

**SMOKING AMONG SECONDARY SCHOOL STUDENTS IN
MALÉ, MALDIVES**



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**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF PUBLIC HEALTH
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2012**

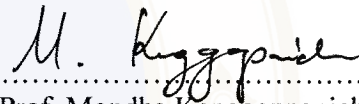
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Thematic Paper
entitled
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MALÉ, MALDIVES**



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was submitted to the Faculty of Graduate Studies, Mahidol University,
for the degree of Master of Public Health

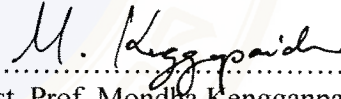
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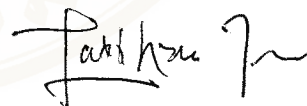
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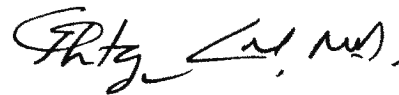
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ACKNOWLEDGEMENTS

Praise is to Allah for granting me this opportunity to study further and granting me the strength to complete this project successfully.

The completion of this study would not have been possible without the contributions of many individuals. I would like to extend my heartfelt appreciation to all those who played a vital role in helping me accomplish this study.

I would like to thank all the members of the Faculty of Public of Health, Mahidol University, for their generous help in many ways throughout the course. I had an excellent time studying here.

I was fortunate and delighted to have worked under the guidance of my dear advisors, Dr. Mondha Kengganpanich, and Dr. Lakkhana Temsirikulchai, whose kindness, supervision, and encouragement from the beginning to the end of this study was an attribution which are irreplaceable by any means. It would have been next to impossible to complete this research without their expert guidance.

I am also grateful to the management, of all the schools who participated in this study, for giving me the opportunity to collect data from their students. I express my immense gratitude to all the study participants, parents and their class teachers, without whom this study would not have been possible.

I am indebted to Thai International Cooperation Agency in providing me this opportunity, in sponsoring and helping me throughout the study period.

I owe my deepest gratitude to my parents, my husband and lovely children, for their constant moral support and endless love throughout the study. Without their support and encouragement my endeavor would be impossible.

Finally, I offer my regards and thanks to all those who helped me and supported me in any respect during the completion of the project.

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**SMOKING AMONG SECONDARY SCHOOL STUDENTS IN MALÉ,
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THEMATIC PAPER ADVISORY COMMITTEE: MONDHA KENGGANPANICH,
Ph.D., LAKKHANA TERMSIRIKULCHAI, Ph.D.**ABSTRACT**

This cross-sectional study aimed to explore the factors affecting smoking in lower secondary school students in Malé, the capital city of Maldives. Predisposing factors, as well as reinforcing and enabling factors for initiating and maintaining smoking behavior were explored in the students.

Data were collected using a pre-tested self-administered questionnaire from a randomly selected sample. A total of 370 students participated in the study during the period of data collection from 4 different schools in Malé.

The prevalence of current smokers among this group was 7%. The proportion of at least one time smokers was 16%. Current smokers among males were more common than among females, with 11% of males and 1% of females. The mean age of initiation of smoking was 13.42 ± 1.74 . Factors significantly related to smoking were determined by using multiple logistic regression analysis. Age, gender, attitude, accessibility to tobacco, smoking by teachers and smoking by friends were found to be significant predictors of smoking in this group. It is predicted that males are three times more likely to smoke (OR = 3.62, 95% CI = 1.24-10.50). As for the accessibility, the students who had access to tobacco are 3 times more likely to smoke (OR = 2.99, 95% CI = 1.31-6.80). After controlling for other variables, the students who have seen teachers smoking had more than double the risk of smoking (OR = 2.79, 95% CI = 1.35-5.80), while students having friends who smoke was the most dominant contributor to smoking. This group of students were seven times more at risk to smoke (OR = 7.13, 95% CI = 3.34-15.22).

The findings of this study call for a comprehensive strategy for preventing adolescent smoking, involving peers, school personnel, parents, and the community as a whole.

KEY WORDS: SMOKING / TOBACCO / SCHOOL / MALDIVES

85 pages

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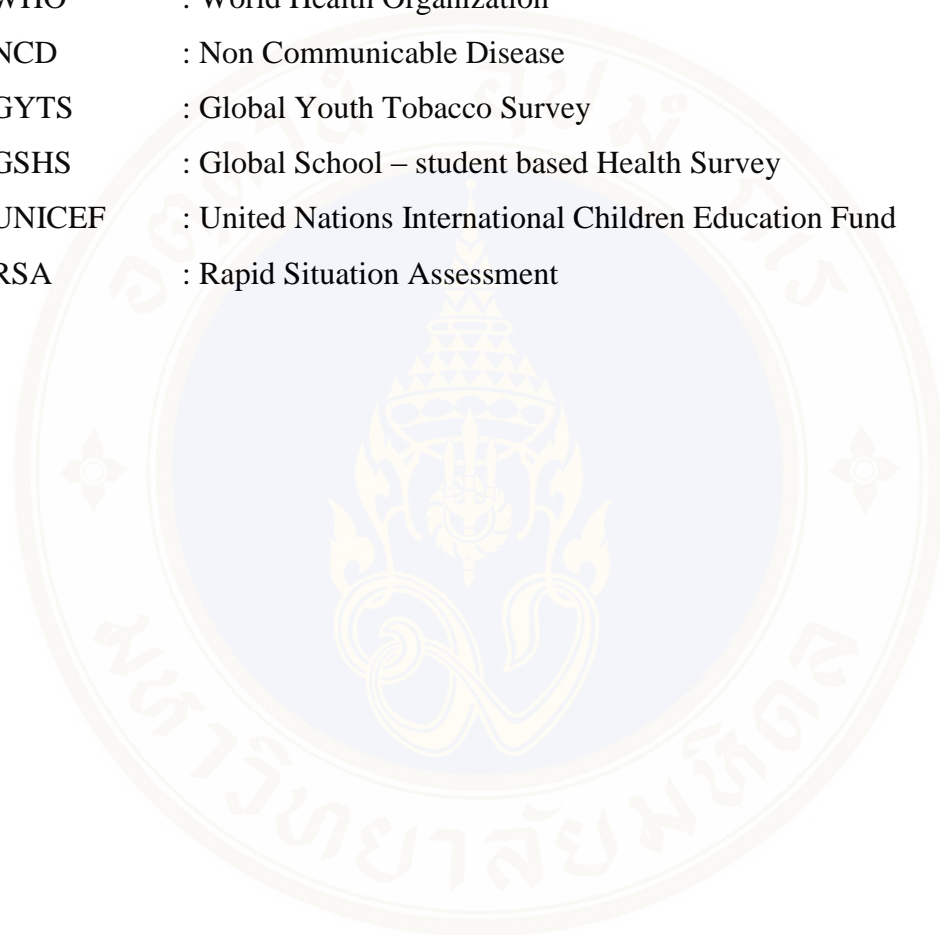
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LIST OF ABBREVIATIONS

WHO	: World Health Organization
NCD	: Non Communicable Disease
GYTS	: Global Youth Tobacco Survey
GSHS	: Global School – student based Health Survey
UNICEF	: United Nations International Children Education Fund
RSA	: Rapid Situation Assessment



CHAPTER I

INTRODUCTION

1.1 Background and Justification

Early onset of tobacco use leads to regular or heavy smoking in adolescence and throughout adulthood. Smoking kills between one third to one half of those who continue the habit and on average smokers die, a decade younger than nonsmokers (1). Given the potential long-term lifetime harm from early onset of smoking, it is imperative to study the factors affecting smoking to support effective strategies for prevention of this dreadful behavior in adolescents.

The tobacco epidemic is one of the biggest public health threats the world has ever faced. Negative effects of tobacco are well known and can result in many health problems as well as socioeconomic consequences (2). South-East Asia Region is the single largest area on the globe for production and consumption of tobacco products and has become a rewarding market for tobacco industries. Tobacco has been ‘dumped’ into the region for consumption, especially targeted to the youth and the poor (3). Hence, there is a high prevalence of smoking and low age at initiation in all countries, indicating that this behavior is a well established social norm in the region (4).

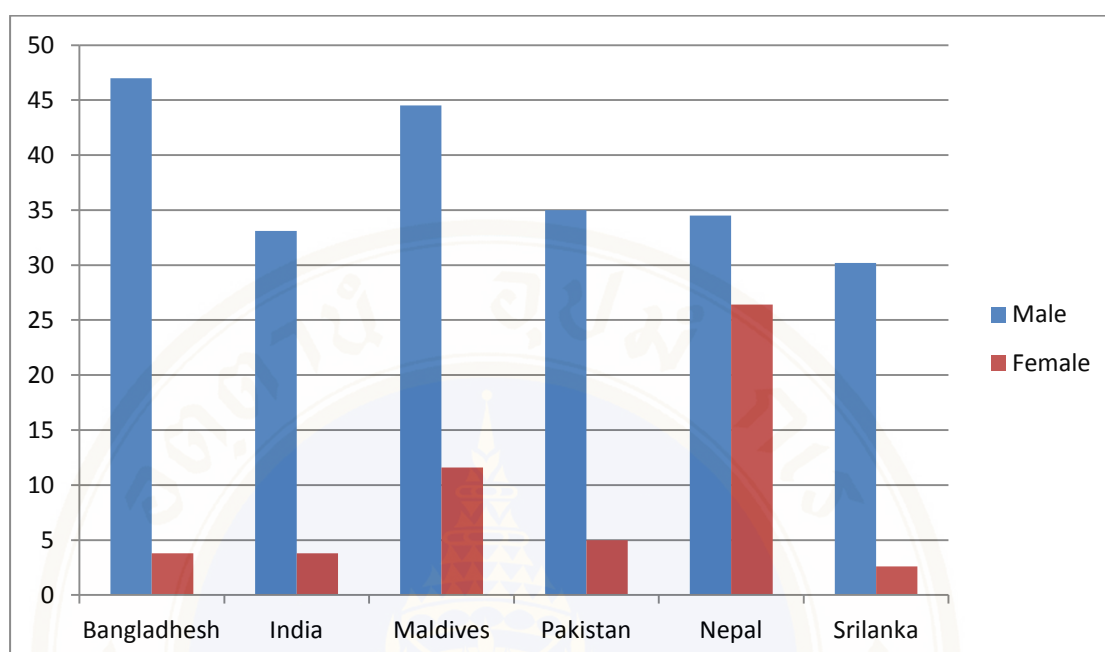
Even though tobacco is not cultivated in Maldives, a variety of products are imported into the country. According to the data from Maldives Custom Services (Table 1.1), there is an increase in the imports of all tobacco products in the past few years (5). The amounts are immense considering the size of the population which recently reached just 300,000 persons.

Table 1.1 Imports of Tobacco products to Maldives

Year	Tobacco Leaves (Kgs)	Number of cigars	Number of cheroots	Number of cigarettes	Chewing tobacco by weight (Kgs)
1999	61,547.68	24,426	834,845	347,622,780	180.00
2000	24,449.06	304,266	2,188,139	252,638,840	3,246.65
2001	44,168.70	187,156	4,056,070	223,540,520	2,405.28
2002	45,533.88	315,080	251,900	229,788,400	8,398.13
2003	30,598.25	289,183	67,625	226,903,220	4,718.08
2004	63,056.02	226,473	3,878	256,586,880	7,900.91
2005	45,505.15	200,968	4,125	263,461,671	11,976.92
2006	36,034.29	836,168	786,000	255,544,900	22,019.04
2007	24,493.13	316,207	27,157,100	286,444,050	17,949.77
2008	29,810.81	586,111	37,159,860	334,128,160	25,511.08

Source: Maldives Customs Service 2009

Furthermore, the prevalence of smoking in Maldives is among the highest in South East Asia (Figure 1.1). The NCD Risk Factor Survey (2004) shows that one in every fourth (24.8%) of Maldivians smoke with a prevalence of 39.9% in males and 9.6% in Females (6). The mean age at initiation of smoking was 21.2 ± 14.6 years.

Figure 1.1 Age standardized prevalence rate (%) in selected SEAR countries, 2008

Source: WHO MPOWER: Appendix III, table 3.5b, 2008 (7)

Most of tobacco's damage to health does not become evident until years or even decades after the onset of use. Hence, the epidemic of tobacco-related disease and death has yet to reach its peak. WHO estimates that by 2030 tobacco will kill more than 8 million people worldwide, with 80% of these premature deaths among people living in low- and middle-income countries (2). This is already evident by the estimation of deaths attributable to tobacco within countries. In the region, population attributable fraction due to tobacco is 8.7% of deaths which is higher compared to 3.8% in the world (8). In Maldives the proportions of death attributable to tobacco is 32% for all Non-Communicable Diseases (NCDs) and 16% for all communicable disease deaths in 2004 (9) and the morbidity data shows that there is an increase in the trend of these diseases.

Tobacco use is evidently one of the main risk factors for a number of chronic diseases, including cancer, lung diseases, and cardiovascular diseases documented by the series of Surgeons' General Reports (10). Tobacco smokers have 2-3 fold higher relative risk of coronary heart disease (CHD), 1.5 times for stroke, 1.4 times for chronic obstructive pulmonary disease (COPD) and 12 fold risks for lung

cancer. These risks have an age-gradient with higher relative risk (5-6 times) in the younger age groups, and are similar for men and women (1).

Adolescence is a transition period from child to adulthood. The immediate family environment, peers, societal norms, the environment at school and the workplace influence the development of adolescents' personality, capacities and vulnerabilities. New capacities are acquired and new situations are faced, creating many opportunities for development but also creates risks to their health. Children of this age are particularly vulnerable to tobacco addiction as the adolescents will not have fully developed their insight of the enormous risks of their actions (11). By the time the risk to health is recognized, the addicted individuals find it difficult to stop tobacco use. Hence, this is a phase of life which can be regarded as the best target for tobacco prevention strategies in populations.

According to the 2006 Census of Maldives, approximately half of the population is under the age of 19 years (12). The capital city - Malé is home to approximately one third of this population. Hence, a large number of adolescent population is living in Malé where most of them attend schools. The proportion of adolescents age 13 -15 years attending lower secondary schools are 97.3%. Maldives conducted the Global Youth Tobacco Survey (GYTS) in the years 2003 and 2007 in an effort to track tobacco use among 13 – 15 year old adolescents. The Global School-student based Health Survey (GSHS) targeted to the same age group was also conducted in 2009 and includes tobacco use as one of its measure.

The GSHS conducted in 2009 showed that the prevalence of current smokers to be 11.6%. The proportion of smokers among males were higher than females, with 17.7% in males and 5.5% in females (13). Among them most of the children (65%) started smoking at the age of 14 years or younger. The results were similar in Malé, with a proportion of 15.8% current smokers among boys and 5.6% among girls. This results is alarming as GYTS data from 2003 and 2007 has shown that there is a reduction from 6.9% to 3.8% in the proportion of students who smokes cigarettes (14). Hence, tobacco use among adolescents is evidently becoming a severe problem in the country.

A well established knowledge base should be available of the factors, related to smoking to plan for strategies of further prevention programs of this

dreadful behavior. In an effort to further understand the factors effecting smoking the PRECEDE - PROCEED model is used. This is a conceptual model which shows practical ways to initiate health promotion interventions in a given community (15).

Two fundamental propositions emphasized in the model are:

1. Health and health risks are caused by multiple factors.
2. Efforts to effect behavioral, environmental, and social change must be multidimensional or multisectoral, and participatory.

Hence, the model is a tool to explore the factors and environments that influence behavior. This way, interventions can be designed based not on speculation, rather, on a clear understanding of what factors influence the behavior in that population.

Thus, predisposing, enabling and reinforcing factors which influence smoking will be identified. For individuals who smoke, these factors are often seen as matters of individual choice. However these factors are shaped in part by the broader societal context in which they take place. Findings of this study will allow the program planners to use a blend of individual, interpersonal, and community based intervention – which is vital for an effective program.

Therefore this study would provide a better understanding of the multi level factors influencing the adolescents to initiate and maintain as smokers which will assist local anti smoking programs in setting priorities for future intervention efforts. Secondary school is a place where a huge proportion of adolescents is accessible and can be a good population to target for tobacco control interventions.

1.2 Research Question

What are the factors affecting smoking among secondary school students of Malé, Maldives.

1.3 Objectives

1.3.1 General objective

To explore the factors affecting smoking among secondary school students in Malé, Maldives.

1.3.2 Specific objectives

1. To determine the current prevalence rate of smoking in the secondary school students in Malé.
2. To describe:
 - 2.1. predisposing factors (age, gender, grade, parents' education level, money allowance, present living condition, knowledge about tobacco and attitude towards smoking),
 - 2.2. enabling factors (availability of tobacco, accessibility of tobacco, restrictions to use tobacco at home, restrictions to use tobacco at school and media on tobacco) and
 - 2.3. reinforcing factors (smoking in friends, smoking in family and smoking in teachers) related to smoking in secondary school students.
3. To determine association between predisposing factors, enabling factors, reinforcing factors and smoking behavior.
4. To predict smoking among secondary school students by predisposing, enabling and reinforcing factors.

1.4 Hypotheses

1. There are associations between predisposing factors (age, gender, grade, parents' education level, money allowance, present living condition, knowledge about tobacco and attitude towards tobacco) and smoking behavior.

2. There are associations between enabling factors (availability of tobacco, accessibility of tobacco, restrictions to use tobacco at home, restrictions to use tobacco at school and media on tobacco) and smoking behavior.

3. There are associations between reinforcing factors (smoking in friends, smoking in family and smoking in teachers) and smoking behavior.

1.5 Variables of the study

1.5.1 Independent variables

Predisposing factors:

- Age
- Gender
- Grade
- Parents education level
- Money allowance
- Present living condition
- Knowledge about tobacco
- Attitude towards tobacco

Enabling factors:

- Availability of tobacco
- Accessibility of tobacco
- Restrictions to use tobacco at home.
- Restrictions to use tobacco at school
- Media on tobacco

Reinforcing factors:

- Smoking of friends
- Smoking of family
- Smoking of teachers

1.5.2 Dependent variables

Smoking behavior

1.6 Operational definitions

Smoking refers to the inhalation of smoke from burning tobacco encased in cigarettes, cigars or bidi/sutta etc.

Smoking bahvior refers to status of smoking among the secondary school students classified into 3 groups:

Never smokers refer to the respondents who state that they have never smoked in their life.

Ex- smokers refer to the respondents who state that they have smoked at least once in their life, and have not smoked during the last 30 days prior to the time of data collection.

Current smokers refer to the respondents who state that they smoked at least once in the last 30 days prior to the time of data collection.

Predisposing factors refers to attributes of the adolescents that motivate behavior prior to the onset of smoking. It includes age, gender, parents' education level, money allowance, present living condition, knowledge about tobacco, attitude towards tobacco.

Parents' education level refers to the highest level of education attained by either mother or father of the respondent.

Money allowance refers to the money that the student receives from parents or caregivers per week including money that the respondent earns.

Present living condition refers to the living environment and the relationship of the respondent with the people he/she is presently living.

Knowledge about tobacco refers to the respondents' ability to recall facts about tobacco including the constituents of cigarettes, health effects of smoking and laws of tobacco in Maldives.

Attitude towards tobacco refers to the respondents' opinion on smoking, cessation of smoking and tobacco control laws which includes positive and negative opinions.

Enabling factors refers to the characteristics of the environment that facilitates smoking behavior. It includes availability of tobacco, accessibility to tobacco, restriction to use tobacco at home, restriction to use tobacco at school, media on tobacco.

Availability of tobacco refers to having shops, which sells tobacco for smoking, surrounding the residence and school according to the respondent.

Accessibility of tobacco refers to the convenience to obtain tobacco for smoking which is composed of the opinion on, cigarette price, and easiness to buy cigarettes.

Restrictions to use tobacco at home refer to the respondents' reflection of the rules of smoking inside the place of his/her residence.

Restrictions to use tobacco at school refer to respondents' reflection of the rules of smoking inside the schools.

Media on tobacco refers to the respondents' reflection on the extent of exposure to any form of media on tobacco advertising and anti smoking campaigns. Anti smoking campaigns include tobacco control campaigns, teaching in schools and health education programs on tobacco.

Reinforcing factors refers to the drive which strengthens the motivation to continue smoking behavior. It includes smoking friends, smoking family and smoking teachers.

Smoking in friends refers to the proportion of smokers among the close friends of the respondent.

Smoking in family refers to the proportion of smokers among the people, elder than the respondent, presently living at the place of his/her residence.

Smoking in teachers refers to the number of smoking teachers that the respondent recalls to have seen in the past 3 months.

1.7 Conceptual framework

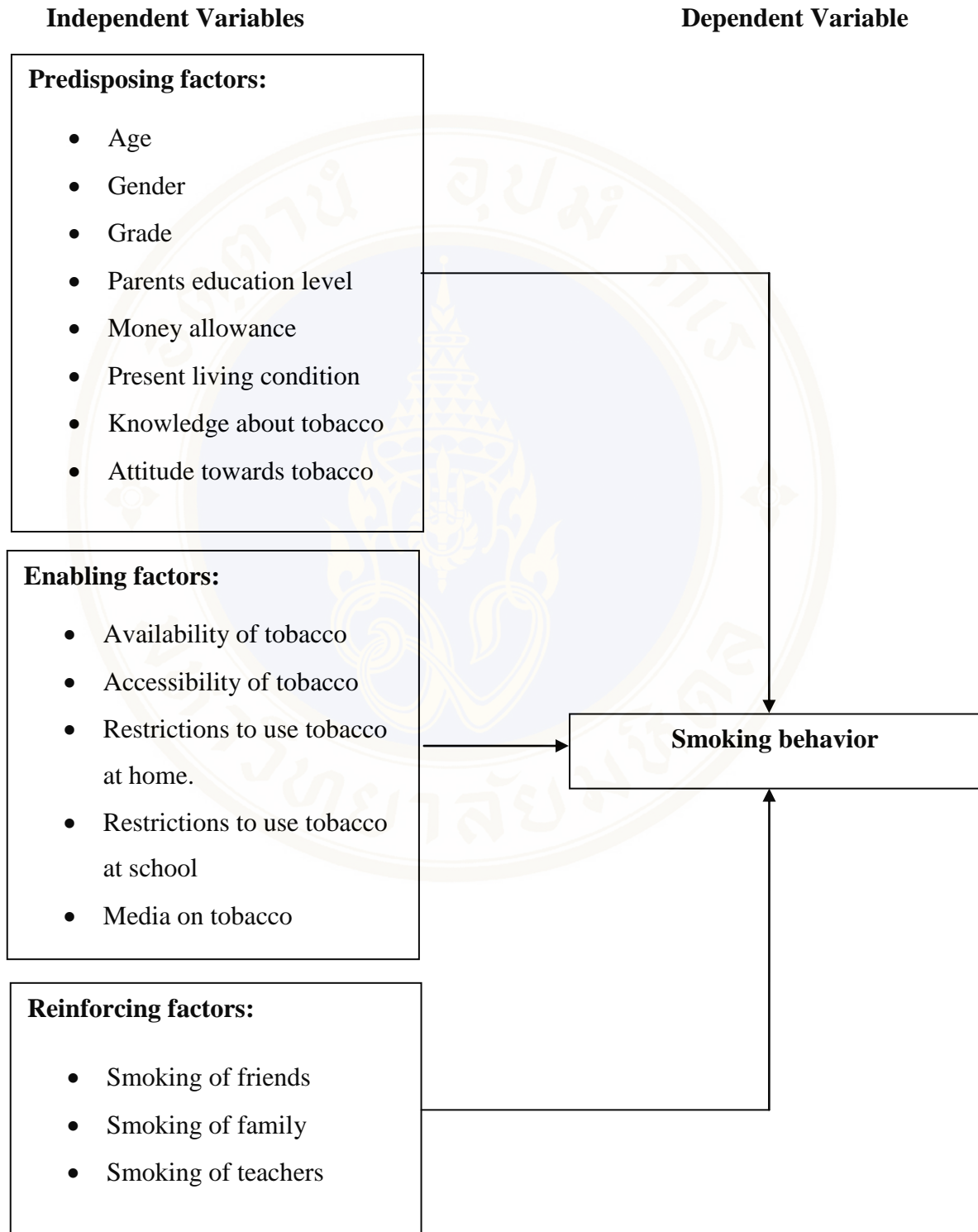


Figure 1.2 Conceptual Framework

CHAPTER II

REVIEW OF LITERATURE

The world we live in has changed dramatically in the past few decades. Epidemiological transition has replaced the global disease pattern to a new set of diseases. It is astounding to realize that many of these diseases are caused by behavioral factors rather than a microorganism as in the past. Use of tobacco is one of the leading causes of preventable death and illness in the world today (2).

Tobacco use when started at an early age has the highest risk of smoking related symptoms. These include coughing, shortness of breath, colds, sinus infection, lung infections, lung cancer, poor physical fitness, heart disease and overall poorer health. Adolescents who smoke are more likely to use illegal drugs, attempt suicide and engage in high risk sexual behaviors (16).

There is a substantial scientific literature on the factors affecting tobacco use. The researches on factors that influence smoking in adolescents overlap and fall into two categories; personal factors and socio-environmental factors. Personal factors concern the environment the adolescents grow up, i.e. home, friends, schools, and different aspects of adolescents' behavior. Socio-environmental factors concern the influences exerted by the community (advertising, media etc.) and the governments (taxation, laws, regulations etc). In order to suit the study question this literature review is narrowed down into following broad headings:

- 2.1. Background information of Maldives.
- 2.2. Knowledge regarding tobacco
- 2.3. Review of theory used in the study.
- 2.4. Related research

2.1 Background information of Maldives

2.1.1 Geography and socio cultural aspects

The Maldives situated in the Indian Ocean crossing the equator, consists of 1192. For the purpose of administration the Maldives is divided into 20 administrative atolls. About 194 islands are inhabited and 99 islands are tourist resorts (17).

The total population of the Maldives is approximately 315,885 in the year 2010 (18). Malé is the capital island and the most densely populated island accommodating 35 percent of the population in just a square kilometer area. The Maldives is a 100 percent Muslim country. An amazing 98 percent of the population is literate (19). The official language is Dhivehi and the medium of education is English.

During the last decade, Maldives experienced overall economic and social development together with a remarkable improvement in all the health indicators and increasing the longevity of the population. With these progresses there is an increase in the proportion of aging population together with associated life style diseases such as diabetes, hypertension, cancers and mental illnesses and its related complications.

However, a large proportion, 35% of the population at present comprises of adolescents (19). The highest proportion among adolescents is in the age group 10-14 years belonging to lower secondary level which is composed of grades 8 – 10 (17). Formal school provision started in the capital city of Malé and was the only island on which it was available in the past. Policies over the last few decades favoring the development of the atolls resulted in a very significant improvement in the formal educational provision in the atolls. However like in other countries, the capital attracted more people from the atolls, seeking better education. Hence the schools of Malé consist of nearly one third of the school-going population in the country. About 29% of students in lower secondary schools in Maldives study in Malé (20).

2.1.2 History of tobacco use and tobacco control in Maldives

There is insignificant evidence to support when exactly tobacco came into existence in Maldives. However, Portuguese during their occupation of the Indian subcontinent is said to have brought tobacco into the region and spread to all the countries (21). Soon it became a habit and socially accepted norm in the region including Maldives.

Very little is seen of the history of tobacco use and tobacco control in Maldives from the available literatures. Tobacco control in Maldives can be traced back to 1942 in which import of tobacco products was banned for some years by a law. In 1947 smoking was banned for students under the age of 17 together with prohibition of smoking in public places. However this prohibition lasted for a short period of time. In 1982, a public appeal was made by the government for antismoking (22). As a response health education on the adverse effects of tobacco was strengthened.

In 1984, advertising was banned in government media and serving cigarettes at official gatherings and reception was stopped. Sale of tobacco products to children under 16 years was made a legal offence in 1991. Smoking was banned in all health care facilities in 1993, followed by a prohibition of smoking in all government buildings and educational institutions in 1994. A total ban on all forms of tobacco advertisement and promotion was imposed during that time. Due to the health promoting activities of tobacco control, a number of islands declared themselves completely tobacco free. From 1997 surveys were conducted to estimate the prevalence of smoking in different populations (21).

In 2000, a large-scale school anti-tobacco program was initiated by the education sector for the whole country. Import duty on tobacco products increased three fold following the adoption of new legislation on trade of commercial products. In 2004, Maldives ratified WHO Framework Convention on Tobacco Control. As a consequence tobacco control efforts have been strengthened as evident from initiation of printing public awareness message on the harmful effects of tobacco in Dhivehi on all tobacco products packed in Maldives. Later import and export bill was amended and duty on cigarettes, tobacco and tobacco products was doubled (Afaal & Moosa 2002).

In 2010, Tobacco Control Bill was ratified by the government. The bill prohibits public smoking in general but allows smoking in public places such as parks and halls. It states measures to control tobacco use including prohibition of growing and advertising tobacco and tobacco products, ways of importing and exporting such products including wholesaling and retailing. It also states standards for packaging and labeling tobacco products and principles for taxing such products. According to the Act, smoking is not allowed in a workplace or part of a workplace specified by a regulation. It specifies smoking be prohibited in health centres, mosques, child welfare centres, educational institutes, government authorities, sports institutes, and playgrounds. It also prohibits sale of tobacco and tobacco products to any person under 18 years. The sales of tobacco and tobacco products is also made illegal without a license or a permit that has to be renewed periodically (23).

2.1.3 Prevalence of Tobacco in Maldives

A survey conducted by Department of Public Health documents the prevalence of tobacco use in 1997 as 41% with 57% in males and 29% in females (22). However the NCD risk factor survey (6) which was conducted in Malé in 2004 shows a lower prevalence of 24.8%. The prevalence among adolescence aged 13-15 years was first documented in 2003 by the GYTS. According to the GYTS in 2003 and 2007, there was a significant reduction in the prevalence of tobacco among 13-15 year olds from 6.9% in 2003 to 3.8% in the year 2007 (14).

Yet, the first GSHS of Maldives in 2009 shows a substantial increase in the prevalence of smoking from 3.8% (GYTS 2007) to 11.6% in the same age group. The prevalence of smoking in students studying in Malé is not much different from the national figure. In students of lower secondary schools of Malé the prevalence of smoking cigarettes stands at 10.6%, with 15.8% in males 5.6% in females (13).

2.2 Knowledge regarding tobacco

2.2.1 Tobacco and its origin

According to the literature, the tobacco plant *Nicotiana tabacum* is indigenous to Central and South America (24). Native Americans smoked tobacco through a pipe for special religious and medical purposes for a long time before Columbus discovered America in 1492 (25). His voyage witnessed the habit of smoking tobacco in amazement. When they returned back to Europe they have taken the tobacco leaves and introduced the practice to Europe, where it became popular.

The first manufactory of tobacco was established in Seville, and the first cigar factory was built in Hamburg by Schlotmann in 1788. By the 1800's, many people in different parts of the world had begun using small amounts of tobacco. Some chewed it and others smoked it occasionally in a pipe, or they hand-rolled a cigarette or cigar. The cigar was the dominant tobacco product for virtually 100 years before cigarette smoking became popular (24).

Cigarette smoking became popular when James Bonsack of USA, invented the cigarette-making machine in 1881 (26). The first brand of cigarettes was called 'Duke of Durham' as Bonsack went into business with the son of Washington Duke. During the same time, many US companies followed suit with their own cigarette making machines. As a result, new markets came up, and for the first time young people around the age of 18 became the major consumer market (24).

The beginning of 20th century witnessed a boost in the production of cigarette industries particularly when women and adolescents became their consumers (26). The Second World War brought a further boost as uniformed women joined male soldiers in smoking. Thus the global proportion of cigarette consumption quadrupled during this time (24). Tobacco use has always been a controversial issue with its increasing popularity on the one side and the growing evidence of harmful effects to health on the other. Hence, the focus of the activities of authorities today is to regulate the use of tobacco products worldwide.

2.2.2 Constituents of Tobacco

The main ingredient in cigarettes is tobacco. There are over 5,000 chemicals in cigarettes and 98 hazardous smoke components (27). Three of the most

widely known chemicals are nicotine, tar, and carbon-monoxide. Nicotine is a strong poisonous drug which is just as addictive as heroin or cocaine when taken in small amounts. In its pure form, just one drop of intake would kill a person. Nicotine is also responsible for the dependence that develops in smokers within a few years after initiation (24).

Dietrich Hoffmann, a biochemist, published many analytical papers on cigarette smoke. There are at least 3 papers he has written on the constituents of tobacco. He is one of the leading contributors to scientific progress in this field.

Table 2.1 Classes of compounds present in fresh tobacco smoke.

Class	Number
Neutral gases	>5
Carbon oxides	2
Nitrogen oxides	1
Amides, imides, lactames	~240
Carbxylic acids	~230
Lactones	~150
Esters	~470
Aldehydes	~110
Ketones	~520
Alcohols	~380
Phenols	~280
Amines	~200
Volatile N-nitrosamines	4
Tobacco specific nitrosamines	4
N-Heterocyclics	~920
Hydrocarbons, aliphatics, acyclics, aromatic	~760
N-Heterocyclics	~920
Hydrocarbons, aliphatics, acyclics, aromatic	~760

Table 2.1 Classes of compounds present in fresh tobacco smoke (Cont..)

Class	Number
Nitriles	~100
Anhydrides	~10
Carbohydrates	~40
Ethers	~310
Nitro-compounds	>10
Metals	~30
Short – and long living radicals	N/A

Source: Borgerding M, Klus H. Analysis of complex mixtures (25)

The immediate toxic effects from these compounds are numerous including irritation to respiratory tract, inflammation to the lungs leading to long term health effects such as lung cancer (24).

2.2.3 Harmful effects to health

Smoking mostly causes damage to the respiratory system before affecting several other organs. A high proportion of these harmful effects – lung cancer, chronic obstructive pulmonary disease (COPD) – have fatal outcomes.

Smoking harms nearly every organ of the body. Smoking causes many diseases and reduces the health of smokers in general (10). The following gives a summary of health risks related to smoking, taken from, The Health Consequences of Smoking: A Report of the Surgeon General (10).

Table 2.2 Relative risk of smokers compared to non-smokers

Disease	Relative risk
Coronary heart disease	2 to 4 times
Stroke	2 to 4 times
Men developing lung cancer	23 times
Women developing lung cancer	13 times
Death from chronic obstructive lung diseases	12 to 13 times

Smoking causes coronary heart disease, the leading cause of death from non communicable disease in the world. This condition results when there is reduced circulation by narrowing the blood vessels causing a range of problems from pain to tissue loss or gangrene. Smoking also causes swelling or weakening of aorta and leads to abdominal aortic aneurysm.

Smoking causes lung diseases such as emphysema, bronchitis, chronic airway obstruction by damaging the airways and alveoli of the lungs. The most notorious of them all is cancer of the lungs. Smoking is also related to many cancers namely, acute myeloid leukemia, cancer of the bladder, cervix, esophagus, kidney, larynx, lung, oral cavity, pancreas, pharynx, stomach.

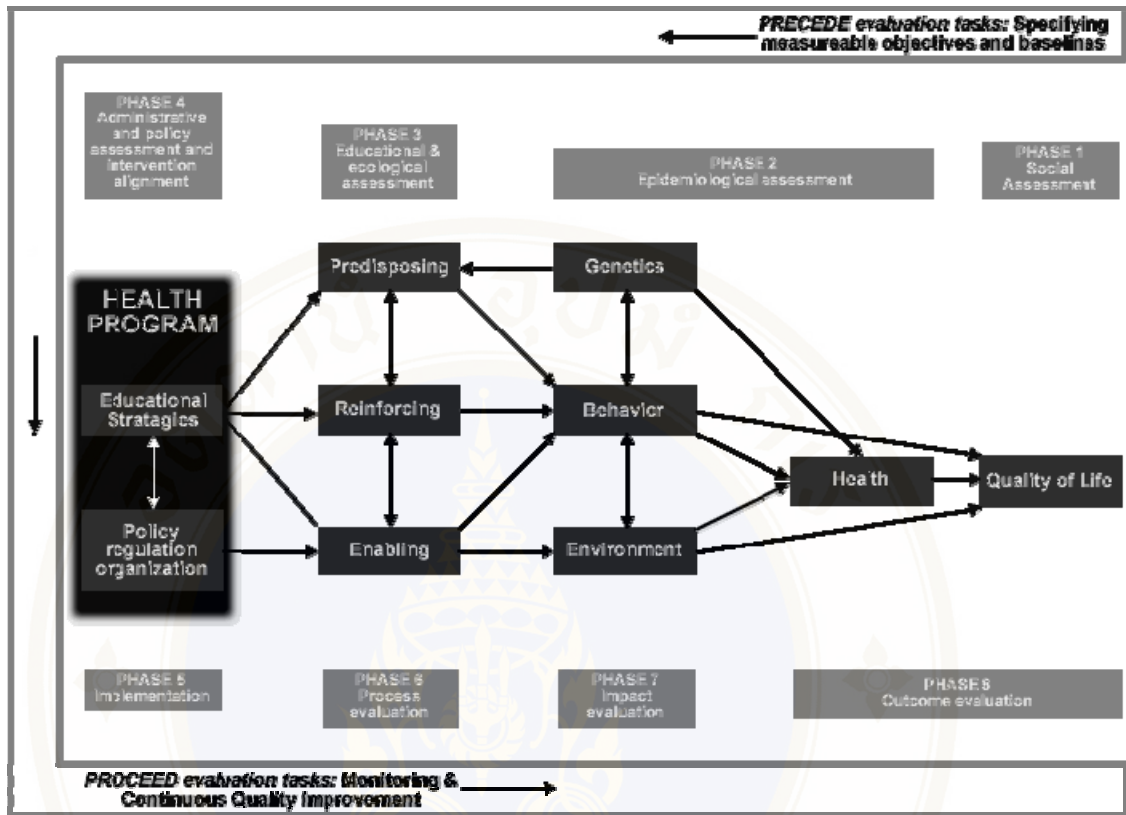
Women have other health effects from smoking such as lower bone density in postmenopausal women who smoke. Smoking women also have an increased risk for hip fracture than women who never smoked. Other health effect in women include infertility, and in pregnancy and childbirth includes preterm delivery, stillbirth, low birth weight, and sudden infant death syndrome (SIDS).

2.3 Related theory used in the study

The PRECEDE framework was developed in the 1970s by Lawrence W. Green and Marshall W. Kreuter. The acronym stands for Predisposing, Reinforcing, and Enabling Constructs in Educational/Environmental Diagnosis and Evaluation. In 1991, PROCEED (Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development) was added to the framework to be acquainted with the significance of environmental factors as determinants of health and health behaviors. It also describes how to proceed with the intervention itself (15).

In 2005, a more rationalized version of PRECEDE-PROCEED was developed in response to ecological and participatory approaches which became as essential elements of public health programs. This version of PRECEDE-PROCEED consists of four planning phases, one implementation phase, and three evaluation phases (Figure 3).

Figure 2.1 PRECEDE PROCEED model



Source: Lawrence W. Green and Phil Rabinowitz (15)

The principle behind PRECEDE-PROCEED is that a change process should focus initially on the desired outcome. PRECEDE’s four phases, for that reason, move logically from the behavior which needs intervention towards to the desired result. It includes administrative and policy issues that need to be addressed in order to mount that intervention successfully.

The PRECEDE component of the framework identifies the most proximal factors that is in place to initiate or sustain a behavior. These factors are classified as predisposing, reinforcing, and enabling factors, which together influence the likelihood that behavioral and environmental change will occur.

2.3.1 Predisposing Factors

"Predisposing factors" is defined in this model as factors that exert their effects prior to a behavior occurring, by increasing or decreasing a person’s motivation to undertake that particular behavior (15).

Predisposing factors were previously seen to include demographic attributes (age and gender), social structure (education, occupation, ethnicity etc.), and health beliefs (attitudes, values, and knowledge that might influence perceptions of a specific behavior). Later on importance was given to factors which operate principally in the psychological sphere. They include a person's knowledge, attitudes, beliefs, personal preferences, existing skills, and self-efficacy beliefs. Hence, emphasis is given to factors that appeal to people's motives for behavioral change.

Predisposing factors that can function as targets for change in public health programs work together with each other. For example, harmful effects of smoking awareness lead to cognitive learning, which in turn, produces knowledge about the harmful effects. Cognitive learning also builds up as experience, which creates beliefs about negative effects of smoking. As human beings compel for consistency, a change in any of these will affect the others. Predisposing factors are not always a sufficient cause of individual or collective behavior change. For a complete behavioral change to occur other factors should work together.

2.3.2 Enabling Factors

Within the model, "enabling factors" are defined as factors that make it possible for individuals or populations to change their behavior or their environment (15). Enabling factors include resources, conditions of living, societal supports, and skills that facilitate a behavior's occurrence.

A person may need to utilize a number of skills to carry out successfully all of the tasks involved in changing behavior. New skills may include those involved with determining how to identify, access, and use tobacco products. For example, an adolescent who finds it easy to purchase a cigarette may smoke whereas adolescents who are rejected when approached to buy a cigarette may not smoke.

Accessibility and affordability of tobacco products are also enabling factors. On the other hand changing behavior may be easier if aspects of one's environment are supportive of that change. As an example, tobacco use may be reduced if, adolescents are encouraged to quit, through a ban on smoking in schools and in other public spaces. Imposing taxes on cigarettes increases their cost and acts as a hindrance to smoking, especially among the adolescent age group. Laws that

prohibit tobacco sales to minors can combine to decrease access to tobacco among adolescents, and may serve to discourage their experimentation with tobacco. Making smoking cessation aids available, accessible, and relatively low cost may also increase the likelihood that adolescent smokers might attempt to quit.

2.3.3 Reinforcing Factors

Reinforcing factors are those factors following a behavior that provide continuing reward or incentive for the persistence or repetition of the behavior (15). These factors come into play after a behavior has begun. Examples include family, peer influence, significant others etc. For instance, adolescents are more likely to continue smoking if their close friends (peers) smoke with them.

2.4 Related research

Smoking initiation in adolescents involves both personal factors and environmental factors which can be grouped into predisposing, enabling and reinforcing factors. Studies which have investigated the factors associated with adolescent smoking behavior have suggested the factors related to smoking to be: age, gender, parental smoking, peer influence, media, other family members smoking, knowledge, attitude, availability and restriction to smoke.

2.4.1 Availability of Tobacco

Tobacco is not cultivated in Maldives but the sheer size of the different products of tobacco available in the country is daunting. Tobacco is imported into the country and is used in the form of cigarettes and cigars, cheroots, chewing tobacco and tobacco leaves. These leaves are used to make bidi (a local product of crushed tobacco encased in hand-rolled newspaper stripes used for smoking). Some people consume tobacco in more than one form. Cigarettes are most commonly used and the import of cigarettes is the largest in proportion to the other types of tobacco product.

An important external factor that leads adolescents to smoke is the ability to purchase cigarette easily. The GYTS (2007) of Maldives shows a very high proportion of cigarette smokers (83.3%) who usually buy cigarettes from a store

reported they were not refused purchase because of their age (14). Therefore it is easy for adolescent smokers to buy cigarette even though selling tobacco to less than 18 year olds is a legal offense in Maldives.

2.4.2 Advertising

Tobacco advertising promotes the idea that smoking is desirable. For years smoking was shown glamorous through advertising in movies, television, and billboards by the tobacco industry. While cigarette advertising is now prohibited in many countries including Maldives, its influence can still be felt by the subtle strategies to advertise cigarette which show ones classiness through things that adolescents use, such as purse, hat, key chain etc. On the other hand there are anti smoking campaigns which has promoted anti smoking policies by the governments. Anti smoking initiations by Governmental and Non Governmental Organizations (NGOs) became increasingly loud in their opposition and further bans are considered by the government, including smoking in public places.

There is a growing body of evidence indicating influences of media on smoking status among adolescents. A study by Liu & Tan (2009) shows that anti-smoking media campaign significantly reduces the smoking prevalence among adults and adolescents (28). In addition, a longitudinal study done on Mexican youths show that exposure to movie smoking is a risk factor for smoking onset in that group. The results show that students with highest levels of exposure to movie smoke are more than twice as likely to smoke at the follow-up (29).

The initiation process of smoking is intention to smoke. A study conducted by Straub, Hills, Thompson, & Moscicki (2003) to explain effects of pro- and anti-Tobacco Advertising on nonsmoking adolescents ' intentions to smoke shows that confirms them to be strong predictors of intention to smoke (30).

2.4.3 Parental smoking

Parents are the source of primary socialization and their influence is strong the early childhood. This formative period affects the child's whole life. It has frequently been shown in the literature that one or both parents' smoking is associated with smoking in their children.

A study by Howell (2008) determining association between parental smoking and adolescent age of smoking initiation in 14 African countries shows that only 6% of smokers originated from non-smoking parents and a significant association between smoking with parental smoking status was found (31). Likewise a study done by Wen et al. (2005) to assess parental influence on smoking behavior by high school students in Taiwan verifies parents play a more important role than peer influence in smoking among high school students in Taiwan (32).

2.4.4 Friend smoking

Although the family has the first impact on the child as he or she grows older the influence of friends becomes extremely strong. Many studies have shown that peers smoking is one of the most important factors related to the initiation of smoking. A study conducted by O'Loughlin, Karp, Koulis, Paradis, & Difranza (2009) to identify determinants of cigarette-smoking initiation finds peer as an influential factor to initiate smoking in adolescents(33). Therefore having friends who smoke can act as a reinforcing factor of the habit of smoking. Similarly a longitudinal study on Danish adolescents attending randomly selected public schools by Bidstrup et al. (2009) shows significant association between friends smoking and smoking initiation in adolescents (34).

CHAPTER III

MATERIALS AND METHODS

3.1 Research design

This research was a cross-sectional study designed to explore the factors affecting smoking among secondary school students in Malé, the capital city of Republic of Maldives.

3.2 Study population

The study population of this study was all the students who are studying in lower secondary level schools of Malé in the academic year 2012. The lower secondary level consists of grades 8 – 10. According to the School Statistics of Ministry of Education of the Republic of Maldives, there are 17 schools altogether accommodating students at this level.

As the study population of this study was all the students in the lower secondary schools, 2 schools are not included since the schools just progressed to include lower secondary grades, and don't have students in all the grades of that level. Therefore a total of 15 schools were included with a total of 5462 students in grade 8-10.

3.3 Study sample size and sampling technique

The sample size was estimated using stratified sampling method for different proportions. The sampling method chosen for this study was stratified two-stage random sampling technique.

In stage 1, schools were stratified according to gender. The schools were selected using simple random sampling with proportion to number of students in each stratum. In stage 2, one class from each grade of the selected school, was randomly

selected for the study. Samples were all the students in the classes selected after random sampling.

3.3.1 Sample size for stratified sampling

Table 3.1 Sample size estimation

Type of school	Population weight			Proportion			
	N_h	W_h	N_h^2	P_h	$N_h P_h$	$N_h P_h (1 - P_h)$	$N_h P_h (1 - P_h) / W_h$
boys	1357	0.248444	1841449	0.158	214.406	180.5299	986054.1
girls	1448	0.265104	2096704	0.056	81.088	76.54707	418100.1
mixed	2657	0.486452	7059649	0.106	281.642	251.7879	1375266
Total	5462					508.8649	2779420

Where,

N_h = total number of students in stratum h

W_h = fraction of observations allocated to stratum h ($W_h = N_h / N$)

P_h = Prevalence of smoking in stratum h

n = the estimated sample size

N = population size

d = level of precision ($d = 0.03$)

$$\begin{aligned}
 n &= \frac{Z_{\alpha/2}^2 \sum_{h=1}^L N_h^2 P_h (1 - P_h) / W_h}{N^2 d^2 + Z_{\alpha/2}^2 \sum_{h=1}^L N_h P_h (1 - P_h)} \\
 &= \frac{1.96^2 \times 2779420}{(5462^2 \times 0.03^2) + (1.96^2 \times 508.86)} \\
 &= 370
 \end{aligned}$$

The number of students were selected proportionately to the number in each type of schools from the calculated sample size. i.e.

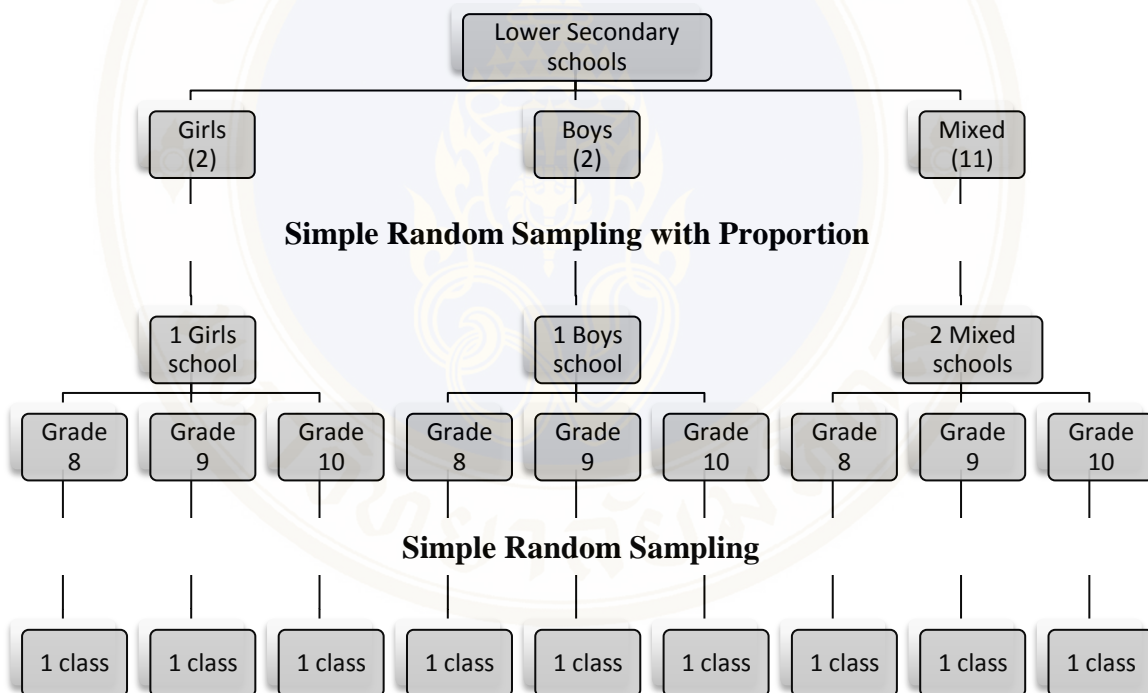
$$\text{Boys schools} = \frac{1357}{5462} \times 370 = 92 \text{ students} \sim 1 \text{ school}^*$$

$$\text{Girls schools} = \frac{1448}{5462} \times 370 = 98 \text{ students} \sim 1 \text{ school}^*$$

$$\text{Mixed schools} = \frac{2657}{5462} \times 370 = 180 \text{ students.} \sim 2 \text{ schools}^*$$

* It was estimated that the secondary schools of Malé accommodates approximately 32 students in each class. i.e ~ 96 students/ school is possible.

Figure 3.1: Sampling design



Inclusion criteria

- All the lower secondary school students both female and male studying in the classes selected in the academic year 2012.
- The students who were willing and whose mother/father/guardian agree and signed the consent form to participate in the study.

Exclusion criteria

- Students who were not citizens of Maldives.
- Students who were absent during the data collection period.

The proposal of this study was approved by the Ethical Review Committee of Human Research, Faculty of Public Health, Mahidol University. The proposal was also approved by National Health Research Committee at Ministry of Health, Republic of Maldives. After getting approval from both the Committees a letter was sent to Ministry of Education, with the approval letters, requesting permission to contact the schools to be studied. The schools were then contacted through Ministry of Education, and permission solicited from both the Principal and the class teacher in charge of the sampled class before data collection.

The objectives and significance of the study was clearly explained to the Principal and the class teacher. A meeting was arranged with the parents of randomly selected classes, and informed consent was taken. A date and time was arranged with the class teacher, to collect data. On the day of data collection, the investigator explained the objectives and significance of the study to the students and consent was taken from the students who agreed to participate in the study.

The questionnaires were distributed to the students. All students were given chance to clarify on questions they were not clear about. Care was taken to protect the confidentiality of the participants.

3.4 Research instrument

A self-administered questionnaire was developed and reviewed by the research advisor and co-advisor. The questionnaire from Global Youth Tobacco Survey was used as a guideline to construct instruments to measure each variable on the PRECEDE model used as a framework of this study. Translation of questionnaire to local language was not done as the language of instruction in Maldives is English. The entire set of questionnaire is composed of 4 parts as follows:

Part I: General information

This part is composed of 21 items that includes questions on age, gender, smoking in parents, friends and place of residence, availability of cigarettes and exposure to media on tobacco. Exposure to media was categorized into exposure to promotion of tobacco and exposure to anti tobacco media messages. The variables were summated to get an overall exposure. It was then categorized into never exposure, exposure to less than average and exposure to more than or equal to average.

Part II: Smoking behavior

This part is composed of 21 items about the smoking behavior and is divided into ex-smokers and current smoker. Apart from the smoking behavior, age at start, reasons to start smoking, brands preferred, place and time of smoke, amount of cigarettes smoked per day is included. Furthermore intention to start smoking in non-smokers, intention to quit smoking in current smokers and reasons for quitting in ex-smokers is also included.

Part III: Knowledge about tobacco

This part is composed of 10 items that includes questions on facts about smoking. For each item, respondents were to choose “Yes”, “No” or “Uncertain”. A score of 1 was given for each correct response and 0 for incorrect or “Uncertain” response. Maximum total score was 10 and minimum 0.

Knowledge of the respondents was rated into three levels (Bloom’s taxonomy) from the total score as follows:

Good knowledge level ($\geq 80\%$ correct answer): Total score of 8 to 10.

Moderate knowledge level (60 - 79% correct answer): Total score of 6 to 7.

Poor knowledge level ($< 60\%$ correct answer): Total score 0 to 5.

Part IV: Attitude towards smoking

This part is composed of 12 items measuring attitude towards smoking from a mixture of positive and negative attitude statements. For each item, respondent were to choose one from “Strongly agree”, “Agree”, “Uncertain”, “Disagree” or

“Strongly disagree”. The responses were converted into a 5-point Likert’s scale as follows:

<u>Attitude</u>	<u>Positive attitude score</u>	<u>Negative attitude score</u>
Strongly Agree	5	1
Agree	4	2
Uncertain	3	3
Disagree	2	4
Strongly disagree	1	5

Maximum total score was 60 and minimum 12. Attitude of the respondents were rated into three levels from the total score as follows:

Positive attitude ($\geq 80\%$ score): Total score of 51 to 60.

Neutral attitude (60 - 79% score): Total score of 41 to 50.

Negative attitude ($< 60\%$ score): Total score 12 to 40.

3.4.1 Quality of the instrument

The content of the questionnaire was examined by two experts on tobacco and behavioral science from Faculty of Public Health, Mahidol University to check the accuracy and completeness of the content.

Pre-testing of the instruments was done using 32 students of a secondary school which was not included in the sampling.

Pre-testing of the instruments was done using 30 students of a secondary school which was not included in the sampling. The reliability of the instruments on knowledge and attitude was ensured. The Cronbach’s alpha for the reliability of the instruments on knowledge and attitude was found to be 0.78 and 0.72 respectively.

3.5 Ethical consideration

Data collection for this research began only after the approval from Ethics Committee for Human Research, Faculty of Public Health, Mahidol University and National Health Research Committee, Ministry of Health and Gender, Republic of Maldives.

The decision to participate or not, was strictly voluntary. Participants were informed that they have full right to withdraw from the study at anytime during data collection period. Proper instructions were also given about their right to choose not to answer questions that makes them uncomfortable. The objectives and significance of the study was explained to the students and written consent from the parents and participants taken before the data collection. The respondents were given the opportunity to ask any question at any time during the data collection period, pertaining to any information related to the research topic. The anonymity and confidentiality of the participants was ensured.

The individual responses given by the participants will never be disclosed to anyone. All the questionnaires after completion will be kept in a place where no one can have access except the researcher. Codes were used to identify the data collection forms with no link to the real identity of any of the participants.

3.6 Data analysis

3.6.1 Data entry

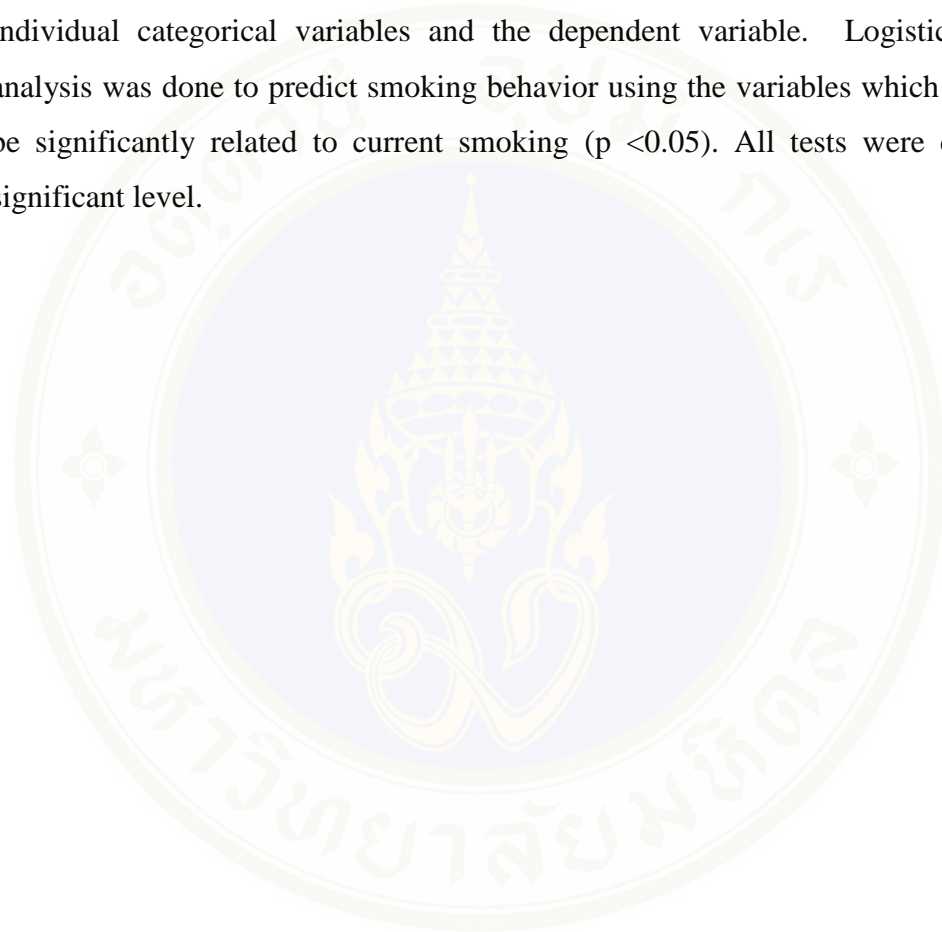
EpiData software was used to enter data upon completion of data collection. A record file was created in the program and checks done to enhance clean data for analysis. Once data entry was complete, the data was transferred to SPSS version 18 for descriptive analysis and analysis of association of the variables.

3.6.2 Statistical Analysis

The data was explored again to ensure clean data to avoid inconsistencies and duplications. The extent of missing data was verified and controlled accordingly.

Descriptive statistics were used to describe each variable in the conceptual framework. For quantitative type of variable, mean, median, mode and standard deviation and percentage distribution was used. For qualitative type of variable percentage and mode was adopted.

Chi square test was performed to determine the associations between individual categorical variables and the dependent variable. Logistic regression analysis was done to predict smoking behavior using the variables which turns out to be significantly related to current smoking ($p < 0.05$). All tests were done at 5% significant level.



CHAPTER IV

RESULTS

The purpose of this research was to explore the factors effecting smoking in lower secondary school students of Malé, Maldives. Total of 4 schools were randomly recruited for the study. All the students in the class randomly selected from each grade of the 4 schools were recruited for the study. A total of 370 students participated in the study with 82.6% response rate. The results are presented as follows.

1. Predisposing factors
2. Enabling factors
3. Reinforcing factors
4. Smoking behavior
5. Relationship between predisposing factors, enabling factors and reinforcing factors and smoking behavior.
6. Factors significantly related to current smoking among secondary school students.

4.1 Predisposing factors

Table 4.1 illustrates the general characteristics of predisposing factors. The age ranges of the students were from 13 to 19 years with an average of 14.74 ± 1.30 . Proportion of males was higher than females, with 59.7% and 40.3% respectively. About half (52.7%) of them lived with both of their parents, while the others lived with either one parent or their relatives. Most of the students (73.2%) lived in rented houses in Malé.

Regarding educational status of parents, majority of the parents were literate. Most of the parents who were literate have attended schools (80.8%) and some of them completed university education (14.3%). About 46.2% of students received some amount of money to spend on their own. Most of them get an

allowance of less than 100 MRf per week. A small proportion (6.2%) of student even receives more than 1000 MRf as an allowance per week.

Harmful effects of smoking and the knowledge on laws of smoking in Maldives were evaluated. Level of knowledge was rated 'Good', 'Moderate' and 'Poor'. Out of all students 20.0% of them had good level while half (50.5%) of the students had moderate level of knowledge.

Attitude about smoking in the students was measured using 12 items. After scoring the responses in the items, the attitude was summarized and rated as 'Good', 'Moderate' and 'Poor' attitude. Of all students 16.5% of them had good attitude while a little over than half (59.2%) of the students had moderate level of attitude to smoking.

Table 4.1 General characteristics of lower secondary students in Malé - Predisposing factors

Predisposing factors (n = 370)	Number	Percent
Age in years		
13	74	20.0
14	94	25.4
15	101	27.3
16	67	18.1
17	26	7.0
18 and above	8	2.2
Mean \pm S.D.	14.74 \pm 1.30	
Min-max	13 - 19	
Gender		
Male	221	59.7
Female	149	40.3
Studying in		
Grade 8	133	35.9
Grade 9	109	29.5
Grade 10	128	34.6

Table 4.1 General characteristics of lower secondary students in Malé - Predisposing factors (cont...)

Predisposing factors (n = 370)	Number	Percent
Parents education level		
Not literate	14	4.9
School level	186	80.8
University level	70	14.3
Pocket money allowance per week		
None	199	53.8
< 100 Mrf	93	25.1
100 – 499 Mrf	27	7.3
500 – 999 Mrf	28	7.6
≥1000 Mrf	23	6.2
Presently living with		
Both parents	195	52.7
Single parent	60	16.2
Relatives	115	31.1
Current place of living		
Own house	99	26.8
Rented house/apartment	271	73.2
Knowledge level on Tobacco		
Good	74	20.0
Moderate	187	50.5
Poor	109	29.5
Attitude on tobacco		
Good	61	16.5
Moderate	219	59.2
Poor	90	24.3

4.1.1 Knowledge about Tobacco

Harmful effects of smoking and the knowledge on laws of smoking in Maldives was evaluated. Table 4.2 illustrates the individual items evaluating knowledge on tobacco. As for the individual responses on the knowledge of tobacco and its effects, the items with the highest percentage of correct responses were, smoking has harmful effect on people around the smoker (90.5%), smokers are likely to get lung cancer (88.1%) and smoking causes heart attack (86.8%). Comparatively the knowledge on the laws of tobacco in Maldives is lower in the students. Out of 3 items the highest correct responses (47.3%) among them was, selling cigarettes to under 18 years is prohibited in Maldives. Only 32.7% of students responded correctly for the item on advertising tobacco in Maldives is prohibited in Maldives.

Table 4.2 Knowledge about tobacco

Statements of knowledge (n = 370)	Correct		Incorrect	
	Number	%	Number	%
Smoking harms people around	335	90.5	35	9.5
Smokers are likely to get lung cancer.	326	88.1	44	11.9
Smoking causes heart attack	321	86.8	49	13.2
Smoking is harmful for the pregnant woman but does not have an on the fetus	315	85.1	55	14.9
Nicotine does not cause addiction	236	63.8	134	36.2
Smoking increases capacity of lungs	227	61.4	143	38.6
Selling cigarettes to under 18 y old is prohibited in Maldives	175	47.3	195	52.7
Smoking relieves stress	130	35.1	240	64.9
Advertising of tobacco is prohibited in Maldives	121	32.7	249	67.3
Smoking is allowed in public places	81	21.9	289	78.1

4.1.2 Attitude about Smoking

Table 4.3 shows the results of attitude about smoking in the students using 12 items. Analyzing on each item of attitude on smoking, about half (44.8%) of the students strongly agree that it is difficult to quit smoking, while 33.7% also agree to the same. 51.1% strongly disagree to the statement, smoking helps in thinking. About one third (34.8%) agree that children get encouraged to smoke when they see others smoking. A one third (33.8%) also disagree that smoking reduces stress. However 28.8% agree and 18.8% strongly agree that smoking reduces weight.

Regarding perception of the effect of smoking related to media, 32.2% of students agree that scenes of tobacco use from media initiates smoking. 56.8% strongly feel that smoking is a disgusting behavior. 43.2% strongly disagree to the statement; smoking signifies one is grown up. 37.5% also strongly disagree, that friend's acceptance will increase if smoked with them when offered.

55.3% of the students strongly agree that smoking should be prohibited in public areas and a little over one third (34.5%) of students strongly disagree; to smoking to be a personal freedom and others have no right to interfere. Lastly, majority of the students (56.5% strongly agree and 16.3% agree) does not prefer smoking friends.

Table 4.3 Attitude about smoking

Statements of attitude on smoking (n = 370)	Strongly agree (%)	Agree (%)	Uncertain (%)	Disagree (%)	Strongly disagree (%)
Smoking is disgusting (+)	209 (56.8)	83 (22.6)	28 (7.6)	22 (6.0)	26 (7.1)
I prefer non smokers (+)	208 (56.5)	60 (16.3)	54 (14.7)	20 (5.4)	26 (7.1)
Smoking should be prohibited (+)	203 (55.3)	65 (17.7)	55 (15.0)	19 (5.2)	25 (6.8)

Table 4.3 Attitude about smoking (cont.)

Statements of attitude on smoking (n = 370)	Strongly agree (%)	Agree (%)	Uncertain (%)	Disagree (%)	Strongly disagree (%)
It is difficult to quit smoking (+)	165 (44.8)	124 (33.7)	20 (5.4)	21 (5.7)	38 (10.3)
Children are encouraged by seeing smoking (+)	112 (30.4)	128 (34.8)	46 (12.5)	32 (8.7)	50 (13.6)
Scenes of smoking initiates smoking (+)	70 (19.0)	119 (32.3)	133 (36.1)	20 (5.4)	26 (7.1)
smoking helps in thinking (-)	25 (6.8)	26 (7.1)	42 (11.4)	87 (23.6)	188 (51.1)
Smoking signifies one is grown up (-)	31 (8.4)	40 (10.9)	78 (21.2)	60 (16.3)	159 (43.2)
Friends accept when smoking (-)	32 (8.7)	48 (13.0)	75 (20.4)	75 (20.4)	138 (37.5)
Smoking should not be interfered by anyone (-)	43 (11.7)	54 (14.7)	60 (16.3)	84 (22.8)	127 (34.5)
Smoking reduces stress (-)	38 (10.4)	63 (17.2)	60 (16.3)	82 (22.3)	124 (33.8)
Smoking reduces weight (-)	69 (18.8)	106 (28.8)	115 (31.3)	39 (10.6)	39 (10.6)

4.2 Enabling Factors

As shown in Table 4.4, the availability of tobacco as per the opinion of students is very high. All the students (100%) have stated that there are shops near schools selling cigarettes and 97.8% of students live at homes where they have a shop selling cigarettes close by.

The accessibility of tobacco was inquired using opinion on price of cigarette and easiness to buy cigarettes. About one third (33.9%) of students don't know the price while 39.5% don't know the easiness to buy. However one third (33.6%) of student also consider the price of cigarettes to be cheap while 33.8% of students think it to be easy to buy a cigarette. Majority of students were never offered a cigarette by a friend or any other person. However, 12.4% of students were offered cigarette by friends and 15.7% of students were offered by others.

As for the reflection of rules of smoking inside the place of living and the schools, 80.3% of students live in houses where smoking is not allowed and 69.2% of students feel that smoking is strictly prohibited inside the schools. However 30.8% of students have stated that implementation of restriction on smoking inside the school to be poor.

Considering the overall exposure to tobacco promotion from media messages, majority (59.7%) of the students have never been exposed to any of the Medias promoting tobacco. However there were about one fifth (21.9%) of students who were exposed to pro-tobacco messages more than average. In view of the overall exposure to anti-smoking media messages, half (50.0%) of the students were exposed to anti-smoking media messages from majority of the medias. A little proportion (4.9%), however, was never been exposed to any anti-smoking media messages.

Table 4.4 General characteristics of lower secondary students in Malé – Enabling factors

Enabling factors (n = 370)	Number	Percent
Having shops selling cigarettes near home		
Yes	362	97.8
No	8	2.2
Having shops selling cigarettes near school		
Yes	370	100.0
No	0	0.0

Table 4.4 General characteristics of lower secondary students in Malé – Enabling factors (cont.)

Enabling factors (n = 370)	Number	Percent
Opinion of student on the price of cigarette		
Very expensive	59	16.1
Expensive	64	17.5
Cheap	55	15.0
Very cheap	64	17.5
Don't know	124	33.9
Opinion of student on the easiness to buy cigarette		
Very easy	82	22.4
easy	42	11.4
Difficult	14	3.8
Very difficult	84	22.9
Don't know	145	39.5
Friends offer cigarettes		
Yes	19	5.1
Sometimes	27	7.3
Never	324	87.6
Cigarettes offered by others		
Yes	58	15.7
No	312	84.3
Reflection of rules about smoking inside home		
Smoking allowed at home	73	19.7
Smoking not allowed at home	297	80.3
Reflection of implementation of rules about smoking inside school		
Good	256	69.2
Poor	114	30.8

Table 4.4 General characteristics of lower secondary students in Malé – Enabling factors (cont.)

Enabling factors (n = 370)	Number	Percent
Exposure to pro tobacco media messages		
Never	221	59.7
Average	68	18.4
More than average	81	21.9
Exposure to anti tobacco media messages		
Never	18	4.9
Average	167	45.1
More than average	185	50.0

4.2.1 Exposure to Tobacco Promoting Media Messages

Table 4.5 shows the proportion of students who stated that they have ever seen or heard of tobacco promoting messages on different Medias. The highest exposure of tobacco promotion was from internet with 35.3% followed by movies with 27.9%. The least promotion was from radio which was 5.6%.

Table 4.5 Exposure to pro-tobacco media messages

Media (n= 370)	Number	Percent
Internet	127	35.3
Movies	100	27.9
Magazines	61	17.0
Newspapers	49	13.7
Posters	46	12.8
TV	41	11.4
Billboards	31	8.7
Radio	20	5.6

4.2.2 Exposure to Anti-smoking Messages on Media

Table 4.6 illustrates the proportion of students who stated that they have ever seen or heard of anti tobacco messages on different Medias. The highest exposure of anti tobacco was from TV with 87.8% followed by health education sessions outside class room and class room teaching with 81.3% and 81.2% respectively.

Table 4.6 Exposure to anti-smoking media messages

Media (n = 370)	Number	Percent
TV	318	87.8
Health education sessions outside class room	295	81.3
Class room teaching	294	81.2
Radio	268	73.6
Posters	265	57.6
Newspapers	229	63.3
Magazines	208	57.6

4.3 Reinforcing Factors

Table 4.7 demonstrates the general characteristics of the reinforcing factors. Total number of elders living with the students together with number of them currently smoking was inquired. About half (51.6%) of students live in houses where none of the family members smoke. However, 10.3% of students live in houses where more than half of the adult family members smoke. Brother seemed to be the most common person smoking in the family followed by the father.

Number of close friends together with number of them currently smoking was also inquired. Most of the students (77.6%) have none of their close friends as smokers. Though, 7.8% of students have at least half of their close friends currently smoking. As for the teachers, 28.4% of the students have seen at least one of their teachers smoking in the past 3 months.

Table 4.7 General characteristics of lower secondary students in Malé – Reinforcing factors

General characteristics (n = 370)	Number	Percent
Proportion of friends smoking		
None	287	77.6
< 50%	54	14.6
≥ 50%	29	7.8
Proportion of family members smoking		
None	191	51.6
< 50%	141	38.1
≥ 50%	38	10.3
Number of teachers smoking		
None	265	71.6
1 - 2	85	23.0
More than 2	20	5.4

4.4 Smoking behavior in lower secondary school students

As illustrated in Table 4.8, 7.0% of students confirmed that they are current smokers. The proportion of current smoking in males is higher than females with 10.9% in males and 1.3% in females. 22.2% of males and 6.0% of females ever smoked in their life while 12.2% of males and 4.7% of females have quitted now.

Table 4.8 Smoking Status among Lower Secondary Students in Malé

Smoking status (n = 370)	Males		Females		Total	
	Number	%	Number	%	Number	%
Current smokers	24	10.9	2	1.3	26	7.0
Ex- smokers	27	12.2	7	4.7	34	9.2
Non smokers	170	76.9	140	94.0	310	83.8

Table 4.9 shows the smoking behavior of 60 students who ever smoked. The mean age of initiation of smoking is 13.42 ± 1.74 with most (30.0%) of them starting at 15 years old. The range of age of initiation is 9 – 16 years. About half (51.7%) of the ever smokers had their first cigarette to experiment, while one fourth (26.7%) of them were insisted by their friends. Majority (55.0%) of the ever smokers stated, friends, as a source of cigarette for their first try, followed by 23.3% from family members and 21.7% bought the cigarettes on their own.

Concerning the places that the students most commonly smoke, 41.7% of the ever smokers smoke in public places, and 23.3% smoke at their homes, while the others smoke at their friends place or outside the school premises. The average number of cigarettes smoked per day is 2.0 ± 1.81 with a range of none to 7. The most common form of tobacco product that the ever smokers use for smoking is cigarettes. More than half (56.7%) of students smoke while they are with their friends. About one fourth (26.7%) smoke when they are alone and the rest smoke during stressful times.

Concerning the accessibility of cigarettes, for the students, the majority (53.3%) of ever smokers had at least bought cigarettes once on their own. 71.9% of them bought from a shop near their schools. Out of those who never bought a cigarette on their own, 60.7% obtain it from their friends and the rest from family members.

As for quitting smoking, 60.0% of ever smokers received advice to quit smoking by friends (36.7%), family member (18.3%) and teachers (16.7%). A majority (73.3%) have tried to quit, while the rest of them never tried. The reasons stated were, they like smoking (31.1%), there is no harm smoking (31.1%) and friends/others smoke around them (37.5%). On the other hand ever smokers who has successfully stayed away from smoking for the past one month stated the reason to quit as, wanted to quit on own (41.2%), advice from friends (23.5%) and others dislike (35.3%).

Table 4.9 Smoking pattern of smokers in secondary school students of Malé

Smoking pattern (n = 60)	Number	Percent
Age of initiation		
9	2	3.4
10	4	6.7
12	11	18.3
13	11	18.3
14	11	18.3
15	18	30.0
16	3	5.0
Mean ± S.D.	13.42 ±	
Min-max	1.74	
	9 - 16	
Reason for initiation		
Friends urging	16	26.7
To be away from worries	6	10.0
To relax	7	11.6
Experimenting	31	51.7
First cigarette received from		
A friend	33	55.0
A family member	14	23.3
Bought on own	13	21.7
Place most commonly smoked		
Friends place	13	21.7
Home	14	23.3
Outside school premises	8	13.3
Public places	25	41.7

Table 4.9 Smoking pattern of smokers in secondary school students of Malé (cont.)

Smoking pattern (n = 60)	Number	Percent
Type most commonly used to smoke		
Cigarette	60	100
Number of cigarettes smoked per day		
0	2	5.9
1	19	55.9
2	6	17.7
4	1	2.9
5	4	11.8
6	1	2.9
7	1	2.9
Mean \pm S.D.	2.0 \pm 1.81	
Min-max	0 - 7	
Most often smoked		
With friends	34	56.7
Alone	16	26.6
Stressful times	10	16.7
Ever bought cigarettes on own		
Yes	32	53.3
No	28	46.7
Place bought (n= 32)		
Shop near home	9	28.1
Shop near school	23	71.9

Table 4.9 Smoking pattern of smokers in secondary school students of Malé (cont.)

Smoking pattern	Number	Percent
Means of getting cigarettes without purchasing (n= 28)		
From friends	17	60.7
From family members	11	39.3
Received advice to quit smoking		
Yes	36	60.0
No	24	40.0
Advice received from (n= 36)*		
Friends	22	36.7
Family members	11	18.3
Teachers	10	16.7
Ever tried to quit		
Yes	44	73.3
No	16	26.7
Reasons for not trying to quit (n=16)		
like smoking	5	31.3
There is no harm in smoking	5	31.3
Friends/ others smoke around	6	37.4
Ex- smokers: Reason in quitting (n=34)		
Wanted to quit on own	14	41.2
Advice from friends	8	23.5
Others dislike	12	35.3

* Multiple responses

4.5 Factors affecting smoking in school students of Malé

4.5.1 Predisposing factors and smoking behavior

The relationship between predisposing factors and smoking behavior is shown in Table 4.10. All the independent variables under predisposing factors were cross tabulated and Chi-square was performed to find the association between the variables. The results show that there is a significant relationship between age and the status of smoking (p-value <0.001). It is evident that the more the age is the higher the prevalence of current smokers. As age and grade would go together, it is seen that grade is also significantly related to the status of smoking (p-value = 0.032). Apparently the higher the students go by the educational ladder, the higher the proportion of smoking among them.

Similarly there is an association between gender and smoking. The proportion of smoking in males is higher in ex-smokers as well as current smokers. Hence, there is a strong relationship between gender and smoking status (p-value <0.001).

In regard to knowledge and attitude of tobacco use in the students, there is a relationship between both the variables and the smoking status. The proportion of smoking is seen to be less in the group with good knowledge and good attitude. Hence, there is a strong relationship between knowledge about tobacco and the smoking status (p-value = 0.027) and attitude about tobacco use and smoking status (p-value <0.001).

The Chi-square test failed to detect significant relationship between parents' education level, money allowance and the variable on the people living with the student. Parents' education level was categorized to the highest education level by either of parents, into three categories. In spite of an insignificant relationship between the smoking status of the student with their parents education level, it is seen that the proportion of current smokers are more (12.9%) in higher level of educated parents.

Concerning the money allowance that the students get to spend on their own, it is seen that students who does not get an allowance smoke more (9.4%) than those who get an allowance (5.0%). Regarding the people living with, the highest

proportion of current smokers is in the group living with a single parent. 11.7% of student living with single parents currently smoke while the proportion among students living with both parents is 5.6%.

Table 4.10 Relationship between predisposing factors and smoking behavior

Predisposing factors (n = 370)	Smoking status						p- value ¹
	Non smoker		Ex- smoker		Current smoker		
	Number	Percent	Number	Percent	Number	Percent	
Age							
13 -15	238	88.5	17	6.3	14	5.2	<0.001
≥ 16 years	72	71.3	17	16.8	12	11.9	
Gender							
Male	170	76.9	27	12.2	24	10.9	<0.001
Female	140	94.0	7	4.7	2	1.3	
Grade							
8	120	90.2	7	5.3	6	4.5	0.032
9	93	85.3	10	9.2	6	5.5	
10	97	75.8	17	13.3	14	10.9	
Parents education level							
Not literate	12	85.8	1	7.1	1	7.1	0.329
School education	243	85.0	27	9.4	16	5.6	
University education	55	78.5	6	8.6	9	12.9	
Money allowance							
Yes	171	85.5	19	9.5	10	5.0	0.254
No	139	81.8	15	8.8	16	9.4	

¹p – value by Chi- square test

Table 4.10 Relationship between predisposing factors and smoking behavior (cont.)

Predisposing factors (n = 370)	Smoking status						p- value ¹
	Non smoker		Ex- smoker		Current smoker		
	Number	Percent	Number	Percent	Number	Percent	
Living with							
Both parents	169	86.7	15	7.7	11	5.6	0.352
Single parent	48	80.0	5	8.3	7	11.7	
Relatives	93	80.9	14	12.2	8	7.0	
Knowledge about tobacco							
Good	67	90.5	6	8.1	1	1.4	0.027
Moderate	161	86.1	13	6.9	13	7.0	
Poor	82	75.2	15	13.8	12	11.0	
Attitude towards tobacco							
Good	53	86.9	4	6.6	4	6.6	<0.001
Moderate	202	92.2	14	6.4	3	1.4	
Poor	55	61.1	16	17.8	19	21.1	

¹p – value by Chi- square test

4.2.3 Enabling factors and smoking behavior

Table 4.11 shows the cross tabulated variables under enabling factors. Chi-square was used to find out the association. Availability of tobacco is not significant as almost all the students have cigarettes available either near their home or the school. Therefore this variable cannot be compared.

As for the other variables, the results show that there is a significant relationship between accessibility of tobacco and the status of smoking (p-value <0.001). It is seen that the prevalence of smoking is higher when tobacco is accessible to the students. There is also a significant association between restriction to use tobacco at school and the current smoking status (p-value = 0.013). Apparently the

proportion of current smokers among the students who feel that their school restrict tobacco use were higher. It is similar with the students who feel that smoking is not allowed at home. However, there is no significant relationship between restriction to use tobacco at home and the current smoking status.

In regard to the overall exposure to pro tobacco messages and the current status of smoking, there is significant relationship between the two variables (p-value <0.001). The prevalence of current smoking among the students who were exposed to pro-tobacco messages at distinct levels was different. Students who were never exposed to any pro-tobacco media messages had the least prevalence (4.5%) among the three groups. The more the exposure to pro-tobacco media messages the higher was the prevalence of smoking.

Concerning the exposure to anti tobacco media messages and status of smoking, there was no significant relationship. However, the prevalence of current smokers was the highest (11.1%) among the students who were never exposed to any anti-tobacco media messages.

Table 4.11 Relationship between enabling factors and smoking behavior

Enabling factors (n = 370)	smoking status						p-value ¹
	Non smoker		Ex - smoker		Current smoker		
	Number	%	Number	%	Number	%	
Accessibility of tobacco							
Yes	141	74.2	27	14.2	22	11.6	<0.001
No	169	93.9	7	3.9	4	2.2	
Restrictions to use tobacco at home							
Yes	63	86.3	5	6.8	5	6.8	0.735
No	247	83.2	29	9.8	21	7.1	

¹p – value by Chi- square test

Table 4.11 Relationship between enabling factors and smoking behavior (con...)

Enabling factors (n = 370)	smoking status						p- value ¹
	Non smoker		Ex - smoker		Current smoker		
	Number	%	Number	%	Number	%	
Restrictions to use tobacco at school							
Yes	224	87.5	19	7.4	13	5.1	0.013
No	86	75.4	15	13.2	13	11.4	
Exposure to Pro-tobacco Media Messages							
Never	193	87.3	18	8.1	10	4.5	<0.001
Average	61	89.7	5	7.4	2	2.9	
More than average	56	69.1	11	13.6	14	17.3	
Exposure to Anti-smoking Media Messages							
Never	14	77.8	2	11.1	2	11.1	0.437
Average	136	81.4	20	12.0	11	6.6	
More than average	160	86.5	12	6.5	13	7.0	

¹p – value by Chi- square test

4.2.4 Reinforcing factors and smoking behavior

Table 4.12 illustrates the variables under reinforcing factors which also cross tabulated. Chi-square was used to find out the association. The association between reinforcing factors and the current status of smoking is shown below. It is seen that the prevalence of smoking among students with smoking friends, and smoking family members and teachers whom they see smoking are higher than who does not have them. The association between smoking of friends and teachers and the current status of smoking was also a significant (p-value <0.001). However, the

association between smoking of family and current smoking status was not significant.

Table 4.12 Relationship between reinforcing factors and smoking behavior

Reinforcing factors (n = 370)	Smoking status						p- value ¹
	Non smoker		Ex- smoker		Current smoker		
	Number	Percent	Number	Percent	Number	Percent	
Smoking of friends							
No	264	92.0	16	5.6	7	2.4	<0.001
Yes	46	55.4	18	21.7	19	22.9	
Smoking of family							
No	164	87.2	14	7.4	10	5.3	0.183
Yes	146	80.2	20	11.0	16	8.8	
Smoking of teachers							
No	240	90.6	12	4.5	13	4.9	<0.001
Yes	70	66.7	22	21.0	13	12.4	

¹p – value by Chi- square test

4.6 Factors Significantly Related to Smoking

To determine factors significantly related to smoking, status of smoking were grouped into ever-smokers and non-smokers. Multiple logistic regression analysis was done using all the variables significantly related to smoking status using Chi-square. Forward selection of factors was used as a method. The final selection model is illustrated in table 4.13.

Factors that were significantly associated were age, gender, attitude, accessibility, exposure to pro-tobacco media messages, smoking of teachers and smoking of friends. From the logistic regression it is seen males are more likely to smoke and age is also a predictor of smoking. It is also seen that students who have poor attitude on the use of tobacco are more likely to smoke than students who have good attitude (OR=2.82, 95% CI=0.93-8.51).

As for the accessibility, the students who are accessible to tobacco are almost three times at risk of smoking compared to those who are not accessible (OR=3.47, 95% CI=1.45-8.30). After controlling of other variables the students who have seen teachers smoking, are three times at risk to smoke (OR=3.66, 95% CI=1.69-7.94), while students who have smoking friends was the most dominant contributor to smoking. Students were six times more likely to smoke than students who do not have any close friends smoking (OR=6.14, 95% CI=2.80-13.46). It is also seen that students were exposed to majority of the medias on pro-tobacco messages are more likely to smoke than students who were never exposed (OR=2.16, 95% CI=0.92-5.04).

Table 4.13 Factors significantly related to smoking among 370 secondary school students.Cox and Snell R² = 31.5%

Significant variables			Estimated	95% C.I.for OR	
	B	S.E.(B)	OR	Lower	Upper
Gender (Female*)					
Male	1.315	0.468	3.725	1.489	9.315
Age (13-14 years*)					
≥ 16 years	1.281	0.403	3.599	1.633	7.932
Attitude (Good attitude*)					
Moderate	-0.960	0.580	0.383	0.123	1.193
Poor	1.036	0.565	2.819	0.932	8.525
Accessibility (No*)					
Yes	1.244	0.445	3.471	1.451	8.302
Smoking of teachers (None*)					
Yes	1.297	0.395	3.658	1.685	7.939
Smoking of friends(None*)					
Yes	1.815	0.400	6.142	2.803	13.461
Exposure to Pro-tobacco media (Never*)					
Average	-1.128	0.607	0.324	0.099	1.063
More than average	0.768	0.433	2.156	0.923	5.035
Constant	-9.495	1.327	0.000		

*Reference group

CHAPTER V

DISCUSSION

Adolescence is a crucial time in the developmental stages of life. Events of life and behavior during these years can shape the life in the future, influence lifetime health and can even put current health at risk. Adolescent tobacco use and the subsequent health problems are a major concern across the globe. This study was designed to explore the factors effecting smoking in adolescents. The target population was all the lower secondary school students of Male', Maldives. From a representative sample a total of 370 students (59.7% of males and 40.3% of females) answered the self-administered questionnaire, during the entire period of data collection.

5.1 Prevalence of Smoking

Prevalence of smoking among lower secondary school students was found to be 7.0% in this study. The prevalence is less compared to the latest study (GSHS 2009) results which reported a prevalence rate of 10.6% of the same age group. However previous studies of GYTS of 2007 and 2003 documented prevalence of smoking as 3.8% and 6.9% respectively. The smoking prevalence of this study is also a reflection of the status of smoking in adolescents as majority of adolescents is in the school system. However, adolescents who are not in the school system are more likely to smoke as they are usually dropout from school, unemployed and aimless. Hence, the overall prevalence of smoking among adolescents is expected to be higher than the prevalence in this study.

5.2 Predisposing Factors

The prevalence of smoking among male students is eight times higher than females. This is the highest difference compared to the results of GYTS and GSHS. Thus the rate of decline in the male students is less than the overall decline of prevalence of smoking over the years. This study also propose that males are three times at risk of smoking than females (OR=3.50, CI=1.43-8.58). Cultural and social norms may contribute to the low smoking rates in female. In addition it is seen in this study that females compared to males have good attitude, is less accessible to tobacco, have seen fewer teachers smoking and have less smoking friends. All these factors are predictors of smoking in this study.

Age in relation to smoking status is a predictor of smoking in this study. Students who reach 16 years are 3 times at risk of being a smoker than those who are below (OR=3.14, CI=1.48-6.69). Smokers in this study initiated smoking as early as 9 years to 16 years. It might be possible that when the adolescents begin social activities, they are vulnerable to environmental influences. To some extent smoking can be explained as a channel to promote friendship. Friends were the most common source of cigarettes in this study. Offering cigarettes by the smokers has become a friendly gesture. Hence, accepting it would mean an easy way to make new friends and develop relationships. The most common reason to initiate smoking was experimenting. Considering the early age of initiating, the adolescents are unaware of the harmful effects smoking. Hence, preventive programs for the adolescents should be started as early as possible to reduce the rate of smoking in adolescents.

This study showed that there is a relationship between knowledge level and status of smoking (p-value = 0.027). This can be an indication of the effectiveness of health promotion activities of anti tobacco initiatives. However, the students' knowledge on health effects of tobacco was better than knowledge on the laws of tobacco in Maldives. Hence, it is important that the adolescents improve their knowledge on the laws of tobacco. Behavioral studies show that there is a significant relationship between knowledge and practice. Hence, improving knowledge of laws of tobacco will ensure in adolescents following them.

Attitude was found to be a predictor of smoking in this study. Students who have poor attitude are 3 times at risk of being a smoker than those who have good attitude (OR=3.62, CI=1.24-10.50). This is in line with the study by Bidstrup et al (2009), which also showed a strong association with smoking initiation and attitude (34). A large proportion of students had positive responses on individual responses in the attitude questionnaire. However, most of the students feel that smoking reduces weight.

5.3 Enabling Factors

Cigarettes are available at every corner of Male', near homes and near schools. Hence, a difference in availability was not found among smoking status. However, there was a distinction among the students to the accessibility of tobacco. Further analysis revealed that accessibility to tobacco is related to smoking (p-value <0.001). It is also found to be a predictor of smoking. It is seen that the students who are accessible to tobacco are almost 3 times at risk of smoking (OR=2.99, CI=1.31-6.81). Despite legislation that prohibits sales to minors, students are able to acquire through direct purchase themselves, through other friends and family members who smoke. 52.4% of the students were not aware that the prohibits tobacco sales to under 18 years, and 53.3% of the smokers agreed that they ever bought cigarettes on their own. Easy access to tobacco demonstrates poor awareness and enforcement of tobacco law. Initiative need to be taken for corrective measures, to reduce smoking among young people.

In regard to exposure to pro tobacco messages and the current status of smoking, the results showed that there is a significant relationship between magazines, movies and internet (p-value <0.01). The prevalence of current smoking among the students exposed to pro-tobacco messages in these Medias was considerably higher. Anti tobacco policy makers should carefully look into the behavior of young adults and their passions to review policies on tobacco regarding accessibility.

5.4 Reinforcing Factors

Molyneux et al (2004) stated that restricting exposure to other smokers is an important measure in decreasing the rate of smoking and hence, smoking-related diseases (35). Exposure to other smokers is usually from people close by, such as smoking family members and smoking friends. Apart from this, from a developmental perspective, the desire to establish an autonomous self and different identity is an innate characteristic of adolescents. For this reason, smoking is used as a symbol of independence and personality. It is expected that students who have close friends smoking are at risk to smoke. As for smoking of friends, this variable was found to be the strongest predictor of smoking in this study. Students with close friends as smokers were found to be seven times more likely to smoke than the other students (OR=7.13, 95% CI=3.34-15.22). Therefore, tobacco prevention programs should be more targeted at associating tobacco use with negative images and overcoming peer pressure.

The impact of friends and parental smoking has been studied in a wide range of contexts in a large number of studies with a variety of outcomes (31)(32). Findings with regard to close friends smoking in this study were more consistent with other studies than those for parental smoking. This was not unexpected, considering that 73.2% of students live in rented houses and 31.1% of students live with relatives leaving their families behind in islands for studies. Hence, the 'family' in this study does not provide the factors in a family close to the student. Therefore there is no relationship between 'family' smoking and the smoking status of the students.

In this study, teachers' smoking was a strong predictor of student smoking, which increased the odds by 2.80. Teachers are role models to the students and demonstration of smoking behavior among them could be a bigger obstacle in pursuing the purpose of smoking prevention programs. Curiosity and imitation are natural adolescent behaviors that create the need to try something new. As role models, teachers directly influence students' behavior and judgment to a great extent. Lowering smoking prevalence among teachers, increasing teachers' knowledge of the hazards of smoking, therefore, should be among the strategies in a tobacco prevention program of adolescents.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This study was a cross sectional study to explore factors effecting smoking among lower secondary school students of the capital city of Maldives - Male'. The study was designed according to the PRECEDE part of PRECEDE-PROCEED model. This model serves as a tool to explore the factors and environments that influence the behavior of interest. Predisposing factors, reinforcing and enabling factors for initiating and maintaining smoking behavior was explored in the students. Data was collected using a self-administered questionnaire, from a randomly selected sample, during the period of data collection from 4 schools of Male'.

A total of 370 students participated in the study. The average age of them is 14.7 years with a range of 13 – 19 years. Proportion of males was higher than females, with 59.7% and 40.3% respectively. Most of the students (73.2%) lived in rented houses in Male'. 46.2% of students received a money allowance to spend on their own. 51.6% of students live in houses where none of the family members smoke. 80.3% of students live in houses where smoking is not allowed. 77.6% have none of their close friends as smokers. As for the teachers, 28.4% of the students have seen at least one of their teachers smoking in the past 3 months. 12.4% of students were offered cigarette by friends and 15.7% of students were offered by others.

Out of all students 20.0% of them had good level of knowledge and 16.5% of them had good attitude. In addition half (50.5%) of the students had moderate level of knowledge and 59.2% of the students had moderate level of attitude to smoking. The highest exposure of tobacco promotion was from internet with 35.3% followed by movies with 27.9%. In contrast the highest exposure of anti tobacco was from TV with 87.8% followed by health education sessions outside class room and class room teaching with 81.3% and 81.2% respectively.

One of the main findings of this study is the prevalence of current smoking which is 7.0%. The proportion of ever smokers was 16.2%. Current smoking in males is higher than females with 10.9% in males and 1.3% in females while 22.2% of males and 6.0% of females ever smoked in their life. The mean age of initiation of smoking is 13.42 ± 1.74 with most (30.0%) of them starting at 15 years old. About half (51.7%) of the ever smokers had their first cigarette to experiment, while 55.0% of them got them through a smoking friends. 53.3% of ever smokers had at least once bought cigarettes on their own. 73.3% have tried to quit, while 56.7% of them were able to stay away from smoking for the past one month.

The relationship between predisposing factors and smoking status is well established. The results show that there is a significant relationship between age and the status of smoking (p-value <0.001). Similarly there is an association between gender and smoking (p-value <0.001). In regard to knowledge and attitude of tobacco use, there is a strong relationship between smoking status and these two variables with knowledge (p-value = 0.027) and attitude (p-value <0.001).

Some of the variables under enabling factors were also found to have a relationship with smoking status. The results show that there is a significant relationship between accessibility of tobacco and the status of smoking (p-value <0.001). There is also a significant association between restriction to use tobacco at school and the current smoking status (p-value = 0.013). The results also showed that there is a significant relationship between pro tobacco messages through magazines, movies and internet and the smoking status (p-value <0.01).

The association between reinforcing factors and the current status of smoking is also ascertained. There is a significant relationship between smoking of friends and teachers and the current status of smoking in this study (p-value <0.001).

Factors significantly related to smoking were also determined by using multiple logistic regression analysis. The factors that were in the final model were age, gender, attitude, accessibility, smoking of teachers and smoking of friends. From the logistic regression it is predicted that males are more likely to smoke (OR = 3.62, 95% CI=1.24-10.50). As for the accessibility, the students who are accessible to tobacco are 3 times at risk to smoke (OR = 2.99, 95% CI=1.31-6.80). After controlling of other variables the students who have seen teachers smoking, are more

than double the risk to smoke (OR = 2.79, 95% CI=1.35-5.80), while students who have smoking friends was the most dominant contributor to smoking. This group of students were seven times at risk to smoke (OR = 7.13, 95% CI=3.34-15.22).

Findings of this study calls for a comprehensive strategy for preventing adolescent smoking, involving school personnel, parents, and the community as a whole. Although theoretically smoking is not permitted in schools, there are still 12.2% of students in this study who reported that some people smoke inside the school in some places. This suggests that smoking is not strictly prohibited in some schools in Male'. Furthermore, the students have access to cigarettes without any government regulations. Although smoking has been banned in many public places, and tobacco advertising and promotions are prohibited in the local media, no one seems to be responsible for enforcement and there is no close monitoring by any organization. Students were mostly exposed to pro-tobacco messages through internet in this study.

A potential limitation in this study is that the data relied on self-reported response that was not confirmed by other sources. Therefore response bias was possible. Furthermore, this study was cross-sectional rather than longitudinal, which would limit the extent to which conclusions about causality could be drawn.

6.2 Recommendation

6.2.1 Recommendation for policy

Several practical implications are possible based on the findings of this study. First, this study confirms the importance of the social environment in the process of smoking initiation and highlights that using an integrated community based approach in smoking prevention will likely be beneficial. As smoking is sometimes initiated even before adolescence, smoking prevention programs should be commenced as early as possible.

Smoking prevention aimed at reducing smoking behavior should consider the impact of smoking of friends and teachers. Programs, creating non-smoking majorities within groups, working with popular role models, or increasing

self-awareness regarding harmful effects of smoking and laws of tobacco control in Maldives, may be effective in preventing smoking. Negative attitude on the harmful aspects of smoking and positive attitude to stay away from smoking need to be developed in the students. Regulation of a health education curriculum in line with regular school curriculum could be another way to prevent adolescents from smoking.

As peers are the main predictor of smoking, students should be equipped to resist pressure to smoke. Most of the students initiate smoking to experiment after receiving it from a friend or buying it on their own. Implementation of tobacco law should be strengthened, such as making cigarettes unavailable to minors. Buddies help buddies to stop smoking are good strategies to quit smoking which can be adopted by an anti smoking program.

Smoke free school policy should be strengthened and expanded to include restrictions of selling cigarette at shops near schools. Anti smoking programs should also probe into possibilities of blocking internet promotions of tobacco as well as censoring scenes promoting tobacco through international media. Smoking by teachers is a predictor of smoking in students. Thus, teachers should be another target for an effective anti smoking programs. Teachers should be made aware of the effect of demonstrating smoking behavior to their students.

A surveillance program of smoking behavior among adolescents should be established. A national standard should be developed with current status of smoking among secondary school students. It should also include the extent of enforcement of tobacco law on areas relevant to adolescent smoking.

6.2.1 Recommendation for further studies

The finding of this study was also in line with other studies confirming that PRECEDE model is a good tool to explore the factors effecting a certain behavior. The findings furthermore suggest that in the context of adolescent smoking and the typical environment of Male', the conceptual framework could include more variables. Variables related to previous smoking behavior, other direct pressures from the environment, and smoking-based selection of friends should be considered. It will

also be useful to conduct prospective studies to establish a temporal relationship between the factors of interest.



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APPENDIX A

QUESTIONNAIRE

Smoking in Lower Secondary Students of Male', Republic of Maldives

This questionnaire will remain strictly confidential and will not be circulated to any other person or group.

Instruction:

Please tick ✓ in next to the statements and/or fill in the blanks.

Name of school.....

Part 1: General information

1. Age..... years old
2. Gender Male Female
3. Studying in Grade 8 Grade 9 Grade 10
4. Current place of living
 Own house Rented house/apartment
 Others specify
5. Presently living with
 Both parents Father alone Mother alone
 Relatives Others specify.....
6. Mothers education level:
 Illiterate Primary level Secondary level
 Diploma Bachelors Masters and above
 Others specify.....
7. Father education level:
 Illiterate Primary level Secondary level
 Diploma Bachelors Masters and above
 Others specify.....
8. Is there any source of money you get to spend on your own (including your earnings if any)?
 No Yes ⇒ ☞ How much? Rufiyaa per
9. How many people elder than you live at your home? people

10. Do any of them smoke?

- No Yes ⇒ How many?
- ⇒ Who are they? (Tick all who smoke)
- Father Mother Brother
- Sister Others (specify).....

11. Which statement best describes the rules about smoking inside your home?

- Smoking is not allowed anywhere inside my home
- Smoking is allowed in some places or at some times
- There are no rules about smoking in my home

12. Do you have shops near your home selling cigarettes?

- No Yes ⇒ How far? minutes walk from home

13. Do you have shops near your school selling cigarettes?

- No Yes ⇒ How far? minutes walk from school

14. What is your opinion on the price of cigarette?

- Very expensive expensive don't know
- Cheap Very cheap

15. If you buy a cigarette, how easy would it be buy one?

- very easy easy don't know
- difficult very difficult

16. Which statement best describes the enforcement of rules about smoking inside your school?

- No one smokes inside my school.
- Sometimes people smoke in some places.
- Some people secretly smoke inside the school.
- Smoking is allowed anywhere in school.

17. During the past year how many of your teachers have you seen smoking?.....

18. How many close friends do you have? friends

19. How many of them smoke? friends

20. Do your friends offer you a cigarette when you are with them?

- Yes sometimes never

21. Has anyone other than your friends ever offer you a free cigarette?

- Yes No

Please tick ✓ in next to the most appropriate response in each statement.

22. Have you ever seen or heard pro-tobacco media messages on:

Source/media	Yes	No	Uncertain
1. TV	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
2. Radio	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
3. Billboards	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
4. Posters	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
5. Newspapers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
6. Magazines	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
7. Movies	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain

23. Have you ever seen/heard or got any information about harmful effects of smoking or campaign for not smoking from any of the following:

Source/media	Yes	No	Uncertain
1. TV	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
2. Radio	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
3. Posters	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
4. Newspapers	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
5. Magazines	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
6. Class room teaching	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
7. Health education sessions outside class room	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain

Part 2: Smoking behavior

1. Have you ever smoked in your life?

Yes

No ⇒ Go to Part 3

2. In the past 30 days, have you smoked at least one cigarette?

Yes

No ⇒ Go to Q 10

3. When do you feel like smoking at present? (Multiple response)

- With friends Alone
 Before a meal After a meal
 Stressful times First thing in the morning
 Others specify

4. Which brands of cigarettes do you usually use?

- Marlboro Camel
 Benson Others specify

5. Have you ever bought your cigarette on your own?

- Yes ⇒ Where do you buy? (Multiple response)

- Shop near school
 Shop near home
 Others specify

- No ⇒ How do you get the cigarettes? (Multiple response)

- From a friend
 From family members
 Others specify

6. Have you ever received any advice/help to quit smoking?

- No
 Yes ⇒ From whom? (Multiple response)

- Friends
 Family members
 Teachers
 Health care professional
 Others specify

7. Have you ever tried to quit smoking?

- Yes ⇒ How many times?

⇒ Why was it not successful? (Multiple response)

- Difficult to suppress the habit
 Gloomy when not smoking
 Friends/others smoke around me
 Smoking advertisements
 Others specify

- No ⇒ Reasons for not trying to quit. (Multiple response)

- I like smoking
 There is no harm smoking
 Friends/others smoke around me
 Used to as a habit

⇒ Will you ever try to quit smoking?

- Yes No Not sure

8. I spend about Rufiya per month to buy cigarettes.

9. At present I smoke about Cigarettes per day.

10. Age at start of smoking years old

11. What was the main reason for smoking for the first time? (single response)

- | | |
|---|---|
| <input type="checkbox"/> Friends urging | <input type="checkbox"/> to resemble family members |
| <input type="checkbox"/> To relax | <input type="checkbox"/> to be away from worries |
| <input type="checkbox"/> just experimenting | <input type="checkbox"/> Others specify..... |

12. Where did you get your first cigarette from?

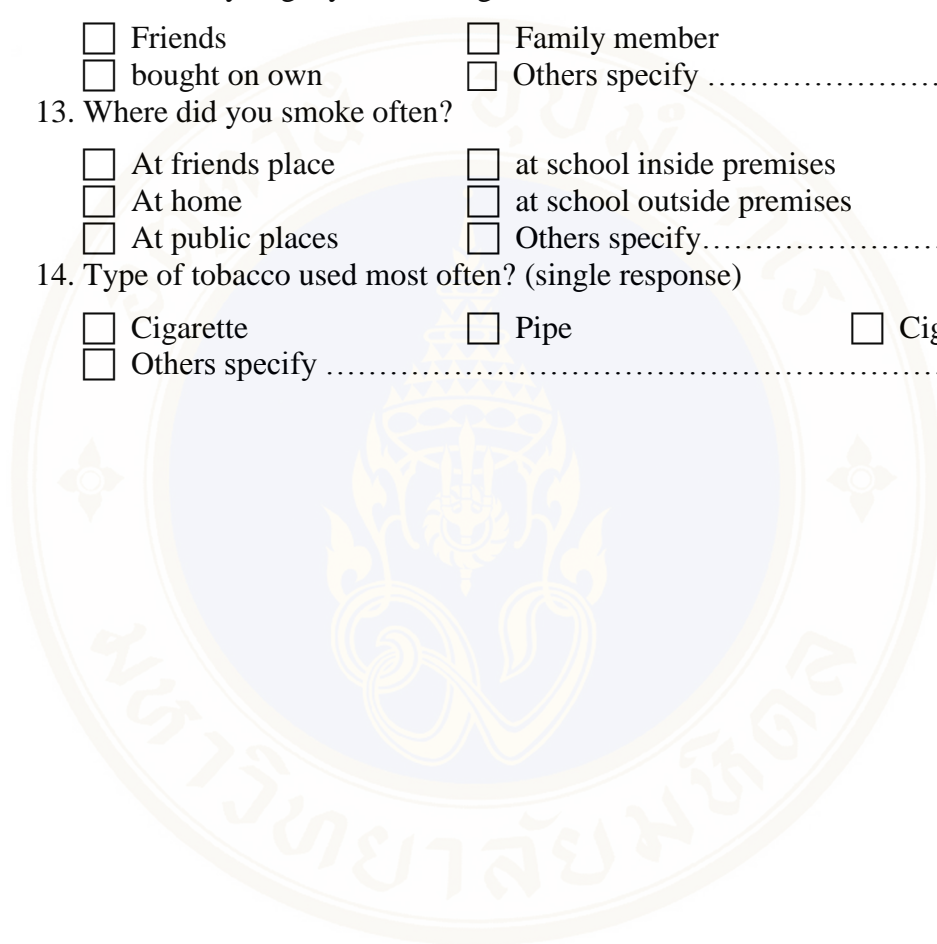
- | | |
|--|---|
| <input type="checkbox"/> Friends | <input type="checkbox"/> Family member |
| <input type="checkbox"/> bought on own | <input type="checkbox"/> Others specify |

13. Where did you smoke often?

- | | |
|---|---|
| <input type="checkbox"/> At friends place | <input type="checkbox"/> at school inside premises |
| <input type="checkbox"/> At home | <input type="checkbox"/> at school outside premises |
| <input type="checkbox"/> At public places | <input type="checkbox"/> Others specify..... |

14. Type of tobacco used most often? (single response)

- | | | |
|---|-------------------------------|--------------------------------|
| <input type="checkbox"/> Cigarette | <input type="checkbox"/> Pipe | <input type="checkbox"/> Cigar |
| <input type="checkbox"/> Others specify | | |



Part 3: Knowledge about tobacco**Instruction:**

Please tick ✓ in next to the most appropriate response in each statement.

No	Statement	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
1	Nicotine in cigarettes causes addiction to smoking.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
2	Smoking causes Heart attack.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
3	Smoking causes Diabetes.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
4	The most common cause of death in smokers is lung cancer.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
5	The fetus is not affected even if the mother smokes cigarette.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
6	Smoking depresses the nervous system.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
7	Harmful effects of smoking is less in secondhand smokers.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
8	Selling cigarettes to children under 18 year old is prohibited in Maldives.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
9	Smoking in public places is allowed in Maldives by law.	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain
10	Advertising tobacco products is prohibited in Maldives	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Uncertain

Part 4: Attitude towards smoking

Instruction:

Please tick ✓ in next to the most appropriate response in each statement.

No	Statement	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1	It is not difficult to quit smoking	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
2	Smoking causes diseases which can be easily treated	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
3	Smoking should be banned from society	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
4	Smoking reduces stress and anxiety	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
5	Smoking should be banned in the society	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
6	Children are encouraged to smoke when they see others smoke in front of them	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
7	Friends should help friends to quit smoking	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
8	Smoking occasionally is not harmful to health	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
9	Scenes of smoking in mass media initiates people to smoke	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
10	Restricted areas for smoking really helps to decrease smoking	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
11	I would never wear something which has a picture of cigarette on it	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree
12	Smoking makes people more attractive	<input type="checkbox"/> Strongly Agree	<input type="checkbox"/> Agree	<input type="checkbox"/> Uncertain	<input type="checkbox"/> Disagree	<input type="checkbox"/> Strongly Disagree

End of Questionnaire –Thank you very much for your participation.

APPENDIX B

INFORMATION SHEET

1. Title of project:

Smoking among Secondary School Students of Male', Maldives.

2. Study site:

Lower Secondary Schools of Male', Maldives

3. This project is conducted by Ms. Aminath Shafia under supervision of major advisor as follows:

Major Advisor: Asst. Prof. Dr. Mondha Kengganpanich
Department of Health Education and Behavioral Science
Faculty of Public Health, Mahidol University
Bangkok, Thailand

4. Brief Background, Rationale:

The tobacco epidemic is one of the biggest public health threats the world has ever faced. Negative effects of tobacco are well known and can result in many health problems as well as socioeconomic consequences. According to WHO, tobacco use is attributable to nearly 6 million deaths and causes hundreds of billions of dollars of economic damage worldwide each year. The rate of smoking in Maldives is 24.8% in 2004 and is among the highest in South East Asia. Moreover tobacco was the cause of 32% of all Non-Communicable Diseases (NCDs) and 16% of all communicable disease deaths in Maldives in 2004.

The Global Youth Tobacco Survey (GYTS) conducted in 2003 and 2007 shows a significant reduction in the proportion of student smokers among 13-15 year olds

from 6.9% in 2004 to 3.8% in 2007. Though, it is alarming to discover that the recent (2009) Global School-student based Health Survey (GSHS), in Maldives shows that 11.6% of the students currently smokes cigarette. Among them most of the children (65%) started smoking at the age of 14 years or younger. Hence, tobacco use among adolescents is evidently becoming a severe problem in the country.

Most of tobacco's damage to health does not become evident until years or even decades after the onset of use. Adolescence is a transition period from child to adulthood and children of this age are vulnerable to tobacco addiction. At this age the adolescents will not have fully developed their insight of the enormous risk of smoking. By the time the risk to health is recognized, the addicted individuals find it difficult to stop tobacco use. Therefore it is vital to prevent individuals to initiate smoking before they become addicted to it.

A well established knowledge base should be available of the factors related to smoking to plan for strategies of further prevention programs of this dreadful behavior. For individuals who smoke these factors are often seen as matters of individual choice. However these factors are shaped in part by the broader societal context in which they take place.

The purpose of this study is to explore factors affecting smoking in Secondary school students of Male' Maldives. Once these factors are identified in the target population, interventions can be designed based on a clear understanding of the specific factors influencing the behavior in that population. The factors which influence the behavior of interest will allow the program planners to use a blend of individual, interpersonal, and community based intervention – which is vital for an effective program.

Therefore this study would provide a better understanding of the multi level factors influencing the adolescents to initiate and maintain as smokers which will assist local anti smoking programs in setting priorities for future intervention efforts. Secondary schools of Male' is a place where a huge proportion of adolescents from Maldives is accessible and can be a good population to target for tobacco control interventions.

5. Objectives:

To explore the factors affecting smoking among secondary school students of Male' Maldives.

6. You are invited to be a volunteer/subject to participate in the project:

Smoking of tobacco is injurious to health. It is a known cause of many detrimental effects to the human body, besides its impact on social and mental health of individual, family, society and the nation at large. You could be at risk of facing these consequences either directly or indirectly. Therefore you are invited to take part in this study by answering the self-administered questionnaire.

If you willingly agree to participate, please sign the informed consent and then fill up the questionnaire which includes your general information, knowledge, attitude and smoking behavior.

7. Period of time that you will be involved in this research activities

To fill up the questionnaire it is estimated to take not more than 25 minutes.

8. Expected benefits/ risks of the project to you and to others:

There is no direct benefit to the participants of this study. However, your contribution will help to explore, the factors affecting smoking in secondary school students of Male', Maldives. Hence, this study would provide a better understanding of the factors influencing the adolescents to initiate and maintain as smokers which will assist local anti smoking programs in setting priorities for future intervention efforts. Thus, the long term consequences of smoking can be prevented.

No Foreseeable risks are anticipated pertaining to the integrity of the participants of this study. However you might feel uncomfortable recalling past experiences and other personal matters; hence your decision, if not to attempt those questions will be respected.

9. Maintaining confidentiality.

The individual responses given by you will never be disclosed to anyone. All the questionnaires after completion will be kept in a place where no one can have access except the researcher. Codes will be used to identify the data collection forms with no link to the real identity of any of the participants. All the forms filled by the respondents will be destroyed after the analysis of data and writing the final report.

10. The right of the subject (he/she) to withdraw from the project.

The participation of this study is completely voluntary. You have the right to refuse, withdraw or skip answering any question at any time. The researcher will be available during the entire data collection period. You may ask any question to the researcher related to the study at anytime. Confidentiality and anonymity will be maintained throughout the process of data collection and thereafter.

11. Contact address of authorized persons in case of emergency.

Ms. Aminath Shafia

M. Nimsa

Fareedheemagu

Male', Republic of Maldives.

This research project is approved by the:

Ethical Review Committee for Human Research,

Faculty of Public Health, Mahidol University.

APPENDIX C

INFORMED CONSENT – PARENT

Project Title: Smoking among Secondary School Students of Male’, Maldives

Responsible person: Ms. Aminath Shafia
Student ID: 5438216
Program: Master of Public Health (International Program)
Faculty of Public Health, Mahidol University, Thailand

Date (day/month/year)

I (Mr./Mrs./Ms.).....
Home address..... Male’, Maldives

I have read and understood all statements in the **information sheet**. I have also been explained the objectives and methods of the study, as well as possible risks and benefits that may happen to myself and respondent under my guardianship upon the participation in the study. I understand that the information will be kept confidential and the respondents name will not be declared in any case. I shall be given a copy of the signed **informed consent form**.

I have the right to withdraw my child from the project at any time without any adverse effects upon myself or my child.

..... (Signature of respondent’s parent/ gurdian)

..... (Name of respondent’s parent/ gurdian)

..... (Signature of Researcher)

Aminath Shafia

..... (Signature of witness)

..... (Name of witness)

APPENDIX D

INFORMED CONSENT – STUDENT

Project Title: Smoking among Secondary School Students of Male’, Maldives

Responsible person: Ms. Aminath Shafia
Student ID: 5438216
Program: Master of Public Health (International Program)
Faculty of Public Health, Mahidol University, Thailand

Date (day/month/year)

I (Mr./Mrs./Ms.).....
Home address..... Male’, Maldives

I have read and understood all statements in the **information sheet**. I have also been explained the objectives and methods of the study, as well as possible risks and benefits that may happen to myself upon the participation in the study. I understand that the information will be kept confidential and my name will not be declared in any case. I shall be given a copy of the signed **informed consent form**.

I have the right to withdraw from the project at any time without any adverse effects upon myself.

..... (Signature of respondent’s parent/ gurdian)

..... (Name of respondent’s parent/ gurdian)

..... (Signature of Researcher)

Aminath Shafia

..... (Signature of witness)

..... (Name of witness)

APPENDIX E**CERTIFICATE OF APPROVAL FOR RESEARCH PROPOSAL**

Certificate of Approval
Ethical Review Committee for Human Research
Faculty of Public Health, Mahidol University

COA. No. MUPH 2012-045

Protocol Title : SMOKING AMONG SECONDARY SCHOOL STUDENTS OF MALE' , MALDIVES

Protocol No. : 29/2555

Principal Investigator : Ms. Aminath Shafia

Affiliation : Master of Public Health (International Program)
Faculty of Public Health, Mahidol University

Approval Includes :

1. Project proposal
2. Information sheet
3. Informed consent form
4. Data collection form/Program or Activity plan

Date of Approval : 9 February 2012

Date of Expiration : 8 February 2013

The aforementioned project have been reviewed and approved according to the Declaration of Helsinki by Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University.

S. Nantham

(Assoc. Prof. Sutham Nanthamongkolchai)

Chairman of Ethical Review Committee for Human Research

Phitaya Charupoonphol

(Assoc. Prof. Phitaya Charupoonphol)

Dean of Faculty of Public Health

APPENDIX F

APPROVAL OF RESEACH PROPOSAL

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



National Health Research Committee
Ministry of Health and Family
Male'
Republic Of Maldives

5th March 2012

Ms. Aminath Shafia
Male,
Republic of Maldives,

Approval of Research Proposal

Title of Study "Smoking among Secondary School Students in Male'
Proposal: Maldives."
Researcher: Ms:Aminath Shafia

Dear Ms- Aminath Shafia

The members of the Health Research Committee have reviewed your revised research proposal "To explore the factors affecting smoking among lower secondary school students."

The members of the committee after reviewing have approved the proposed study.

It is requested that the final report of the research be forwarded to the Ministry of Health and Family for future local reference and use.

Health Information Projects Monitoring and Evaluation
Ministry of Health and Family
(Secretariat of the National Health Research Committee)



BIOGRAPHY

Name	Aminath Shafia
Nationality	Maldivian
Date of birth	03. 04. 1977
Place of birth	S. Hulhudhoo, Maldives
Education	
1998 – 2002	Bachelor of Science in Nursing B.P Koirala Institute of Health Sciences, Dharan, Nepal
Working experience	
August 2002 – to date	Assistant Lecturer Faculty of Health Sciences The Maldives National University, Male', Maldives.
Sept. 1996 – July 1998	Tutor Trainee Institute of Health Sciences, Male', Maldives.
Permanent address	Shafeeuge S. Hulhudhoo, Maldives E-mail: amthshafia@hotmail.com