatively worded items were reverse scored. Sum the scores for the 60 items. If the total score was more than or equal to the mean was termed as having ‘high level’ of self-concept, and less than the mean was termed as having ‘low level’ of self-concept. The questionnaires were tried out in 223 students of preliminary survey. It was calculated for reliability using Cronbach’s Alpha coefficient method. (Cronbach’s Alpha coefficient = 0.839, Questionnaire No. 113-172)

3.3.1.2 Interpersonal level factors

Interpersonal level factors included: Parental tobacco use, Parental attitude, Family rules, Teachers' tobacco use, Teachers' attitude, Friends' tobacco use, Peer pressure, and Friends' attitude.

3.3.1.2.1 Family rules: It was assigned in 2 categories, one for prohibiting tobacco use and never allowing smoking inside house, two for not prohibiting tobacco use or allowing smoking inside house.

3.3.1.2.2 Peer pressure: Peer pressure was measured by direct peer pressure and indirect peer pressure. Direct peer pressure was assessed by which how many respondent's friends encouraged him or her to smoke. Indirect peer pressure was assessed by which how many of the respondent's four closest friends smoke. If respondent had one or more than one friends encouraged him or her to smoke, or one or more than one closest friends smoked in the past year, it was noted as respondent having peer pressure.

3.3.1.3 Tobacco user among secondary school students: it included ever cigarettes smoking, current cigarette smoking, ever other tobacco use and current other tobacco use. The age at which students began cigarette smoking, place where students usually smoke, and the numbers of smoking cigarettes a month was also included. However, the way of getting cigarettes, main reasons for quitting of smokers, brands of cigarette which current smokers usually smoked were asked in this part.

3.3.2 Different ecological level forms and questionnaires

Different ecological level forms and questionnaires were used to collect information and data of schools, classroom, community, health service center, media center, related government department from people who managed the official documents concerning the related ecological factors. The school-level form with the school ID showed the district, community, and the school name. The surveyor interviewed principals and teachers of middle school about the tobacco-free school

policy, the tobacco-free school environment, and the tobacco-free school project; checked relevant official documents and records. The classroom-level form with the class ID showed the school name, the sample, the school ID. Health service center-level form, media center-level form, and local related government department-level form have their IDs and community ID. The community-level form with the community ID showed the district. Through every different ID of these forms, researcher could classify these different ecological factors. The information and data by interviewing the people who managed the official documents concerning the related ecological factors and observation filled in these forms and questionnaires. Different ecological level forms and questionnaires include 3 parts:

3.3.2.1 Organizational level factors

3.3.2.1.1 Tobacco-free school policies and systems: It was measured by interviewing the principal and teacher who managed the documents concerning tobacco-free school policies and systems and checking these documents by interview and observation. If confirmed these documents, it was noted as there was tobacco-free school policies and systems in this school.

3.3.2.1.2 Tobacco-free school environment: It was measured by interviewing the principal and teacher who managed the documents concerning tobacco-free school environment and checking these documents by interview and observation. If this school had an official document of local government department, this school was noted as the tobacco-free school.

3.3.2.1.3 School health education: It was measured by interviewing the principal and teacher who managed the curricula concerning school health education about tobacco use and checking these documents by interview and observation. If confirmed these curricula, it was noted as there was school health education in this school.

3.3.2.1.4 Tobacco-free school project: It was measured by interviewing the principal and teacher who managed the documents

about taking part in one smoke-free school program and checking these documents by interview and observation. If confirmed these documents, it was noted as there was tobacco-free school project in this school.

3.3.2.1.5 Media and advertising: It was measured by interviewing the director or official of media center who managed the official documents about banning all tobacco advertisement on television, videos, newspapers or billboards in local region and checking these documents by interview and observation. If confirmed these documents, it was noted as banning tobacco advertisements on media.

3.3.2.1.6 Anti-smoking campaign: It was measured by interviewing the director or doctor of health service center who managed the documents about conducting anti-smoking campaign and checking these documents by interview and observation. If confirmed these documents, it was noted as having a anti-smoking campaign in this district.

3.3.2.2 Community level factors

3.3.2.2.1 Community tobacco control activities: It was measured by interviewing the director or member of community neighborhood committee who managed the documents about community tobacco control activities and checking these documents by interview and observation. If confirmed these documents, it was noted as there were community tobacco control activities:

3.3.2.2.2 Minor’s access and availability of cigarettes: It was measured by interviewing the director or member of community neighborhood committee who managed the documents about minor’s access and availability of cigarettes and checking these documents by interview and observation. If confirmed these documents, it was noted as minor couldn’t access to cigarettes in this community.

3.3.2.2.3 Community custom: It was measured by interviewing the director or member of community neighborhood committee and checking

these documents, records, local chronicles, annals of local history, and local customs compilation of local history by interview and observation. If confirmed these, it was noted as cigarette was a traditional gift in festival and special occasion in the community.

3.3.2.3 Public policy

3.3.2.3.1 Tobacco-control policy: It was measured by interviewing the official of local government department who managed the official documents about smoking-free policies and checking these documents by interview and observation. If confirmed these documents, it was noted as there were tobacco control policies in this district.

3.3.2.3.2 Leaf tobacco prices and subsidization policies: It was measured by interviewing the official of local government department who managed the official documents about leaf tobacco purchase prices and subsidization policies and checking these documents by interview and observation. If confirmed these documents, it was noted as there were a leaf tobacco purchase prices and subsidization policies in this district.

3.3.2.3.3 Cigarette price and taxation policy: It was measured by interviewing the official of local government department who managed the official documents about taxation policy and cigarette price and checking these documents by interview and observation. If confirmed these documents, it was noted as there were a taxation policy and cigarette price control in this district.

3.3.3 In-depth interview guidelines and record forms

In-depth interview guidelines and record forms were used to collect perception of FCTC among people of the different ecological groups. They include six parts: Price and tax measures, Non-price measures protection from exposure to tobacco smoke, Packaging and labeling of tobacco products, Tobacco advertising, promotion and sponsorship, Sales to and by minors, Demand reduction measures concerning tobacco dependence and Cessation.

3.4 Ethical considerations

The ethics of the study was very important and had to be considered since it concerned with human being. An approval of ethical clearance by The Faculty of Public Health, Mahidol University Ethics Committee for Human Research was obtained as the document proof number MUPH2009-204 dated on December 3rd 2009 (Appendix L). The study was risk free to the respondents. The confidentiality to response from each participant was not mentioned in the study.

Before the survey, all student and participants signed consent forms. The confidentiality of their verbatim-transcribed statements was ensured by using code numbers for each participant. Formal letters were mailed to principles of all participating schools. Passive consent was obtained from every student by delivering parent-notification letters to their parents before data collection. Student respondents' confidentiality was ensure by anonymous self-administration of questionnaires.

Information sheet was read and explained to the sampled students which included the study purpose, background information, procedures, risk and benefits of this study, confidentiality and the nature of the study until they were clearly understood.

There had been no foreseeable physical and mental risk. However, the students might felt uncomfortable to recall some remote memory such as the age of initiation of the tobacco use and pattern of tobacco use. This study would not bring immediate benefit for them but it would provide the important information for identifying the smoking behavior and the factors affecting the smoking behavior among youth which would be particularly important in order to preventing youth smoking in China.

The respondents' decision whether they participated in this study or not is respected. Before survey and interview, researcher and surveyor told participants that they had the right to withdraw from the study at anytime without advert effects. If researcher and surveyor found subject had uncomfortable feeling, they told subject

could withdraw from the study immediately. The participation in this study was strictly voluntary. The respondent had the right to refuse to answer the question or to withdraw at any time without advert effects.

All responses were kept anonymous. There was no single chance to link with their name and their responses on the questionnaires. All questionnaires were kept at a safe place that no one can accessible. Identification numbers were used to identify the data collection form. Only the primary investigator could access to questionnaires. After all responses were entered for data analysis, all questionnaires and forms were destroyed. Whatever the kind of report would have published, any personal information of respondents and schools would never be motioned.

3.5 Data collection and analysis

Data collection was done during 3-15 December 2009. After data collection, data were checked and cleaned for error before analysis. Data processing included: generating a code book that included items variable name, variable description and variable value; developing data set for analysis; data entry; data check and cleaning; construction of data file. Data analysis included descriptive statistics, univariate analysis, chi-square, multinomial logistic regression and structural equation modeling. The data were processed and analyzed by the SPSS and AMOS.

Descriptive statistics was used to describe each variable in the conceptual framework based upon type of variable. Chi-square was employed to examine the difference of the prevalence rates by ecological factors. Multinomial logistic regression (for three-category dependent variable of tobacco use) was employed to assess the relative relationship of ecological factors and tobacco use. The criteria at 0.25 level was used to identify of p-value the candidate variables. Structural equation modeling (SEM) with analysis of moment structures (AMOS) was utilized to analyze the hypothesized model. SEM permits modeling with a set of relations among

constructs and allows for simultaneous estimation of all hypothesized paths and also estimation of mediation or indirect effects. Details for variables coding in multinomial logistic regression were presented in Table 3.1.

Table 3.1 Variable coding for multinomial logistic regression

Variables	Variable coding
Tobacco use	0=Never tobacco use, 1=Ever tobacco use, 2=Current tobacco use
Gender	1=Male, 2=Female
Age	1=17 years old, 2=16 years old, 3=15 years old, 4=14 years old, 5=13 years old, 6=12 years old
Academic performance	1=Failure, 2=Poor, 3=Moderate, 4=Good
Knowledge	1=Low, 2=Moderate, 3=High
Attitude	1=Favorable, 2= Moderate, 3=Unfavorable
Self-concept:	0=Low, 1=High
Coping with stress	0=Low, 1=High
Interpersonal relationship skill	0=Low, 1=High
Critical thinking	0=Low, 1=High
Communication skill	0=Low, 1=High
Self esteem	1=Low, 2=Moderate, 3=High
Parental smoking	1=Yes, 2=No
Parental attitude	1=Favorable, 2=Unfavorable
Friends smoking	1=Yes, 2=No
Friends attitude	1=Favorable, 2= Unfavorable
Peer pressure	1=Yes, 2=No
Family rules	0=No, 1= Yes
Teachers' smoking	1=Yes, 2=No

Table 3.1 Variable coding for multinomial logistic regression (cont.)

Variables	Variable coding
Tobacco-free school environment	0=No, 1=Yes
Tobacco-free school policies and systems	0=No, 1=Yes
School health education	0=No, 1=Yes
Tobacco-free school project	0=No, 1=Yes
Smoking intervention program	0=No, 1=Yes
Community activity	0=No, 1=Yes
Minor's access	1=Yes, 2=No
Tobacco policy	0=No, 1=Yes

CHAPTER IV

RESULTS

In this chapter, the results of data analysis are presented. The results of analysis were presented in 5 parts as follows:

4.1 General information and demographic characteristics

4.2 Tobacco use

4.3 Ecological factors related to students tobacco use

4.4 Multinomial logistical regression analysis of ecological factors related to students tobacco use

4.5 The analysis of an ecological model among smoking students by SEM

4.1 General information and demographic characteristics

The survey was conducted in middle schools of two cities, both rural and urban schools. 3231 students were randomly selected from the sampled schools. The data of students tobacco use were collected through the self-administered questionnaire. Total of 3231 questionnaires returned with 100.0% response rate. Among the sampled students, 55.2% students lived in a rural area, while 44.8% lived in an urban area. Of 3231 students participated in the study, female were 47.1%, and male were 52.9%. Proportion of male was slightly higher than female. The ages were 12 to 17 years old. 16.6% of the sample were twelve years old, 17.2% were thirteen years old, 17.5% were fourteen years old, 18.0% were fifteen years old, 16.3% were sixteen years old, and 14.4% were seventeen years old (Table 4.1).

Table 4.1 General characteristics of students

Characteristics	Number	Percent
Region		
Rural	1784	55.2
Urban	1447	44.8
Age (years old)		
12	537	16.6
13	555	17.2
14	565	17.5
15	581	18.0
16	527	16.3
17	466	14.4
Gender		
Female	1522	47.1
Male	1709	52.9

The qualitative data of ecological factors were collected through interviewing the people of the different ecological groups in 2 sampled cities. The interviewee included five level ecological groups: students of middle school and their parents, principals and health education teachers of middle school, directors and clerks of media center, directors and public health doctors of health service center, directors and members of community neighborhood committee and officials of related government department. Among 8 sampled schools, three schools had tobacco free policies and systems; one school was the tobacco free school which was evaluated by local government department; seven schools had the school health education about tobacco control; one school had the tobacco free school project (Table 4.2)

Table 4.2 Students and related ecological factors in each sampled school

School	Number of students	Tobacco free policies	Tobacco free school	School health education	Tobacco free school project
No. 1	386	Yes	Yes	Yes	No
No. 2	483	Yes	No	Yes	Yes
No. 3	352	Yes	No	Yes	No
No. 4	364	No	No	Yes	No
No. 5	380	No	No	Yes	No
No. 6	376	No	No	Yes	No
No. 7	355	No	No	Yes	No
No. 8	535	No	No	No	No
Total	3231	3/8	1/8	7/8	1/8

The qualitative data of perceptions of the FCTC by different groups of ecological model were collected through in-depth interview. The results can be concluded into six categories (Details are in Appendix J).

According to price and tax measures, some interviewees thought that increase tax could reduce youth tobacco consumption; but others thought differently. If China imposes higher tax on higher-priced cigarettes, many students may turn to cheaper tobacco products and roll-your-own cigarettes, and that would do them more harm. Most of parents agreed with tax increasing, but one of them thought that it is not fair for the poor students. Most of the government department officers agreed with increase fax measures because they thought that it would not only increase government revenue, but also save the lives of millions of people. The health workers at health centers although agreed with increasing tax measures. They suggested that increasing tax rate should be more than inflation rate.

4.2 Tobacco use

4.2.1 Tobacco use status (Table 4.3 Table 4.4)

The study found 342 current tobacco users and 636 ever tobacco users among 3,231 samples. The prevalence of current tobacco use was 10.6%, 16.2% among the males and 4.3% among the females. The prevalence of ever tobacco use was 19.7%, 25.3% among the males and 13.4% among the females. Among the the males and females, the prevalence of current tobacco use were 9.5% and 2.9% of twelve years old respectively; 11.3% and 3.7% among the thirteen years old respectively; 14.7% and 4.0% among the fourteen years old respectively; 17.1% and 3.6% among the fifteen years old respectively; 15.8% and 6.2% among the sixteen years old respectively, and 29.8% and 6.1% among the seventeen years old respectively; the prevalence of ever tobacco use were 17.6% and 7.3% of twelve years old respectively; 22.0% and 11.0% among the thirteen years old respectively; 23.9% and 13.5% among the fourteen years old respectively; 23.7% and 15.2% among the fifteen years old respectively; 30.1% and 18.0% among the sixteen years old respectively, and 34.5% and 17.3% among the seventeen years old respectively;

Table 4.3 Tobacco use of students classified by gender

Tobacco use	Total		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Current use	342	10.6	277	16.2	65	4.3
Ever use	636	19.7	432	25.3	204	13.4
Never use	2253	69.7	1000	58.5	1253	82.3

Table 4.4 Tobacco use of students among different age groups

Age	Male			Female		
	Tobacco use			Tobacco use		
	Never (%)	Ever (%)	Current (%)	Never (%)	Ever (%)	Current (%)
12	191 (72.9)	46 (17.6)	25 (9.5)	247 (89.8)	20 (7.3)	8 (2.9)
13	188 (66.7)	62 (22.0)	32 (11.3)	233 (85.3)	30 (11.0)	10 (3.7)
14	180 (61.4)	70 (23.9)	43 (14.7)	224 (82.4)	37 (13.6)	11 (4.0)
15	180 (59.2)	72 (23.7)	52 (17.1)	225 (81.2)	42 (15.2)	10 (3.6)
16	171 (54.1)	95 (30.1)	50 (15.8)	160 (75.8)	38 (18.0)	13 (6.2)
17	90 (35.7)	87 (34.5)	75 (29.8)	164 (76.6)	37 (17.3)	13 (6.1)

4.2.2 Smoking pattern

Smoking pattern among students smokers in this study includes:

Age first tried a cigarette (Table 4.5)

Amount of cigarettes smoking per day (Table 4.6)

Brands of cigarette (Table 4.7)

Accessibility of getting cigarettes(Table 4.8)

Smoking place (Table 4.9)

Considering the age that smokers first tried a cigarette, 33.3% of smokers smoked their first cigarette before age 7. Before age 10, 60.9% of smokers smoked their first cigarette.

Table 4.5 The age that smokers first tried a cigarette by gender (n=978)

Age	Total		Male		Female	
(years old)	Number	Percent	Number	Percent	Number	Percent
≦7	326	33.3	241	34.0	85	31.6
8 - 9	270	27.6	188	26.5	82	30.5
10-11	265	27.1	189	26.7	76	28.3
12-13	60	6.1	45	6.3	15	5.6
14-15	38	3.9	30	4.2	8	3.0
≧16	19	1.9	16	2.3	3	1.1

Among 342 current smokers, 47.1% of them smoked six or more cigarettes per day; 24.9% of them smoked one or less than one cigarette per day.

Table 4.6 Amount of cigarettes smoking per day in current smokers (n=342)

Quantity of cigarettes smoking	Number	Percent
Less than 1 cigarette	53	15.5
1 cigarette	32	9.3
2 to 5 cigarettes	96	28.1
6 to 10 cigarettes	92	26.9
11 to 20 cigarettes	69	20.2

Regarding the brands of cigarette which current smokers usually smoked, 22.5% of current smokers did not have a usual brand. The most common brands of cigarette were Huangshang, Dujiang, and Hefei which made in Anhui Province. 42.3% of current smokers smoked cigarettes made in Anhui province; 20.0% smoked cigarettes made in other provinces of China; 13.2% smoked Marlboro cigarette.

Table 4.7 Brands of cigarette which current smokers usually smoked (n=342)

Brand	Number	Percent
Not have a usual brand	77	22.5
Heifei (Anhui made)	50	14.6
Huangshan (Anhui made)	48	14.0
Dujiang (Anhui made)	47	13.7
Marlboro (foreign country made)	45	13.2
Other (other province made)	75	22.0

Regarding the accessibility of getting cigarettes in current smokers, buying cigarettes by themselves was most common way (70.8%). 67.6% of current smokers bought cigarettes from a store, 3.2% of them bought cigarettes from a vender.

Table 4.8 The accessibility of getting cigarettes among current smokers (n=342)

Accessibility	Number	Percent
Bought in a store	231	67.6
Adult gave them to me	22	6.4
Took them from family	21	6.1
Someone else bought them for me	18	5.3
Borrowed from someone else	16	4.7
Bought from a vender	11	3.2
Other	23	6.7

Among current smokers, 36.0% of them smoked cigarettes at home, followed by 18.7% of them smoked cigarettes at friends' houses, and 15.8% of them smoked cigarettes in public places (e.g. parks, shopping centres, street corners). Only 2.3% of current smokers smoked at school.

Table 4.9 Place where current smokers usually smoked (n=342)

Place	Number	Percent
At home	123	36.0
At friends' houses	64	18.7
In public place	54	15.8
At social events	42	12.3
At school	8	2.3
Other	51	14.9

4.2.3 Quit smoking

Among 342 current smokers, 60% females and 56% males among students want to stop smoking cigarretes. During the past 12 months, 29.1% femals and 28.0% males among students ever tried to quit smoking cigarretes (Table 4.10).

As showen in Table 4.11, the reasons of quitting smoking were inquired among student smokers. The most important reason was their parents did not like it (28.6%), followed by to save money (20.6%), their friends did not like it (19.5%) and to improve health (14.8%).

Table 4.10 Attempt to quit smoking (n=342) and try to quit (n=897) by gender

Gender	Attempt to quit		Try to quit	
	Yes (%)	No (%)	Yes (%)	No (%)
Females	39 (60.0)	26 (40)	72 (29.1)	175 (70.1)
Males	156 (56.3)	121 (43.7)	182 (28.0)	468 (72.0)
Total	195 (57.0)	147(43.0)	254 (28.3)	643 (71.7)

Table 4.11 Main reasons for quitting of smokers by gender (n=704)

Main reasons	Total		Male		Female	
	Number	Percent	Number	Percent	Number	Percent
Parents oppose	201	28.6	141	28.9	60	27.8
To save money	145	20.6	96	19.7	49	22.7
To improve health	104	14.8	67	13.7	37	17.1
Friends oppose	137	19.5	102	20.9	35	16.2
Other	117	16.6	82	16.8	35	16.2

4.3 Ecological factors related to students' tobacco use

4.3.1 Intrapersonal factors related to students' tobacco use

In this study, the intrapersonal level factors included age, gender, knowledge of tobacco use, attitude towards tobacco use, academic performance last semester, life skills, self-concept and self-esteem of students. Chi-square was employed to examine the differences in tobacco use by these ecological factors. All of the intrapersonal level factors had statistically significance. These factors are shown in table 4.12.

The prevalence of current tobacco use and ever tobacco use were 6.1% and 12.3% among the students of twelve years old respectively, 7.5% and 16.6% among the thirteen years old respectively, 9.6% and 18.9% among the fourteen years old respectively, 10.7 and 19.6% among the fifteen years old respectively, 12.0% and 25.2% among the sixteen years old respectively, 18.9% and 26.6% among the seventeen years old respectively.

Among the males, The prevalence of current tobacco use and ever tobacco use were 16.2% and 25.3%. Among the females, The prevalence of current tobacco use and ever tobacco use were 4.3% and 13.4%. The prevalences of tobacco use were

higher in males than females.

Among the students with low level knowledge, the prevalence of current tobacco use and the prevalence of ever tobacco use were 24.5% and 45.2% respectively. The prevalence of current tobacco use and ever tobacco use were higher in students of low level of the knowledge than high level of knowledge.

Among the students with favorable attitude towards smoking, the prevalence of current tobacco use and the prevalence of ever tobacco use were 11.2% and 25.2% respectively The prevalence of current tobacco use and ever tobacco use were higher in students with favorable attitude towards smoking than unfavorable attitude.

The prevalence of current tobacco use and ever tobacco use were higher in students with low level stress coping, interpersonal relationship skill, critical thinking and communication skill than high level respectively .

The prevalence of current tobacco use and the prevalence of ever tobacco use among the students with failur academic performance were 39.3% and 7.6% respectively. The prevalence of current tobacco use and ever tobacco use among the students with poor academic performance were 12.5% and 29.0% respectively.

The prevalence of current tobacco use and the prevalence of ever tobacco use were 35.5% and 42.7% respectively among the students with low level self-concept. The prevalence of current tobacco use and ever tobacco use were higher in students with low level self-concept than high level self-concept.

The prevalence of current tobacco use and the prevalence of ever tobacco use were 38.1% and 14.5% respectively among the students with low level self esteem. The prevalence of current tobacco use and ever tobacco use were higher in students with low level self esteem than high level self esteem.

Table 4.12 Intrapersonal factors related to student' tobacco use

Intrapersonal factors	Tobacco use			P-value
	Never (%)	Ever (%)	Current (%)	
Age (years old)				<0.001
12	438 (81.6)	66 (12.3)	33 (6.1)	
13	421 (75.9)	92 (16.6)	42 (7.5)	
14	404 (71.5)	107 (18.9)	54 (9.6)	
15	405 (69.7)	114 (19.6)	62 (10.7)	
16	331 (62.8)	133 (25.2)	63 (12.0)	
17	254 (54.5)	124 (26.6)	88 (18.9)	
Gender				<0 .001
Male	1000 (58.5)	432 (25.3)	277 (16.2)	
Female	1253 (82.3)	204 (13.4)	65 (4.3)	
Knowledge				<0 .001
Low	193 (30.3)	288 (45.2)	156 (24.5)	
Moderate	564 (62.0)	209 (23.0)	136 (15.0)	
High	1496 (88.8)	139 (8.2)	50 (3.0)	
Attitude				< 0.001
Favorable	210 (63.6)	83 (25.2)	37 (11.2)	
Moderate	292 (63.1)	113 (24.4)	58 (12.5)	
Unfavorable	1751 (71.8)	440 (18.1)	247 (10.1)	
Critical thinking				< 0.001
Low	805 (64.4)	241 (19.3)	204 (16.3)	
High	1448 (73.1)	395 (19.9)	138 (7.0)	
Communication skill				<0 .001
Low	985 (65.7)	326 (21.7)	188 (12.6)	
High	1268 (73.2)	310 (17.9)	154 (8.9)	

Table 4.12 Intrapersonal factors related to student' tobacco use (cont.)

Intrapersonal factors	Tobacco use			P-value
	Never (%)	Ever (%)	Current (%)	
Coping with stress				< 0.001
Low	984 (63.0)	419 (26.8)	159 (10.2)	
High	1269 (76.0)	217 (13.0)	183 (11.0)	
Interpersonal relationship skill				0.048
Low	1079 (69.7)	324 (20.9)	146 (9.4)	
High	1174 (69.8)	312 (18.5)	196 (11.7)	
Academic performance				< 0.001
Failure	119 (53.1)	17 (7.6)	88 (39.3)	
Poor	624 (58.4)	310 (29.0)	134 (12.5)	
Moderate	1076 (75.7)	240 (16.9)	106 (7.5)	
Good	434 (83.9)	69 (13.3)	14 (2.7)	
Self-concept				<0 .001
Low	222 (33.8)	280 (42.7)	154 (23.5)	
High	2031 (78.9)	356 (13.8)	188 (7.3)	
Self esteem				<0.001
Low	137 (47.4)	42 (14.5)	110 (38.1)	
Moderate	907 (58.3)	494 (31.7)	155 (10.0)	
High	1209 (87.2)	100 (7.2)	342 (10.6)	

4.3.2 Interpersonal factors related to students' tobacco use

In this study, the interpersonal level factors included parental smoking, parental attitude toward smoking, family rules, friend' smoking, friend' attitude, peer pressure, teacher' attitude and teacher' smoking. Chi-square was employed to examine the differences of tobacco use by these ecological factors. All interpersonal level

factors except teachers' attitude had statistically significance. These factors are shown in table 4.13.

Considering family factors related student smoking, the prevalence of current tobacco use and ever tobacco use were 28.4% and 24.8% respectively among the students whose parents smoked; the prevalence of current tobacco use and ever tobacco use were 2.7% and 17.4% respectively among the students whose parents did not smoke. Among the students whose parents had favorable attitude toward smoking the prevalence of current tobacco use and ever tobacco use were 46.2% and 27.8% respectively; among the students whose parents had unfavorable attitude toward smoking the prevalence of current tobacco use and ever tobacco use were 3.3% and 18.0% respectively. Among the students whose families did not have a family rule and allowed smoking inside home, the prevalence of current tobacco use and ever tobacco use were 11.2% and 20.5% respectively; Among the students whose families had a family rule and never allowed smoking inside home, the prevalence of current tobacco use and ever tobacco use were 2.2% and 8.4% respectively.

Regarding friends' smoking, the prevalence of current tobacco use and ever tobacco use were 16.0% and 28.0% respectively among the students whose friends smoked;. the prevalence of current tobacco use and ever tobacco use were 18.1% and 15.8% respectively among the students whose friends did not smoke. Among the students whose friends had favorable attitude toward smoking, the prevalence of current tobacco use and ever tobacco use were 14.0% and 21.2% respectively; among the students whose friends had unfavorable attitude toward smoking, the prevalence of current tobacco use and ever tobacco use were 9.2% and 19.1% respectively. Among the students who had a peer pressure. the prevalence of current tobacco use and the prevalence of ever tobacco use were 13.8% and 24.3% respectively; among the students who had not a peer pressure. the prevalence of current tobacco use and the prevalence of ever tobacco use were 8.1% and 16.2% respectively.

Table 4.13 Interpersonal factors related to student' tobacco use

Interpersonal factors	Tobacco use			P-value
	Never (%)	Ever (%)	Current (%)	
Parental smoking				<0.001
No	1791 (79.9)	391 (17.4)	61 (2.7)	
Yes	462 (46.8)	245 (24.8)	281 (28.4)	
Parental attitude				<0.001
unfavorable	2113 (78.7)	484 (18.0)	87 (3.3)	
Favorable	140 (25.6)	152 (27.8)	255 (46.6)	
Family rules				<0.001
Prohibit smoking	203 (89.4)	19 (8.4)	5 (2.2)	
Not prohibit	2050 (68.3)	617 (20.5)	337 (11.2)	
Friends' smoking				<0.001
No	1676 (76.1)	348 (15.8)	177 (8.1)	
Yes	577 (56.0)	288 (28.0)	165 (16.0)	
Friends' attitude				<0.001
Unfavorable	1658 (71.7)	441 (19.1)	214 (9.2)	
Favorable	595 (64.8)	195 (21.2)	128 (14.0)	
Peer pressure				<0.001
No	1383 (75.7)	295 (16.2)	148 (8.1)	
Yes	870 (61.9)	341 (24.3)	194 (13.8)	
Teachers' smoking				<0.001
No	2010 (71.9)	530 (19.0)	254 (9.1)	
Yes	243 (55.6)	106 (24.3)	88 (20.1)	
Teachers' attitude				0.282
unfavorable	471 (67.4)	151 (21.6)	77 (11.0)	
Favorable	1782 (70.4)	485 (19.1)	265 (10.5)	

4.3.3 Organizational factors related to students' tobacco use

In this study, the organizational level factors included school tobacco control policies and systems, tobacco-free school environment, school health education, tobacco-free school project, media and advertising, and anti-smoking campaign. Chi-square was employed to examine the differences of tobacco use by these ecological factors. All organizational level factors except tobacco-free school project, media and advertising had statistically significance. These factors are shown in table 4.14.

The organizational level factors were assessed by reviewing official documents and using government department assessing results. This assessing method was objective and avoided the reporting bias of students. In the schools with tobacco-free school policies and systems, the current tobacco use and ever tobacco use rate were 10.1% and 15.1% respectively; in the schools that had not tobacco-free school policies and systems, the current tobacco use and ever tobacco use rate were 10.9% and 22.5% respectively. In the tobacco-free school environment, the current tobacco use and ever tobacco use rate were 7.5% and 16.3% respectively; in the schools that were not tobacco-free schools, he current tobacco use and ever tobacco use rate were 11.0% and 20.1% respectively. In the schools with health education about tobacco control, the current tobacco use and ever tobacco use rate were 9.8% and 18.9% respectively; in the schools that had not health education about tobacco control, the the current tobacco use and ever tobacco use rate were 14.8% and 23.3% respectively. In the schools with tobacco-free school project, the the current tobacco use and ever tobacco use rate were 9.1% and 17.2% respectively; in the schools that had not tobacco-free school project, the the current tobacco use and ever tobacco use rate were 10.9% and 20.1% respectively. In the students of media and advertisement banning tobacco group, the the current tobacco use and ever tobacco use rate were 10.9% and 19.9% respectively; in the students at media and advertisement no banning tobacco group, the the current tobacco use and ever tobacco use rate were 10.2% and

19.4% respectively. In the students with anti-smoking campaign group, the the current tobacco use and ever tobacco use rate were 11.1% and 16.4% respectively; in the students with no social marketing campaign, the the current tobacco use and ever tobacco use rate were 10.3% and 21.2% respectively.

Table 4.14 Organizational factors related to students' tobacco use

Organizational factors	Tobacco use			P-value
	Never (%)	Ever (%)	Current (%)	
Tobacco-free school policies				<0.001
No	1339 (66.6)	452 (22.5)	219 (10.9)	
Yes	914 (74.8)	184 (15.1)	123 (10.1)	
Tobacco-free school environment				0.011
No	1959 (68.9)	573 (20.1)	313 (11.0)	
Yes	294 (76.2)	63 (16.3)	29 (7.5)	
School health education				<0.001
No	331 (61.9)	125 (23.3)	79 (14.8)	
Yes	1922 (71.3)	511 (18.9)	263 (9.8)	
Tobacco-free school project				0.119
No	1897 (69.0)	553 (20.1)	298 (10.9)	
Yes	356 (73.7)	83 (17.2)	44 (9.1)	
Media and advertising				0.74
No banning tobacco	939 (70.4)	258 (19.4)	136 (10.2)	
Banning tobacco	1314 (69.2)	378 (19.9)	2206 (10.9)	
Anti-smoking campaign				0.007
No	1531 (68.5)	473 (21.2)	231 (10.3)	
Yes	722 (72.5)	163 (16.4)	111 (11.1)	

4.3.4 Community factors related to students' tobacco use

In this study, the community factors included community tobacco control activity, minor's access and availability of cigarettes, and community custom. Chi-square was employed to examine the differences of tobacco use by these ecological factors. It found that only minor's access and availability of cigarettes had statistically significance. These factors are shown in table 4.15.

Table 4.15 Community factors related to students' tobacco use

Community factors	Tobacco use			P-value
	Never (%)	Ever (%)	Current (%)	
Community activity				0.021
No	1688 (68.6)	510 (20.7)	263 (10.7)	
Yes	565 (73.4)	126 (16.4)	79 (10.2)	
Minor's access of cigarettes				< 0.001
Yes	1995 (68.5)	593 (20.4)	323 (11.1)	
No	258 (80.6)	43 (13.5)	19 (5.9)	
Community custom				0.743
No	1980 (69.5)	566 (19.9)	302 (10.6)	
Yes	273 (71.3)	70 (18.3)	40 (10.4)	

In the communities with tobacco control activities, the current tobacco use and the ever tobacco use rate were 10.2% and 16.4% respectively; in the communities where there were not tobacco control activities, the current tobacco use and the ever tobacco use rate were 10.7% and 20.7% respectively. In the communities where the sale of cigarette to students under 18 years old was forbidden, the current tobacco use and the ever tobacco use rate were 5.9% and 13.5% respectively; in the communities where the sale of cigarette to students under 18 years old was not forbidden, the current tobacco use and the ever tobacco use rate were 11.1% and 20.4% respectively.

In the communities where cigarette as gift was a community custom, the current tobacco use and the ever tobacco use rate were 10.4% and 18.3% respectively; in the communities where cigarette as gift was not a community custom, the current tobacco use and the ever tobacco use rate were 10.6% and 19.9% respectively.

4.3.5 Public policies related to students' tobacco use

In this study, the public policies included: the tobacco-control policy in the city, leaf tobacco prices and subsidization policy, cigarette price and taxation policy. Chi-square was employed to examine the differences of tobacco use by these ecological factors. It found that only the tobacco-control policy in the city had statistically significance.The results are shown in table 4.16.

Table 4.16 Public policies related to students' tobacco use

Public policies	Tobacco use			P-value
	Never (%)	Ever (%)	Current (%)	
Tobacco-control policy				< 0.001
No	1090 (66.2)	372 (22.6)	184 (11.2)	
Yes	1163 (73.4)	264 (16.6)	158 (10.0)	
Leaf tobacco price				0.701
No	2053 (69.7)	583 (19.8)	308 (10.5)	
Yes	200 (69.7)	53 (18.5)	34 (11.8)	
Taxation policy and cigarette price				0.847
No	1604 (69.4)	459 (19.9)	247 (10.7)	
Yes	649 (70.5)	177 (19.2)	95 (10.3)	

The public policies were assessed by reviewing official documents objectively. In the city with tobacco-control policy, the current tobacco use and ever

tobacco use rate were 10.0% and 16.6% respectively; in the city where there was not a tobacco-control policy, the current tobacco use and ever tobacco use rate were 1.2% and 22.6% respectively. In the district with leaf tobacco prices and subsidization policy, the current tobacco use and ever tobacco use rate were 11.8% and 18.5% respectively; in the district where there was not leaf tobacco prices and subsidization policy, the current tobacco use and ever tobacco use rate were 10.5% and 19.8% respectively. In the district with cigarette price and taxation policy, the current tobacco use and ever tobacco use rate were 10.3% and 19.2% respectively; in the district where there was not cigarette price and taxation policy, the current tobacco use and ever tobacco use rate were 10.7 and 19.9% respectively.

4.4 Multinomial logistical regression analysis of ecological factors related to students tobacco use

The relationships between tobacco use of students and the ecological factors were done by using multinomial logistical regression. Dependent variable was tobacco use (never tobacco use, ever tobacco use and current tobacco use). The independent variables were intrapersonal factors (age, gender, knowledge of tobacco use, attitude towards tobacco use, academic performance, self-esteems, life skills, and self-concept), interpersonal factors (parental smoking, parental attitude toward smoking, family rules, friends' smoking, friends' attitude, peer pressure and teachers' smoking), organizational factors (school tobacco control policies and systems, tobacco-free school environment, school health education, tobacco-free school project, and anti-smoking campaign), community factors (community tobacco control activity, minor's access and availability of cigarettes), and the tobacco-control policy in the city. The results are shown as follows:

The odd ratios of dependent variable with multinomial logistical

regression were depicted in Table 4.17. The factors: age, gender, knowledge, attitude towards tobacco use, life skills, self-concept, parental smoking, family rules and availability of cigarettes, friends attitude, friends smoking, peer pressure, tobacco-free school environment, anti-smoking campaign, minor's access and availability of cigarettes, community tobacco control activity and tobacco-control policy were found to be associated with tobacco use.

Compare students of 13, 14, 15, 16 and 17 year old to students of 12 year old, the possibility of current tobacco use over never tobacco use would increase (OR= 1.767, 2.028, 2.299, and 3.648), except students of 13 years old (OR=1.314, CI=0.810, 2.132); the possibility of ever tobacco use over never tobacco use would increase (OR= 1.909, 2.226, 1.837, 2.542 and 3.019). Tobacco use by age group showed higher in 17 years old group. The low level knowledge was the most effective fator related to probability of tobacco use (OR=22.000 and OR=40.812).

The possibility of current tobacco use over never tobacco use was 5.181 times as high among male students as female students (OR=5.181, CI=3.350, 8.012). The possibility of ever tobacco use over never tobacco use was 2.104 times as high among male students as female students (OR=2.104, CI=1.620, 2,733).

The possibility of current tobacco use over never tobacco use was higher in favorable attitude group than unfavorable attitude group (OR=4.222, CI=2.035, 8.760), and low-level knowledge group than high-level knowledge group (OR=40.812, CI=23.251, 712.639). The possibility of ever tobacco use over never smoking was higher in favorable attitude group than unfavorable attitude group (OR=6.031, CI=4.335, 8.391), and low-level knowledge group than high-level knowledge group (OR=22.000, CI=14.970, 32.333).

The possibility of ever tobacco use over never tobacco use was 2.207 times as high among low-level coping with stress and interpersonal relationship skill students as high-level (OR=2.207, CI=1.150, 3.891), and 2.587 times as high among low-level critical thinking and communication skill students as high-level (OR=2.587,

CI=1.762, 3.800). The possibility of current tobacco use over never tobacco use was higher in low-level critical thinking and communication skill students than high-level (OR=1.896, CI=1.037, 3.468), while was not high in low-level coping with stress and interpersonal relationship skill students than high-level (OR=0.876, CI=0.391, 1.962). The possibility of ever tobacco use over never tobacco use 12.635 times as high among low-lever self concept students as high-level self concept students (OR=12.635, CI=8.881, 17.976). The possibility of current tobacco use over never tobacco use was 9.196 times as high among low-level self concept students as high-level self concept students (OR=9.196, CI=5.400, 15.661).

The possibility of ever tobacco use over never tobacco use was 4.131 times as high among students who had failure academic performance as students who had good academic performance (OR=4.131, CI=2.151, 7.994). The possibility of current tobacco use over never tobacco use was 4.587 times as high among students who had low self esteem as students who had high self esteem (OR=4.587, CI=1.685, 12.410).

The possibility of ever tobacco use over never tobacco use was 2.008 times as high among parental smoking group as parental no smoking group (OR=2.008, CI=1.442, 2.797), 3.191 times as high among parental favorable attitude group as parental unfavorable attitude group (OR=3.191, CI=2.224, 4.579), and 3.356 times as high among families had not rules prohibiting smoke as families had rules prohibiting smoke (OR=3.356, CI=1.806, 6.239). The possibility of current tobacco use over never tobacco use was 13.907 times as much in parental smoking group as no parental smoking group (OR=13.907, CI=8.824, 21.918), 3.603 times as high among parental favorable attitude group as parental unfavorable attitude group (OR=3.603, CI=1.150, 11.459), and 22.996 times as much in families had not rules prohibiting smoke as families had rules prohibiting smoke (OR=22.996, CI=15.083, 35.060).

The possibility of ever tobacco use over never tobacco use was 9.203 times as high as friends smoking group as friends no smoking group (OR=9.203,

CI=5.077, 16.684). The possibility of current tobacco use over never tobacco use was 3.316 times as much in friends smoking group as no friends smoking group (OR=3.316, CI=1.721, 6.387). The possibility of ever tobacco use over never tobacco use was 1.553 times as high among friends have favorable attitude group as friends have unfavorable attitude group (OR=1.553, CI=1.003, 2.185). There was not the significant association between the friends' attitude to tobacco use with current tobacco use (OR=1.058, CI=0.657, 1.704).

The possibility of ever tobacco use over never tobacco use was 9.250 times as high among peer pressure group as no peer pressure group (OR=9.874, CI=5.077, 16.684). The possibility of current tobacco use over never tobacco use was 3.225 times as much among friends have peer pressure as friends have no peer pressure (OR=3.225, CI=1.619, 6.424).

The possibility of ever tobacco use over never tobacco use was 1.859 times as high among schools that had tobacco-free school policies and systems group as no tobacco-free school policies and systems (OR=1.859, CI=1.011, 3.418). There was not the significant association between tobacco-free school policies and systems with current tobacco use (OR=1.302, CI=0.524, 3.234). The possibility of ever tobacco use over never tobacco use was 2.463 times as high among no tobacco-free school environment as tobacco-free school environment (OR=2.463, CI=1.343, 4.518).

The possibility of current tobacco use over never tobacco use was 3.327 times as high among no tobacco-free school environment as tobacco-free school environment (OR=3.327, CI=1.627, 6.804).

The possibility of ever tobacco use over never tobacco use was 4.770 times as high among no anti-smoking campaign group as anti-smoking campaign group (OR=4.770, CI=2.336, 9.738). The possibility of current tobacco use over never tobacco use was 6.530 times as high among no anti-smoking campaign group as anti-smoking campaign group (OR=6.530, CI=2.354, 18.116).

The possibility of ever tobacco use over never tobacco use was 1.990 times as high among group of no community tobacco control activity as group of community tobacco control activity (OR=1.990, CI=1.174, 3.373),

Table 4.17 ORs (95 % CIs) of dependent variables with multinomial logistical regression

Factors	**Ever tobacco use v.s. No use**	**Current tobacco use v.s. No use**
Intrapersonal level:		
Gender		
Male	2.104 (1.620-2.733) ***	5.181 (3.350-8.012) ***
Female	1.000	1.000
Age		
17	3.019 (1.894-4.813)***	3.648 (1.900-7.004)***
16	2.542 (1.628-3.970)***	2.299 (1.460-3.619)***
15	1.837 (1.169-2.887) **	2.028 (1.290-3.188) **
14	2.226 (1.422-3.486) ***	1.767 (1.113-2.807) *
13	1.909 (1.213-3.005) **	1.314 (0.810-2.132)
12	1.000	1.000
Knowledge		
Low	22.000 (14.970-32.333) ***	40.812 (23.251-71.639) ***
Moderate	3.095 (2.290-4.183) ***	6.646 (4.026-10.971) ***
High	1.000	1.000
Attitude		
Favorable	6.031 (4.335-8.391) ***	4.222 (2.035-8.760) ***
Moderate	2.504 (1.394-4.501) **	2.304 (1.428-3.719) **
Unfavorable	1.000	1.000

Table 4.17 ORs (95 % CIs) of dependent variables with multinomial logistical regression (cont.)

Factors	Ever tobacco use v.s. No use	Current tobacco use v.s. No use
Academic performance		
Failure	4.131 (2.151-7.994) ***	2.650 (0.982-7.153)
Poor	0.690 (0.441-1.080)	1.604 (0.710-3.625)
Moderate	0.682 (0.458-1.015)	1.596 (0.762-3.344)
Good	1.000	1.000
Self esteem		
Low	0.530 (0.265-1.057)	4.587 (1.695-12.410) **
Moderate	0.776 (0.459-1.311)	1.281 (0.923-3.344)
High	1.000	1.000
Coping with stress		
Low	1.263 (0.910-1.754)	1.954 (0.770-4.953)
High	1.000	1.000
Interpersonal relationship skill		
Low	1.210 (0.755-1.945)	1.114 (0.743-1.671)
High	1.000	1.000
Critical thinking		
Low	3.472 (2.433-4.950) ***	2.012 (1.199-3.715) *
High	1.000	1.000
Communication skill		
Low	4.032 (2.457-6.622) ***	3.597 (2.109-5.617) ***
High	1.000	1.000

Table 4.17 ORs (95 % CIs) of dependent variables with multinomial logistical regression (cont.)

Factors	Ever tobacco use v.s. No use	Current tobacco use v.s. No use
Self-concept		
Low	12.635 (8.881-17.976) ***	9.196 (5.400-15.661) ***
High	1.000	1.000
Interpersonal level:		
Parental smoking		
Yes	2.008 (1.442-2.797) ***	13.907 (8.824-21.918) ***
No	1.000	1.000
Parental attitude		
Favorable	3.191 (2.224-4.579) ***	3.630 (1.150-11.459) *
Unfavorable	1.000	1.000
Family rules		
No	3.356 (1.806-6.239) ***	22.996 (15.083-35.060) ***
Yes	1.000	1.000
Friends smoking		
Yes	9.203 (5.077-16.684) ***	3.316 (1.721-6.387) ***
No	1.000	1.000
Peer pressure		
Yes	9.874 (5.260-18.537) ***	3.225 (1.619-6.424) **
No	1.000	1.000

Table 4.17 ORs (95 % CIs) of dependent variables with multinomial logistical regression (cont.)

Factors	Ever tobacco use v.s. No use	Current tobacco use v.s. No use
Friends attitude		
Favorable	1.553 (1.003-2.185)*	1.058 (0.657-1.704)
Unfavorable	1.000	1.000
Teachers' smoking		
Yes	1.194 (0.774-1.842)	1.343 (0.546-3.302)
No	1.000	1.000
Organizational level:		
Tobacco-free school environment		
No	2.463 (1.343-4.518)**	3.327 (1.627-6.804) **
Yes	1.000	1.000
Tobacco-free school policies and systems		
No	1.859 (1.011-3.418) *	1.302 (0.524-3.234)
Yes	1.000	1.000
School health education		
No	1.219 (0.878-1.692)	0.986 (0.604-1.610)
Yes	1.000	1.000
Tobacco-free school project		
No	0.909 (0.585-1.414)	0.694 (0.373-1.292)
Yes	1.000	1.000

Table 4.17 ORs (95 % CIs) of dependent variables with multinomial logistical regression (cont.)

Factors	Ever tobacco use v.s. No use	Current tobacco use v.s. No use
Anti-smoking campaign		
No	4.770 (2.336-9.738) ***	6.530 (2.354-18.116)***
Yes	1.000	1.000
Community level:		
Community activity		
No	1.990 (1.174-3.373) *	1.393 (0.953-2.036)
Yes	1.000	1.000
Minor's access		
No	1.895 (1.004-3.578) *	1.305 (0.490-3.473)
Yes	1.000	1.000
Public policy:		
Tobacco control policy		
No	1.542 (1.195-1.989) ***	2.201 (1.331-3.641) **
Yes	1.000	11.000

Model Chi-square = 2.911E3 df = 70 p <0.001
-2 Log Likelihood = 2.314E3
Pseudo R-Square: Cox and Snell 0.594, Nagelkerke 0.741, McFadden 0.558.
N = 3231
* p < 0.05 , ** p< 0.01, *** p < 0.001
OR : odds ratios ; CI : confidence intervals

4.5 The analysis of an ecological model among current smokers by SEM

Structural equation modeling (SEM) with analysis of moment structures (AMOS) was utilized to analyze the hypothesized ecological model. As normality of

each observed variable was a prerequisite for maximum likelihood estimation (MLE) in SEM, the skewness and kurtoses of indicators were computed. Normality among these variables was found to be acceptable. The dichotomous variables were also considered appropriate for MLE in SEM. Dependent variable was amount of smoking cigarettes among current smokers during the past 30 days. The results are shown in Table 4.18 and Figure 4.1.

Model fit was evaluated using goodness of fit index (GFI), tucker lewis index (TLI), incremental fit index (IFI) and root mean square error of approximation (RMSEA). Values 0.983， 0.992， 0.995 > 0.90 on the GFI, TLI and IFI and 0.03 < 0.06 on the RMSEA indicated good fit. Thus, hypothesis model was supported. The model fit results are shown in appendix M:

In this model, a latent variable named ‘cognitive factor’ consisted of knowledge and attitude. Another latent variable named ‘self concept and life skill’ consisted of life skill and self concept. The result of parameter estimates revealed that cognitive factor (a latent intrapersonal factor) had a significant and positive direct influence on the amount of smoking cigarettes (β=0.752, P<0.001). Self-concept and life skill (a latent intrapersonal factor) had a significant and negative direct influence on the amount of smoking cigarettes (β=-0.150, P<0.001). General characteristic had a significant and positive direct influence on the amount of smoking cigarettes (β=0.092, P<0.05). Interpersonal factor had a significant and negative indirect influence on the amount of smoking cigarettes through cognitive factor (β=-0.128, P<0.05). Organizational factor had a significant and negative indirect influence on the amount of smoking cigarettes through self-concept and life skill (β=-0.017, P<0.05), and Public policy for tobacco control had a significant and negative indirect influence the amount of smoking cigarettes use through self-concept and life skill (β=-0.034, P<0.001).

Table 4.18 Total, indirect, and direct effects of independent variables on dependent variable of hypothesized model.

Dependent variable	The quantity of smoking cigarettes		
	TE	**DE**	**IE**
Independent variables			
Cognitive factor	.752***	.752***	0.00
Self concept and life skill	-.150***	-.150***	0.00
General characteristic	.092*	.092*	0.00
Interpersonal factor	-.128*	.000	-.128*
Organizational factor	-.017*	.000	-.017*
Public policy	-.034***	.000	-.034***

Result (Default model) Minimum was achieved

Goodness of fit index for the hypothesized model

Chi-square = 25.958, Degrees of freedom = 20, Probability level = .167

GFI = 0.983

AGFI = 0.963

RESEA = 0.000

Note: * P<0.05， *** P<0.001

Note: GFI = Goodness of fit index, AGFT = Adjusted goodness of fit index, RESEA = Root mean square error of approximation, TE = Total effect, IE = indirect effect, DE = Direct effect

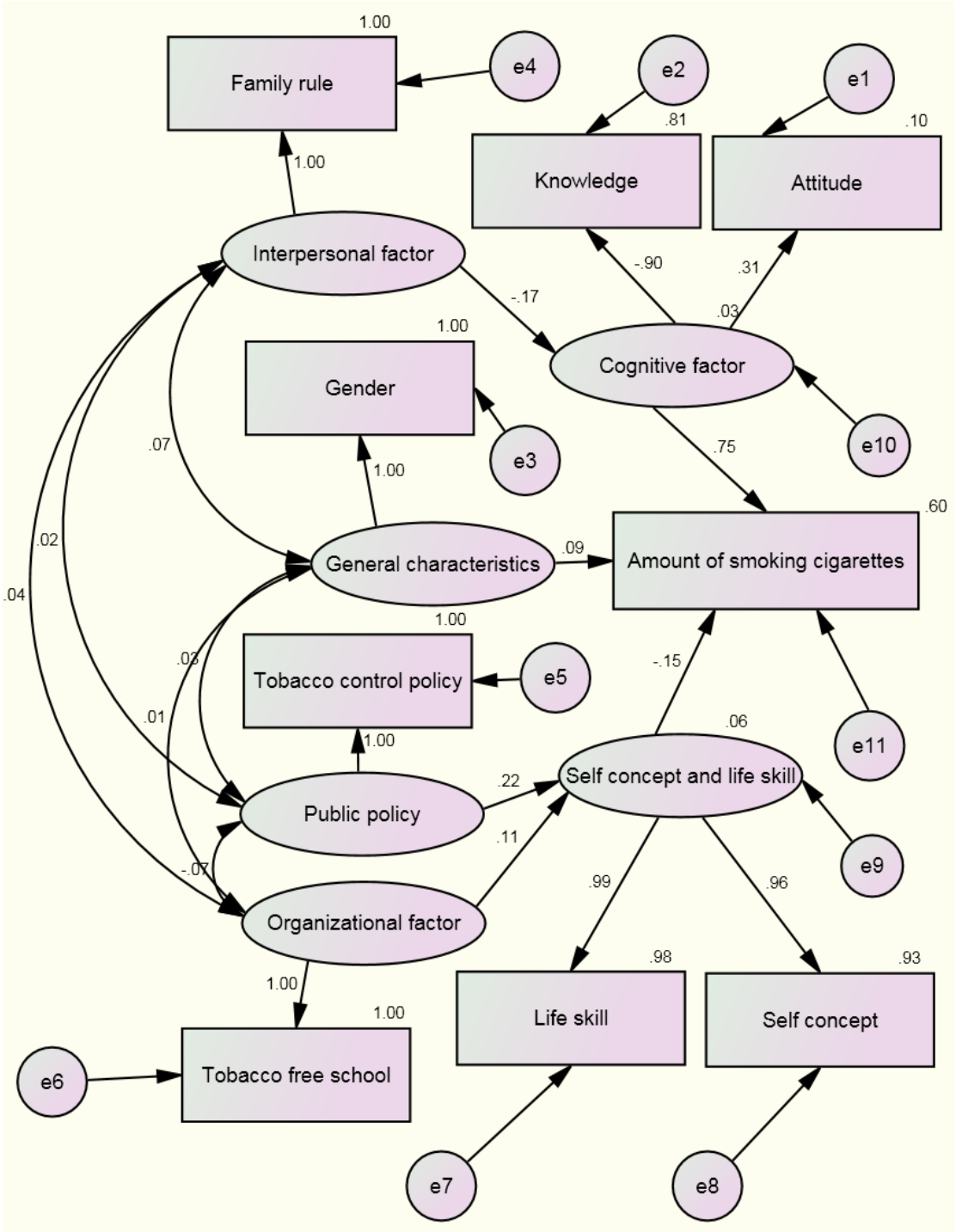


Figure 4.1 Standardized estimates of the smoking cigarettes amount model among students smokers during the past 30 days

CHAPTER V

DISCUSSION

It has been mentioned earlier that the main purposes of the research were to study tobacco use of the secondary school students and the ecological factors related to their tobacco use. The samples in this study were secondary school students of age 12-17 years old and the people of the different ecological groups who were principals and health education teachers of secondary schools, directors and officials of media center, directors and public health doctors of health service centers, directors and members of community neighborhood committees and officials of related government departments. The discussion is based on the findings related to specific objectives and hypotheses. It is presented in 3 parts as the following:

5.1 Tobacco use

5.2 Ecological factors related to students' tobacco use

5.3 The relationship between ecological factors and the amount of smoking cigarettes among current smokers

5.4 Limitations of the study

5.1 Tobacco use

This study showed the prevalence of current tobacco use was 10.6%, 16.2% among the males and 4.3% among the females; the prevalence of ever tobacco use was 19.7%, 25.3% among the males and 13.4% among the females. The prevalence of current tobacco use and ever tobacco use found in this study was higher than the study in Zhuhai city. They were 1.99% and 13.72% respectively (Chen qi, et

al. 2006: 863-64). In some western countries, the current tobacco use rates among youth tend to decline. For example, among male senior high-school students in the USA, the current tobacco use rate has dropped from 29.2% in 2001 to 22.9% in 2005 (CDC 2008).

In this study, 33.3% of smokers smoked their first cigarette before age 7, 60.9% of smokers smoked their first cigarette before age 10. Compare to the research in Wuhan, which found that the hazard of smoking initiation for boys was very low (<2%) before 7 years of age, majority of the students in the study started smoking at very younger age (Chen, X., et al. 2001:437-445). The China GYTS indicated that 32.5% of the male students and 13% of the female students had tried smoking and the average age of smoking initiation was 10.7 years of age (Warren 2000:867-76). Compared with the results of the China GYTS and the results of a survey in 2005 (JiCY. 2007; Ministry of Health PRC 2008), the percentage of students who had smoked before age 10 had increased. This indicated that the age of smoking initiation is decreasing and tobacco products were within the reach of students irrespective of their age. The hazard pattern suggests that the best time for smoking prevention is before 10.

Considering the amount of smoking cigarretes, 47.1% of current smokers smoked six or more cigarettes per day. Most of them were heavy smokers. The demand reduction measures concerning tobacco dependence should focus on these population. 67.6% of them bought cigarretes from stores by themselves and 3.2% of them bought cigarettes from a vender although FCTC has recommended not to sell cigarretes to minors. In China, all tobacco vendors and shops should place a clear and prominent indicator inside their points of sale about the prohibition of tobacco sales to minors, and in case of doubt, must request the buyer provide appropriate evidence of full legal age. Among current smokers, 36.0% of them smoked at home. followed by 18.7% of them smoked cigarettes at friends' houses, and 15.8% of them smoked cigarettes in public places. Only 2.3% of them smoked at school. Home was an main

smoking place. 57.0% of them want to stop smoking cigarretes. During the past 12 months, 28.3% of them ever tried to quit smoking cigarretes. But China still has not many qualified smoking cessation doctors. The most important reason was their parents opposed student smoking. This also showed family factor was an important factor affecting student smoking behavior. .

5.2 Ecological factors related to students tobacco use

5.2.1 Intrapersonal level factors:

In this study, the intrapersonal level factors: age, gender, knowledge, attitude towards tobacco use, life skills and self-concept were found to be associated with tobacco use.

The current tobacco use prevalence and ever tobacco use prevalence increased with age among both males and females. The elder age group was more likely to smoke than the younger age group. Some previous found similar results (Lam, T.H. et al. 1998; Li X., et al.1999:621-625; Zhang, L.W. et al. 2000:415-22). In another previous study, the male current smoking rate increases with age quickly, but there are marked differences in the extent of increase between age groups. Smoking rates among females stays nearly constant at a low level without significant differences among age groups (JiCY. 2007).

According to the results of this study, the prevalence of tobacco use in male was higher than females. Boys are more likely than girls to tobacco use. Other studies of middle school students in China also showed that the prevalence of tobacco use among males was significantly higher than in females. The differences in tobacco use rates between boys and girls were not as large as one would expect (Liu Zhimin, et al. 2001:247-250; Fang X. Z. et al. 2000:244-250). By significant association, there was higher risk of probability to tobacco use in male than females in China. The male

and female difference in tobacco use of China student could be explained by that, generally, student tobacco use was considered as bad behaviors by China society. Even though the substance use was unacceptable for boys and girls, the blemish was more towards girls. This was due to the social restriction on tobacco use; therefore withheld girls to tobacco use, especially in public. This finding was similar to the Global Youth Tobacco Survey (GYTS) in Indonesia, which showed that the prevalence among boys (24.5%) was significantly higher than among girls (2.3%) (Aditama, Pradono et al. 2008). But findings in the western countries were different. The prevalence of current cigarette smoking was similar between genders (Baska, Sovinova et al. 2006:110-6). The prevalence of cigarette smoking and use of other tobacco products was similar between boys and girls, and susceptibility to initiate smoking among never smokers was similar among boys and girls (Warren, Jones et al. 2008:1-28). The difference in current cigarette smoking rates between boys and girls is smaller than the difference between men and women (Omar Shafey, et al. 2009: 28-38).

In this study, low-level knowledge of the hazards of tobacco use and favorable attitudes to tobacco use were associated with student tobacco use. Students who had low level of knowledge or favorable attitude towards tobacco use had higher probability to tobacco use. This finding was similar with some previous studies. Poor knowledge of the hazards of tobacco use and positive attitudes to tobacco use is independently associated with adolescent smoking (Lam, T.H. 1998: 217-23; Osaki 1999:254-260; Zhang 2000:415-22). A smoker was likely to have favorable attitudes toward tobacco use, to continue smoking in the junior high school students (Chen, Jew-Wu. 1988: 163). Young smokers are more likely than nonsmokers to have positive attitudes about tobacco use (Mayhew KP 2000:S61-S81). But other studies showed that there was not an association between knowledge and behavior for tobacco use (Peter boyle et al. 2004: 219-22). Knowledge of the health risk of tobacco use plays a relatively small part in a child’s decision about smoking and alone is insufficient to deter a child from smoking (Royal college of physicians of London 1992).

This study found low-level life skill and low-level self concept were associated with student tobacco use. This finding was similar with some previous studies found similar results. Life skills were associated with smoking for girls (Jennifer A. Epstein et al. 2003: 485-491). The life skills can enhance personal and social competence and to decrease motivations to tobacco use and vulnerability to social influences that support tobacco use (Gilbert J. Botvin at al. 2002). Self-concept was also associated with student tobacco use (Smith, Teresita Maria et.al. 2004:1-19).

This study found academic performance was associated with ever tobacco use and not associated with current tobacco use; self esteem was not associated with ever tobacco use and associated with current tobacco use. A previous research on the relationship between academic performance and adolescent smoking has produced similar findings. Smoking status was significantly related to poor school performance (Nawal Hassan Gholome Ali, et al. 2007: 330-334). Other studies in China also showed that the prevalence of tobacco use among Chinese adolescents was associated with poorer self-perceived academic performance (Li Xiaoming 1999:621-625) and performing poorly in school (Zhu 1996:368-75). Another study in an urban tobacco producing county of North Carolina also found self-esteem related significantly to adolescents' smoking behavior and future intention to smoke. Significantly more females intended to smoke and had lower self-esteem than males. Low self-esteem may be important to developing the smoking habit among adolescents. Prevention of smoking initiation should involve promotion of children's self-esteem (Murphy NT, Price CJ 1988: 401-5).

5.2.2 Interpersonal level factors

This study showed that there was the significant association between the interpersonal level factors (parental smoking, friend smoking, friend attitude toward smoking, family rules and peer pressure) and tobacco use of students.

This study found that the students whose parents smoked or whose parents

had favorable attitude to tobacco use or whose families had not rules prohibiting smoke had high probability to tobacco use. This find was similar with some previous studies. Some studies found that the family was a major factor for initial experimental smoking. Children whose parents are both smokers are twice as likely to smoke as children whose parents are non-smokers (Can RX. 2007: 79-87; Duan JL. 2007: 115-119). Previous research of students in Zhejiang Province, eastern China, showed that parental smoking was the strongest predictor of smoking (Hesketh 2001:1653-5). Another study of junior middle school students in China revealed that mothers' smoking behavior and attitude had significant effects on students' tobacco use (Fang 2000:244-250). The likelihood of tobacco use was significantly higher among those having mothers' smoking behavior (Zhang, L. et al. 2000: 415-22). Parental ant-smoking attitudes are strongly influential and have been shown to carry more weight than actual parental smoking (Royal college of physicians of London 1992). Previous research on the relationship between household smoking restrictions and teen smoking had produced mixed results. Biener L, et al. found no relationship between household smoking restrictions and teen smoking (Biener L, et al. 1997:358-363). In contrast, Jackson and colleagues found that household smoking restrictions were related to smoking onset in children (Jackson C, et al. 1997:359-364).

In this study, friends' smoking behavior and peer pressure were the important factors related to tobacco use. was positively correlated with student tobacco use. This finding was similar with some previous studies. Many researchers have reported a strong relationship between adolescent tobacco use and having friends who smoke (Goodrow 2003:89-94; Osaki 1999:254-260; Unger 2002:476-484; The National Center on Addiction and Substance Abuse 2003; Zhang, L. et al. 2000: 415-22). Having close friends who smoked and being encouraged by close friends to smoke were strong risk factors for tobacco use (Zhu 1996:368-75). The Global Youth Tobacco Survey (GYTS) in Addis Ababa, Ethiopia showed having smoking friends was strongly associated with smoking after controlling for age, gender, parental

smoking status, and perception of risks of smoking (OR = 33) (Rudatsikira, Abdo et al. 2007:176). But results of this study did not conclude whether student smoking was a result of friend influence or whether adolescents that were more likely to smoke selected friends that smoked. Some studies also showed similar results that peer pressure was positively correlated with adolescent tobacco use. Students who had peer pressure were 1.78 times as likely to smoke as students who had not peer pressure (Bruce Simons-Morton, et al. 2001:95-107). Students who used tobacco tended to overestimate the use of tobacco by their peers. Therefore, they may feel that 'everyone else' was using tobacco and that if they did not, they would not fit in. Some researchers suggested that girls are particularly susceptible to peer pressure. Significantly more females (15%) than males (9%) reported that pressure was the reason for beginning to smoke (Sarason 1992:185-190). In contrast to other studies, however, they reported that boys were more likely to feel peer pressure than were girls (The National Center on Addiction and Substance Abuse 2003).

This study found that there was not the significant associations between teacher smoking and teacher attitude with student tobacco use in this study. The possible reasons were as follows: Cigarette smoking was generally accepted among Chinese adults, especially brain workers and teachers. Students did not care about teachers whether smoked or not and attitude. Students had contacts with teachers in classroom where the teachers did not smoke.

5.2.3 Organizational level factors

This study showed that there was the significant association between the organizational level factors (tobacco-free school policies and systems, tobacco-free school environment and anti-smoking campaign) and student's tobacco use. This finding was similar with some previous studies. In 1992, China began creating tobacco-free schools. Under the leadership of the Ministry of Health, the government department organized the formulation of tobacco-free school standards. The school

that had reached the standards was named tobacco-free school by local government. According to tobacco-free school standards, firstly, the tobacco-free school limited the opportunity for middle school students to tobacco use. Further, the existence and enforcement of tobacco-free school policies promoted norms against tobacco use as an acceptable behavior for everyone, including teachers, who were important role models for adolescents. Moreover, antismoking curricula could provide vital information on the health dangers of tobacco use. The school with no-smoking policy for both staff and students has less tobacco use among students (Royal college of physicians of London 1992). There were not the significant associations between to school health education and tobacco-free school project with students tobacco use. The possible reasons were as follows: tobacco-free school project did not carry out well; in all schools, school health education had a standardized curriculum; health education about tobacco use was only a part of this curriculum; moreover, the total curriculum had several hours.

This study showed prohibiting smoking in mass media and prohibiting tobacco advertisement was not significantly associated with student tobacco use. It can be explained by which, tobacco advertisement, promotion and sponsorship take on numerous forms in China, such as in radio, magazine, television, billboards and promotions, tobacco-sponsored sporting and entertainment events. Current Advertising Law did not ban tobacco companies from advertising. There were many indirect tobacco advertisement and promotion forms in China. Some promotion has even appeared on school uniforms (Ministry of Health PRC 2008). It was difficult to prohibit those indirect tobacco advertisement and promotion. In some districts of China, media center and government could prohibit direct tobacco advertisement, and could not prohibit indirect tobacco advertisement and promotion. The effect of indirect tobacco advertisement using the brand name of a tobacco product is very effective, particularly among youth. The impact of such advertising is three times greater among young people, as compared to the effect on adults (Pollay RW, Siddarth S, Siege1 M, et al. 1996:1-6).

5.2.4 Community level factors

This study showed that there was the significant association between community tobacco control activity and tobacco use. The possibility of ever tobacco use over never tobacco use was 1.990 times as high among group of no community tobacco control activity as group of community tobacco control activity (OR=1.990, CI=1.174, 3.373), Compare no community tobacco control activity to community tobacco control activity, the possibility of current tobacco use over never tobacco use did not increase (OR = 1.731, CI=0.777, 3.857). There was not significant association between community tobacco control activity and current tobacco use. This study showed that there was a significant association between minor's access and availability of cigarettes with ever tobacco use, but there was a not significant association between minor's access and availability of cigarettes with current tobacco use. Compare minor's access and availability of cigarettes to no minor's access and availability of cigarettes, the possibility of current tobacco use over never tobacco use did not increase (OR = 1.305, CI=0.490, 3.473). The possibility of ever tobacco use over never tobacco use was 1.895 times as minor's access and availability of cigarettes as no minor's access and availability of cigarettes (OR = 1.895, CI=1.004, 3.578). A previous study showed that youth living in towns that had local tobacco sales ordinances (no selling to minors) were significantly less likely to become established smokers than were youth living in towns without an ordinance (Siegel 1999:334-342). Regarding minor's access and availability of cigarettes, many respondents reported that it was unrealistic to protect minors from smoking only by vendor and shop self-regulation without concrete legal enforcement and punishment in China. Chinese law explicitly banned the sale of cigarettes to minors under 18; few vendors and shops paid much heed to the law. A large number of retailers still break the law which prohibits the sale of cigarettes to children under eighteen. Students could buy cigarettes easily. There was rarely community where shop did not sale cigarettes to minors under 18 during long time. Survey found that over 90% of young people have

never been refused when attempting to purchase cigarettes. Students were easily access to cigarettes (Ministry of Health PRC 2008).

5.2.5 Public policy

This study showed that the tobacco control policy had significant association with tobacco use. The possibility of current tobacco use over never tobacco use was 2.201 times as high among students of no tobacco control policy group as students of tobacco control policy group (OR=2.201, CI=1.331, 3.641). Compare no tobacco control policy group to tobacco control policy group, the possibility of ever tobacco use over never tobacco use was 1.542 times as high among students of no tobacco control policy group as students of tobacco control policy group (OR = 1.542, CI=1.195, 1.989). Although the tobacco control policy of many cities in China stipulates few smoke-free public places, 90% of people living in large cities supported a ban on smoking on public transport and in schools and hospitals. More than 80% supported a smoking ban in workplaces, and about half supported banning smoking in restaurants and bars (Ministry of Health PRC 2007). The study showed leaf tobacco prices and subsidization policy had not association with students tobacco use; cigarette price and taxation policy had not association with students tobacco use. WHO have introduced six proven policies that may affect youth smoking (WHO 2008). The six policies included cigarette price and taxation policy. Some precious study found that a 10 percent increase in cigarette prices reduces cigarette demand by 2.5 to 5 percent. Youth, minorities, and low-income smokers are two to three times more likely than other smokers to quit or smoke less in response to price increases. Cigarette prices strongly influence smoking initiation in youth; price increases significantly reduce long-term trends in cigarette consumption. A 10 percent increase in cigarette price would reduce consumption by 5 percent and raise enough revenue to pay for the basic health needs of 33 million rural residents (WHO 2008). This study showed the taxation policy had no effect on students tobacco use. Firstly, because cigarette prices

in China were controlled by the government instead of the market, the price remained unchanged after the government raised the tobacco consumption tax. The tax did not really raise the retail prices of cigarettes. Leaf tobacco purchase prices and subsidization policy also did not affect cigarette price directly. Secondly, although China had levied five percent more taxation on tobacco wholesales since 2009, the price remained low compared with other countries. For example, a package of Marlboro cost $2.04 in China while it was $9.39 in Singapore and $11.48 in Norway. Governments had become the biggest purchasers of expensive cigarettes. Thirdly, the government raised the tobacco consumption tax depending on different tobacco classes. The tax increase on cheap cigarettes was still too modest. Low taxation made cheap cigarettes very affordable. Fourthly, China had a lot of cheap cigarettes. The policies did not change the lowest cigarettes price. The cheapest brand in Anhui province of China was just 3 Yuan a pack ($ 0.5). The top 3 most highly consumed cigarette brands are all priced at less than 5 Yuan/Pack. This is affordable to most young people (Ministry of Health PRC 2008).

5.3 The relationship between ecological factors and the amount smoking cigarettes among current smokers

A hypothesized model of the amount of smoking cigarettes among current smokers during the past 30 days was fitted to the empirical date (Chi-square = 25.958, Degrees of freedom = 20, Probability level = .167, GFI = 0.983, AGFI = 0.963, RESEA = 0.000). The findings indicated that ecological model of tobacco use could provide an empirical explanation of smoking behavior among Chinese students. The findings allow researchers to better understand students tobacco use and affecting factors for developing appropriate tobacco use prevention and intervention activity.

5.4 Limitations of the study

There were a number of potential limitations in this study. Firstly, the data of student questionnaire were based on self-reporting by the middle school students and thus were subject to self-reporting bias. Secondly, the ability to generalize these findings to the other middle school students' populations or other geographic locations in China was limited, because the study was done in Anhui province and smoking rates vary substantially across different populations and geographic locations in China. Thirdly, although the questionnaire was formatted to make it easies for adolescents to read, some student may not concentrate on answering the all questions. Finally, as with any cross-sectional data, causality could not be inferred from the observed associations in the current study.

CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

This study was a cross-sectional research of tobacco use among secondary school students. Of a total of 3231 students, the prevalence of current tobacco use was 10.6%, 16.2% among the males and 4.3% among the females; the prevalence of ever tobacco use was 19.7%, 25.3% among the males and 13.4% among the females. 58.4% of secondary school student smokers smoked their first cigarette before age 10. The ever tobacco use prevalence and current tobacco use prevalence increased with increasing age group.

There were multiple influences on tobacco use among secondary school students. The intrapersonal factors, interpersonal level factors, organizational factors, community factors and public policy were significantly associated with tobacco use among secondary school students. The intrapersonal level factors related tobacco use among secondary school students were gender, age, knowledge, attitude, life skill and self-concept. The interpersonal level factors related tobacco use among secondary school students were parental smoking, friend smoking, friend attitude toward smoking, family rules and availability of cigarettes. The organizational level factors relayed tobacco use among secondary school students were tobacco-free school, and social marketing campaign. The community level factors related tobacco use among secondary school students were community tobacco control activity, minor’s access and availability of cigarettes. The policy related tobacco use among secondary school students was tobacco control policy in the city. Cigarette price and tax policy to reduce

the demand for tobacco, had not a significant association with tobacco use among secondary school students in Anhui.

A hypothesized model of the quantity of smoking cigarettes among secondary school students smokers was adequately fitted to the date. Intrapersonal factors in this model had significant direct relationships with the quantity of smoking cigarettes among secondary school students smokers during the past 30 days. ‘Cognitive factor’ (a latent intrapersonal factor) had a significant and positive direct influence on the quantity of smoking cigarettes. ‘Self-concept and life skill’ (a latent intrapersonal factor) had a significant and negative direct influence on the quantity of smoking cigarettes. General characteristic (an intrapersonal factor) had a significant and positive direct influence on the quantity of smoking cigarettes. Interpersonal factor, organizational factor and policy had significant and negative indirect relationships with the quantity of smoking cigarettes among secondary school students smokers. Some ecological factors had interaction across these different levels in model of the quantity of smoking cigarettes among secondary school students smokers. The organizational factor (tobacco-free school), interpersonal factor (family rules and availability of cigarettes) and tobacco control policy through intrapersonal factors affected the quantity of smoking cigarettes among secondary school students smokers during the past 30 days.

6.2 Recommendations

Based on the findings of this study, the following recommendations are presented:

6.2.1 Recommendation for policy

In China, tobacco control was a complicated social activity, which involved political, economic and health sectors. Because there were multiple

influences on tobacco use among middle school students, China should begin the implementation of the national strategy of comprehensive tobacco control. The comprehensive non-price measures were more effective and important means of reducing tobacco consumption. Tobacco control among students was a comprehensive and systematic project that should include building tobacco-free school and strictly implementing tobacco control policy. The tobacco-free school and tobacco control policy were the feasible measures that could change intrapersonal factors affecting tobacco use among middle school students. Student smoking prevention program should not only provide information about health risk of smoking but also continuously building skill to resist smoking. Community tobacco control activity should focus on family environment and shop environment such as smoking-free in home, prohibiting shop from selling tobacco to minor, decreasing minor's access and availability of cigarettes in the community.

6.2.2 Recommendation for further study

The result from multinomial logistical regression analysis showed that school health education, banning tobacco advertisement and smoking in mass media, cigarette price and taxation policy, and tobacco-free school policies had not significant association with tobacco use of students. The further research with an in-depth and focus group discussion is needed for explaining these findings. The research about evaluating these measures and policies should also been carried out in these schools and districts.

The organizational level factors (tobacco-free school, smoking intervention program), the community level factors (community tobacco control activity, minor's access and availability of cigarettes) and tobacco-control policy had influences on tobacco use of students. A follow-up study to evaluate change of tobacco use over time combines is required for a better understanding the these factors in explaining the causal inference.

REFERENCE

Aditama, T. Y., J. Pradono, et al. (2008). Global Youth Tobacco Survey (GYTS) in Indonesia. Prev Med.

Aguirre-Molina, M. and D. M. Gorman (1996). Community-based approaches for the prevention of alcohol, tobacco, and other drug use. Annu Rev Public Health 17: 337-58.

Alexander, C., Allen, P., Crawford, M., & McCormick, L. (1999). Taking a first puff: Cigarette smoking experiences among ethnically diverse adolescents. Ethnicity & Health 4(4): 245-257.

American Academy of Pediatrics Committee on Substance Abuse (2001). Tobacco's toll: implications for the pediatrician. Pediatrics 107(4):: 794–798.

Arday DR, G. G., Schulman J, Nelson DE, Mowery P, Samet JM (1995). Cigarettesmoking and selfreported health problems among US high school seniors,1982–1989. American Journal of Health Promotion 10(2):: 111–116.

Arnab, R. (2004). Optional randomized response techniques for complex survey designs. Biom. J. 46, 114– 124

Balch GI. (1998). Exploring perceptions of smoking cessation among high school smokers: input and feedback from focus groups. Preventive Medicine 27(5 Pt 3): A55–A63.

Baska, T., H. Sovinova, et al. (2006). Findings from the Global Youth Tobacco Survey (GYTS) in Czech Republic, Hungary, Poland and Slovakia--smoking initiation, prevalence of tobacco use and cessation. Soz Praventivmed 51(2): 110-6.

Bauman, K. E., Fisher, L. A., Bryan, E.S., and Chenoweth, R.L. (1984). Antecedents, subjective expected utility and behavior: A panel study of adolescent cigarrete smoking. Addict. Behav. 9: 11-36.

Beijing Patriotic Health Committee, Beijing Municipal commission of Education, Beijing Association of Smoking and Health. (2000). Investigation on smoking of school students in Beijing. Journal of Cardiovascular and Pulmonary Diseases. 19(4):294-298.

Biener L, Cullen D, Di ZX, Hammond SK (1997). Household smoking restrictions and adolescents' exposure to environmental tobacco smoke. Prev Med 26(3):358-363,.

Biener L,Siegel M.(2000).Tobacco marketing and adolescent smoking: more support for causal inference. American Journal of Public Health 90: 407-411.

Botvin GJ,Goldberg C., Botvin EM, Dusenbury L(1993).Smoking behavior of adolescents exposed to cigarette advertising. Public Health Reports 108(2): 217-224.

Bruce Simons-Morton, Denise L. Haynie, Aria D. Crump, et al. (2001). Peer and Parent Influences on Smoking and Drinking among Early Adolescents. Health Education & Behavior, 28, 1, 95-107

Centers for Disease Control and Prevention (2000). Tobacco use among middle and high school students—United States, 1999. Mor Mortal Wkly Rep 49(3):49-53.

Centers for Disease Control and Prevention (2001). Youth tobacco surveillance—United States, 2000. Morbidity and Mortality Weekly Report 50(SS4): 30.

Centers for Disease Control and Prevention (2004). Cigarette use among high school students—United States, 1991–2003. Morbidity and Mortality Weekly Report 53(23): 499–502.

Centers for Disease Control and Prevention (2008) http:f/apps.nccdcdc.gov/yrbss, 2008-05-08.

Centers for Disease Control (CDC). Core questions global youth tobacco survey (GYTS) 2008 http://www.cdc.gov/tobacco/global/gyts/00_pdfs/gyts_core_questionnaire.pdf

Chassin L, P. C., Sherman SJ, Edwards DA, (1990). The natural history of cigarette smoking: predicting young adult smoking outcomes from adolescent smoking patterns. Health Psychology 9(6): 701–716.

Chang, H.J., Wang, C.L., Huang, K.C. (2004). Using randomized response to estimate the proportion and truthful reporting probability in a dichotomous finite population. J. Appl. Stat. 31, 565–573

Chaudhuri, A., Mukerjee, R. (1988). Randomized Response: Theory and Techniques. Marcel Dekker, New York

Chen, J.-W. (1988). Adolescents' knowledge, behavior patterns, and attitudes related to cigarette smoking in the Republic of China. Dissertation Abstracts International 49(11-B): 4739.

Chen, P. L., H. Y. Chiou, et al. (2008). Chinese version of the Global Youth Tobacco Survey: cross-cultural instrument adaptation. BMC Public Health 8: 144.

Chen qi, Liang Xiao dong, Zhu Ke jing, et al. Logistic regressive analysis on influencing factors of smoking behavior amongyouth in zhuhai city. Modern Preventive Medicine, 2006; 133 , 863-64. (in Chinese)

Chen, X., Yan Li, Jennifer B. Unger, Jie Gong, C. Anderson Johnson and Qian Guo. (2001). Hazard of Smoking Initiation by Age Among Adolescents in Wuhan, China. Preventive Medicine 32(5): 437-445.

Coultas RD. (1992). Women and tobacco. Geneva, World Health Organization.

Coulton, C. J. (1996). Measuring neighborhood context for young children in an urban area. (Special Issue: Ecological Assessment). American Journal of Community Psychology, 24(1), 5-33.

De Moor, C., Cookson, K., Elder, J. P.,Young, R., Molgaard, C. A.,&Wildey, M. (1992). The association between teacher attitudes, behavioral intentions, and smoking and the prevalence of smoking among seventh-grade students. Adolescence, 27, 565-578.

DiFranza JR, R. N., McNeill AD, et al. (2000). Initial symptoms of nicotine dependence in adolescents. Tobacco Control 9: 313–319.

Distefan JM, Gilpin E, Sargent JD, Pierce JP. (1999). Do movie stars encourage adolescents to start smoking? Evidence from California. Prev Med 28:1-11.

Dong, C. T., Y. J. Lan, et al. (2005). Investigation on smoking status of medical professionals in Chengdu City and on intervention for tobacco control Sichuan Da Xue Xue Bao Yi Xue Ban 36(5): 709-12.

Duan JL. (2007). Tobacco control in children and adolescents in Beijing. Paper Collections of the first Cross-Strait Conference on Tobacco Control. 2007: 1 15-1 19.

Ertas, N. (2007). Factors associated with stages of cigarette smoking among Turkish youth. Eur J Public Health 17(2): 155-61.

Evans N,Farkas A., Gilpin E, Berry C, Pierce JP.(1995). Influence of tobacco marketing and exposure to smokers on adolescent susceptibility to smoking. Journal of the National Cancer Institute 87(20): 1538-1545.

Fang, X. Z., Yu; Lin, Denhua. (2000). Relationships between family factors and smoking behavior of junior middle school students. Acta Psychologica Sinica 32(2): 244-250.

Fitts, W.H. and Warren, W.L. Tennessee Self-Concept Scale: 2 manual. 2nd edition. Los Angeles: Western Psychological Services, 1996.

Fox, J., Tracy, P. (1986). Randomized Response: A Method for Sensitive Surveys. Sage Publication, Beverly Hills

Gilbert J. Botvin, Kenneth W. Griffin (2004). Life Skills Training as a Primary prevention Approach for Adolescent Drug Abuse and Other Problem Behaviors. International Journal of Emergency Mental Health, 2002 4(I),pp 41-47.

Gittelsohn, J., Roche, K. M., Alexander, C. S., & Tassler, P. (2001). The social context of smoking among African-American and White adolescents in Baltimore city. Ethnicity and Health, 6(3/4): 211-225.

Glanz Karen, Rimer Barbara K, Lewis Frances Marcus (2002). Health behavior and health education: Theory, research, and practice. 3nd ed. San Francisco: Jossey-Bass.

Glanz Karen, Rimer Barbara K, Viswanath K (2008). Health behavior and health education: Theory, research, and practice. 4th ed. San Francisco: Jossey-Bass.

Gong, J., X. Chen, et al. (2006). Are private school students more likely to smoke than public school students in China? Prev Med 43(2): 117-21.

Goodrow, B., Seier, E., & Stewart, K. (2003). Social influences and adolescent attitudes on smoking: Analysis of the 2000 tennessee youth tobacco survey. Adolescent & Family Health 3: 89-94.

Greenberg, B. V., Abdul-Ela, A. A., Simmons, W. R. & Horvitz, D. G. (1969). The unrelated question randomised response model: Theoretical framework. Journal of the American Statistical Association 66: 243–250.

Greenberg, B.G., Kubler, R.R., Abernathy, J.R., Horvitz, D.G. (1971). Applications of the RR technique in obtaining quantitative data. J. Am. Stat. Assoc. 66, 243–250

Green, L. W., & Kreuter, M. W., (1999). Health promotion planning: An educational and ecological approach. Mountain view: Mayfield Publishing Company.

Green, L. W., & Kreuter, M. W., (2005). Health promotion planning: An educational and ecological approach. New York: McGraw-Hill.

Griffin, K. W., Botvin, G. J., Doyle, M. M., Diaz, T., & Epstein, J. A. (1999). A six-year follow-up study of determinants of heavy cigarette smoking among high-school seniors. Journal of Behavioral Medicine 22: 271-284.

Group, T. G. Y. T. S. C. (2002). Tobacco use among youth: a cross country comparison. Tobacco Control 11: 252-270.

Gu, D., X. Wu, et al. (2004). Cigarette smoking and exposure to environmental tobacco smoke in China: the international collaborative study of cardiovascular disease in Asia. Am J Public Health 94(11): 1972-6.

Guindon GE, Boisclair D. Past, current and future trends in tobacco use. Washington, DC, World Bank, 2003 (http:// www1.worldbank.org/tobacco/pdf/ Guindon-Past, %20 current-%20whole.pdf, accessed 5 December 2007).

Gupta, S.,Gupta, B., Singh, S. (2002). Estimation of sensitivity level of personal interview survey questions. J. Stat. Plann. Infer. 100, 239–247

Harrison, P. A., Fulkerson, J.A., & Park, E. (2000). The relative importance of social versus commercial sources in youth access to tobacco, alcohol, and other drugs. Preventive Medicine 31: 39-48.

Health Canada (2002). Canadian Tobacco Use Monitoring Survey. Annual Results.

Hesketh, T., L. Lu, et al. (2007). Smoking, cessation and expenditure in low income Chinese: cross sectional survey. BMC Public Health 7(147): 29.

Hill, D. a. B. R. (1991). Adults' accounts of onset of regular smoking: Influences of school, work, and other settings. Public Health Reports 106: 181-5.

Hopkins DP, B. P., Richard CJ,et al and Task Force for Community Preventive Services (2001). Reviews of evidence regarding interventions to reduce tobacco use and exposure to environmental tobacco smoking. American Journal of Preventive Medicine 20(2 suppl): 16-66.

Horvitz, D. G., Shah, B. V. & Simmons, W. R. (1967). The unrelated question randomised response model. Proceedings of the Social Statistics Section, ASA: 65–72.

Huang, K.C. (2004). A survey technique for estimating the proportion and sensitivity in a dichotomous finite population. Stat. Neer. 58, 75–82 (2004)

Huang, K.C., Lan, C.H., Kuo, M.P. (2005). Detecting untruthful answering in randomized response sampling. Qual. Quan. 39, 659–669

Jackson C, Henriksen L, Dickinson D, Levine DW: (1997). The early use of alcohol and tobacco: Its relation to children's competence and parents' behavior. Am J Public Health 87(3):359-364.

Jennifer A. Epstein, Gilbert J. Botvin, Richard Spoth, (2003) Predicting smoking among rural adolescents: Social and cognitive processes. Nicotine & Tobacco Research 5(4):485-491

Ji CY, 2005 China Youth Health-related / Risk Behavior Survey Report. Beijing: Peking University Medical Press, 2007.

Kang, J. M., Y. Jiang, et al. (2007). Study on the level of tobacco-generated smoke in several restautants and bars in Beijing, China. Zhonghua Liu Xing Bing Xue Za Zhi 28(8): 738-41.

Kim, J.M., Warde, W.D. (2004). A stratified Warner's randomized response model. J. Stat. Plann. Infer. 120, 155–165

Kunyk, D., C. Els, et al. (2007). Development and introduction of a comprehensive tobacco control policy in a Canadian regional health authority. Prev Chronic Dis 4(2): A30.

Lam, T. H., S. F. Chung, C. L. Betson, C. M. Wong, and A. J. Hedley (1998). Tobacco Advertisements: One of the Strongest Risk Factors for Smoking in Hong Kong Students. Am J Prev Med 14(3): 217-23.

Landry, M. D. and S. Raman (2008). Millennium Development Goals (MDGs): a global policy paradox. Healthc Q 11(1): 126-8, 4.

Levy, D. T., H. Ross, et al. (2007). The role of public policies in reducing smoking prevalence and deaths caused by smoking in Arizona: results from the Arizona tobacco policy simulation model. J Public Health Manag Pract 13(1): 59-67.

Lewinsohn PM, Brown R., Seeley JR, Ramsey SE. (2000). sychosocial correlates of cigarette smoking abstinence, experimentation, persistence and frequency during adolescence. Nicotine & Tobacco Research 2(2): 121-131.

Li, X., X. Fang, and B. Stanton. (1996). Cigarette Smoking Among Chinese Adolescents and its Association with Demographic Characteristics, Social Activities, and Problem Behaviors. Substance Use and Misuse 31.5 (April): 545-63.

Li Xiaoming, Xiaoyi Fang and Bonita Stanton. (1999). Cigarette Smoking Among Schoolboys in Beijing, China. Journal of Adolescence 22(5): 621-625.

Li YJ, Zhang LC, Tian D, et al. Sampling survey report on smoking status of extramural adolescents in five cities of Liaoning Province. Symposium of the 13th National Seminar on Smoking and Health. 2007: 87-93.

Liu Zhimin; Zhou, W. L., Zhi; Mu, Yue; Cai, Zhiji; Cao, Jiaqi (2001). The use of psychoactive substances among adolescent students in an area in the south-west of China. Addiction 96: 247-250.

Lynch BS, B. R. (1994). Growing Up Tobacco Free: Preventing Nicotine Addiction in Children and Youths. . Washington, DC, National Academy Press.

Ma, S. J., J. F. Wang, et al. (2007). Passive smoking in China: contributing factors and areas for future interventions. Biomed Environ Sci 20(5): 420-5.

Mayhew KP,Flay B., Mott JA(2000).Stages in the development of adolescent smoking. Drug and Alcohol Dependence 59(suppl 1): S61-S81.

McAlister, A., T. C. Morrison, et al. (2004). Media and community campaign effects on adult tobacco use in Texas. J Health Commun 9(2): 95-109.

McCool JP, Cameron LD, Petrie KJ. (2001). Adolescent perceptions of smoking imagery in film. Soc Sci Med 52:1577-87.

McLeroy, K. R., D. Bibeau, et al. (1988). An ecological perspective on health promotion programs. Health Educ Q 15(4): 351-77.

McLeroy, K. R., B. L. Norton, et al. (2003). Community-based interventions. Am J Public Health 93(4): 529-33.

Mei, J. (1993). An Investigation on Smoking Situation Among Middle School Students in Japan and in Jiangxi, China. Zhonghua Liu Xing Bing Xue Za Zhi 14.2 (April): 87-91.

Ministry of Health PRC. Office of the Leading Group for Implementation of the Framework Convention on Tobacco Control. (2007) China's 2007 tobacco control report

Ministry of Health PRC. Office of the Leading Group for Implementation of the Framework Convention on Tobacco Control. (2008) China's 2008 tobacco control report

Mueller, N. B., D. A. Luke, et al. (2006). The best practices: use of the guidelines by ten state tobacco control programs. Am J Prev Med 31(4): 300-6.

Murphy NT, Price CJ (1988). The influence of self-esteem, parental smoking, and living in a tobacco production region on adolescent smoking behaviors. Journal of School Health:58(10):401-5.

Nawal Hassan Gholome Ali, Ahmed Saud Al-Hussaini, Nawal Salem Al-Haid, et al. (2007). Factors associated with Smoking Habits among Kuwaiti Students in the Age Group 9-18 years Kuwait Medical Journal 39 (4): 330-334

O'Donnel, M.P. (1996). Editor's note. American Journal of Health Promotion. 10(4), 244

Osaki, Y. M., M; Mei, J. (1999). A comparison of correlates of cigarette smoking behavior between Jiangxi province, China and Japanese high school students. Journal of Epidemiology 9: 254-260.

Pechmann C, Shih CF. (1999). Smoking scenes in movies and antismoking advertisements before movies: effects on youth. J Marketing. 63(3): 1-13.

Peter Boyle, N. G., Jack Henningfield, John Seffrin,Witold Zatonski (2004). Tobacco and Public Health:Science and Policy. New York, Oxford University Press.

Pierce JP, Choi W., Gilpin EA, Farkas AJ, Berry CC. (1998). Tobacco industry promotion of cigarettes and adolescent smoking. JAMA 279: 511-515.

Pollay RW, Siddarth S, Siege1 M, et al. Cigarette advertising and realized market shares among youths and adults. J Marketing, 1996,60:1-6.

Prabhat J, and Frank C. Editors. Tobacco Control in Developing Countries. Oxford University Press, 2000.

Rasinski, K. A., Willis, G. B., Baldwin, A. K., Yeh, W. & Lee, L. (1999). Methods of datacollection, perception of risks and losses, and motivation to give truthful answers to sensitive survey questions. Applied Cognitive Psychology 465–484.

Richard, L., L. Gauvin, et al. (2008). Integrating the ecological approach in health promotion for older adults: a survey of programs aimed at elder abuse prevention, falls prevention, and appropriate medication use. Int J Public Health 53(1): 46-56.

Richard, L., L. Gauvin, et al. (2002). Making youth tobacco control programs more ecological: organizational and professional profiles. Am J Health Promot 16(5): 267-79.

Ritchey, P. R., G., & Hasse, L. (2001). The relative influence of smoking and drinking and drinking on smoking among high school students in a rural tobacco-growing county. Journal of Adolescent Health 29: 386-394.

Rudatsikira, E., A. Abdo, et al. (2007). Prevalence and determinants of adolescent tobacco smoking in Addis Ababa, Ethiopia. BMC Public Health 7(147): 176.

Rudatsikira, E., A. S. Muula, et al. (2008). Correlates of cigarette smoking among school-going adolescents in Thailand: findings from the Thai global youth tobacco survey 2005. Int Arch Med 1(1): 8.

Sallis, J. F., A. Bauman, et al. (1998). Environmental and policy interventions to promote physical activity. Am J Prev Med 15(4): 379-97.

Sarason, I., Mankowski, E., Peterson, A. & Dinh, K. (1992). Adolescent's reasons for smoking. Journal of School Health 62(5): 185-190.

Scheers, N.J. (1992). A review of randomized response techniques. Meas. Eval. Couns. Dev. 25, 27–41

Schmitt, C. L., A. M. Malarcher, et al. (2007). Community guide recommendations and state level tobacco control programmes: 1999-2004. Tob Control 16(5): 318-24.

Scott T. Leatherdale & Steve Manske (2005). The Relationship Between Student Smoking in theSchool Environment and Smoking Onset in Elementary School Students Cancer Epidemiology, Biomarkers & Prevention 14(7):1762–5.

Services, U. D. o. H. a. H. (1998). Responses to increase in cigarette prices by race/ ethnicity, income and age groups- United States, 1976-1993. MMWR 47: 605-9.

Shiffman S (1991). Refining models of dependence: variations across persons and situations. British Journal of Addiction 86(5): 611–615.

Siegel, M., Biener, L., & Rigotti, N.A. (1999). The effect of local tobacco sales laws on adolescent smoking initiation. Preventive Medicine 29: 334-342.

Simantov, E., Schoen, C. & Klein, J. (2000). Health-compromising behavior: Why do adolescents smoke or drink? Archives of Pediatrics & Adolescent Medicine 154(10): 1025-1050.

Simons-Morton, B., Crump, A.D., Haynie, D.L., Saylor, K.E., Eitel, P., & Yu, K. (1999). Psychosocial, school, and parent factors associated with recent smoking among early-adolescent boys and girls. Preventative Medicine 28: 138-148.

Siziya, S., A. S. Muula, et al. (2008). Correlates of current cigarette smoking among school-going adolescents in Punjab, India: results from the Global Youth Tobacco Survey 2003. BMC Int Health Hum Rights 8: 1.

Siziya, S., E. Rudatsikira, et al. (2008). Antismoking messages and current cigarette smoking status in Somaliland: results from the Global Youth Tobacco Survey 2004. Confl Health 2: 6.

Smedley, B. D. and S. L. Syme (2001). Promoting health: intervention strategies from social and behavioral research. Am J Health Promot 15(3): 149-66.

Smith, D. R., N. Wei, et al. (2006). Tobacco smoking habits among a cross-section of rural physicians in China. Aust J Rural Health 14(2): 66-71.

Smith, Teresita Maria; Tingen, Martha S.; Waller, Jennifer L. (2004). The Influence of Self-Concept and Locus of Control on Rural Preadolescent Tobacco Use Southern Online Journal of Nursing Research; Nov2004, Vol. 5 Issue 6, p1-19, 19p

Sorensen, G., Stoddard, A., Ockene, J. K., Hunt, M. K., & Youngstrom, R. (1996). Worker participation in an integrated health promotion/health protection program: Results from the WellWorks Project. Health Education Quarterly, 23 (2), 191-203.

Stokols, D. (1992). Establishing and maintaining healthy environments. Toward a social ecology of health promotion. Am Psychol 47(1): 6-22.

Sudman, S. & Bradburn, N. M. (1982). Asking Questions: A Practical Guide to Questionnaire Design. San Fransisco: Jossey Bass.

Taylor, J. E., Conrad, M.W., O'Bryne, K.K., Haddock, C.K., & Carlos Poston, W.S. (2004). Saturation of tobacco smoking models and risk of alcohol and tobacco use among adolescents. Journal of Adolescent Health, 35: 190-196.

The GTSS Collaborative Group. (2006). A cross wuntry comparison of exposure to secondhand smoke among young. Tobacco Control 14(SupplII): ii4-ii 19

The National Center on Addiction and Substance Abuse, N. (2003). The Formative Years: Pathways to Substance Abuse Among Girls and Young Women Ages 8-22. New York, Columbia University Press.

Tickle JJ, Sargent JD, Dalton MA, Beach ML, Heatherton T.(2001). Favourite movie stars, their tobacco use in contemporary movies and its association with adolescent smoking. Tob Control. 10:16-22.

Trinidad, D. R., K. Messer, et al. (2007). The California Tobacco Control Program's effect on adult smokers: (3) Similar effects for African Americans across states. Tob Control 16(2): 96-100.

U.S. Department of Health and Human Services, Ed. (1994). Preventing Tobacco Use Among Young People: A Report of the Surgeon General. Atlanta.

Unger, J. B., Li Yan, Sohaila Shakib, Louise Ann Rohrbach, Xinguang Chen, Guo Qian, Chih-Ping Chou, Shan Jianguo, Stanley Azen, Hong Zheng and C. Anderson Johnson (2002). Peer Influences and Access to Cigarettes as Correlates of Adolescent Smoking: A Cross-Cultural Comparison of Wuhan, China, and California. Preventive Medicine 34(4): 476-484.

Unger, J. B., L. Yan, et al. (2001). Adolescent smoking in Wuhan, China: baseline data from the Wuhan Smoking Prevention Trial. Am J Prev Med 21(3): 162-9.

Urberg, K., Cheng, C., & Shyu, S. (1991). Grade changes in peer influence on adolescent cigarette smoking: A comparison of two measures. Addictive Behaviors 16: 21-28.

Valente, T. W. (2002). Evaluating Health Promotion Programs. New York, Oxford University Press.

Wagen Knecht LE, Bruke GL, Perkins LL, Haley NJ, Friedman GD. (1992). Misclassification of smoking status in the CARDIA study: a comparison of self report with serum nicotine levels. Am J Public Health 82:33-36.

Wang, H. (2006). Tobacco control in China: the dilemma between economic development and health improvement. Salud Publica Mex 48 Suppl 1: S140-7.

Warner, S. L. (1965).Randomised response: A survey technique for eliminating evasive answer bias. Journal of the American Statistical Association 60: 63–69.

Warner, S. L. (1971). The linear randomised response model. Journal of the American Statistical Association 66 (336): 884–888.

Warren, C. W., Rilry, L.,Asma,S.,Erikson,M.P.,Green,L.,Blanton,C.,et al. (2000). Tobacco use by youth: a surveillance report from the global youth tobacco survey project. Bulletin of the World Health Organization 78(7): 868-76.

Warren, C. W., N. R. Jones, et al. (2008). Global youth tobacco surveillance, 2000-2007. MMWR Surveill Summ 57(1): 1-28.

Wen, X., W. Chen, et al. (2007). Analysis on the influence factors of parental participation in prevention and control of smoking among secondary school students. Wei Sheng Yan Jiu 36(3): 323-6.

Wen, X., W. Chen, et al. (2008). Differences in students' smoking-related knowledge, attitudes, and behaviors among public, factory, and private secondary schools in Guangzhou, China. J Sch Health 78(1): 46-53.

Wen, X. Z., J. H. Huang, et al. (2007). Possibility and predictors of successful cigarette purchase attempts by 201 primary school students in Guangzhou, China. Zhonghua Liu Xing Bing Xue Za Zhi 28(1): 24-7.

Weng xinzhi, H. z., Cheng danyang (1987). Smoking prevalence in China aged and above. Chinese Medical Journal 100(11): 886-92.

WHO (1994). Life skills education for children and adolescents in schools Genava, World Health Organization

WHO (2004). Building block for tobacco control: a handbook. Geneva, world health organization.

WHO (2008). WHO report on the global tobacco epidemic. Geneva, World Health Organization.

William C. Livingood, Carolyn D. Woodhouse, Judy Jopling Sayre, et al. (2001). Impact Study of Tobacco Possession Law Enforcement in Florida 28(6). 733-748

World Bank (1999). Curting the epidemic: Covernments and the economics of tobacco control. Wanshington, World Bank.

Xu Y, Zhang XW, Guo JX, et al. (2007). Investigation on smoking-Attempting Behavior among Junior High School Students in Zhejiiang Province. Zhejiang Prev Med 19(8):5-7.

Yang GH. (2005). Deaths and their Risk Factors among Chinese Population. Beijing: Peking Union Medical College Press.

Yang, G., J. Ma, et al. (2001). Smoking cessation in China: findings from the 1996 national prevalence survey. Tob Control 10(2): 170-4.

Yang, G. H., J. M. Ma, et al. (2005). Smoking and passive smoking in Chinese, 2002. Zhonghua Liu Xing Bing Xue Za Zhi 26(2): 77-83.

Yang, T., Y. Wu, et al. (2007). Attitudes and behavioral response toward key tobacco control measures from the FCTC among Chinese urban residents. BMC Public Health 7(147): 248.

Yu su feng, Shen Yi mei, Shen Wei min, Zhang Guo qiang, Cui Ming y , Xiang Jian qin Survey on the smoking status and KAP among 983 middle school students. Chinese Journal of Health Education, 2007; l123: 750-52. (in Chinese)

Zhang, L., W. Wang, and Q. Zhao (2000). Psychosocial Predictors of Smoking Among Secondary School Students in Henan, China. Health Education Research 15(4): 415-22.

Zhang, L., W. F. Wang, et al. (2005). A cross-sectional study of smoking risk factors in junior high school students in Henan, China. Southeast Asian J Trop Med Public Health 36(6): 1580-4.

Zhao FM, Wu GL, Duan LL, et al. (2004). Survey of smoking imagery in recent film and television plays in China. Chinese J Public health 20(3): 372.

Zhou, X., Z. Su, et al. (2006). A comparative survey on alcohol and tobacco use in urban and rural populations in the Huaihua District of Hunan Province, China. Alcohol 39(2): 87-96.

Zhu, S. H., D. Li, B. Feng, T. Zhu, and C. M. Anderson. (1998). Perception of Foreign Cigarettes and Their Advertising in China: a Study of College Students from 12 Universities. Tobacco Control. 7.2 (Summer): 134-40.

APPENDICES

APPENDIX A

GUIDELINE OF SURVEY

1. Survey materials

The Surveyor must have the following materials:

Instructions for Survey

One large envelope in which class members can put their completed Answer Sheets

Class Tracking Information

School- and Classroom-Level Forms with IDs

Community-Level Forms with IDs

A Questionnaire and Answer Sheet for each student

A pre-addressed, postage-paid return envelope

2. Completing the Forms

When the school sample is drawn, three forms will be produced for each selected school: 1) the School-Level Form 2) the Classroom-Level Form, and 3) the Community-Level Form.

The School-Level Form shows the district, community, the school name, the school ID, and the sample size. The Surveyor interview principals and teachers of middle school about the tobacco-free school policy, the tobacco-free school, and the tobacco-free school project; check related official documents and records. All results fill in the form.

The Classroom-Level Form also shows the School name, the Sample, the School ID and the Class ID. The surveyor will enter the number of students who are

enrolled in the class and the number of students who actually participated in the survey. All students in the selected classes are eligible for participation. The surveyor survey teacher's smoking behavior in sampled classes.

The Community-Level Form also shows the district, the community ID. The Surveyor interview directors and members of community neighborhood committee about community tobacco control activities, minor's access and availability of cigarettes, and community custom; check related official documents and records, local chronicles, annals of local history, local customs compilation of local history, and chorography. All results fill in the form.

APPENDIX B

QUESTIONNAIRE FORM

(FOR STUDENTS)

This survey is about tobacco use. This is NOT a test! It will help us develop better tobacco education programs for young people like you.

DO NOT WRITE YOUR NAME ON THE SURVEY OR ANSWER SHEET. Your answers will be kept private. No one will know what you write. Answer the questions based on what you really know or do.

- ✧ Please read each question carefully before answering it.
- ✧ Choose the answer that best describes what you believe and feel to be correct.
- ✧ Choose only **one** answer for each question.
- ✧ On the answer sheet, locate the circle that corresponds to your answer and fill it in completely with the pencil that was provided to you.
- ✧ Correctly fill in the bubbles :

  Like this: ●
- ✧ If you have to change your answer, don't worry, just erase it completely, without leaving marks.
- ✧ Remember, each question only has one answer.

1. How old are you?
   a. 11 years old or younger
   b. 12 years old
   c. 13 years old
   d. 14 years old
   e. 15 years old
   f. 16 years old
   g. 17 years old
   h. 18 years old or older

2. What is your sex?
   a. Female b. Male

THE NEXT 13 QUESTIONS ASK ABOUT YOUR USE OF TOBACCO

3. Have you ever tried or experimented with cigarette smoking, even one or two puffs?
   a. Yes b. No (Skip to question No.13)

4. How old were you when you first tried a cigarette?
   a. 7 years old or younger
   b. 8 or 9 years old
   c. 10 or 11 years old
   d. 12 or 13 years old
   e. 14 or 15 years old
   f. 16 years old or older

5. During the past 30 days, on how many days did you smoke cigarettes?
   a. 0 days
   b. 1 or 2 days
   c. 3 to 5 days
   d. 6 to 9 days
   e. 10 to 19 days
   f. 20 to 29 days
   g. All 30 days

6. During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?
   a. I did not smoke cigarettes during the past 30 days
   b. Less than 1 cigarette per day
   c. 1 cigarette per day
   d. 2 to 5 cigarettes per day
   e. 6 to 10 cigarettes per day

f. 11 to 20 cigarettes per day
g. More than 20 cigarettes per day

7. During the past 30 days, what brand of cigarettes did you usually smoke?
a. I did not smoke cigarettes during the past 30 days
b. I do not have a usual brand
c. Huangshan
d. Dujiang
e. Heifei
f. Marlboro
g. Other

8. During the past 30 days, how did you usually get your own cigarettes?
a. I did not smoke cigarettes during the past 30 days
b. I bought them in a store such as a convenience store, supermarket, or discount store,
c. I bought them from a vending machine
d. I gave someone else money to buy them for me
e. I borrowed (or bummed) them from someone else
f. A person 18 years old or older gave them to me
g. I took them from family member
h. I got them some other way

9. Where do you usually smoke? (SELECT ONLY ONE RESPONSE)
a. I have never smoked cigarettes
b. At home
c. At school
d. At work
e. At friends' houses
f. At social events
g. In public spaces (e.g. parks, shopping centres, street corners)
h. Other

10. Do you want to stop smoking cigarettes?
a. I do not smoke now
b. Yes
c. No

11. During the past 12 months, did you ever try to quit smoking cigarettes?
a. I did not smoke during the past 12 months
b. Yes
c. No

12. What was the main reason you decided to stop smoking? (SELECT ONE RESPONSE ONLY)

a. I have never smoked cigarettes
b. I have not stopped smoking
c. To improve my health
d. To save money
e. Because my family does not like it
f. Because my friends don't like it
g. Other

13. At any time during the next 12 months do you think you will smoke a cigarette?

a. I have already tried smoking cigarettes
b. Yes
c. No

14. Have you ever used any form of smoked tobacco products other than cigarettes (e.g. cigars, water pipe, cigarillos, little cigars, and pipe)?

a. Yes b. No

15. Have you ever used any form of smokeless tobacco products (e.g. chewing tobacco, snuff, dip)?

a. Yes b. No

THE NEXT QUESTION ASK ABOUT INTRAPERSONAL FACTORS RELATED TO YOUR USE OF TOBACCO

16. How many was your average grade of academic performance in last semester?

a. ≥ 80
b. 70-79
c. 60-69
d. <60

THE NEXT 17 QUESTIONS ASK ABOUT INTERPERSONAL FACTORS RELATED TO YOUR USE OF TOBACCO

17. Do your parents smoke cigarettes?

a. None
b. Both
c. Father only
d. Mother only
e. I don't know

18. Do your parents use cigars, water pipe, cigarillos, little cigars, and pipe?
    a. None
    b. Both
    c. Father only
    d. Mother only
    e. I don't know

19. Do your parents use chewing tobacco, snuff, or dip?
    a. None
    b. Both
    c. Father only
    d. Mother only
    e. I don't know

20. Has your parents discussed the harmful effects of smoking with you?
    a. Yes b. No

21. Has your parents supervised your smoking behavior?
    a. Yes b. No

22. Do your parents know your smoking behavior?
    a. Yes b. No

23. Do your parents oppose adolescent tobacco use?
    a. Yes b. No

24. Which of these best describes the rules about smoking in your home? Smoking is…
    a. Never allowed inside my home
    b. Allowed only at some times or in some places
    c. Always allowed inside my home

25. Can you get cigarettes from your home?
    a. Yes b. No

26. How many of your four closest friends smoke cigarettes?
    a. None
    b. One
    c. Two
    d. Three
    e. Four

f. Not sure

27. How many of your four closest friends use cigars, water pipe, cigarillos, little cigars, pipe?
a. None
b. One
c. Two
d. Three
e. Four
f. Not sure

28. How many of your four closest friends use chewing tobacco, snuff, or dip?
a. None
b. One
c. Two
d. Three
e. Four
f. Not sure

29. How many your friends oppose adolescent tobacco use?
a. None
b. One
c. Two
d. Three
e. Four
f. More than four

30. In the past year, how many your friends encouraged you to smoke?
a. None
b. One
c. Two
d. Three
e. Four
f. More than four

31. If one of your best friends offered you a cigarette, would you smoke it?
a. Definitely yes
b. Probably yes
c. Probably not
d. Definitely not

32. Do your teacher smoke cigarette?

a. Yes
b. No
c. Not sure

33. Does your teacher disagree to adolescent tobacco use?
a. Yes
b. No
c. Don't know / not sure

THE NEXT 4 QUESTIONS ASK ABOUT ORGANIZATIONAL FACTORS RELATED TO YOUR USE OF TOBACCO

34. During this school year, were you taught in any of your classes about the dangers of tobacco use?
a. Yes b. No

35. When you watched TV, videos, or movies, how often did you see actors using tobacco?
a. I never watch TV, videos, or movies
b. A lot
c. Sometimes
d. Never

36. When you watched sports events or other programs on TV, how often did you see cigarette brand names?
a. I never watch TV
b. A lot
c. Sometimes
d. Never

37. How many advertisements for cigarettes have you seen on billboards?
a. A lot
b. A few
c. None

THE NEXT 3 QUESTIONS ASK ABOUT COMMUNITY FACTORS AND POLICY RELATED TO YOUR USE OF TOBACCO

38. During the past 30 days, did anyone ever refuse to sell you cigarettes because of your age?
a. I did not try to buy cigarettes in a store during the past 30 days
b. Yes, someone refused to sell me cigarettes because of my age

c. No, my age did not keep me from buying cigarettes

39. During the past 12 months, have you participated in any community activities to discourage people your age from using cigarettes, chewing tobacco, snuff, dip, or cigars?

a. Yes b. No

40. What do you think the price of the cigarette?

a. Cheap
b. Moderate
c. High

THE NEXT 10 QUESTIONS ASK ABOUT YOUR KNOWLEDGE OF SMOKING.

41 moking can cause lung cancer

a. Yes b. No c. Don’t know / not sure

42 moking can cause respiratory disease

a. Yes b. No c. Don’t know / not sure

43 Smoking can not cause cardiovascular disease

a. Yes b. No c. Don’t know / not sure

44 People can get addicted to using tobacco just like they can get addicted to using cocaine or heroin

a. Yes b. No c. Don’t know / not sure

45 Smoking can not cause health hazards to the secondhand smokers

a. Yes b. No c. Don’t know / not sure

46 Smoking can affect the people who live around the smoker

a. Yes b. No c. Don’t know / not sure

47 Low birth weight baby can be born if pregnant mother smoke

a. Yes b. No c. Don’t know / not sure

48 Smoking can lead to the use of alcohol, marijuana and other substance use

a. Yes b. No c. Don’t know / not sure

49 Tobacco contains nicotine, tar and other carcinogenic agents

a. Yes b. No c. Don’t know / not sure

50 The certain kind of substance in tobacco can cause addiction
a. Yes b. No c. Don't know / not sure

THE NEXT 6 QUESTIONS ASK ABOUT YOUR ATTITUDES TOWARD TOBACCO

51 In your opinion, smoking cigarette makes young people look cool or fit in
a. Agree b. Uncertain c. Disagree

52 Smoking can not help to lose weight
a. Agree b. Uncertain c. Disagree

53 Smoking makes people release tension and have relaxation
a. Agree b. Uncertain c. Disagree

54 Smoking makes people have more friends
a. Agree b. Uncertain c. Disagree

55 Smoking cigarette helps people feel comfortable at celebration, party or other social gathering
a. Agree b. Uncertain c. Disagree

56 Smoking makes people look more mature and attractive
a. Agree b. Uncertain c. Disagree

THE NEXT 10 QUESTIONS ASK ABOUT YOUR SELF-ESTEEM

57 On the whole I am satisfied with myself
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

58 At times I think that I am no good at all
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

59 I feel that I have a number of good qualities
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

60 I am able to do things as well as most other people
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

61 I feel I do not have much to be proud of
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

62 I certainly feel useless at times
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

63 I feel that I am a person of worth, at least the equal of others
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

64 I wish I could have more respect for myself
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

65 All in all, I am inclined to feel that I am a failure
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

66 I take a positive attitude toward myself
a. Strongly disagree b. Disagree c. Agree d. Strongly agree

THE NEXT 46 QUESTIONS ASK ABOUT YOUR LIFE SKILLS.

67 I treat people who are different from me with respect.
a. True b. False

68 I often follow instructions as someone given me.
a. True b. False

69 I often refuse if someone asks me to do something.
a. True b. False

70 I often help other people.
a. True b. False

71 I enjoy doing kind acts for others.
a. True b. False

72 I am considerate of others.
a. True b. False

73 Overstress can cause people to get sick.
a. True b. False

74 Not all types of stress are harmful or even negative. A very short-term type of stress can be positive.
a. True b. False

75 Everyone feels stressed or worried sometimes.
a. True b. False

76 When people feel stressed, there is nothing people can do to stop it.
a. True b. False

77 Stress does not really impact people emotions.
a. True b. False

78 When some people feel nervous or stressed out, they can take deep breaths to reduce the lever of stress.
a. True b. False

79 When some people feel stress, they can relax the muscles in their body to relieve the stress.
a. True b. False

80 An exhausting study schedule can be the cause of stress.
a. True b. False

81 Regular exercise is one of the best ways to manage stress.
a. True b. False

82 Making time to do something you enjoy can help you relax and reduce stress.
a. True b. False

How often you did what is described in following statement.

83 I use my tone of voice to reinforce what I am trying to say.
a. Never b. Rarely c. Sometimes d. Often e. Always

84 I don't hear everything a person is saying, because I am thinking about what I want to say.
a. Never b. Rarely c. Sometimes d. Often e. Always

85 When talking to someone, I try to maintain eye contact.
a. Never b. Rarely c. Sometimes d. Often e. Always

86 I interrupt other people to say what I want to say before I forget it.
a. Never b. Rarely c. Sometimes d. Often e. Always

87 I recognize when two people are trying to say the same thing, but in different

ways.
a. Never b. Rarely c. Sometimes d. Often e. Always

88 I try to watch other people's body language to help me trying to say.
a. Never b. Rarely c. Sometimes d. Often e. Always

89 I recognize when people are using their hands to reinforce what they are saying.
a. Never b. Rarely c. Sometimes d. Often e. Always

90 I recognize when a person is listening to me, but not hearing what I am saying.
a. Never b. Rarely c. Sometimes d. Often e. Always

91 When I am listening to someone, I try to understand what they are feeling.
a. Never b. Rarely c. Sometimes d. Often e. Always

92 I try to see the other person's point of view.
a. Never b. Rarely c. Sometimes d. Often e. Always

93 I change the way I talk to someone based on my relationship with them (i.e., friend, parent, teacher, etc).
a. Never b. Rarely c. Sometimes d. Often e. Always

94 I use my hands to illustrate what I am trying to say.
a. Never b. Rarely c. Sometimes d. Often e. Always

95 I organize thoughts in my head before speaking.
a. Never b. Rarely c. Sometimes d. Often e. Always

96 I use body language to help reinforce what I want to say.
a. Never b. Rarely c. Sometimes d. Often e. Always

97 I make sure I understand what another person is saying before I respond.
a. Never b. Rarely c. Sometimes d. Often e. Always

98 I think of possible results before I take action.
a. Never b. Rarely c. Sometimes d. Often e. Always

99 I get ideas from other people when having a task to do.
a. Never b. Rarely c. Sometimes d. Often e. Always

100 I develop my ideas by gathering information.
a. Never b. Rarely c. Sometimes d. Often e. Always

101 When facing a problem, I identify options.
a. Never b. Rarely c. Sometimes d. Often e. Always

102 I am able to give reasons for my opinions.
a. Never b. Rarely c. Sometimes d. Often e. Always

103 I usually have more than one source of information before making a decision.
a. Never b. Rarely c. Sometimes d. Often e. Always

104 I put my ideas in order by importance.
a. Never b. Rarely c. Sometimes d. Often e. Always

105 I back my decisions by the information I got.
a. Never b. Rarely c. Sometimes d. Often e. Always

106 I compare ideas when thinking about a topic.
a. Never b. Rarely c. Sometimes d. Often e. Always

107 I keep my mind open to different ideas when planning to make a decision.
a. Never b. Rarely c. Sometimes d. Often e. Always

108 I am aware that sometimes there are no right or wrong answers to a question.
a. Never b. Rarely c. Sometimes d. Often e. Always

109 I develop a checklist to help me think about an issue.
a. Never b. Rarely c. Sometimes d. Often e. Always

110 I can easily tell what I did was right or wrong.
a. Never b. Rarely c. Sometimes d. Often e. Always

111 I am able to tell the best way of handling a problem.
a. Never b. Rarely c. Sometimes d. Often e. Always

112 I make sure the information I use is correct.
a. Never b. Rarely c. Sometimes d. Often e. Always

THE NEXT 60 QUESTIONS ASK ABOUT YOUR SELF CONCEPT

113 I do not have confidence about my study.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

114 I am not satisfied with my present academic performance.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

115 I think I have a strong understanding.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

116 I feel that my recitation is poor.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

117 I think my homework is good.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

118 If I hit a difficult task, I will ask someone to help.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

119 If I do something wrong, I will be brave enough to acknowledge and review it.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

120 I will refer to the views of others to do things.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

121 I feel that I am a person with strong leadership.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

122 If I meet a disagreement, I will communicate and not persist.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

123 When things are endless, I will stay home in a sulk (Sheng Men Qi).
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

124 I think that other people do not know me.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

125 Sometimes I have the idea of self-abnegation.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

126 When I feel bored, I will hurt myself.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

127 When I am alone, I would feel so helpless.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

128 I feel that my home is a nurturing family.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

129 At home I think I am very lonely.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

130 I feel that my family has a very harmonious atmosphere.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

131 I feel that my family is very happy.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

132 I am not used to chat with my family.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

133 I am not easy to break into a new group.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

134 I treat the opposite sex friend as same-sex friend.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

135 My friends and I give advice and happy each other.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

136 Friends are very important to me.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

137 Friends are my spiritual support.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

138 Although I am not good-looking, but I feel very confident.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

139 I am all smiles, a cheerful person.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

140 I think I am very lively.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

141 People often say that I am very thoughtful.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

142 I am a person whom people do not feel hate of.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

143 I think my schoolwork that always is inferior to other students.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

144 I hate the language class.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

145 I think that my schoolwork has been a bottleneck, and can often not break

through.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

146 My biggest problem is that schoolwork is poor.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

147 I often do not understand the teacher in class.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

148 When I meet a stranger, I will very naturally smile to him.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

149 In a strange environment, I will initiatively know other people.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

150 When I was bored, I would like to invite friends to relax and chat.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

151 I can enrich myself and continue to achieve my goal.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

152 I will initiatively help others.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

153 I am afraid of lonesome feeling.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

154 I often can not control my emotions.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

155 I can not accept a friend’s betrayal.
a. Strongly disagree b. Disagree c. Somewhat disagree

d. Somewhat agree e. Agree f. Strongly agree

156 When I was accused and slandered inexplicably, I would be very angry.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

157 I often feel that there is not goal in my life.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

158 I think Mom and Dad all make me happy and take care of me.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

159 I feel that my family was cold, no warm.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

160 I feel that my family members make happy each other.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

161 I think my mom and dad are ferocious, very authoritarian.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

162 I think my family is discord. I hope to escape as soon as possible.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

163 I feel that we must be mutual respect with the opposite sex people.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

164 I can not lose my friends.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

165 I do not have an intimate friend.
a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

166 My friend and I can talk about anything like the same family member .

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

167 I think I have good interpersonal relations.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

168 I think I have a lot of weaknesses.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

169 I think I am a very dynamic person.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

170 I feel people think I am cold.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

171 I feel that I am a shy person.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

172 I am a person to get along very easily.

a. Strongly disagree b. Disagree c. Somewhat disagree
d. Somewhat agree e. Agree f. Strongly agree

THANK YOU

APPENDIX C

STUDENT TOBACCO USE SURVEY: SCHOOL–LEVEL FORM

School name: _____ School ID: _____

District: _____ Community: _____ Community ID: _____

Interviewee name; _____ Interviewee occupation: _____

1. Does this school have a tobacco-free policy? If this school has a tobacco-free policy, how does the school manage and implement?

   _____

   a. Yes b. No

2. Are there any official documents and records about tobacco-free school policies in the school?

   _____

   a. Yes b. No

3. Is this school the tobacco-free school which is evaluated by the government department? Which department? When?

   _____

   a. Yes b. No

4. Are there any official documents and records of tobacco-free school in the school?

   _____

a. Yes b. No

5. How does your school inform your student about the tobacco-free policy of this school?

_____

6. Does this school participate in tobacco-free school project? How to do?

_____

a. Yes b. No

7. Are there any official documents and records of the tobacco control project in the school?

_____

a. Yes b. No

8. Does this school have the health education about tobacco use? How to do?

_____

a. Yes b. No

9. Are there any official documents and records of the health education activities about tobacco use in the school?

_____

a. Yes b. No

Interviewer signature: _____ Date: _____

APPENDIX D

STUDENT TOBACCO USE SURVEY: CLASS–LEVEL FORM

Class name: _____ Class ID: _____

School name: _____ School ID: _____

1. How many of students are enrolled in this class?

   _____

2. How many of students participated in the survey?

   _____

2. Does this class have teachers who smoke?

   _____

3. How many of teachers smoke in this class?

   _____

Interviewer signature: _____ Date: _____

APPENDIX E

STUDENT TOBACCO USE SURVEY: MEDIA CENTER FORM

Media center name: _____ Media center ID: _____

Community name: _____ Community ID: _____

District: _____ City: _____

Interviewee name; _____ Interviewee occupation: _____

1. Are there actors or actresses smoking on television, videos, or movies in the district? If there are, how often?

   _____

   a. Yes b. No

2. Do you prohibit the advertisements about tobacco? If yes, how to do?

   _____

   a. Yes b. No

3. Are there any official documents and records about prohibiting the advertisements about tobacco t?

   _____

   a. Yes b. No

4. Are there advertisements about tobacco on local TV program in the district? If there are, how often?

   _____

   a. Yes b. No

Interviewer signature: _____ Date: _____

APPENDIX F

STUDENT TOBACCO USE SURVEY: HEALTH SERVICE CENTER FORM

Health service center name: _____ Health service center ID: _____

Community name: _____ Community ID: _____

District: _____ City: _____

Interviewee name; _____ Interviewee occupation: _____

1. Are there any smoking intervention programs in the district? If there are, how do the programs do?

_____

a. Yes b. No

2. Are there any official documents and records about smoking intervention program in the district?

_____

a. Yes b. No

Interviewer signature: _____ Date: _____

APPENDIX G

STUDENT TOBACCO USE SURVEY: GOVERNMENT DEPARTMENT FORM

Government department name: _____Government Department ID: _____

Community name: _____ Community ID: _____

District: _____ City: _____

Interviewee name: _____ Interviewee occupation: _____

1. Are there any tobacco control policies in the district?

a. Yes b. No

2. Are there any official documents and records about tobacco control policies in the district?

a. Yes b. No

3. Are there specific provisions for setting prices for leaf tobacco purchase and relevant policies on substitution in local district??

a. Yes b. No

4. Are there any official documents and records about leaf tobacco purchase prices and subsidization policies in the district?

a. Yes b. No

5. Are there any taxation policies and cigarette price raise policies in the district?

a. Yes b. No

6. Are there any official documents and records about taxation policies and cigarette price raise policies in the district?

a. Yes b. No

Interviewer signature: _____ Date: _____

APPENDIX H

STUDENT TOBACCO USE SURVEY: COMMUNITY–LEVEL FORM

Community name: _____ Community ID: _____

District: _____ City: _____

Interviewee name; _____ Interviewee occupation: _____

1. Does this community have the community tobacco control activities? If this community has the community tobacco control activities, how does this community do?

   _____

   a. Yes b. No

2. Are there any official documents and records about tobacco control activities in the community?

   _____

   a. Yes b. No

3. Does your community prohibit shop from selling tobacco to minor? If yes, How to do?

   _____

   a. Yes b. No

4. Are there any official documents and records about prohibiting shop from selling tobacco to minor in the community?

   _____

a. Yes b. No

5. Can students get their cigarettes by buying them (in a store, shop or from a street vendor) in this community?

_____

a. Yes b. No

6. Are there any shops where students are refused purchase of cigarettes because of their age in this community? Where?

_____

a. Yes b. No

7. Is tobacco a traditional gift in festival and special occasion in this community? How do local chronicles, annals of local history, local customs compilation of local history, and chorography record?

_____

a. Yes b. No

8. Has the cigarette price raised in the community this year?

_____

a. Yes b. No

9. Are there any advertisements for cigarettes at sports events, fairs or billboards in community?

_____

a. Yes b. No

Interviewer signature: Date:

APPENDIX I

QUESTIONS ABOUT PERCEPTIONS AND OPINIONS OF THE WHO FCTC (IN-DEPTH INTERVIEWING)

Interviewee name; _____ Interviewee occupation: _____

Community name: _____ Community ID: _____

District: _____ City: _____

1. Do you know about the Framework Convention on Tobacco Control? Can you talk about some articles of the FCTC?

_____

2. What are you perceptions and opinions about these measure of FCTC

   a) Price and tax measures are an effective and important means of reducing tobacco use especially among young people.

_____

   b) Protection from exposure to tobacco smoke can reduce youth tobacco use.

_____

   c) Regulation of the contents of tobacco products can reduce youth tobacco use or not.

_____

   d) Tobacco industries interfere with the tobacco control policy.

_____

   e) Large, clear health warnings and these warnings cover 50% or more of the principle display areas can reduce tobacco use, especially among young people.

f) Tobacco product packaging and labeling do not promote a tobacco product by any means that are false, misleading, deceptive, or likely to create an erroneous impression about its characteristics, health effects, hazards, or emissions among young people.

g) Promote public awareness and access to information on the addictiveness of tobacco, the health risks of tobacco use and exposure to smoke and the benefits of cessation can reduce youth tobacco use.

h) Comprehensive ban on all tobacco advertising, promotion, and sponsorship can reduce tobacco use especially among young people.

i) Cessation programs in a range of settings, including diagnosis and treatment of nicotine dependence in national health programs, establishment of programs for diagnosis, counseling and treatment in health care facilities can reduce youth tobacco use.

j) Establishment of smoke-free policies and enforcement of existing policies are an effective and important means of reducing tobacco use especially among young people.

Interviewer signature: _____ Date: _____

APPENDIX J

PERCEPTIONS OF THE FCTC BY DIFFERENT GROUPS OF ECOLOGICAL MODEL

The perceptions of WHO FCTC include the perceptions of price and tax measures to reduce the demand for tobacco and the perceptions of non-price measures to reduce the demand for tobacco, such as protection from exposure to tobacco smoke, packaging and labeling of tobacco products, tobacco advertising, promotion and sponsorship, sales to and by minors and demand reduction measures concerning tobacco dependence and cessation. The perceptions of WHO FCTC by different groups of ecological model are as follows:

1. The perceptions of price and tax measures to reduce the demand for tobacco

School:

Teacher Zhu "The effective taxation plan to curb smoking is to levy a fixed duty on every package of cigarettes. The prices of low-end cigarettes should be expected to rise, too. Since cigarette prices haven't risen this time, the purpose of curbing smoking has not been achieved"

Teacher Yang "Some tobacco taxation plans could reduce tobacco consumption, while some might have no effect at all in China. To effectively control tobacco through tax policy, the government should raise tax rates as well as tobacco prices at the same time."

Teacher Zang "The higher tax rate on tobacco is inequitable because it doesn't affect all citizens equally, only smokers. Place an unfair burden on smoker. With the cost of per pack so high many smokers are resorting to rolling their own and most often smoke them without filters in rural area."

Student Wang "To increase the tobacco tax and lift tobacco prices will prevent students from smoking and encourage more smokers to quit the harmful habit."

Student Zhao "High cigarette tax is especially efficacious in reducing smokers among the young. Students are particularly sensitive to price. Poor smokers and students will reduce their consumption when price rises."

Student Liu "Raising tobacco tax alone won't help people give up smoking. If China imposes higher tax on higher-priced cigarettes, Then, the producers and consumers could turn to cheaper cigarettes."

Student Li "Raising taxes alone, the economic burden of smokers is increased. The physical and psychological addiction to the habit cannot die overnight. Many students may turn to cheaper tobacco products, and that will do them more harm than good."

Parents:

Mr. Liu "If government increase the tobacco tax, and prices, smuggled and counterfeit cigarettes are common in black market. Smokers can hand-roll their cigarettes. The result of high cigarette prices increase counterfeit cigarettes and cheap roll-your-own cigarettes, quality of the tobacco comes into question. "

Mr. Zhao "The government should gradually reduce its dependence on taxes from the tobacco industry. I think that higher taxes will compel cigarette companies to sell more of their products and cause more harm to the people."

Mr. Li "The higher cigarette price can reduce the number of smokers, a number of citizens don't. I will continue to smoke regardless of the price. Faced with high cigarette prices, smokers might limit their consumption; alternatively, they might switch to lower-priced brands or use no taxed sources."

Mr. Wang "Higher cigarette prices may push some smokers to quit smoking and squeeze the amount of cigarette consumption of the ones who go on smoking."

Mr. Hu "Raising tobacco taxes is unfair to low-income smokers because they have to spend more of their limited income on cigarettes. While the poor are more responsive to price rises than those who are more well off. I think that many poor smokers continue smoking in the face of price rises. Raising taxes on cigarettes will only force smokers to choose between high-priced and cheaper brands."

Mrs. Zhang "A number of government officials smoke expensive cigarettes. Officials consume a large percentage of expensive cigarettes because they can use public money to buy cigarettes. Cigarettes are often used in government receptions. Many local governments buy cigarettes with money supplied by Chinese citizens despite surging prices. Governments have become the biggest purchasers of brand-name cigarettes."

Government department:

Mr. Shu "The government raised the tobacco consumption tax depending on different tobacco classes. The tax increase on cheap cigarettes is still too modest. If the prices of high-end cigarettes surged but those of cheaper ones remained stable.

Many smokers might divert their consumption to cheaper cigarettes. The total volume of tobacco consumption and the money spent on cigarettes would remain unchanged. In fact, the average price of a pack of 20 cigarettes here is just 6 Yuan ($ 1). The cheapest brand in China is just 3 Yuan a pack ($ 0.5). Higher tobacco tax could make up for a part of the budget deficit, and curbing smoking is only a secondary consideration."

Mr. Zhu "The price remained unchanged this time because cigarette prices in China are controlled by the government instead of the market. If the tax does not really raise the retail prices of cigarettes, it would have no effect. The government should raise both taxes and the retail price of cigarettes as a tobacco control measure."

Mrs. Yue "Raising the tax rate on cigarettes will not only increase government revenue, but also save the lives of millions of people. Despite the increase in tobacco tax, its rate is still about 10 percent lower than the international average. Hence, there is still space for further tax increase."

Health center:

Doctor Xui "In china, raising the tax on tobacco and consequently making cigarettes more expensive is an effective measure of reducing tobacco consumption in young persons. A certain percentage of cigarette tax (at least 5 percent) should be set aside to help smokers quit."

Doctor Cao "Tobacco tax should make cigarettes less affordable for the smokers by keeping the retail prices of cigarettes growing faster than consumers' incomes. If the increase in prices is slower than that in the disposable incomes of tobacco consumers, cigarettes would become relatively cheaper compared with the purchasing power of smokers."

2. The perceptions of non-price measures to reduce the demand for tobacco

School:

Teacher Wu "Many countries across the world have imposed heavy taxes on their tobacco industry to force people to quit smoking. But we have to know that reducing smoking is a comprehensive and systematic project, and raising taxes is just one of the many tools that it can use. Taxes can be raised only after all the necessary non-tax steps have been taken."

Principal Xie "Only after we have imposed the above non-tax measures can we consider using taxation as a tool to control smoking. That's because non-tax measures can achieve the goal without adding monetary burden on smokers. The government should use more non-tax measures such as banning smoking in public places to cut down the number of smokers and reduce smoking.

Health center:

Mr. Shen "The comprehensive non-price measures are more effective and important means of reducing tobacco consumption."

3. The perceptions of protection from exposure to tobacco smoke

School:

Teacher Yu "Exposure to tobacco smoke causes death, disease and disability. Restaurants should ban smoking or set up smoking areas. Anhui province should have the local tobacco control regulation in public places."

Government department:

Mr. Yao "China lags behind other countries in efforts to control the use of tobacco, and the biggest problem is the lack of national regulations banning smoking in public areas. Tobacco-related laws must be drawn up as soon as possible. The lack of a specific anti-smoking law is one of the reasons why tobacco control work has made little progress. Although our city has made improvements in smoking control in public venues in the past decade, people still complain about exposure to passive smoking, as places like restaurants and hotels are not included in the existing rule."

Community:

Member Zhen "I support that the total ban in all enclosed public places. The problem is that when the ban comes in, people will move into the streets or come back home, and then smoke more, they can not ban smoking completely. Smoking should also be banned at work places and restaurants. The detailed requirements for smoking rooms should be stipulated too."

Member Yu "Smoking should be banned in all public areas. Smokers need to realize not everyone likes the smoke they exhale. I would like to see smoking banned in public places, especially indoors. Only a strict law, violating which would attract stringent punishments, will keep public venues free of tobacco fumes."

Member Guo "Scientific studies have not conclusively established the harmfulness of secondhand smoke. Smoking bans should not be established in law. I would rather not go if I am not allowed to smoke in some public areas. In my opinion, it seems unlikely that secondhand smoke presents any significant harm to otherwise healthy nonsmoking adults at the very low concentration. There should be some alternatives for smokers. Airports and train stations must set up ventilated smoking rooms."

Director Zhang "Currently, smoking is allowed in certain areas in public places, the enforcement of smoking bans is poor. The tobacco industry generates a lot of tax and employs a large number of people. Some local governments count

heavily on the local tobacco industry as a major source of tax revenue, which as a result makes smoking more difficult to control. I support that the total ban in all enclosed public places. Ban smoking in all healthcare facilities and government-run health departments."

Director Yao "Customers like dining, drinking, chatting and smoking at the same time, some smokers would gather and drink with friends at home if the smoking ban in restaurants and pubs. There should be smoking areas in public indoor places. Owners and managers of karaoke parlors and restaurant fear a loss of business. Smoking should be strictly banned in schools, hospitals, stadiums, libraries, theaters and museums."

Health center:

Mr. Ye "Smokers often insist they have the individual right to smoke. Smoking, after all, is still a legal activity for adults, but nonsmokers have rights, too. Hotels and entertainment centers must ban smoking indoors or provide a separate smoking area. Smoking bans are legal and necessary; the only effective means of protecting nonsmokers in a public place is a smoking ban."

4. The perceptions of packaging and labelling of tobacco products

School:

Teacher Shu "Graphic warnings are believed to be an effective deterrent and I strongly support picture warnings on cigarette packs. Cigarette packages should include images of sickness and suffering caused by tobacco, along with written warnings."

Teacher Ma "Cigarette packaging may still mislead consumers and provide false reassurance to consumers about the risks of smoking. It is pictorial warnings which are believed to be more powerful in convincing people of the dangers of smoking. National Tobacco Corporation feared warning pictures of tobacco's effects on packets would reduce sales and harm their profits"

Principal Huang "Health warnings on tobacco packages are a simple, cheap and effective strategy that can vastly reduce tobacco use. Words on packets in China have hardly any warning effect. If China uses graphic warnings, it would become the largest anti-tobacco promotion in the world. It will also be good to change the habit of giving cigarettes as gifts and help curb corruption. Why does exported Chinese tobacco have different packs from that sold in domestic markets? For example, Zhonghua cigarette pack for overseas consumers has a picture of a smoker's ulcerated foot, which is invisible on the red packing of the same brand for domestic smokers. "

Principal Yue "It is likely that children will be more affected by pictorial health warnings than textual ones. China needs to do a lot more by way of visual illustrations on cigarette packets to impress young minds about the ill effects of smoking.

Printing warning signs on the cover of cigarette packs is one of the most effective ways of controlling smoking."

5. The perceptions of tobacco advertising, promotion and sponsorship

School:

Teacher Jiang "The slogan 'Love China' is good, but when producers put 'Smoking can damage your health' beside it, the slogan becomes an advertisement. The words 'I love China' is written big and bold on billboards, the slogan is actually a catch phrase used by the Shanghai Tobacco Company for advertising its well-known Chong Hua cigarettes. Chong Hua means China, or the Chinese. Such covert advertising is also used for other tobacco brands, including Huangshan, produced by Bengbu Cigarette Factory, and Baisha, made by Baisha Group."

Principal Chen "The more young people are exposed to tobacco advertising, the more likely they are to start smoking. There should be specific stipulations to ban explicit promotion of tobacco when it comes to contribution to social welfare by tobacco firms. For example, a school in Sichuan province had its signboard engraved with the words 'Sichuan Tobacco Project Hope Primary School'. A slogan engraved on another board goes: 'Aspire to contribute to society. Tobacco helps you become a talent."

Community:

Director Wan "Though tobacco advertisements are banned, disguised form of tobacco advertisements exists everywhere. I picked up the habit to emulate some female stars, whose affectations with cigarettes in films or TV soap operas. They are very smart."

Media center:

Mr. Ma "Currently, due to a lack of legislation and low awareness, many scenes in TV series and films contain smoking scenes, which has a negative impact on viewers, particularly on minors who are not mature and tend to follow."

Mr. Jiang "Most Chinese films contain smoking scenes. Nearly all tobacco-related scenes show smoking in a positive or neutral light. Directors include smoking in their productions because they receive 'contributions' from tobacco companies. The practice of including smoking in scenes will help tobacco companies foster more customers, especially the young."

6. The perceptions of sales to minors and demand reduction measures concerning tobacco dependence and cessation

School:

Student Zhang "My friend has never been refused when attempting to purchase cigarretes."

Student Hu "Students are able to purchase single cigarettes from mobile venders and small individual shops. There are many tobacco retail venders near schools and homes of students."

Community:

Member Ma "Chinese law explicitly bans the sale of cigarettes to minors under 18; few vendors and shops pay much heed to the law. Indeed, it is common to see students puffing away in their uniforms. It is unrealistic to protect minors from smoking only by vendor and shop self-regulation without concrete legal enforcement and punishment in China"

Director Zhao "All tobacco vendors and shops should place a clear and prominent indicator inside their points of sale about the prohibition of tobacco sales to minors, and in case of doubt, must request the buyer provide appropriate evidence of full legal age."

Health center:

Docter Gao China still has not many qualified smoking cessation doctors Most doctors know little about smoking cessation treatment and the drugs involved. The Ministry of Health should train more qualified doctors in smoking cessation and establish more such clinics nationwide. Smoking cessation should been integrated into China's medical education.

Docter Jiang Because most people think smoking is just bad habit, few smokers turn to doctors for assistance. Most smokers have no idea that tobacco addiction is a disease requiring medical treatment to quit. Whether or not smoker can quit successfully is determined entirely by willpower and perseverance.

APPENDIX K

INTERVIEWEES OF THE DIFFERENT ECOLOGICAL GROUPS

Li	12 years old, Male, Seven grade student, lived in urban region.
Liu	13 years old, Female, Eight grade student, lived in rural region.
Wang	14 years old, Male, Nine grade student, lived in rural region.
Zhang	15years old, Female, Ten grade student, lived in urban region.
Zhao	16 years old, Male, Eleven grade student, lived in rural region.
Hu	17 years old, Male, Twelve grade student, lived in urban region.
Mr. Li	36 years old, Father of student Li, Policeman.
Mr. Liu	40 years old, Father of student Liu, Farmer.
Mr.Wang	39 years old, Father of student Wang, Farmer.
Mrs. Zhang	39 years old, Mother of student Zhang, Worker.
Mr. Zhao	42 years old, Father of student Wang, Farmer
Mr. Hu	44 years old, Father of student Hu, Official
Principal Huang	50 years old, Male, Deputy principal of middle school.
Principal Xie	55 years old, Male, Deputy principal of middle school.
Principal Chen	40 years old, Male, Deputy principal of middle school.
Principal Yue	52 years old, Female, Deputy principal, of middle school.
Teacher Zang	41 years old, Male, health education teacher of middle school.
Teacher Zhu	43 years old, Female, health education teacher of middle school.
Teacher Yang	45 years old, Male, health education teacher of middle school.
Teacher Shu	40 years old, Female, health education teacher of middle school.

Teacher Jiang	50 years old, Male, health education teacher of middle school.
Teacher Ma	55 years old, Male, health education teacher of middle school.
Teacher Wu	36 years old, Male, health education teacher of middle school.
Teacher Yu	30 years old, Male, health education teacher of middle school.
Mr. Ma	51 years old, Male, Deputy directors of media center.
Mr. Jiang	54 years old, Male, Deputy directors of media center.
Mr. Zhang	40 years old, Male, Official of media center
Mr. Li	31 years old, Male, Official of media center
Mr. Yue	27 years old, Male, Official of media center
Mrs. Wang	51 years old, Female, Official of media center
Mr. Ye	47 years old, Male,Directors of health service center
Mr. Shen	44 years old, Male, Deputy directors of health service center
Doctor Xui	34 years old, Male, Public health doctors of health service center
Doctor Cao	28 years old, Male, Public health doctors of health service center
Doctor Jiang	38 years old, Male, Public health doctors of health service center
Doctor Gao	49 years old, Female, Public health doctors of health service center
Manager Yu	41 years old, Female, NGO manager
Manager Yan	45 years old, Female, NGO manager
Director Li	55 years old, Male, Director of community neighborhood committee
Director Yao	50 years old, Female, Director of community neighborhood committee
Director Zhao	47 years old, Male, Director of community neighborhood committee
Director Zhang	54 years old, Female, Director of community neighborhood committee
Director Wan	56 years old, Male, Director of community neighborhood committee
Director Xie	49 years old, Male, Director of community neighborhood committee
Member Yu	55 years old, Female, Member of community neighborhood committee

Member Ma	50 years old, Male, Member of community neighborhood committee
Member Yue	45 years old, Male, Member of community neighborhood committee
Member Zhen	53 years old, Female, Member of community neighborhood committee
Member Zhu	40 years old, Male, Member of community neighborhood committee
Member Liu	46 years old, Male, Member of community neighborhood committee
Member Jiang	44 years old, Male, Member of community neighborhood committee
Member Guo	47 years old, Female, Member of community neighborhood committee
Mrs. Yue	45 years old, Female, Official of local government department.
Mr. Shu	42 years old, Male, Official of local government department
Mr. Yao	48 years old, Male Official of local government department
Mr. Zhu	40 years old, Male Official of local government department

APPENDIX L

ETHIC DOCUMENT

Documentary Proof of Ethical Clearance
Ethics Committee for Human Research
Faculty of Public Health, Mahidol University

Proof Number	MUPH2009-204
Project Title	Perceptions of Framework Convention on Tobacco Control by different groups of the ecological model; teenage smoking problems in China
Project Number	145/2552
Principal Investigator	Mr. Yue Qing
Official Address	Doctor of Public Health (International Program) Faculty of Public Health, Mahidol University 420/1 Rajvithi Road, Bangkok, Thailand

The aforementioned project and informed consent have been reviewed and approved by Ethics Committee for Human Research, according to the Declaration of Helsinki.

P. Luksamijarulkul

(Assoc. Prof. Pipat Luksamijarulkul)
Chairman of Ethics Committee for Human Research

Phitaya Ch MD.

(Assoc. Prof. Phitaya Charupoonphol)
Dean of Faculty of Public Health

Date of Approval : 3 December 2009
Date of Expiration : 2 December 2010

APPENDIX M

MODEL FIT SUMMARY

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	25	25.958	20	.167	1.298
Saturated model	45	.000	0		
Independence model	9	1131.760	36	. < 0.001	31.438

Model	RMR	GFI	AGFI	PGFI
Default model	2.005	.983	.963	.437
Saturated model	.000	1.000		
Independence model	110.283	.719	.648	.575

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.977	.959	.995	.990	.995
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Model	PRATIO	PNFI	PCFI
Default model	.556	.543	.553
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

Model	NCP	LO 90	HI 90
Default model	5.958	.000	23.277
Saturated model	.000	.000	.000
Independence model	1095.760	989.630	1209.284

Model	FMIN	F0	LO 90	HI 90
Default model	.076	.017	.000	.068
Saturated model	.000	.000	.000	.000
Independence model	3.319	3.213	2.902	3.546

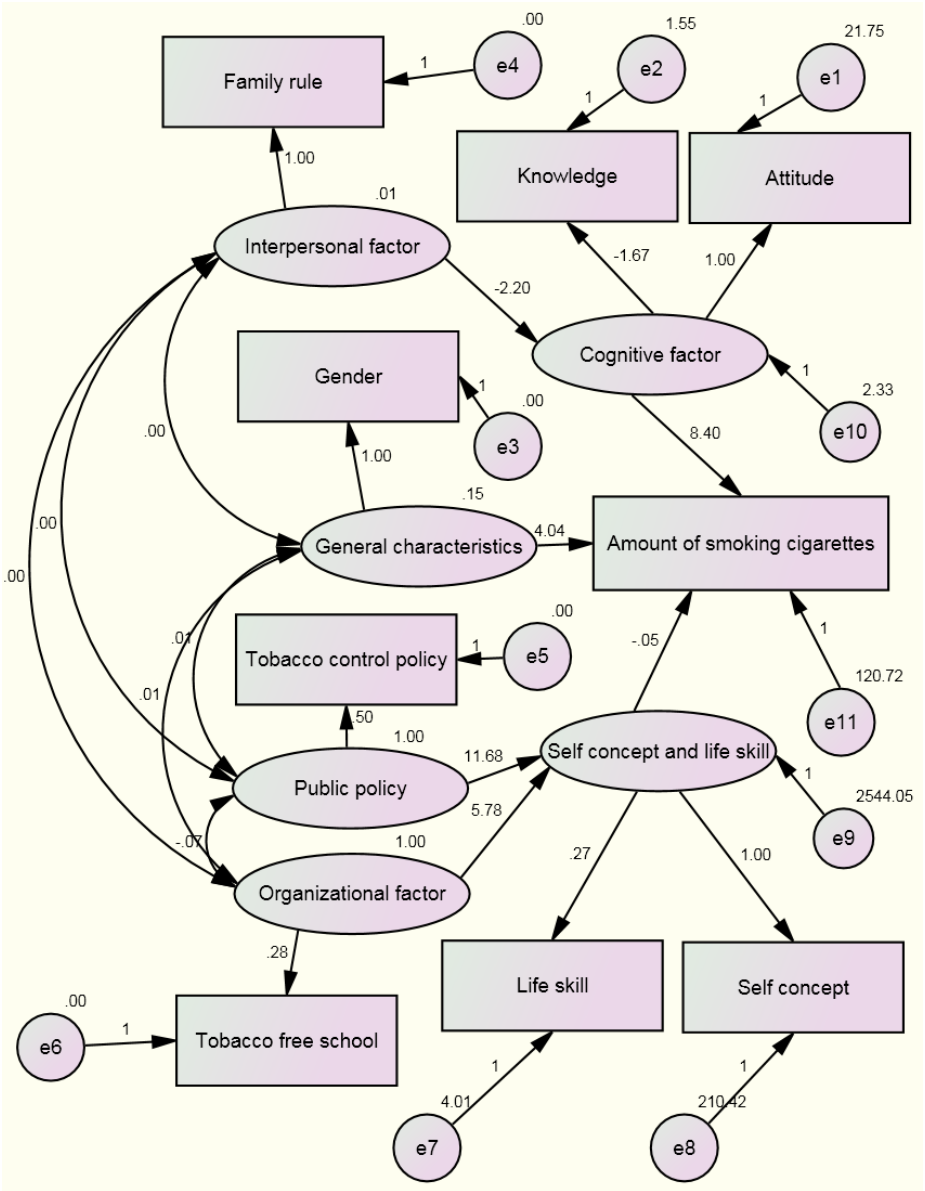
Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.030	.000	.058	.863
Independence model	.299	.284	.314	.000

Model	AIC	BCC	BIC	CAIC
Default model	75.958	77.468	171.828	196.828
Saturated model	90.000	92.719	262.566	307.566
Independence model	1149.760	1150.303	1184.273	1193.273

Model	ECVI	LO 90	HI 90	MECVI
Default model	.223	.205	.274	.227
Saturated model	.264	.264	.264	.272
Independence model	3.372	3.060	3.705	3.373

APPENDIX N

UNSTANDARDIZED ESTIMATES OF MODEL



BIOGRAPHY

NAME	Yue Qing
DATE OF BIRTH	9 Sep., 1966
PLACE OF BIRTH	Anhui, China
INSTITUTIONS ATTENDED	Anhui Medical University, 1980-1985 Bachelor of Science (Medicine) Peking Union Medical College, 1993-1996 Master of Science (Medicine) Mahidol University, 2005-2011 Doctor of Public Health (Health Education and Behavioral Sciences)
SCHOLARSHIP RECEIVED	Ford Foundation
HOME ADDRESS	Hefei Anhui Province, China Tel. 86-13865997543 E-mail: Yueqing0909@126.com
EMPLOYMENT ADDRESS	Wuhulu 387, Anhui medical college Tel. 86-551-2865934