

**SMOKING BEHAVIOR OF STUDENTS IN PRIVATE HEALTH  
SCIENCE COLLEGES IN KATHMANDU VALLEY, NEPAL**



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**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF  
MASTER OF PRIMARY HEALTH CARE MANAGEMENT  
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Thesis  
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## SMOKING BEHAVIOR OF STUDENTS IN PRIVATE HEALTH SCIENCE COLLEGES IN KATHMANDU VALLEY, NEPAL

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### ABSTRACT

A cross-sectional study was carried out to ascertain smoking behavior of Health Science college students in the Kathmandu Valley, Nepal. Data were collected from January 26 to February 11, 2011 by using a structured questionnaire. The sample size was 218, which consisted of 89 males and 129 females.

Overall prevalence of smoking among the students in this study was 14.2%. Prevalence among male and female students was 83.87% and 16.12% respectively. Most (18.9%) of the smokers were in the age group above 22 years and the mean age of smoking was 20.8 years. Among the regular smokers 41.9% smoked at least one cigarette per day. Majority (77.4%) purchased cigarettes by themselves from shops or got them from friends (16.1%). The average daily expenditure on cigarettes was about 23 Nepalese rupees (about 0.3 USD). Majority (80%) of the students reported movies to be influential to smoking. However, most students smoked by the influence of friends (36.7%) who smoked. The results showed a significant association between smoking behavior and factors influencing the smoking behavior: sex ( $P$ -value $<0.001$ ); father's occupation ( $P$ -value  $< 0.05$ ); place of residence ( $P$ -value $<0.05$ ), and attitude level ( $P$ -value $<0.001$ ).

Smoking is prevalent among the college students and is a popular form of tobacco use. Colleges should conduct programs like counseling to stop smoking among the smokers and conduct health education and health promotion programs to prevent students from starting smoking. Rules and regulations on cigarette use should be enforced to discourage smoking by students. Parents should be role models to their children to prevent them from smoking. Anti-smoking programs should be implemented throughout the country in an effective way.

KEY WORDS : SMOKING BEHAVIOR / STUDENTS / HEALTH SCIENCE /  
COLLEGES

96 pages

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## LIST OF ABBREVIATIONS



AIDS	Acquired Immunodeficiency Syndrome
AIHD	Asian institute for Health Development
COPD	Chronic Obstructive Pulmonary Disease
DPRK	Democratic Peoples' Republic of Korea
GTSS	Global Tobacco Surveillance System
GYTS	Global Youth Tobacco Survey
HIV	Human Immunodeficiency Virus
IRB	Institutional Review Board
SEAR	South-East Asia Region
SPSS	Statistical Package for Social Sciences
TID	Tobacco Industry Demoralization
TTM	Trans Theoretical Model
WHO	World Health Organization

## **CHAPTER I**

### **INTRODUCTION**

#### **1.1 Rationale and justification of the study**

According to the World Health Organization (WHO), tobacco use will become the leading preventable cause of premature death, disease and disability around the world (1). Tobacco use in any form is the second major cause of death in the world. The growing death rate of smokers which is three to four times higher than that of non-smokers constitutes the evidence (2). Of the 4.9 million deaths worldwide annually, tobacco is estimated to be the cause of death. This may go up to about 10 million by the year 2020. If this trend continues, more than 70% of people in developing countries may die due to tobacco use (3).

Smoke inhaled from the processed and dried leaves of tobacco prepared in the form of cigarette is cigarette smoking. It is the nicotine contained in tobacco that make smokers feel relaxed, pleasant and satisfied fulfilling the addiction. Nicotine in most irregular smokers produces an active mental state improves memory and results in extreme pleasure. Metabolism disorders and loss of appetite are also side effects of nicotine (4). Despite these factors, people smoke for different purposes such as for fun, for ritualistic value, and in response to social pressure (5).

The trend of tobacco use is increasing in all age groups of men and women, as well as among rich and poor (7). The proportion of children and young people aged 11 to 15 smoking in England was 8% in 1988 and rose to 13% by 1996. 82% of such smokers later became adult smokers (6). Concern over the rise in the number of young people starting to smoke has been recognized in the policy initiatives of the UK government which has set targets to reduce smoking by children in England from 13% to 9% or less by 2010 (9).

Each day in the United States about 4,000 young people aged between 12 - 17 years experience cigarette smoking, of which 1,140 become daily smokers. Cigarette smoking has become more common among adults. People below the poverty

line (30.6%) are more likely to be involved in smoking than those who live at or above poverty level (20.4%). Now, the trend of smoking has been increasing in developing countries whereas it has been decreasing in developed countries. The demand for tobacco is increasing by 3.4% per year worldwide. Even in developed countries like Japan, 51% of people smoke (5).

It is said that one third of the world's smokers are in the western pacific region where in every single minute two people die from a tobacco related disease (5). In the United States, 23% of high school students are current smokers. Each year cigarette smoking causes about 1 of every 5 deaths (438,000 people). More people die from tobacco related diseases than from HIV, illegal drug use, or alcohol use. On the basis of the International Tobacco control Southeast Asia Survey conducted on certain selected characteristics 23.9 % of the 18 to 24 year age group are smokers. From this it is clear that adolescent group (age group between 18 to 24) is the most vulnerable group involved in smoking.

Out of 500 million smokers in Asia, in most Asian countries, more than 50% smokers are male and less than 5% are female. Moreover, the prevalence of woman smokers may drastically increase in coming decades because of promotion by multinational tobacco companies in Asia (5).

In Australia, 51% of men and 49% of women are daily smokers. The most likely age group to smoke is the young. Tobacco use is relatively high in low and middle income countries. As a result, rapid increase in the disease burden is expected high in China and India, where the use of tobacco has grown fast. If the current trend continues, about 2 to 3 million of people will die due to tobacco related diseases in China alone by the year 2020 (10). In the United States smoking by adults fell from 2% to 20.8% during the period 1965 -2006.

Similarly in the United Kingdom, the percentage of male smokers fell from 65% to 45% and that of female smokers from 45% to 34%. As a result, the rate of smoking is decreasing from 54% to 29 % among males and 36% to 24% among females in the United Kingdom. In Norway, smoking by males decreased from 53% to 42%. Likewise, in Canada smoking declined from 44% to 35%. 90 % of deaths due to lung cancer in Egypt are due to tobacco use. In 1995, 5,14,000 people died of lung

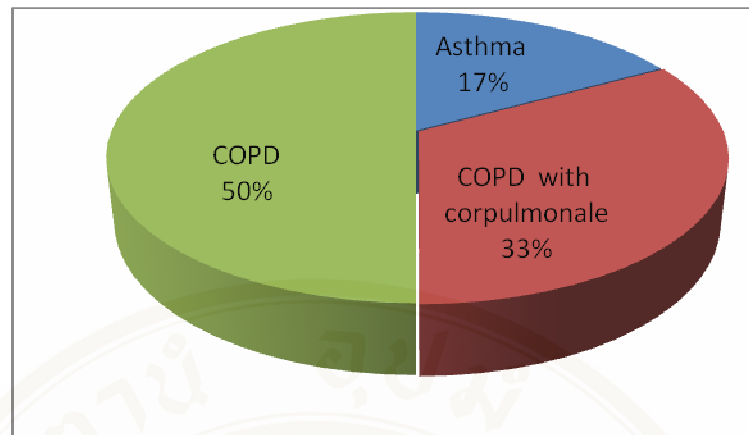
cancer and 6,25,000 deaths were due to heart and other vascular diseases as a consequence of tobacco use in the developed countries (10, 11).

Overall cigarette consumption per adult increased by 7.1% between 1970 and 1985 globally. The rate was lower than this in most industrial countries. However, there was a remarkable increase in per adult consumption by 42 % in Africa, by 24 % in Latin America, and by 22% in Asia during that period (11).

More than 4000 substances hazardous to human health are contained in tobacco, at least 43 are carcinogenic or toxic. Tobacco is responsible for a high rate of morbidity and mortality in the world. Thus, tobacco use is an important cause of non-communicable disease. From the current trend of smoking tobacco may be the leading cause of death worldwide, causing more deaths than HIV/AIDS, automobile accidents, homicide, and suicide combined (12).

Tobacco is responsible for 90% of lung cancer, 75% of chronic bronchitis and emphysema and 25% of ischemic heart diseases in men under 65 years, as well as for a number of other types of cancer (13). Tobacco may affects almost every organ of the human body causing cancer of oral cavity, bladder, pharynx, larynx, esophagus, cervix, kidney, lung, pancreas, stomach, and acute myeloid leukemia. It is said that every smoke cuts at least five minutes of life on average (14, 15).

In Nepal there is very little information about the impact of tobacco on health. Tobacco use has been one of the risk factors contributing to a high prevalence of pulmonary diseases in Nepal. Figure 1.1 shows that in a study conducted of ninety three patients in Dhulikhel Hospital, Dhulikhel, Nepal, about one half (50%) of the study group was suffering from COPD and of the remaining half, 33% were COPD with cor pulmonale, and 17% had asthma. The higher number of COPD patients was due to the majority of the patients (80%) being smokers. According to the study of the US Department of Health and Human Services, cigarette smoking is the most important factor that contributes to COPD globally. According to Sharon Parmet et al. smoking is responsible for causing about 80% to 90 % of COPD cases (54).



**Figure 1.1** Smoking and COPD

**Source:** Impact of Pharmaceutical intervention on Inhalation Technique, 2005. (54)

In Nepal smokers are more likely to be suffering from some major chronic diseases, such as cancers, strokes, heart diseases, COPD, etc. and they would be more likely to be needing more health services than non-smokers. About 14,000 deaths in Nepal (9,000 male deaths and 5,000 female deaths) are caused by of smoking.

Smoking prevalence worldwide is 29%. The overall rate in Nepal is 38.4%. Worldwide 47% men and 12% women smoke. But in Nepal this is 48.4% for men and 28.7% for females. This shows that the percentage of women smoking in Nepal is higher than in the world as a whole (44).

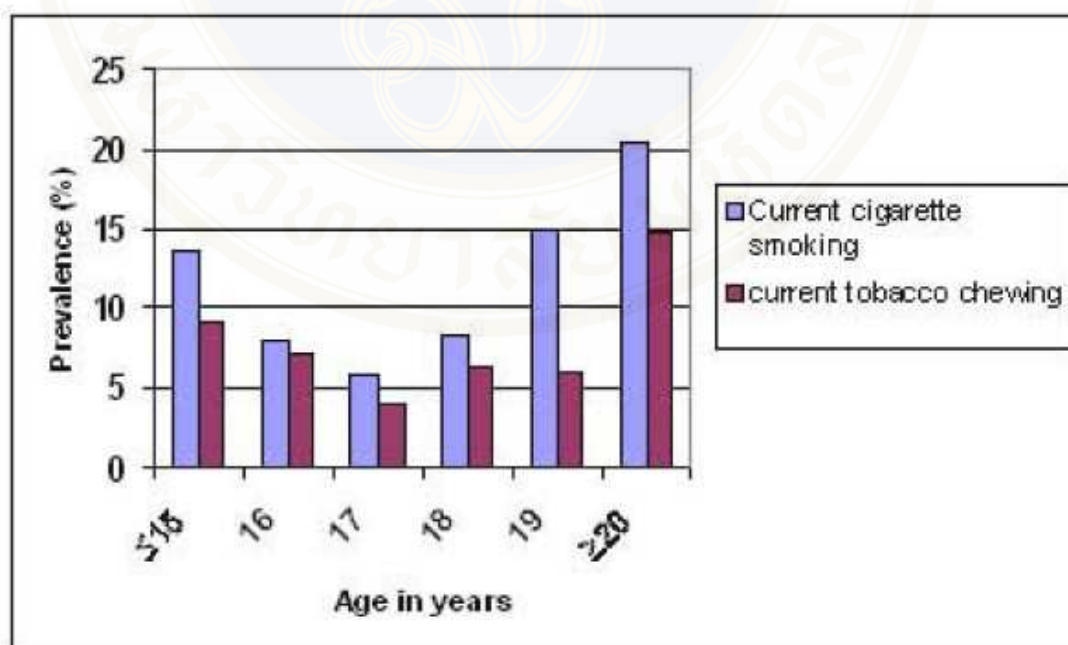
Table 1.1 shows that in a study conducted of 1590 junior college students in western Nepal, overall prevalence of 'ever users' of tobacco products was 13.9%, prevalence among boys and girls was 20.5% and 2.9% respectively. Prevalence of 'current use' of tobacco products was 10.2% (cigarette smoking: 9.4%, smokeless products: 6.5%, both forms: 5.7%) (21).

**Table 1.1** Prevalence of tobacco use (%)

Tobacco product	Male	Female	Overall
	Percentage (%)		
Ever used any tobacco product	20.5	2.9	13.9
Currently smoking cigarettes	14	1.9	9.4
Currently using chewable tobacco	9.3	1.9	6.5
Currently using both forms of tobacco product	8.2	1.5	5.7

**Source:** Prevalence and correlates of tobacco use amongst junior collegiates in twin cities of western Nepal, 2008 (21)

Figure 1.2 shows that majority of current users' of any tobacco product were 17 years or older. The prevalence of 'current users' increased after 17 years, the highest being among students who were 20 years or older. (21).



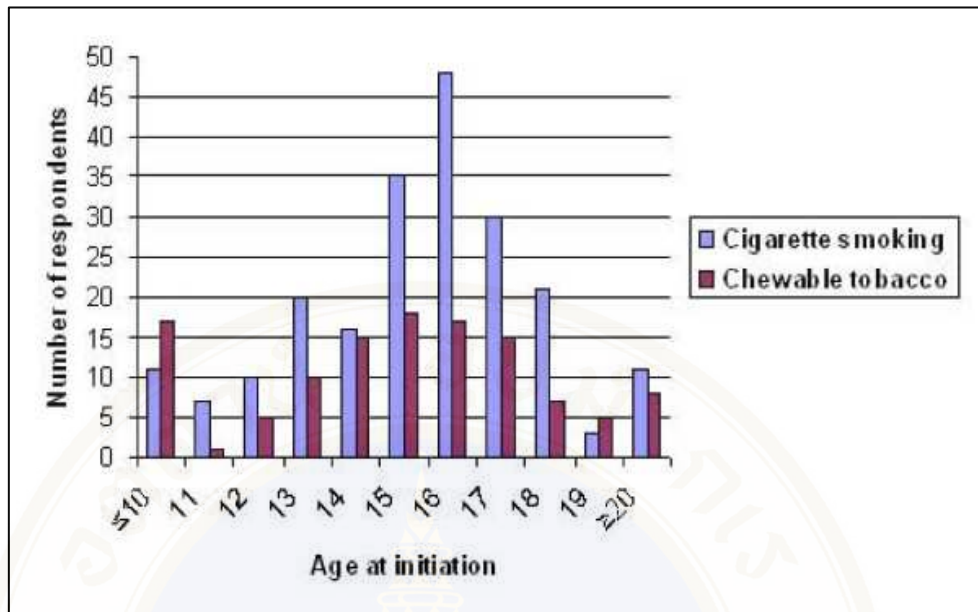
**Figure 1.2** Prevalence of tobacco use according to age in Nepal

**Source:** Prevalence and correlation of tobacco use amongst junior collegiates in twin cities of western Nepal, 2008 (21)

Mothers who smoke during pregnancy give birth to lower average birth weight infants than non-smoking women. A survey of 1997 conducted in Nepal shows that more smoking mothers gave birth to "small" (20.6%) and "very small" (3.3%) infants than non-smoking mothers. Only 15.2% and 2.2% non-smoking mothers gave birth to 'small' and "very small infants" respectively. It also shows more non-smoking mothers give birth to normal (57.7%) and big babies (24.9%) than smoking mothers who give birth to only 52.6% and 23.6%, normal and big babies respectively (44).

The Government of Nepal/UNICEF survey of 1997 also shows more smoking mothers give birth to dead infants (2.7%) than the non-smoking mothers (2.1%). Similarly, a lower percentage of infants of smoking mothers (95.4) survived. The survival rate of infants of smoking mothers is lower than infants of the mothers who did not smoke during pregnancy (96.2%). Besides this, smoker mothers experience a high risk of neonatal deaths, and sudden infant deaths (44).

In Nepal, the cause of death due to chronic non-communicable diseases was 42% (16). This rate may be due to about 48% of smoking prevalence in males and 28% in females aged 18 years and above (17). In the mountain region, the prevalence of female smoking was 71.6%. Studies conducted in Nepal have found that prevalence of smoking as high as from 20% to 72% in different parts of Nepal (18, 19). A study from eastern Terai (plain land region of Nepal) showed that 12.9% women smoke cigarettes and 14.1% use smokeless tobacco (19). The GTSS collaborative group has reported that tobacco use (both cigarette and smokeless tobacco) by those aged 13-15 years is high, and has emphasized that anti-smoking programs are necessary for the prevention of initiation and to promote cessation of tobacco among current users (20). The GYTS, Nepal has reported a prevalence of 16.3% for all forms of tobacco use among the high school students of the central region (21).



**Figure 1.3** Age at initiation of tobacco use in Nepal

**Source:** Prevalence and correlation of tobacco use amongst junior collegiates in twin cities of western Nepal, 2008 (21)

Figure 1.3 shows age at initiation of tobacco use. Majority of ever smokers, and ‘ever users’ of chewable tobacco had initiated between the ages 12 and 18 years. A few percent of ever smokers, and ever users' of chewable tobacco had initiated before 15 years of age.

Although it is widely known that smoking is not good for the health, many smokers do not quit smoking. One major cause for their not quitting smoking is their love of smoking. That is actually a misconception because the real reason is that they do not like not smoking.

Several highly toxic chemicals enter into the human body through smoking. Nicotine is one of the major content of cigarettes. As it is addictive in nature it makes the smoker addicted to it. Nicotine is running through the blood stream of smokers. When the level of nicotine decreases in a smoker's blood, he/she will become tense. The smoker needs continuous doses of nicotine in his/her blood to behave normally. When the level of nicotine decreases, the smoker would immediately smoke. After smoking, the level of nicotine becomes normal and smoker would be automatically normal. This is the only cause for smoking. Nicotine should be

consumed up to a limit. The exceeding limit of nicotine content in the body can do serious harm to it. A successful smoker is one, who is able to manage the content of nicotine (51).

Knowledge of smoking-related illnesses is high with regard to some of the well-known risks of smoking (i. e. heart disease and pulmonary disease). Although knowledge of premature deaths was high among smokers, perceived risk of diseases like disability was much lower. Knowledge was associated with perceived risk about different categories of diseases. Age, education, race, sex and previous history of disease, and overall general health were also important predictors of perceived risk for various smoking-related illnesses (52).

In the study towards smoking policies and tobacco control measures in relation to smoking status and smoking behavior, 2006, more than half the current and former smokers stressed smoking policies and tobacco control measures concerning penalties, such as fines for sales to minors, and banning on promotive actions as advertising on tobacco. But about half of them disagreed about increasing taxes on tobacco, and against refusing medical care to smokers (53).

Young People of colleges are often targeted by the tobacco industry for marketing. Moreover, college age is a transition period and students are vulnerable to tobacco addiction. Colleges need tobacco control programs. Studies about tobacco use among higher college students in Nepal are lacking. Studies about awareness and knowledge of the health hazards of smoking are also lacking. Moreover, previous studies including GYTS, Nepal and The World Bank has studied about tobacco use and its correlates among junior college students in western Nepal but have not explored the factors determining tobacco use behavior by higher college students. This study identified various predisposing, enabling and reinforcing factors which determined tobacco use by the junior college students (21). Identification of such factors may be useful to formulate policy interventions needed towards behavior change to prevent and control tobacco use by college students. In order to study the smoking behavior by higher college students, this study was carried out with the objective to ascertain the smoking behavior of Health Science College students in the Kathmandu Valley, Nepal.

## **1.2 Research questions**

**1.2.1** What is the prevalence of smoking by students in Private Health Science Colleges in the Kathmandu valley, Nepal?

**1.2.2** What are the factors related to smoking behavior of students in Private Health Science College in the Kathmandu Valley?

## **1.3 Research Objectives**

### **1.3.1 General objectives**

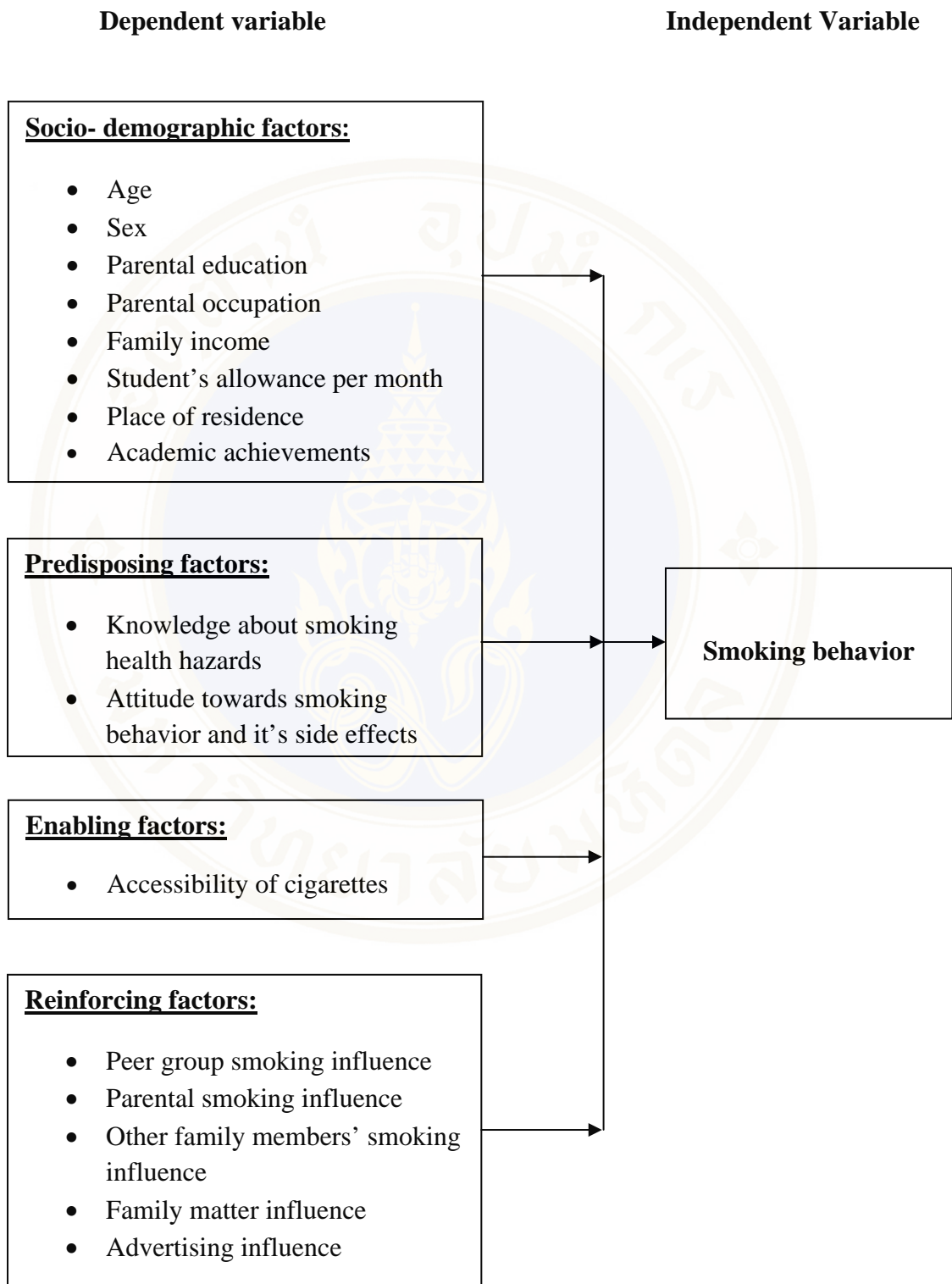
To ascertain the smoking behavior of Health Science College Students in the Kathmandu Valley, Nepal.

### **1.3.2 Specific objectives**

1.3.2.1 To examine the prevalence of smoking by Health Science College students in Nepal.

1.3.2.2 To identify the factors influencing smoking behavior of the students.

### 1.4 Conceptual Framework



In this study the conceptual framework was the **PRECEDE-PROCEDE** model. The model was first introduced by Lawrence Green and Kreuter in 1999 and composed of predisposing factors, enabling factors, and reinforcing factors as set in the conceptual framework. Predisposing factors include a person's knowledge, attitude, beliefs, values and perceptions that stop motivating for change.

Enabling factors include the availability, accessibility, and affordability of community resources which facilitate the performance of action. Reinforcing factors include social support, peer pressure, family, teachers, neighbors and other persons support etc. As the appropriate variable that will allow the researchers to support and drive from the study findings, how smoking behaviors among target population can be changed to suit the National and International demands or to achieve the goal on smoking reduction and prevention program.

In previous studies on smoking behavior Trinch C. (47), Kailawadoko S. (43), Thapa K. (42), Nurdin, (22) and Win T. (45) also applied the Precede-Proceed model. This model provides a framework for also developing a project focused on the smoking behavior of Bachelor of Health Science students in the Kathmandu valley, Nepal. The model serves as a device to identify the variables and the predisposing, enabling, and reinforcing factors that motivate students smoking.

## 1.5 Operational definitions

### 1.5.1 Dependent variable:

**Smoking behavior:** Refers to the characteristic behavior that is measured by type of smoking behavior and pattern of smoking behavior. It is classified into two groups as follows: **current smokers** and **non-smokers**. **Current smokers** are those who smoke regularly or occasionally regardless of the number of cigarettes they smoke per day or per month at the time of interview. **Occasional smokers** are those who do not smoke daily. **Regular smokers** are those who smoke daily regardless of the number of cigarettes they smoke in a day. **Non-smokers** are those who had never smoked before in his or her entire life. **Ex-smokers** are those who had smoked in the past but completely stopped smoking/quit smoking at the time of interview.

### 1.5.2 Independent variables

#### **Socio-demographic factors: includes**

**Age** refers to the age of students.

**Sex** refers to the gender of students.

**Parental education** refers to the education of father and mother of students.

**Occupation of parents** refers to the type of work adopted by the parents of students. That may be;

1. Agriculture
2. Private business
3. Government employment
4. Confined to household cores
5. Others

**Family income** refers to the average earning of parents per month.

**Allowance/month** refers to the amount of pocket money that respondents receive from their parents per month.

**Place of residence** refers to the place where students live at the time of interview. They may stay at;

1. Condominium
2. Dormitory
3. Relative's house or in own home
4. Rented room
5. Hostel

**Academic achievements** refers to the academic performance of students.

#### **Predisposing factors:**

**Knowledge** refers to the extent of respondents' understanding about the health hazards of smoking.

**Attitude towards smoking** refers to how the respondents feel about the significance of the negative and positive effects of smoking.

**Enabling factors:**

**Accessibility** refers to how easily respondents can obtain cigarettes.

**Reinforcing factors:**

**Parental smoking influence** refers to the influence of smoking behavior of parents of the respondents on their children.

**Peer groups smoking influence** refers to the influence of friends, classmates, room-mates and close friends who smoke on the respondents.

**Other family members' smoking influence** refers to the influence of existing smoking behavior of family members of the respondents on the respondents.

**Family matter influence** refers to the influence of problems relating to socio-economic and other problems in the family of the respondent.

**Advertising influences** refers to the influence of advertising popular brands of cigarettes by famous celebrities on the respondent.

**Health science colleges** refers to the colleges which deal with the study of subjects related to preventive and promotional health.

**Bachelor of Health Science** refers to the three/four year course on Health Science after completion of three years course in health science (Proficiency level, that is known as diploma in Nepal) or 10+2 level in science.

**1.6 Limitation of the study**

This study had some limitations. As the method of interview was self reporting, some students may have under reported their tobacco use. Moreover, existing norms about smoking by girls might have caused some female students hesitate admitting that they smoked. Some students who were smokers might have been absent from the college on the day of survey. They could not be interviewed. The study was carried out on students of bachelor level students at health science colleges in the capital city only. So the results do not necessarily represent the other cities of Nepal.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 Smoking in the World**

Tobacco smoking is one of the chief causes of death and illness in the world. Of the more than 4000 harmful substances contained in tobacco at least 43 are carcinogenic or toxic to human health. Every year about 5 million people die from tobacco use, most of them from developing countries. If the current trend of smoking continues in the world, smoking will cause more deaths than HIV/AIDS, suicide, homicide, and vehicle accidents (12). Smoking by young people was increasing in developing countries than in developed countries. In America from 1960s to 1990 the rate of smoking started to decline and fell by 23% among adults in 1997. However, the consumption of tobacco is growing by 3.4% per year in the developing countries.

Young teens aged between 13 to 15 constitute about one in five smokers. Worldwide, about 50% of children aged between 13 to 15 years are from Asia who starts smoking every day. The curiosity of young teens leads them to constitute one in five smokers in the world. About 15 billion cigarettes are sold daily in the world. In 2000-2007, the Global Youth Tobacco Survey (GYTS), found that students aged 13-15 years, were likely to be exposed to smoking by advertising on the bill boards, newspapers, magazine promotions and sponsorships (25).

The survey conducted by the Youth Risk Behavior by center for Disease Control and Prevention showed that the rate of smoking increased by one third from 1992 to 1997. From 1992 to 1996, the daily smoking rate of the students in the tenth grade increased from 12.3% to 18.3%. However, the rate of smoking among eighth, tenth, and twelfth grade students declined in 1997. The study conducted in the University of Brazil and around the world showed that the smoking habit is acquired early. The findings of the studies showed that the global tendency of smoking was increasing among the University students (26).

Though mass-manufacturing of cigarettes was started only after the 19<sup>th</sup> century, its use became wide scale in a short period. Recent data shows that of the 1.2 billion smokers worldwide about 82 % live in low and middle-income countries (44).

## **2.2 Smoking in South-East Asia**

The WHO South-East Asia Region (SEAR) comprises of 11 countries: Bangladesh, Bhutan, Democratic People's Republic of Korea (DPRK), India, Indonesia, Maldives, Myanmar, Nepal, Srilanka, Thailand and Timor Leste. The population of the region was 1,536 billion in 2000 which was about 25.35% of the world's population. Of these countries, half are developing countries and the other half fall into the category of the least developed countries. India, Indonesia, Bangladesh and Thailand are among the top 20 tobacco-producing countries in the world. The production of cigarettes has increased in India, Indonesia Bangladesh, and Myanmar, while it has declined in Srilanka and Thailand. In Nepal, it has remained constant in the last ten years. Recent data about DPRK is not available (27).

**Table 2.1** The prevalence of tobacco use in the South-East Asia Region (SEAR)

Country	Year	Adult Tobacco prevalence	
		Current Any Tobacco Smoking Male	Tobacco Smoking Female
Bangladesh	2004	47.0	3.8
Bhutan	-	-	-
DPRK	2002	58.6	-
India	2005	33.1	3.8
Indonesia	2004	65.9	4.5
Maldives	2001	44.5	11.6
Myanmar	2003	46.5	13.6
Nepal	2006	34.8	26.4
Srilanka	2003	30.2	2.6
Thailand	2004	39.8	3.4
Timor	-	-	-

**Source:** MPOWER-WHO Report on the Global Tobacco Epidemic, 2008 (25)

The table above shows the prevalence of tobacco use in the South-East Asia Region (SEAR) Countries (25). The South-East Asia Region has around 325 million young people aged between 15 and 24 year. The tobacco industry targets young people in general, and young females in particular, through advertising, promotion and sponsorship of tobacco products.

Marketing strategies of cigarette companies influence young people to use tobacco products. Traditionally women of this region do not use tobacco but there is a growing tendency for young girls to use tobacco (28).

### 2.3 Tobacco use and smoking prevalence in Nepal

Tobacco smoking products in Nepal are cigarettes, bidi, Hukka and chilim or kankad. The smokeless tobacco products (STPs) are surti leaves, khaini, gutkha, pan with tobacco ingredients. The traditional forms of smoking such as Kankad/sulfa/chilim and Hukka are no longer in use because many cigarette brands are cheap and easily available in any shop throughout the country. It is believed that cigarette smoking raises status in the society. In the past, many farmers grew tobacco for their own consumption, but the survey shows that the practices do not exist these days. The 2000 Smoking Behavior Survey found only about 0.15% households producing tobacco for home consumption (44).

Smoking tobacco is common in Nepal regardless of age and sex of people. In Jumla, a high mountain district, the prevalence of smoking by males aged 20 years and over was found to be 84.7% and 71.7% for females.

In the mid hill areas like Sundarijal and Bhadrabas villages smoking prevalence by males was 78.3% and by female was 58.9%. In the Terai areas like Parasauni (Bara district) smoking prevalence rate was the lowest, males 62.8%, and females 48.4%. The Kathmandu urban sample showed high male smoking prevalence 64.6% while among the females it was estimated at 14.2%.

A national survey conducted in 2000 of 4,889 respondents of 10 districts showed that 42.6% all respondents aged 15 and above had smoked some time. The proportion of males who had smoked was 54.0% and females was 31.6%. The survey also inquired about the reasons for starting to smoke. The majority of respondents (52.5%) who had smoked did so because of influence from friends.

The second most important reason for smoking was the influence of parents or other senior family members who smoked. Family influence appears to be more prominent among females (23.7%) than among males (15.9%) in encouraging people to smoke. Other reasons cited were personal inquisitiveness (7.7%), one's own interest to smoke (7.9%), worry (4.8%) and the influence of siblings (0.7%). Some 4.5% of woman started to smoke because their husbands encouraged them (44).

Based on the above data the overall prevalence of tobacco use by adults (aged 15 and over) including products such as cigarettes, *bidi*, *hukka*, *sulfa*, *chilim*,

*kankad*, rolled-on-tobacco, chewing tobacco (*khaini*, *pan masala*, *gutkha*, *surti*, etc.) was 44.7% and it was almost twice as high among males (58.1%) compared with females (31.6%). The survey of 2002, showed that in Nepal there were 6.4 million tobacco users (4.1 million males and 2.3 million females) and 5.5 million smokers (3.4 millions males and 2.1 millions females). The prevalence of overall tobacco use was higher in rural areas (45.8%) than in the urban areas (34.4%). Relatively few women used tobacco products in urban areas (19.9%) compared with rural areas (32.9%).

## 2.4 Health effects of smoking

Tobacco contains nicotine, which is addictive in nature. Nicotine causes dependence in users making its use compulsive, despite the desire and repeated attempts to quit. Nicotine from smoke reaches the brain rapidly, within a few seconds of inhaling (44).

There are some 4000 chemicals in tobacco smoke; at least 43 are of which are known to cause cancer in humans. Tobacco smoke can affect smoker and non-smokers alike to its harmful effects. According to the International Labor Organization, 200,000 workers die every year due to exposure to second-hand tobacco smoke at work. Not only workers, but also children can be the second hand smokers. WHO estimates that around 700 million children worldwide breathe air polluted by tobacco smoke (25). Women who smoke during pregnancy have more chances of losing the fetus through spontaneous abortion (44). Tobacco causes about 5 million premature deaths each year. It is even worse for chronic smokers whose chances for dying prematurely are 50% greater. In 1912 American Dr. Isaac Adler was the first person to suggest the relationship between smoking and lung cancer. The survey conducted on smoking in developed countries showed that 90 to 95% of lung cancer, 30 to 35% of all cancer deaths, 80 to 85% of deaths by chronic obstructive airways, and 20-25% of deaths due to cardiovascular disease are directly related to smoking (25).

It takes a long time for a disease to appear due to exposure to smoke. Studies have shown that tobacco-related diseases take at least 40 years. The major chronic diseases caused by tobacco use are lung cancer, cancer of the mouth,

oesophagus, larynx and pharynx, ischaemic heart disease, cerebro-vascular disease and chronic obstructive pulmonary disease (COPD – this is primarily chronic bronchitis and emphysema). Consumption of *gutkha*, *khaini*, *surti* (dry tobacco leaves), *pan masala*, *supari*, *pan parag* and similar smokeless tobacco products cause mouth, throat and digestive tract cancers (44).

The health risk is not the same for all smokers, but depends upon the amount smoked. Data regarding smoking has shown that those who smoke less than 10 cigarettes a day increase 40% mortality rate, by 70% mortality rate in those person who smoke 10 to 19 cigarette a day, by 90 percent mortality rate in those persons who smoke 20 to 39 cigarette in a day and the person who smoke 2 packets or more in a day by 120 percent mortality rate (2). Only 100% smoke-free environment provides effective protection. A smoke free environment is an ideal condition which is widely supported by both smokers and non-smokers (8).

## 2.5 Public health problems

The major cause of premature deaths in industrialized countries is related to tobacco. A study in China showed that about 1/3rd of the male population will have short life span due to smoking and in the United States about 500,000 deaths per year are related to smoking.

To prevent people dying from smoking, many government department and agencies worldwide are holding anti-smoking campaigns. Second-hand smoking is a major public health problem. So, majority of people have view that smoking should be banned in public places such as bars, pubs, and restaurants. This may be the one way of discouraging people to smoking in enclosed public places. Many states have passed laws against selling tobacco products to under age customers (30).

Another effective way to reduce problems due to smoking is to set rules to make homes 100% smoke free zones. In 2003, 72 % of U.S households had smoke free home rules. Scotland had achieved a 17% reduction in hospital admissions for coronary diseases after banning of smoking in enclosed places in 2006. In countries

where there is a public health system, when smoker become ill the society covers all the costs of medical care by increasing taxes.

According to Albers et al., a ban on smoking should start at the home. According to them, only a ban at home can discourage adolescents from beginning to experiment with cigarettes. Then survey conducted between 2001 and 2002 showed that if there is no complete ban of smoking in households, it is considered that adult smoking is socially acceptable. This finding also suggested that smoking bans in the home can promote anti-smoking norms and also discourage adolescents from experimenting with smoking (30).

In 2006, about 3.7 million men and 1.4 million women suffered premature deaths due to tobacco related diseases, including cardiovascular disease, lung cancer, and respiratory illness. Over half of these deaths were in lower middle- income countries.

There is an argument that the health care burden on the general population is increasing at a high rate (10). Tobacco smoking affects the economic and social burden on communities: it decreases in productivity of land due to tobacco cultivation; increases the health care burden; it causes premature deaths and illness in economically productive age group; and it results loss of foreign exchange due to smuggling (31).

Between 1970 and 1995, there was increase in per capita cigarette consumption in the developing countries by 67%, while it was dropped by 10% in the developed countries. 80% of smokers now live in the developing countries. According to the WHO by the year 2030, 10 million people will die due to tobacco related diseases worldwide each year. According to the study of British doctors, people who stopped smoking before they reached at the age of 30 live almost as long as the people who never smoked. The adverse effects due to tobacco use can also be decreased by reducing frequent smoking and by proper diet and exercise. According to research the damage caused by smoking tobacco can be minimized by the use of antioxidants (10).

## **2.6 Legal rules and regulations and regulations against smoking**

The Framework Convention on tobacco control of the WHO took place on February 27, 2005. It was the world's first public health agreement for setting minimum standards for tobacco control policies between the countries. It will help to eliminate passive smoking in public places, transportation, indoor work places, and other public places. There should be legislation against selling tobacco products to minors. In countries such as the United States, most European Union member states, New Zealand, Canada, South Africa, Australia, India, and Brazil there are minimum smoking ages and it is illegal to sell tobacco products to children. Similarly, the Netherlands, Belgium, and Denmark have an age restriction making it illegal to sell the tobacco to the children under the age of 16. But in China, Turkey and many other countries children are forced to buy tobacco by their parents (10).

In many countries government has set the rules such as imposition of heavy taxation on cigarettes to decrease the consumption of cigarettes. Evidence shows that raising the price of cigarettes helps to lower overall cigarette consumption. Many countries, including Russia and Greece, allow bill boards for advertising the use of tobacco. Tobacco smoking is advertised in special magazines, in gas stations and stores, and during sport events (10).

All television advertising of tobacco products has been banned in the United States since 1917 and in Australia since 1992. These countries extended this ban to other media such as the internet, print media, and radio in 2005. Since 14 December 1998, The GON (Government of Nepal) has partially banned advertisements of tobacco products. It has banned the advertisement of tobacco products on the electronic media (radio and television). Different countries of the world have adopted their own ways to make people aware of health hazards of smoking. The actual effectiveness of tobacco advertising is widely documented. The public health expert, Henery Saffer, argues that the tobacco advertisement increases the consumption of cigarettes. It is suggested that tobacco advertising has a significant effect on smoking, especially for children (10).

The tobacco industry has now changed its strategy for advertising in the last 30 years. More than half of the expenditure goes on the promotional allowances

and items, such as t-shirts, key rings or lighters for young people. Only 10% of expenditure goes on print and outdoor advertisements (15).

Tobacco companies manipulate youth to think smoking is cool, or use athletes and invest in sports sponsorship to sell cigarettes to young people. On the other hand, in order to reduce the health hazards of smoking, efforts have also been made on smoking cessation, prevention, and protection from second hand smoke. Tobacco Industry Demoralization (TID) which is a public health strategy has tried its best to inform and make the public aware of the role of tobacco companies. The focus of TID is not only on asking smokers to change their smoking habit, but on increasing public awareness about the role played by the tobacco companies as they target the youth (32).

## **2.7 The national anti-tobacco use program of Nepal**

Nepal's Ministry of Health's (MOH) national anti-tobacco program goal is to reduce the consumption of tobacco products so that morbidity and mortality resulting from tobacco consumption are decreased. In order to attain this goal the MOH's anti-tobacco program objectives are to: formulate and implement anti-tobacco policies; design and implement anti-tobacco community education to reduce the prevalence of smoking; and to conceptualize, produce and disseminate anti-tobacco mass media (audio, audio-visual, print and inter-personal). In Nepal, tobacco products are levied excise tax for two reasons. One is to raise revenue and the other is to discourage consumption. The first policy appears to be the requirement of putting warning labels on tobacco-product packaging and advertising. Every cigarette package carries a health warning as follows: "Smoking is injurious to health". Since 11 July 1993, a health tax of one paisa (one hundredth part of a Nepalese Rupee) per stick of cigarette has been levied. The revenue generated from this tax is deposited in a separate account and is spent on activities relating to the prevention and treatment of cancer, tuberculosis and other diseases.

This was the first time that a cigarette tax was levied in Nepal. The Government of Nepal (GON) decided that 75% of the health tax on cigarette should go

to B.P. Koirala Memorial Cancer Hospital in Chitwan and 25% should be spent on the prevention of tuberculosis and other diseases. The health tax on cigarettes was doubled in the following year, July 15, 1994, and, since then, it has not been raised. MOH produces print, audio and audiovisual materials with the objective of educating audience about the harmful effects of tobacco use. Every year, on 31<sup>st</sup> May, World No-Tobacco Day is observed. MOH periodically organizes workshops, forums and talk programs focusing on the harmful effects of tobacco products. After observing the World No Tobacco Day on 31<sup>st</sup> May 1992, The GON passed a resolution effective from 1st June 1992 banning smoking in the public places. Since 14 December 1998, The GON has partially banned advertisements of tobacco products. It has banned the advertisement of tobacco products on the electronic media (radio and television), and levies import and export taxes on tobacco products. However, often there is news about smuggling various products, including tobacco products, across the borders of Nepal. People who import tobacco products into the country without paying VAT are fined.

## **2.8 Literature regarding smoking behavior**

Bloomquist (56) defines health behaviors as actions that provide individual and societal well-being through promoting harmonious interaction of body, mind, and spirit. According to Mathre (56), smoking behavior clearly does not promote the health of the individual or society. Indeed, one in six deaths in the United States are attributed to cigarette smoking. Further, approximately 434,000 deaths per year are associated with complications arising from the negative effects of cigarette smoking on the body. The health consequences arising from smoking not only affect the individual but society as well. In this regard, reports say that diseases and health problems directly generate \$22 billion per year in health care costs and \$43 billion per year in lost productivity.

Based on findings, a model of smoker motivation was developed which suggested that both pharmacological and psychological factors contributed to habit maintenance. Three basic motivational types of smokers were identified: (1) high-stress smoker for whom smoking is a secondary activity and who rely on smoking to

form a minor distraction from their current task; (2) low-activity smokers who wish to act or change their current affective state in some way and who rely on pharmacological factors; and (3) neutral relaxation smokers for whom smoking as a pleasurable activity in its own right (56).

Behavioral scientists have made great progress in defining the phenotype in describing individual differences in smoking behaviors. Molecular biologists have made great progress in identifying an array of nicotinic receptors, the genes involved and their locations, and other neuro-chemicals (particularly dopamine) that may be involved in regulation and activation of nicotine related behavior. Swan et al. analyzed more than 20 studies of smoking behavior in monozygotic and dizygotic twins. They found consistent evidence of genetic influences governing the developmental stages of smoking (initiation, maintenance, cessation), smoking intensity (light to heavy), as well as for level alcohol consumption (57).

The stages of smoking behavior can be broadly categorized into 3 stages: initiation, maintenance, and cessation (34). In the initiation stage, smoking uptake usually occurs during adolescence, while most of smoking-related deaths occur in middle-aged and elderly people. The longer the onset of smoking is delayed, the less likely a person is to become addicted (35). In most cases, experimental smokers progress towards regular daily use because they have already been addicted to nicotine contained in cigarettes. They are therefore entering the stage of maintenance, which usually lasts many years (34).

Adolescence is a period of exploration. It is natural for teenagers to experiment with smoking, just as they do with other adult behaviors. They spend most of their time with their families and friends at school. Therefore, family smoking patterns and peer members play a role in predisposing adolescents to use cigarettes. Beyond family and peer factors, curiosity also plays an important role in experimental smoking (37). Those who have experimented with smoking may become regular smokers if they have friends who smoke. Low socio-economic status in childhood also plays roles in practicing regular smoking and is associated with a reduced likelihood of smoking cessation (35). Compensating for poor achievement, loneliness, broken homes, and other unstable conditions in their lives also play a role in some children becoming regular smokers (37). Social and environmental factors like failure of social

organization (loneliness) and poverty also plays an influencing role on smoking in the lives of many people (38). A relationship has been identified between lower self-esteem and physical self-perception in smoking initiation in youth. In addition adult and scholastic competence, locus of control, socialization, susceptibility to peer influence, and risk-taking are also factors associated with the initiation of smoking behavior (33). Subsequently, some smokers who perceive the advantages and disadvantages of cigarette smoking will later on progress into the cessation process. There are five stages: 1. Pre-contemplation, 2. Contemplation, 3. Preparation, 4. Action, and 5. Maintenance, in the cessation stage, as explained by Tran Theoretical Model (TTM) proposed by Prochaska (36).

Beti et al. found that people who adopt smoking were also found to be influenced by factors such as physical addiction, smell and taste of tobacco. Heavy smokers support is a mechanism to overcome stress, defuse anger, get relief from physical symptoms of disease and have mental peace. Some people also adopt smoking as a result of social pressures from tobacco companies and family members who smoke; they are heavily influenced by their social environment. Once a person has become a current smoker, it is very much difficult to give up smoking. In general, heavy smokers face great challenges to quit smoking. So, they need help from various sectors. The most important sector is the social environment to quit smoking. Support from family and friends plays a vital role that makes it easier for them to quit smoking. But many people continue smoking for the fear that their physical health could suffer if they quit smoking. The study shows that, in reality, heavy smokers are highly addicted to the nicotine both physically and emotionally, and depend on the tobacco and its products. Many factors such as media, cultural and societal acceptance, and tobacco's addictive capacity make it difficult for smokers to quit (41).

The survey conducted by National Level Youth in 5 countries shows that 38% in Indonesia, 33% in Thailand, 30% in Taiwan, 28% in the Philippines and 12% in Nepal, males smoke but the prevalence among woman is very low. In countries like the Philippines, and Indonesia, the attitude of parents about smoking is permissive for their sons but not daughters. Parents who have close relationships with their children are less likely to expose them to smoking. The survey also reported that countries like

Nepal and Indonesia have a system of early marriage, so early marriage might affect smoking prevalence (33).

Naing et al, considered smoking behavior of male adolescents in Malaysia. They found that the reasons to start smoking were following friends, feelings of maturation, enjoyment, following parents, relaxation in free time, and feeling that smoking is a normal behavior for men. In most cases, the reason for non-smokers not smoking was religion, parental influence, health protection and financial reasons. Smokers had relatively poor academic performance compared to non smokers. Thambypillai found that the prevalence of smoking among secondary school boys in an urban school in Kuala Lumpur, Malaysia, was 17.0%. In Saudi Arabia the prevalence of smoking among secondary school boys was 17% while in China it was 2.24%. A study of the Surgeon General of United States found that peer influence was the major reason for starting of smoking. This type of relationship between smoking and peer influence was also found in junior and senior high school students in China. Studies of students in Japan and Spain have shown that the smoking rate of school students is strongly related to having a friend who smokes (40).

## **2.9 Theoretical model**

### **2.9.1 PRECEDE-PROCEED model**

The PRECEDE-PROCEED model was designed by Lawrence Green (1991) and Marshall Kreuter (1999) to provide a comprehensive structure for assessing health and quality of life needs, designing, implementing, and evaluating health education and health promotion programs. PRECEDE stands for Predisposing, Reinforcing, and Enabling Constructs in Educational Diagnosis and Evaluation, which is meant to outline a diagnosis planning process. PROCEED stands for Policy, Regulatory, and Organizational Constructs in Educational and Environmental Development, which is meant to guide implementation and evaluation of programs planned according to the PRECEDE process. Therefore, PRECEDE and PROCEED function in a continuous cycle (58).

PRECEDE has five phases which are diagnostic.

1. Social diagnosis; to determine people's perceptions of their own needs and quality of life in order to understand the target community by conducting multiple data collecting activities.

2. Epidemiological diagnosis; to determine which health problems are most important for the target group by conducting secondary data analysis.

3. Behavioral and environmental diagnosis; to assess factors that contribute to the health problem under consideration, including behavioral factors related to behaviors or lifestyles of the individuals at risk, and environment factors which are external to the individuals and often beyond their control.

4. Educational and organizational diagnosis; to identify the antecedent and reinforcing factors that must be in place to initiate and sustain the behavioral and environmental change process.

5. Administrative and policy diagnosis; to identify policies, resources, and circumstances prevailing in the organizational context that could facilitate or hinder the program implementation.

PROCEED has four phases including implementation and evaluation.

1. Implementation; to implement the health promotion program

2. Process evaluation; to determine the extent to which the program was implemented according to protocol.

3. Impact evaluation; to assess change in predisposing, reinforcing and enabling factors, as well as in the behavioral and environmental factors

4. Outcome evaluation; to determine the effect of the program on health and quality of life indicators.

Predisposing factors; antecedent to the particular behavior by providing rationale or motivation for people to undertake the behavior, including knowledge, attitude beliefs, personal preference, existing skills and self-efficacy beliefs.

Enabling factors; antecedents to the behavior making it possible for a motivation to be realized, that is affecting behavior directly or indirectly through an environmental factor, including available resources, supportive policies, assistance and services.

Reinforcing factors; following the behavior, providing continuing rewards or incentives for reception or persistence of the behavior, including social support, praise, reassurance, symptom relief, peer influence and various reinforcement.

## **2.10 Literature regarding independent variable**

### **2.10.1 Socio-demographic factors**

#### **Age**

Studies of (46), have found that age is the most significant determinant of particular quality of a person. Trinch C. (47), Kailawadoko S. (43), and Win T. (45) found no significant association between age group and smoking behavior. However, Thapa K. (42) showed an association between student age and smoking behavior.

The health consequences and deaths caused by smoking are not only due to smoking behavior and the demographic factors associated with smoking. They are associated with factors such as education, occupation, race, alcohol consumption and various dietary factors, in addition to age and sex (49).

#### **Gender**

The studies of Kailawadoko S. (43), Thapa K. (42), and Win T. (45) showed a significant association between smoking behavior and gender.

#### **Parental education and occupation**

The studies of Kailawadoko S. (43) showed no significant association between smoking behavior and parental education and occupation. The study of Thapa K. (42) showed no significant association between parental occupation and smoking behavior of students. However, it was found that majority of smoker students' parents were involved in private business and most of them had completed bachelor level of study. The result showed a significant association between parental education and smoking behavior (p-value =0.007 for fathers' education and p-value =0.003 for mothers' education). The study of Nurdin (11) showed no significant relationship between parental education (p-value=0.517) and smoking behavior of students.

**Place of residence**

Thapa K. (42) found no significant association between place of residing and smoking behavior of students. It was found that most of the students were living with their parents during the survey. However, Win T. (45) reported that students who live alone were more likely to smoke than those who lived with their parents.

**Family income**

Nurdin (11) and Thapa K. (42) both found no significant association between family income and smoking behavior of students.

**Student's allowance per month**

Nurdin (11), Thapa K. (42), and Win T. (45) showed a significant association between average allowance per month of student and smoking behavior of students. A study conducted of youth in Thailand (37) showed that the greater their income, the higher the rate of adopting smoking behavior. This shows that growing economic status of youth in Thailand does contribute to the smoking behavior of this vulnerable group.

**Academic achievement**

The study of Thapa K. (42) showed that those students who had low performance in academic activities tended to adopt smoking more than those who had better performance ( $p\text{-value}=0.040$ ). A study conducted by Supawongse (23) revealed that Thai students who did well academically tended to remain non-smokers more than those with low grades.

**2.10.2 Predisposing factors****Knowledge about smoking hazards**

Dassanayake BMC. (31), Nurdin (11), Thapa K. (42), and Win T. (45) showed no association between smoking behavior and knowledge about smoking hazards. However, Kailawadoko S. (43) showed a significant association between smoking behavior and knowledge about smoking hazards. The studies showed that although students had good knowledge about hazards of smoking it had no effect on their smoking behavior.

Research conducted by the University of Brazil and Cambridge University demonstrates that the prevalence of smoking by students attending courses in the area

of health, especially medical students, is lower than for students attending courses in the other fields. This suggests that students attending courses about health have higher levels of awareness regarding the hazards of smoking. Another study reported that more than 50% of regular smokers tended to increase tobacco consumption after admission into a university environment. There is a growing tendency to smoke among university students globally (39).

#### **Attitude towards smoking behavior and its side effects**

Dassanyake BMC. (31), Nurdin (11), Thapa K.(42), and Win T. (45) reported that there was a significant association between attitude towards smoking hazards and smoking behavior of students. The studies found that only a few students had a good attitude to smoking behavior. It showed that attitude plays a determinant role on smokers. However, Kailawadoko S.(43) found no significant association between smoking behavior and attitude towards smoking hazards.

#### **2.10.3 Enabling factors**

##### **Accessibility of cigarettes**

Kailawadoko S. (43), and Win T. (45) found a significant association between smoking behavior and accessibility of cigarettes. Students usually got cigarettes from their friends easily. But Trinch C. (47) found no significant association between easy access to cigarettes and smoking behavior. In Nepal, most students think that they can purchase cigarettes from street vendors, tea-stalls and shops easily (24).

#### **2.10.4 Reinforcing factors**

##### **Peer group smoking influence**

Reinforcing patterns begin with having friends who are smokers. Spending time with such friends provides ample opportunities to reinforce smoking behavior. Patterns develop to have a cigarette during breaks at work, with food and beverages, and during social events such as parties. Strong correlations exist between smoking and the consumption of addictive substances. In this way, smokers move away from healthy and productive life (48). Duong PL. (49), Kailawadoko S. (43), Nurdin (11), Trinch C. (47), Thapa K.(42), and Win T. (45) found a significant association

between peer group (e.g. as classmates, roommates, and close friends) on smoking behavior of students. Adolescent students feared matters such as missing out of on fun, losing friends, getting support from them, therefore has influenced them to smoke.

### **Parental and other family member smoking influence**

The studies of Trinch C. (47) in Vietnam, Thpa K. (42) in Thailand, and Win T. (45) in Myanmar, found no significant association between parental smoking habit and students' smoking behavior. But Nurdin (11) in Indonesia, showed that there was association between parental smoking on children's smoking behavior. A study conducted in Budapest, Hungary, showed a relationship between smoking habits of parents and smoking by students. Supawongse, also found that smoking among youth was more common when either parent smoked (23).

### **Family matter influence**

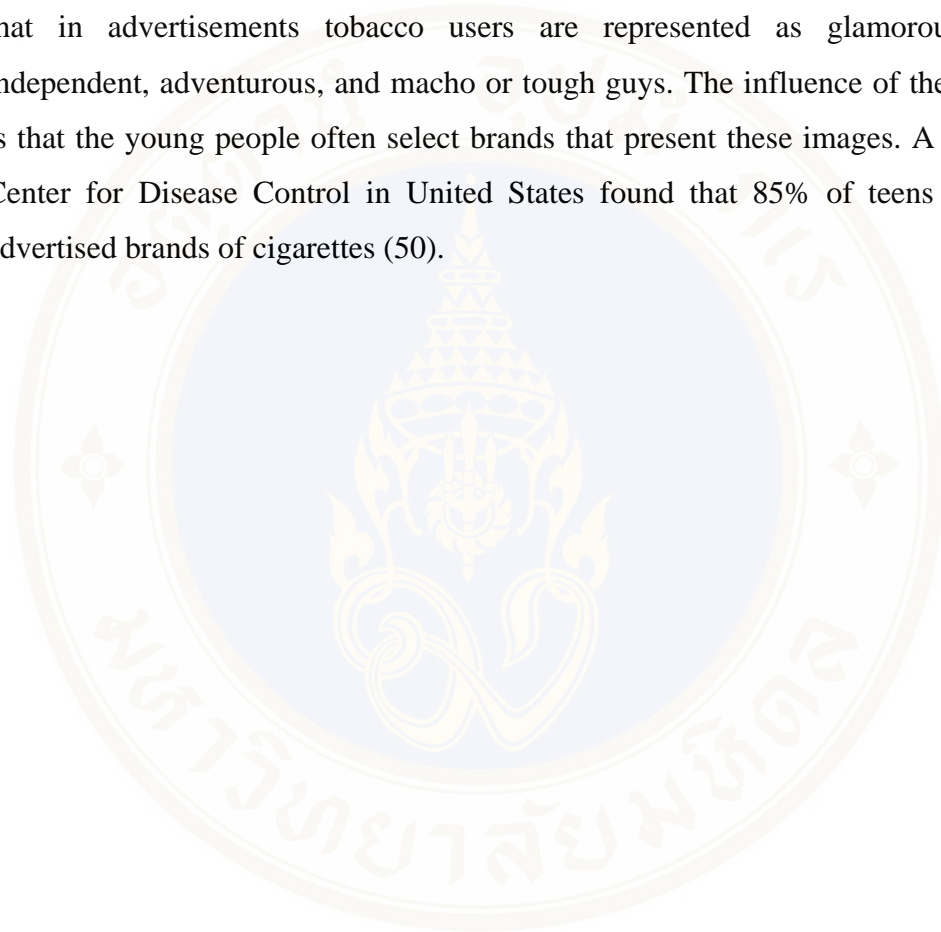
Kailawadoko S. (43) found that students who were in close relationships with their parents did not smoke. However, It was found that one third of students who smoke had good relationship with their parents, while three quarters of non smoking students had no good relationships with their parents. The statistical test failed to find any relationship between parental relationship and smoking behavior of students ( $p\text{-value}=0.66$ ). However, statistical test also showed no significant relationship between smoking behavior of students and their relationship with parents. The study of Supawongse C. showed that smoking by youth was more common with students who had gloomy families (23).

Research indicates that most children in non-intact families are at an educational and social disadvantage compared to children in traditional families. Some of the explanations for this disadvantage have been tied to income differentials, time constraints, and commitment to the child's wellbeing, especially in families with stepparents. Children from stepparent families often look similar to those from single-parent homes. In comparison to stepfamilies, cohabiting relationships and foster care appear to be even more deleterious with respect to child outcomes. The studies showed that adolescents from step-or single-parent families were about 1.5 times more likely to have smoked a cigarette or used alcohol and more than twice as likely to have used marijuana. Family structure remained significantly associated with cigarette, marijuana, and alcohol use. It is independent of age, sex, race, and parent education,

suggesting that these demographic characteristics do not play role for the persistent relationship between structure and these risky behaviors (55).

### **Advertising influence**

The studies of Kailawadoko S. (43), Thapa K. (42), and Win T. (45) showed no association between smoking behavior and advertising. Authors suggested that in advertisements tobacco users are represented as glamorous, popular, independent, adventurous, and macho or tough guys. The influence of the advertising is that the young people often select brands that present these images. A study of the Center for Disease Control in United States found that 85% of teens use heavily advertised brands of cigarettes (50).



## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **3.1 Research design**

This cross-sectional descriptive study examined the factors related to smoking behavior. These factors were the respondent's socio-demographics, knowledge about health hazards of smoking, and attitudes towards smoking and its side effects. Enabling factors describing accessibility of cigarettes, reinforcing factors such as peer pressure, the influence of parental and other family members' smoking habits, family matters, and advertising patterns were also studied.

#### **3.2 Study population**

The study population was bachelor level health science students who were present in their class room at the time of data collection. Students were invited to participate in the survey after giving their consent. The study was conducted in the Kathmandu Valley, Nepal. The study population was first, second and third year students aged eighteen years and above.

#### **3.3 Sample size**

The sample size was calculated using the formula,

$$n = \frac{Z^2 NP(1 - P)}{Z^2 P(1 - P) + (N - 1)E^2}$$

Where,

n = Estimated sample size

Z = Standard normal score set at 1.96, corresponding to 95% confidence interval

P = Prevalence rate of current adult smokers based on the WHO report on the Global Tobacco Epidemic, 2008 = 30.6%.

E = Degree of error set at 0.06 (6%)

N = Number of students from first year to third year of private bachelor of Health Science colleges = 822

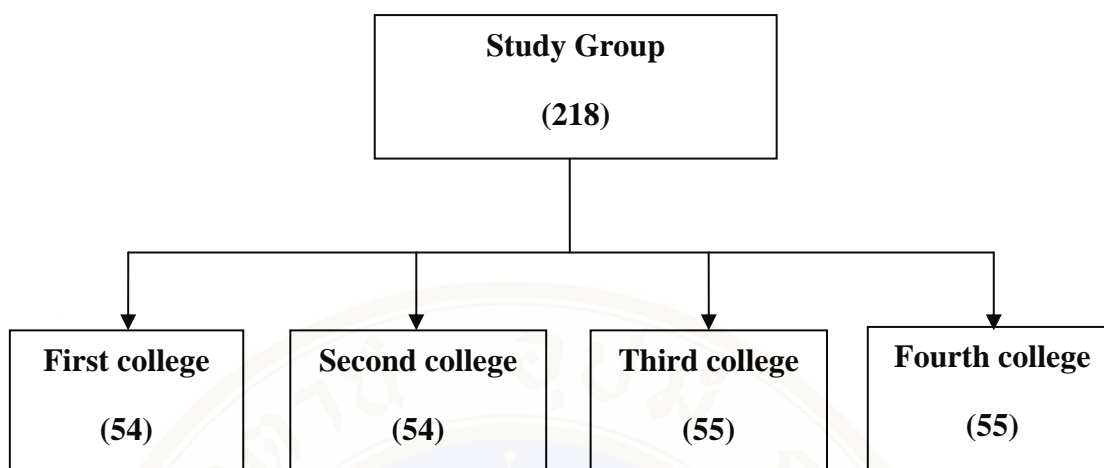
$$n = \frac{1.96^2 (822)(0.306)(0.694)}{1.96^2 [0.306(0.694) + (0.06)^2]} = 198$$

The estimated sample size of students was 198. Out of these students some of them might not complete the questionnaire giving a response rate lower than 100%. Some students who were current smokers might also be absent from the college on the day of survey. The sample size was increased by 10% to allow for insufficient information or incomplete questionnaires. Therefore, the actual sample size was 218.

### 3.4 Sampling technique

A proportional simple random sampling method was used to select the sample group of students within the selected colleges. Out of 13 private health science colleges in the Kathmandu Valley, 4 of them, each with student enrolment of less than 54, were not included in the survey.

Of the 9 remaining private health science colleges, 4 colleges conducted first year, second year and third year sessions, and 5 colleges conducted only first year and second year sessions. These 5 colleges each had a student enrolment of more than 54 and were included in the survey. In this way, 4 colleges (CIST College, Nobel College, Stupa College and Valley college), each with a student enrolment of more than 54, were selected by lottery for this project from the 9 private health science colleges in the Kathmandu Valley. In this way 2 colleges with 54 students each and 2 colleges with 55 students each were selected by lottery for the survey.



**Figure 3.1** Sampling diagram

### 3.5 Data collection tools

The instrument used for research was a structured questionnaire which was based on the conceptual framework. The conceptual framework comprised socio-demographic factors, predisposing factors, enabling factors, reinforcing factors and smoking behavior.

**Part 1.** The questions in the first part of the questionnaire related to socio-demographic factors. They consisted of questions about a respondent's age, sex, year of study, parental education, parental occupation, family income, allowance per month, place of residence and academic achievements. The types of answers to questions in this part of the questionnaire for each variable were as follows.

<b>Question</b>	<b>Answer</b>
Socio-demographic	Yes/No, multiple choice/short answers

**Part 2.** Questions about the patterns of smoking by students.

<b>Question</b>	<b>Answer</b>
Smoking behavior	Yes/No, Multiple choice and short answer

**Part 3.** The questions about a respondent's knowledge and attitude towards smoking comes under predisposing factors. There were 11 questions in the knowledge part. The questions which tested the knowledge of a respondent about health hazards of smoking were multiple choice. Marking the correct answer to a

question was rated '1' and marking an incorrect answer was rated '0'. The level of the knowledge was determined on the basis of the total score obtained as follows:

<b>Scoring</b>	<b>Level</b>
<60%	Low
60%-80%	Moderate
>80%	High

There were 10 questions in the attitude part. The answers to statements about attitude towards smoking behavior were Agree, Not sure or Disagree.

The scoring system for the attitude part was as follows:

**Positive statement:**

- Agree on the statement scores 3
- Not sure on the statement scores 2
- Disagree on the statement scores 1

**Negative statement:**

- Agree on the statement scores 1
- Not sure on the statement scores 2
- Disagree on the statement scores 3

**Part 4.** Accessibility of cigarettes which may help student access to smoking is an enabling factor. The answers to the questions in this part were as follows:

<b>Question</b>	<b>Answers</b>
Accessibility of cigarettes	Yes/No and Multiple choice

**Part 5.** The factors which play a reinforcing role in adopting smoking by students like peoples' smoking influences (peer pressure, parental, other family members' and familial problem related matters), and influence of advertisements on smoking are reinforcing factors. The answers to the questions in this part were as follows.

<b>Question</b>	<b>Answers</b>
Peoples' smoking influences	Yes/No, Multiple choice and short answers

Influence of advertising

Yes/No, Multiple choice and short answers

### 3.6 Data collection procedure

After obtaining permission from the Mahidol University Ethics Committee (IRB No: COA.2010/128.2012), the data collection was done as follows:

1. A formal letter from the AIHD was sent to the authority of the Purbanchal and Pokhara University in Nepal seeking permission to collect data in their colleges.
2. After obtaining approval from the University, the health science colleges were contacted by the researcher personally to explain about the purpose and process of the study as well as about legal and ethical regulations about human research. The researcher made an appointment with each college authority for data collection.
3. On the days of data collection, after giving verbal consent, the students of the selected classes were selected by lottery method and assembled in their class rooms. The purpose of the study was explained and assurance about confidentiality of the information was also provided to the students.
4. A participation information sheet was distributed. After giving their consent to participate in the research a questionnaire prepared in English language was distributed.
5. The students went through the participation information sheet and answered the questionnaires within 25 minutes.
6. The completed questionnaires and informed consent forms were collected. The questionnaires were immediately checked for answers to question 13.

### **3.7 Pretesting**

A pretest of the questionnaire was carried out on 39 bachelor of health science students in Karnali Technical College of Science and Technology. Based on the results of the pretest, as advised by experts, some questions were modified for actual data collection. The reliability value for attitude was .580.

### **3.8 Data management and analysis**

Data was edited, coded and entered in Excel with validation command, and transferred to SPSS 17.0 for software for analysis. Frequency, percentage and descriptive statistics (minimum, maximum, mean and standard deviation), were calculated. The smoking behavior was used as dependent variable. Demographic characteristics, predisposing, enabling and reinforcing factors were taken as independent variables. To examine the relationship between smoking behavior and independent variables, Chi-square tests were used at the significant level set at  $\alpha = 0.05$ .

## CHAPTER IV

### RESULTS

The purpose of this study was to ascertain the smoking behavior of health science college students in the Kathmandu Valley, Nepal. A self administered questionnaire was used for interviewing students. The data were collected from 26 January to 11 February 2011. The data was summarized in terms of frequency and percentage and descriptive statistics (minimum, maximum, mean and standard deviation). A total of 218 students were selected and invited to participate in the survey. Association between independent variables and smoking behavior was shown by Chi-square tests at with the significance level set at  $\alpha = 0.05$ .

The study results were presented in 6 parts based on the conceptual framework as follows:

- 4.1 Socio-demographic factors
- 4.2 Predisposing factors
- 4.3 Enabling factors
- 4.4 Reinforcing factors
- 4.5 Association between smoking behavior and independent variables that influence smoking behavior of students.
- 4.6 Smoking behavior

## 4.1 Socio-demographic factors

**Table 4.1** Frequency and percentage of independent variables by socio-demographic factors

<b>Socio-demographic factors</b>	<b>Number (n = 218)</b>	<b>Percentage (%)</b>
<b>Age</b>		
Up to 19 years	34	15.6
20 to 22 years	131	60.1
Above 22 years	53	24.3
Mean =20.81, SD =1.550, Median=17, Min =18, Max = 28		
<b>Sex</b>		
Male	89	40.8
Female	129	59.2
<b>Year of study</b>		
First year	32	14.7
Second year	117	53.7
Third year	69	31.7
<b>Father's education</b>		
No education	4	1.8
Primary school	10	4.6
Secondary school	38	17.4
Diploma	48	22.0
Bachelor degree	60	27.5
Master degree	51	23.4
Doctoral degree	6	2.8
Other	1	0.5

**Table 4.1** Frequency and percentage of independent variables by socio-demographic factors (cont.)

<b>Socio-demographic factors</b>	<b>Number</b> (n=218)	<b>Percentage</b> (%)
<b>Father's main occupation</b>		
Agriculture	19	8.7
Business	55	25.2
Laboring	1	0.5
Government service	79	36.2
Private service	33	15.1
Teaching	21	9.6
Unemployed	0	0
Other	10	4.6
<b>Mother's education</b>		
No education	31	14.2
Primary school	42	19.3
Secondary school	61	28.0
Diploma	36	16.5
Bachelor degree	39	17.9
Master degree	6	2.8
Doctoral degree	1	0.5
Other	2	0.9
<b>Mother's main occupation</b>		
	<b>(n=217)</b>	
Agriculture	29	13.4
Business	19	8.8
Laboring	0	0
Government service	23	10.6
Private service	14	6.5
Teaching	22	10.1
Unemployed	110	50.7
Other	0	0

**Table 4.1** Frequency and percentage of independent variables by socio-demographic factors (cont.)

Socio-demographic factors	Number (n=218)	Percentage (%)
<b>Student is living now</b>		
Parent's house with family	98	45.0
Hostel	21	9.6
With friends	4	1.8
Rental room	69	31.7
With relatives	25	11.5
Other	1	0.5
<b>Average income of student's family (Rupees/month) (n=198)</b>		
Above per capita income	166	83.8
Below per capita income	32	16.2
Mean= 0233.5025, SD=54216.06241, Min.= 500, Max = 500,000		
<b>Average monthly pocket money student get (Rupees/month) (n=214)</b>		
<1500 Rupees	144	67.3
>1500 Rupees	70	32.7
Mean = 3439.9533, SD = 4115.23615, Min. =150, Max = 4500		
<b>Besides studying, student work for extra-income</b>		
Yes	18	8.3
No	200	91.7
If yes, type of work	18	8.3
Per capita income of Nepal =\$210 (= 15,120 Nepalese rupees)		

**Table 4.1** Frequency and percentage of independent variables by socio-demographic factors (cont.)

<b>Socio-demographic factors</b>	<b>Number</b> (n=218)	<b>Percentage</b> (%)
<b>Student's grade point or average percentage marks</b>		
<b>after the exam</b>		
<b>Grading system (n=71)</b>		
≤ 2 (Satisfactory)	10	14.1
2 to 3 (Good)	27	38.0
> 3 (Excellent)	34	47.9
Mean= 2.8452, SD = .85114, Min.= 1.00, Max = 4.00		
<b>Percentage system (n = 125)</b>		
45 to 59.9 % ( Satisfactory)	18	14.4
60 to 80 % ( Good)	103	82.4
> 80 % (Excellent)	4	3.2
Mean= 67.77, SD = 7.487, Min.= 48, Max = 82		

Table 4.1 shows the socio-demographic characteristics of the respondents. While more than half of the respondents (60.1%) were of aged 20 to 22 years, about one quarter (24.3%) were aged above 22 years. 59.2% of the respondents were female and 40.8% were male. Most of the respondents were in the second year (53.7 %) of their study, and 14.7 % and 31.7 % were from first and third years of their courses respectively. Slightly more than one quarter (27.5 %) of the respondents' fathers were educated to bachelor level, 23.4% of them were educated to master's level and 17.4 % had completed secondary school. 28.0 % of the respondents' mothers were educated to secondary school level and 19.3% had completed primary school education. 36.2% of respondents' fathers were public servants, 25.2% had private businesses. 15.1 % were in private service. Half of the total number of mothers of the respondents were unemployed and only 13.4 % were engaged in agricultural practices.

During the study, period 45 % of the students were living in parents' house with family, 31.7% were living in a rental room and 11.5% were living with relatives.

Regarding family income per month, most of the families fell in the income group of more than 15,000 Rupees and only 16.2 % earned less than that. The minimum and maximum family income were 500 and 500,000 Rupees per month respectively. 67.3 % of the respondents got pocket money of more than 1500 Rupees per month. Only 32.7 % of them received less than 1500 Rupees per month. The minimum and maximum amounts of pocket money received were 150 and 45,000 rupees, respectively. 8.3% of the respondents worked somewhere for extra income. The type of work the respondents adopted for extra income were teaching and home tuition, private business, government and private services and health technician.

47.9 % of the respondents secured grades greater than 3.0, and 38.0 % had secured grades between 2.0 and 3.0. However, 82.4% of the respondents (82.4 %) who were under percentage system of examination secured 60 to 80 % in the last examination. The minimum and maximum marks obtained by the respondents were 48 % and 82 % respectively.

## 4.2 Predisposing Factors

### 4.2.1 Knowledge about smoking hazards

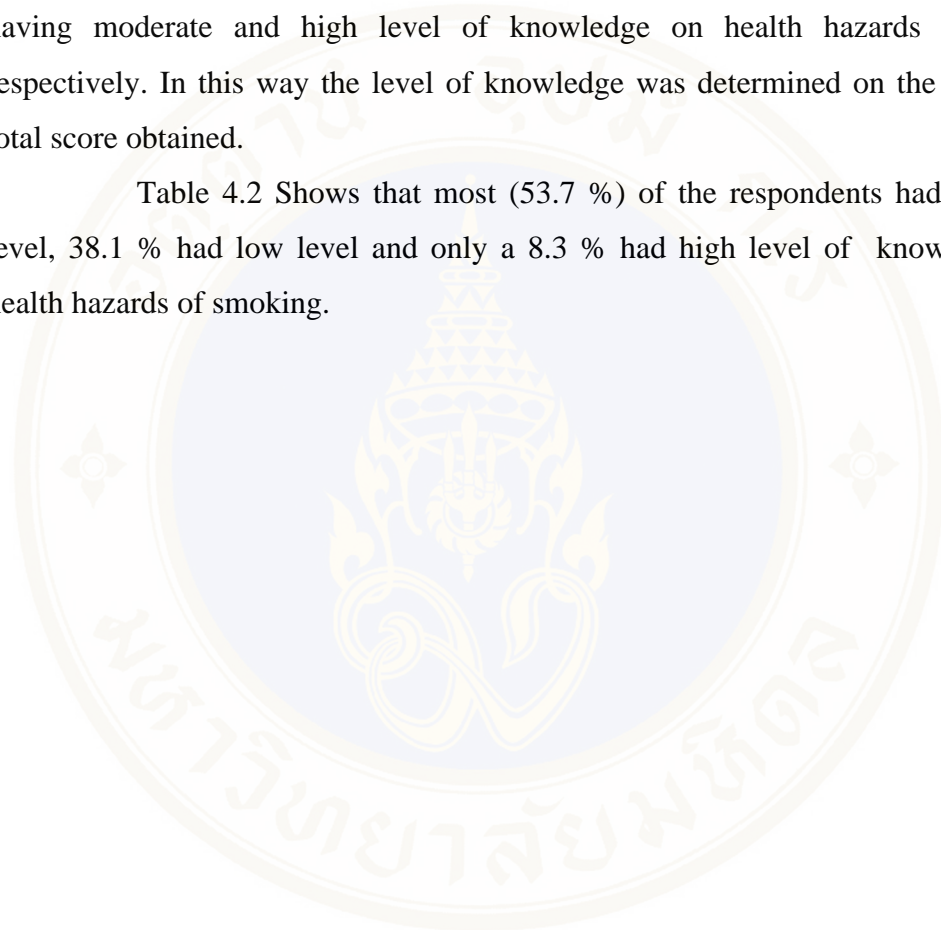
**Table 4.2** Frequency and percentage of respondents by score on knowledge about smoking hazards

<b>Knowledge level</b>	<b>Number</b> (n =218)	<b>Percentage</b> (%)
High (>80%)	18	8.3
Moderate (60%-80%)	117	53.7
Low (<60%)	83	38.1

The knowledge part consists of eleven multiple choice questions about on hazardous and addictive substances contained in cigarettes and health hazardous of tobacco. Respondent's knowledge on health hazards of smoking had been divided into three levels: high, moderate and low. The questions which tested the knowledge of a

respondent about health hazards of smoking were multiple choice. Marking the correct answer to a question was rated '1' and marking an incorrect answer was rated '0'. On marking the right answer to all the questions, one can score a maximum of 11 points. On this basis, those who scored less than 60% of points were labeled as having low knowledge. Similarly, scores between 60% and 80% and above 80% were labeled as having moderate and high level of knowledge on health hazards of smoking respectively. In this way the level of knowledge was determined on the basis of the total score obtained.

Table 4.2 Shows that most (53.7 %) of the respondents had a moderate level, 38.1 % had low level and only a 8.3 % had high level of knowledge about health hazards of smoking.



**Table 4.3** Frequency and percentage of knowledge of respondents about smoking hazards

Knowledge level	Correct answer	
	Number (n = 218)	Percentage (%)
- Hazardous substances in cigarettes	82	37.6
- The addictive substance in cigarettes	195	89.4
- The effect of cigarette smoking by pregnant woman on her fetus	128	58.7
- Which substance in breast milk of a mother who smokes affects the infant	176	80.7
- The effect of cigarette smoking on the nervous system	133	61.0
- Inhaling second hand cigarette smoke adversely affects the following types of people who inhale smoke	205	94.0
- Which of the following is not a side effect of smoking?	198	90.8
- Which of the following statements is correct?	153	70.2
- Expensive cigarettes are	128	58.7
- Why do smokers not quit smoking cigarettes?	35	16.1
- A shopkeeper cannot sell cigarettes to a person, aged below	44	20.2

Table 4.3 shows respondents' knowledge about health hazards of smoking. 94% of them knew that secondary smoking is harmful to health. Similarly 90.8 % and 89.4% respectively knew the side effects of smoking and addictive substances contained in cigarettes. About 70 % of the respondents had knowledge about health problems associated with cigarette smoking.

### 4.2.2 Attitudes towards smoking behavior

**Table 4.4** Frequency and percentage of respondents by score on attitudes towards smoking behavior

Attitude level	Number (n=218)	Percentage (%)
Good (> 20)	162	74.3
Fair( 17 to 20)	45	20.6
Poor ( $\leq$ 16)	11	5.0

**Score:** Good= (> 20) , Fair=(17-20) , Poor= ( $\leq$  16)

Respondents' attitude scores towards smoking behavior were categorized into three levels: good, fair and poor. The correct answer to each statement carried 3 marks; this way respondents could score maximum of 30 if they could answer all ten correctly. The answer choices for each statement were Agree, Not-sure and Disagree. A score of 16 or less was considered poor, between 17 and 20 was considered fair, and above 20 was considered Good (22). Table 4.4 shows 74.3 % of respondents had good, 20.6 % had fair and only 5 % had poor level of attitude.

Respondents' attitude scores towards smoking behavior were categorized into three levels: good, fair and poor. The correct answer to each statement carried 3 marks; this way respondents could score maximum of 30 if they could answer all ten correctly. The answer choices for each statement were Agree, Not-sure and Disagree. A score of 16 or less was considered poor, between 17 and 20 was considered fair, and above 20 was considered Good (22). Table 4.4 shows 74.3 % of respondents had good, 20.6 % had fair and only 5 % had poor level of attitude.

**Table 4.5** Frequency and percentage of respondents by attitudes towards smoking behavior

Attitude towards smoking behavior	Number (n = 218)	Percentage (%)
<b>Smoking makes smokers feel tough</b>		
Agree	52	23.9
Not sure	84	38.5
Disagree	82	37.6
<b>Smoking can relieve tension and anxiety in smokers</b>		
Agree	100	45.9
Not sure	66	30.3
Disagree	52	23.9
<b>Confident people adopt smoking</b>		
Agree	23	10.6
Not sure	46	21.1
Disagree	149	68.3
<b>Quitting smoking cigarettes improves smokers' general health</b>		
Agree	9.6	64.2
Not sure	21	9.6
Disagree	57	26.1
<b>Smoking makes smokers confident</b>		
Agree	30	13.8
Not sure	67	30.7
Disagree	121	55.5
<b>Smoking by teenagers is a sign of maturity</b>		
Agree	26	11.9
Not sure	18	8.3
Disagree	174	79.8

**Table 4.5** Frequency and percentage of respondents by attitudes towards smoking behavior (cont.)

<b>Attitude towards smoking behavior</b>	<b>Number</b> (n = 218)	<b>Percentage</b> (%)
<b>Smoking by woman is a matter of being smart</b>		
Agree	28	12.8
Not sure	15	6.9
Disagree	175	80.3
<b>People should enjoy their right to smoking</b>		
Agree	69	31.7
Not sure	36	16.5
Disagree	113	51.8
<b>Smoking makes smokers warm in the winter</b>		
Agree	79	36.2
Not sure	74	33.9
Disagree	65	29.8
<b>Occasional smoking is not harmful</b> (n=217)		
Agree	47	21.7
Not sure	54	24.9
Disagree	116	53.5

There were 10 statements about attitude towards smoking behavior. Of them, one statement indicated a positive attitude and nine negative attitudes towards smoking. To be disagree, to be not sure and be agree with the each negative statement carries 3, 2 and 1 points of marks respectively. Reverse scoring system applied to the positive statement.

Table 4.5 shows that while more than one third of the respondents (37.6%) disagreed, 23.9 % of them agreed with the statement “Smoking makes smokers feel tough”. However, 38.5 % were not sure about the statement. About 45.9% of the respondents agreed that smoking can relieve tension and anxiety. But 23.9 % of them disagreed and 30.3% were not sure. More than two thirds of the respondents (68.3 %) disagreed, 10 % agreed and 21.1 % were not sure with the statement “Confident

people adopt smoking”. 64.2 % of respondents agreed and 26.1 % disagreed with the statement “Quitting smoking cigarettes improves smokers’ general health”. 55.5 %, 13.8 % and 30.7 % of respondents respectively agreed, disagreed or were not sure with the statement “Smoking makes smokers confident”.

A majority of respondents (79.8%) inconsistent with the statement “Smoking by teenagers is a sign of maturity”. But 11.9 % of them consistent with the statement. 80.3 % disagreed and 12.8 % agreed with the statement “Smoking by woman is a matter of being smart”. 51.8 % of respondents disagreed that people should enjoy their right to smoke, while 31.7 % agreed with the opinion. 36.2% of respondents agreed that smoking makes smokers warm in the winter, while 29.8 % and 33.9 % of them respectively disagreed or were not sure with the statement. For 53.5 % of respondents, occasional smoking is harmful where as for 21.7 % it was not harmful and 24.9 % were not sure about the statement.

### 4.3 Enabling factors

**Table 4.6** Frequency and percentage of students by accessibility of cigarettes

Accessibility of cigarettes	Smoker	
	Number (n = 31)	Percentage (%)
<b>Cigarettes are available around your home at any time</b>		
Yes	24	77.4
No	7	22.6
<b>Cigarettes are available around your college at any time</b>		
Yes	20	64.5
No	11	35.5

**Table 4.6** Frequency and percentage of students by accessibility of cigarettes (cont.)

Accessibility of cigarettes	Smoker	
	Number (n = 31)	Percentage (%)
<b>Student purchase cigarettes from</b>		
<b>(Can answer more than one)</b>		
Teastalls and shops around college	16	23.5
Teastalls and shops around home	16	23.5
Street vendors	9	29.0
Convenience store	8	11.9
Other	1	3.2
<b>If not purchased, student get cigarettes</b>		
<b>(can answer more than one)</b>		
	<b>(n = 31)</b>	
From parents	2	6.4
From friends in college	12	38.7
From friends near home	4	12.9
From neighbors	1	3.2
Do not try to get them	14	45.1
Other	2	6.4

Regarding accessibility of cigarettes, Table 4.6 shows, for a majority of respondents (77.4 %), purchasing cigarettes was not a problem because they were available near their homes. Similarly, 64.5% could purchase cigarettes around their colleges.

In the same way, 29% got cigarettes from street vendors and 11.9 % from convenience stores. Only 14.33% purchased cigarettes from local shops near home.

In response to the question about where they got cigarettes from if they did not purchase, 38.7% answered that they could get them from friends in the college, and from friends near home (12.9 %). However, some respondents (6.4%) got cigarettes from their parents.

## 4.4 Reinforcing factors

### 4.4.1 Peoples' smoking influence

**Table 4.7** Frequency and percentage of students by peoples' smoking influence

Peoples' smoking influence	Number (n = 31)	Percentage (%)
<b>Anybody in student's family smoked</b>		
<b>(Can answer more than one)</b>		
Nobody smokes	24	77.4
Father smokes	5	16.1
Mother smokes	1	3.2
Guardian smokes	0	0
Other	1	3.2
<b>Family members influenced student to smoke</b>	<b>(n = 30)</b>	
Yes	1	3.3
No	29	96.7
<b>Peers influenced student to smoke</b>	<b>(n = 30)</b>	
Yes	11	36.7
No	19	63.3
<b>Students smoked to get accepted by friends</b>	<b>(n = 30)</b>	
Yes	10	33.3
No	20	66.7
<b>Time spent by student with his parents every day</b>		
<b>(Can answer more than one)</b>		
During breakfast everyday	2	6.4
During dinner everyday	3	9.6
During weekend (Holiday)	11	35.4
None	2	6.4
Other	14	45.1

**Table 4.7** Frequency and percentage of students by peoples' smoking influence (cont.)

<b>Peoples' smoking influence</b>	<b>Number</b> (n = 31)	<b>Percentage</b> (%)
<b>Student has conflict with his family member</b> (n=30)		
Yes	2	6.7
No	28	93.3
<b>Student live in the family with</b> (n=30) <b>(Can answer more than one)</b>		
With parents	27	87.0
With mother	3	9.67
With father	0	0
With stepmother	0	0
<b>Other</b>	0	0
<b>Student has financial problem in the family</b> (n=30)		
Yes	4	13.3
No	26	86.7
<b>Student's family has chronic illness</b> (n=30)		
Yes	6	20
No	24	80
<b>Student was supported to study financially by</b> (n=31) <b>(Can answer more than one)</b>		
Father	17	54.83
Mother	4	12.9
Parents	11	35.48
Other	0	0

Regarding who influenced the respondents to start smoking, Table 4.7 shows that 3.3 % of respondents were influenced by family members and 36.7 % by peers to start smoking. However, 33.3 % of the respondents adopted smoking to get accepted by smoker friends. 87% of the respondents lived with their parents and 16.1% had fathers who smoked. 35.4% of the respondents spent their time with parents during weekends. 54.8% and 35.4% of respondents were supported by fathers

and parents respectively to study financially. 20% of the respondents had at least one family member with a chronic illness and 13.3% had financial problems in their families. Moreover, 6.7% of the respondents had conflict with their family members.

#### 4.4.2 Influence of advertising

**Table 4.8** Frequency and percentage of students by influence of advertising

<b>Influence of advertising</b>	<b>Number</b> (n = 31)	<b>Percentage</b> (%)
<b>Student think, advertisements for smoking in media should be totally banned</b>		
	<b>(n = 30)</b>	
Yes	17	56.7
No	13	43.3
Why	16	51.6
<b>Following factors influence people to smoke</b>		
<b>(Can answer more than one)</b>		
	<b>(n=31)</b>	
Popular brands of cigarettes	10	32.2
Used by popular celebrities	12	38.7
Frequency of advertisements played in the media	8	25.8
Other	4	12.9

Table 4.8 shows that 56.7% of the respondents thought that advertisements for smoking in the media should be totally banned. On answering why, out of 51.6 % responses, 19.3% thought that it might motivate teenagers or new smokers to smoking, 6.4% thought that it is not good for health and 3.2% expected that it would help reduce the number of smokers. 38.7% thought that cigarettes used by popular celebrities influence people to smoke. However, 32% thought that popular brands of cigarettes and advertisements (25.8%) which are frequently played in media equally influence people to smoke.

**Table 4.8** In student's opinion which five media with "cigarette appearance" most influenced him (Can answer more than one) (cont.)

Media	How	
	Number (n = 31)	Percentage (%)
Internet	9	29
Newspaper/Magazines	16	51
Movies	25	80
Television	19	61.2
Radio	11	35.4
Drama	5	16.1
Songs	14	45.1
Exhibition	3	9.6
Teleserials	4	12.9
Plays	1	3.2
Book/Novel	6	19.3
Other	0	0

80%, 61.2%, and 51% of the respondents respectively found movies, television and newspapers and magazines were influential on smoking. Similarly, 45.1% found songs were influential on smoking, but 35.4% and 29% thought that radio and internet respectively influenced them (Table 4.8).

## 4.5 Association between socio-demographic factors and smoking behavior

**Table 4.9** Association between socio-demographic factors and smoking behavior

Socio-demographic variable	Smoker		Non-smoker		Ex-smoker		$\chi^2$	P-value
	(n=31)	%	(n=170)	%	(n=17)	%		
<b>Age</b>								
Up to 19 years	5	14.7	29	85.3	0	0	6.826	0.145
20 to 22 years	16	12.2	105	80.2	10	7.6		
Above 22 years	10	18.9	36	67.9	7	13.2		
<b>Sex</b>								
Male	25	28.1	50	56.2	14	15.7	41.649	<b>0.000*</b>
Female	6	4.7	120	93.0	3	2.3		
<b>Year of study</b>								
First year	6	18.8	25	78.1	1	3.1	3.634	0.458
Second year	19	16.2	88	75.2	10	8.5		
Third year	6	8.7	57	82.6	6	8.7		
<b>Father's education</b>								
No education	1	25.0	3	75.0	0	0	8.823	0.842
Primary school	1	10.0	7	70.00	2	20.0		
Secondary school	2	5.3	32	84.2	4	10.5		
Diploma	9	18.8	36	75.0	3	6.2		
Bachelor	8	13.3	47	78.3	5	8.3		
Master degree	9	17.6	40	78.4	2	3.9		
Doctoral degree	1	16.7	4	66.7	1	16.7		
Other	0	0	1	100	0	0		

\*Significance at the level of <0.001

**Table 4.9** Association between socio-demographic factors and smoking behavior  
(cont.)

Socio-demographic variable	Smoker		Non-smoker		Ex-smoker		$\chi^2$	P-value
	(n=31)	%	(n=170)	%	(n=17)	%		
<b>Father's Occupation</b>							17.384	<b>0.002*</b>
Agriculture/Business/Private service/other	10	8.5	98	83.1	10	8.5		
Government service	12	15.2	61	77.2	6	7.6		
Teaching	9	42.9	11	52.4	1	4.8		
<b>Mother's education</b>							7.496	0.914
No education	6	19.4	22	71.0	3	9.7		
Primary school	8	19.0	31	73.8	3	7.1		
Secondary school	6	9.8	48	78.7	7	11.5		
Diploma	4	11.1	30	83.3	2	5.6		
Bachelor	7	17.9	30	76.9	2	5.1		
Master degree	0	0	6	100	0	0		
Doctoral degree	0	0	1	100	0	0		
Other	0	0	2	100	0	0		
<b>Mother's main occupation</b>							13.796	0.314
Agriculture	8	27.6	18	62.1	3	10.3		
Business	2	10.5	17	89.5	0	0		
Government service	4	17.4	18	78.3	1	4.3		
Private service	4	28.6	10	71.4	0	0		
Teaching	2	9.1	17	77.3	3	13.6		
Unemployed	11	10.0	89	80.9	10	9.1		
Other	0	0	1	100	0	0		

\*Significance at the level of 0.05

**Table 4.9** Association between socio-demographic factors and smoking behavior (cont.)

Socio-demographic variable	Smoker		Non-smoker		Ex-smoker		$\chi^2$	P-value
	(n=31)	%	(n=170)	%	(n=17)	%		
<b>Student is living now</b>							15.003	<b>0.005*</b>
Parent's house with Family	6	6.1	87	88.8	5	5.1		
Hostel /Rental room	19	21.1	64	71.1	7	7.8		
With friends/ relatives	6	20.0	19	63.3	5	16.7		
<b>Average income of student's family</b>							5.823	0.054
Above per capita income	22	13.3	131	78.9	13	7.8		
Below per capita income	9	28.1	19	59.4	4	12.5		
<b>Average monthly pocket money student get (Rupees/month)</b>							2.939	0.230
<1500 Rupees	6	8.6	58	82.9	6	8.6		
>1500 Rupees	25	17.4	108	75.0	11	7.6		
<b>Besides studying, student work for extra-income</b>							0.209	0.901
Yes	3	16.7	14	77.8	1	5.6		
No	28	14.0	156	78.0	16	8.0		

\*Significance at the level of 0.05

Table 4.9 shows that there were slightly more smokers (18.9%) at age group above 22 years than at the age group below that, however there was found no association between age group and smoking behavior (P value=0.145). There were more male smokers (28.1%) than female smokers. A significant association was found between sex and smoking behavior ( $p < 0.001$ ).

The respondents in the first year of their study found adopted smoking more than those in the other years of the course, but there was no association between smoking behavior and the year of study.

The respondents of uneducated fathers and mothers were indulged in smoking more than the respondents of educated father and mother. There was no association between education of father and mother and smoking behavior. The respondents whose fathers were teachers were found to smoke at higher percentages. There was a significant association between smoking behavior and father's occupation (P-value=0.002). However, there was no association between mother's occupation and respondent's smoking behavior.

The respondents who lived in hostel and rental room during study period were much more likely to involve in smoking than those who lived in parents' house with family. The association between place of residence and smoking behavior was found significant (P-value=0.005).

The respondents whose average family incomes were below the per-capita income of Nepal were found adopted smoking than by those who had average income more than the former amount. It showed that the respondents who had financial constraints in the family were likely to smoke. The association between average family income and smoking behavior was found nearly significant (P -value=0.054). There was no association between smoking behavior of respondent and average monthly pocket money they received (P-value=0.230), although a higher percentage (17.4%) of respondents received above 1500 rupees pocket money per month. 16.7% of smoker respondents worked for extra income but there was no association between students working for extra income and smoking behavior (P-value=0.901)

#### 4.5.1 Association between knowledge about smoking hazards and smoking behavior

**Table 4.10** Association between knowledge about smoking hazards and smoking behavior

Knowledge level	Smoker		Non-smoker		Ex-smoker		$\chi^2$	P-value
	(n=31)	%	(n=170)	%	(n=17)	%		
<b>Knowledge level</b>							5.842	0.211
High	1	5.6	17	0	0	0		
Moderate	14	12.0	94	80.3	9	7.7		
Low	16	19.3	59	71.9	8	9.6		

Significance at level of 0.05

Table 4.10 shows that most of the respondents had low level of knowledge. The result showed there was no association between knowledge level of respondent and smoking behavior (P-value=0.211).

#### 4.5.2 Association between level of attitude towards smoking and smoking behavior

**Table 4.11** Association between level of attitude towards smoking and smoking behavior

Attitude level	Smoker		Non-smoker		Ex-smoker		$\chi^2$	P-value
	(n=31)	%	(n=170)	%	(n=17)	%		
<b>Attitude level</b>							21.231	<b>0.000*</b>
Good	15	9.3	132	81.5	15	9.3		
Fair	10	22.2	33	73.3	2	4.4		
Poor	6	54.5	5	45.5	0	0		

\*Significance at the level of <0.001

Table 4.11 shows that those respondents who had poor or negative attitude towards smoking behavior (54.5%) were found to adopted smoking. Negative attitude towards smoking behavior was found inversely proportional to smoking behavior. There was significant association between attitude towards smoking behavior and smoking behavior of students (P-value= <0.001).

#### 4.6 Smoking behavior

**Table 4.12** Frequency and percentage of respondents by smoking behavior

Smoking behavior	Frequency (n = 218)	Percentage (%)
Non smoker (Never smoked in life)	170	78.0
Ever smoker ( Smoked in the past)	17	7.8
Current smoker	31	14.2
Current smoker	(n=31)	
Male	26	83.87
Female	5	16.12
Current Smoker	(n = 31)	
Regular smoker	24	77.4
Occasional smoker	7	22.5

Regarding smoking behavior of the students, Table 4.12 shows that 78 % of students were non-smokers, 14.2 % were current smokers and 7.8 % were ex-smokers which means they used to smoke in the past but had completely quit smoking. Of the smokers, 77.4 % were regular and 22.5 % were occasional smokers, and 83.87% were male and 16.12% were female.

**Table 4.13** Frequency and percentage of respondents by smoking behavior

Smoking behavior	Smoker	
	Number (n = 31)	Percentage (%)
<b>Student smoked</b>		
Every day	24	77.4
Once a week	1	3.2
Twice a week	0	0
Three times a week	1	3.2
Other	5	16.2
<b>Student start smoking at</b>		
Above 16 years	24	77.4
Below 16 years	7	22.5
Mean =17.16, Median= 17, SD =2.58, Min.=12 , Max =23		
<b>Student started smoking, because</b>		
Friends in the college influenced	18	40.0
Friends around home influenced	10	22.2
Parents influenced	1	2.2
Other	16	35.6
<b>Brand of cigarette student smoked</b>		
Local brand	13	41.9
Foreign brand	4	13.0
Both	13	41.9
Other	1	3.2

**Table 4.13** Frequency and percentage of respondents by smoking behavior (cont.)

Smoking behavior	Smoker	
	Number (n = 31)	Percentage (%)
<b>Number of cigarettes student smokes in a day</b>		
Occasional smoking	9	29.0
1 to 3 cigarettes	13	41.9
4 to 6 cigarettes	5	16.1
7 to 10 cigarettes	2	6.5
More than 10 cigarettes	2	6.5
Mean = 2.19 , SD = 1.14, Min. =1, Max=5		
<b>Student obtained cigarettes</b>		
Purchase oneself from a shop	24	77.4
Usually from friends	5	16.1
From parents	0	0
From family members	0	0
Others	2	6.5
<b>Student smoked in a day (Can answer more than one)</b>		
After breakfast	6	19.3
After lunch	9	29
After dinner	13	41.9
When feel stressed	12	38.7
Other	11	35.4
<b>Student usually smoked (Can answer more than one)</b>		
Alone	11	31.0
With college friends	15	48.3
With friends around home	14	44.1
With family members	1	3.2
Other	3	9.6

**Table 4.13** Frequency and percentage of respondents by smoking behavior (cont.)

Smoking behavior	Smoker	
	Number (n = 31)	Percentage (%)
<b>Student spent on cigarettes in a day</b>		
<20 Rupees	17	54.8
20 to 29.9 Rupees	4	12.9
30 to 49.9 Rupees	3	9.7
≥50 Rupees	7	22.6
Mean = 23.52 , SD = 20.378, Min. =1, Max =85		
<b>Student can quit smoking cigarettes</b>		
	<b>(n = 30)</b>	
Yes	25	83.3
No	5	16.7
Why	16	53.3
<b>Student had tried to quit smoking</b>		
	<b>(n = 30)</b>	
Yes	15	50.0
No	15	50.0
If yes,Why	13	43.3
<b>To quit smoking, student need help from others</b>		
Yes	5	16.1
No	26	83.9

Regarding students patterns of smoking behavior as shown in Table 4.13 more than three quarter of the students (77.4 %) were daily smokers, whereas among 22.5 % of occasional smokers 3.2 % smoked 1 to 3 days week and an equal percentage of them smoked once a week. Regarding age of starting to smoke cigarettes, a majority of the respondents (77.4 %) started to smoke at the age above 16 years, only a small percentage of respondents started smoking below 16 years of age. The minimum age at initiation of smoking was 12 years. Most of the respondents (40%) started to smoke by the influence of college friends, where as almost the same percentage (35.6%) seemed to be influenced by personal inquisitiveness as they mentioned under the

“other” factor. 22.2 % started to smoke because of the influence of friends around their homes.

While more than one third of the students (41.9 %) smoked local brands, an equal percentage (41.9%) preferred both local and foreign brands and only a small percentage (13 %) chose foreign brands only.

With regard to the number of cigarettes smoked in a day, 29 % of respondents were not habitual smokers because they smoked only sometimes; however, 41.9 % of the respondents smoked 1-3 cigarettes in a day. Only a small percentage (6.5 %) smoked more than 10 cigarettes in a day.

The majority of smokers had no hesitation in purchasing cigarettes themselves from shops. Some of them obtained cigarettes from friends and only a few got them from other sources. 41.9 % liked to smoke after dinner, 38.7% smoked while they felt stressed. Of the 35.4 % of the respondents who smoked, some smoked after college, some in the evening, and some in the morning or whenever they felt alone. Among them some had no fixed time to smoke. 48.3 % and 44.1 % liked to smoke with smoker friends in college and around home respectively and 31% used to smoke alone. Regarding the amount of money (in Nepalese rupees ) spent on cigarettes, more than half of the smokers (54.8 %) spent less than 20 rupees per day for cigarettes. 22.6 % of respondents spent 50 or more rupees on cigarettes. The average money spent on cigarettes was 23 rupees per day. The minimum and maximum amounts spent on cigarette were 1 rupee and 85 rupees respectively.

16% of the respondents did not want to stop smoking cigarettes. Some had no idea about how to quit smoking and some could not stop because they were heavily addicted to them. However, 83.3% wanted to stop smoking cigarettes because of the negative impact on their health. 50% of the smokers had already attempted to quit for this reason but 50% did not want to quit. However, 16.1% sought help from others to help them quit.

## CHAPTER V

### DISCUSSION

This study was conducted on bachelor level health science college students in the Kathmandu valley, Nepal, to ascertain the smoking behavior of health science college students. A self administered questionnaire was used to collect data in January and February, 2011. The questionnaire consisted of questions about socio-demographic characteristics; predisposing, enabling, and reinforcing factor; and smoking behavior. The results obtained are discussed in this chapter.

#### 5.1 Socio-demographic factors

The study showed that 18.9% of smoking students were aged above 22 years. This age is a period of experimentation which leads them to experiment with new things such as smoking due to curiosity when they spend most of their time with smoking friends in college. Therefore, they easily indulge in smoking when they are in company of friends who smoke (11). On the basis of studies conducted about patterns of smoking among adolescents in Malaysia and Thailand, 23.9% of the 18 to 24 year age group were smokers. From this it is clear that adolescents (age group between 18 and 24 years) constitute the most vulnerable to smoking (5). There was no association between age of respondents and smoking behavior. This might be due to a narrow gap in years while grouping the ages, since the minimum age of the respondents in this study was 18 years. This result is similar to the findings of Trinh C. (47) and Kailawadoko S. (43). However, Thapa K. (42) found a significant association between age and smoking. The minimum age of respondents being 16 years and a wider gap between the age groups supported the latter's finding.

More male respondents (83.87%) than females (16.12%) smoked which signifies that males are more likely to smoke than females. It was found that smoking behavior of respondents was statistically significant in association with sex (P-

value $<0.001$ ). This is also supported by the fact that male smokers are more numerous than females (4). This is consistent with previous studies conducted by Kailawadoko S.(43), Thapa K. (42), and Win T.(45). Out of 500 million smokers in Asia, in most Asian countries, more than 50% are male (5).

Of all respondents who smoke 18.8% were in the first year of their courses. This shows that students in Nepal generally acquire the smoking habit early. In this study the age at initiation of smoking of bachelor level of health science students was 12 years. This is supported by a study conducted on junior college students in western Nepal which found that the majority of those who had smoked at some time started smoking between the ages 12 and 18 years (21). A study conducted in the University of Brazil and around the world showed that the global tendency of smoking was increasing among university students (26). However, there was no association between smoking behavior and year of study (P-value=0.458).

Regarding parental education, 25% of the fathers of respondents who smoked, and 19.4% of the mothers of respondents who smoked, were uneducated. However, there was no association between parental education and smoking behavior of their children (P-value=0.843, for father, P-value=0.914 for mother). This shows that education of parents is indirectly related to the smoking behavior of the children. Most of the fathers and mothers of the respondents had completed diploma and primary levels of education. The studies of Kailawadoko S. (43), Nurdin (11) and Thapa K. (42) had also found the similar results.

42.2% of the smoker students' fathers were teachers, and 28.6% of the mothers were in private service. Chi-square test showed no association between mother's occupation and smoking behavior of students (P value=0.314). However, there was a significant association between father's occupation and smoking behavior of students (P value $<0.002$ ). The studies of Kailawadoko S.(43) and Thapa K.(42) were also consistent with this finding.

21.1% of the students who lived in hostels and rented rooms adopted smoking; similarly 20% who lived with their friends in rental rooms and relatives during the study period were found to smoke. This shows that students who lived away from their families or parents were found to indulge in smoking in comparison to 6.1% smokers who lived in parents' houses with families. This showed that students

who lived by themselves had more freedom of exposure to smoking mostly when they were in company of friends who smoked. Peer influences strongly works in such cases. Adolescence is a period of experimentation and exploration. Therefore, beyond peer factor sometimes curiosity plays an important role to experiment with smoking (37). A significant association was found between place of residence of students and smoking behavior (P-value=0.005). Win T. (45) similarly found that students who lived alone were more likely to smoke than those who lived with their parents or families. However, nearly half (45%) of the respondents lived in their parents' houses with their families during their study period.

Regarding family income, although there was a wide range of average monthly family income among students in total, most of the families (83.3%) of students fell in the monthly income category of above per-capita income, that is above 15,000 Rupees per month. But, 28.1% of the smokers belonged to the families whose average family income per month was below 15,000 Rupees, the average per-capita income in Nepal; 13.3% of smoker students belonged to families whose income was above the average per capita income for Nepal. Chi-square test showed a nearly significant association between average family income and smoking behavior of students (P value=0.054). Nurdin (11) and Thapa K. (42) found no association between the two factors. People below the poverty line (30.6%) are more likely to be involved in smoking than those who live at or above poverty level (20.4%) (5).

The study showed that students (17.4%) who got above 1500 Rupees pocket money per month smoked more in comparison to students (8.6%) who received below 1500 rupees per month. It signified that students who had high amounts of pocket money had money for cigarettes. Chi-square test failed to show an association between pocket money and smoking behavior (P value=0.230). This study result was similar to what Supawongse found. According to him, students who got more income were likely to be smokers compared to those who got less income (23). The result showed that students (17.4%) who got more money could spend it on buying cigarettes. Similarly, students who worked for extra income (16.7%) smoked more than those (14%) who did not. However, there was no association between student's working for extra income and smoking behavior (P value=0.901). This result was not consistent with the findings of Nurdin (11), Thapa K (42) and Win T. (45).

## 5.2 Predisposing factors

The results of the study on knowledge about health hazards of smoking among students showed that 38.1% respondents had low levels of knowledge, more than half (53.7%) of them had moderate levels and only a one tenth ( 8.3%) had high levels of knowledge. It showed that although the students were from health science backgrounds, smokers were high in number due to low in level of knowledge about negative impact of smoking. Most of the students might not care about health hazards of smoking despite their knowledge about them. This was true in case of ex-smokers also. The result showed that there was no association between knowledge about smoking hazards and smoking behavior (P-value=0.211). Similarly, Dassanayake BMC. (31), Nurdin (11), and Win T. (45) showed no association between smoking behavior and knowledge about smoking hazards. However, Kailawadoko S. (43) and Thapa K. (42) found a significant association between the two. Their studies showed that although students had good knowledge about the hazards of smoking it had no effect on their smoking behavior.

Research conducted by the University of Brazil and Cambridge University found that the prevalence of smoking by students attending courses in the area of health, especially medical students, was lower than for students attending courses in the other fields. This suggests that students attending courses about health have higher levels of awareness regarding the hazards of smoking. Another study reported that more than 50% of regular smokers tended to increase tobacco consumption after admission into a university environment. There is a growing tendency to smoke among university students globally (39).

This study showed that 74.3% of the students had good attitude levels regarding smoking behavior, Similarly 20.6% and 5% had fair and poor levels, respectively. 54.5% of the students who had poor attitude levels adopted smoking compared to 22.2% of students with fair attitude levels. Chi-square test showed a significant association between attitude regarding smoking behavior and smoking behavior of the students (P-value<0.001). The result was consistent with the findings of Dassanyake BMC. (31), Nurdin (11), Thapa K.(42), and Win T.(45) who also reported that there was a significant association between attitude regarding smoking

hazards and smoking behavior of students. Those studies found that only a few students had a good attitudes regarding smoking behavior. This shows that attitude plays a greater role than knowledge on smokers. It could be concluded that if attitude towards smoking behavior is improved among students through health education and health promotion programs, starting smoking by adolescence can be reduced. However, Kailawadoko S. (43) found no association between smoking behavior and attitude towards smoking hazards.

### **5.3 Enabling and reinforcing factors**

In the study, more than a quarter (29%) of the students purchased cigarettes from street vendors. Slightly less a quarter (23.54%) purchased cigarettes from teastalls and shops near their homes and colleges. 77.4% of the students said that cigarettes were easily available around their homes, and 64.5% near their colleges. It suggested that banning sales of cigarettes might prevent students from smoking cigarettes. However, there is no such legislation existing in Nepal (59). More than one quarter (29%) of the students purchased cigarettes by themselves from street vendors or shops. One measure to control cigarette smoking might be a ban on single cigarette sales. Such legislation also does not exist in Nepal (59). If not purchased, 6.4% of the students obtained cigarettes from their parents. Students regard cigarette smoking as a social norm when they see it at home. Cigarettes were generally smoked at teastalls, restaurants and in public places. Restricted sales of cigarettes and banning smoking in public places might be helpful in reducing smoking by students. The students had seen advertisements about smoking in a wide range of media. 38.7% of them thought that cigarette smoking by popular celebrities might influence people to smoke, and 32.2% thought that popular brands of cigarettes might influence people to smoke. On asking which five media with “cigarette appearance” most influenced them, 80% thought that people are most influenced by movies, 61% by television, 51% by newspapers and magazines, 45% by songs and 35.4% by radio. 56.6% of the students demanded a total ban of advertisements for smoking in the media. In Nepal there is no existing legislation about sampling and sponsoring by the tobacco industry (59). There should

be a complete ban of tobacco advertisements as a partial ban was proved to be ineffective (60).

3.3% of the students reported that they were influenced by their families to smoke. As the number of family members using cigarette increased, the risk of students using cigarettes also increased. 16.1% of the fathers and 3.2% of the mothers of the students were smokers. Smoking among family members, particularly parents, was found to influence the students. Similar results have been reported by Supawongse, (23). For students, smoking at homes might be an acceptable norm. The students who had friends who smoked were mostly smokers. 36.7% reported that they were influenced by their peers for smoking. 13.3% of the students had financial problems in their families and 20% had family members with a chronic illness. Financial, social and other problems like poor academic achievement, and conflicts between friends, create stress and disturb students mentally. 38.7% of the students reported that they smoked when they felt stressed to relieve that stress.

#### **5.4 Smoking behavior**

In this study the overall prevalence of smoking was 14.2 %. Prevalence among male and female students was 11.92% and 2.29% respectively. The prevalence of smoking was lower than that reported by Trinh C. (47), Thapa K. (42) and Win T.(45). The prevalence reported by Trinh C., Thapa K., and Win T. was 21.8%, 74.64% and 35.65%, respectively. As these studies were carried out in different situations, the differences in prevalence might be due to regional differences in culture, traditions and other characteristics of a country. However, a study carried out among junior college students in western Nepal reported the prevalence 9.4% (21). The overall prevalence of smoking in Nepal was 38.4%. Worldwide, 47% of men and 12% of woman smoke, compared with 48.4% of men and 28.7% of females in Nepal. This shows that the percentage of women smoking in Nepal is higher than in the world as a whole (44). In the mountain region, the prevalence of female smoking was 71.6% (18). Studies have found that prevalence of smoking ranges from 20% to 72% in different parts of Nepal. (19).

Of the smokers, 77.4 % were regular smokers and 22.5 % were occasional smokers. Win T. (45) reported 78.05% were regular smokers and 21.95% were occasional smokers. In this study 78 % of the students were non-smokers and 7.8 % were ex-smokers. This was higher than 48.26% and 16.08% respectively as reported by Win T (45).

In this study, although almost one half (45%) of the students lived in their parents' homes with their families, 31.7% lived in rental rooms and some of them lived with friends. The students who lived with friends and rental rooms were more likely to smoke regularly. Win T. (45) reported a much higher percentage of students living in rental rooms (70.9%).

In the study, 48.3% of the students liked to smoke with college friends, however, Kailawadoko S. (43) found only 13% had that kind of habit. Less than half of the students (41.9%) preferred to smoke local brands of cigarettes and a similar number liked both local and foreign brands; this was less than that reported by Win T. (67.08 %). Most of the student smokers got more pocket money than others and some worked for extra income which allowed them to purchase cigarettes. However, in this study, 22.6% of the students could afford only 20 or less Rupees for cigarettes in a day. Such students preferred local brands of cigarettes.

In the study less than half of the students (41.9%) smoked less than ten cigarettes a day (1 to 3 cigarettes), and only a small number of students (6.5%) smoked more than ten cigarettes in a day. There was very different from the findings of Win T. (45) who reported that 92.69% smoked less than 10 cigarettes a day and 1.22% smoked more than ten. This finding was similar to that of Kailawadoko S. (43) who also reported that students smoked 6 cigarettes per day on average. However, this was higher than reported by Trinh C. (11). The reason behind the higher number of cigarettes consumed by the students might be the higher amount of pocket money they received from their families, or their work, the easy availability of cigarettes near their homes and colleges, the cheap price of cigarettes, and the weak legislation controlling tobacco use in the respective countries. Smoking by students is under control in the countries where legislation about the use of cigarettes is strictly followed and enforced.

The study showed that more than three quarters of the students (77.4%) started smoking above the age of 16; and less than a quarter of them (22.5%) started below the age of 16. This result was nearly similar to that reported by Win T. (45) which found 92.68% started over the age of 16 and 7.32 % below that age. This result was slightly lower (86.5%) than that of Kailawadoko S. (43). Excessive smoking among a large section of this age group could be an indication of a future increase in the prevalence of smoking by adults. The reasons for starting to smoke were peer influence (36.7%), to be accepted by smoker friends (33.3%), and personal curiosity. 83% of the students thought that they could quit smoking, 50% had tried to quit, and 16.1% had sought the help of others' to help them quit. This, therefore, suggests the need for counseling and quit-line programs to be available at the colleges to help those smokers who want to quit.

## **CHAPTER VI**

### **CONCLUSION AND RECOMMENDATIONS**

#### **6.1 Conclusion**

WHO predicts that tobacco use will become the chief cause of premature death, disease and disability in the world. The death rate of tobacco users growing faster than that of the non-users is the evidence. Also in Nepal, the cause of death due to non-communicable diseases is high which may be due to the high prevalence of tobacco use in people aged 18 years and above. Tobacco users usually lose their lives at an economically productive age. The physical disability and prolonged illness due to tobacco use leads people to economic loss. It is also a burden on the nation and the society. The growing demand of tobacco use in any form by the young generation is a matter of current concern. The rate of tobacco use by males and females is higher in developing countries than in developed countries. The cause of this, on one hand, may be the openness of society and easy access to tobacco products due to the ineffective implementation of legislation against tobacco use. On the other hand, poverty, unemployment, illiteracy, and lack of awareness of health hazards of tobacco use in developing countries may be another cause for the young generation to become involved in smoking, together with a more aggressive marketing strategy of tobacco companies to promote their business by promoting sports and distributing attractive gifts to lure young people.

The objective of this research study was to ascertain the smoking behavior of health science college students in the Kathmandu Valley, Nepal. The study was conducted on 218 private bachelor level, health science college students in the Kathmandu Valley, Nepal. The results indicated that 14.2% of the respondents were smokers. Although the majority of the respondents were female, smoking was higher among male students than female students.

Most of the smokers were at above 22 years of age, suggesting that older male college students were more likely to smoke. A majority of them started smoking after the age of 16 years. Young adults were involved in smoking more than the teenagers.

This study found no association between age or year of study and smoking behavior. Nor was parental education or maternal occupation associated with smoking behavior. However, paternal occupation was significantly associated with smoking behavior. Similarly, pocket money students received per month, and students working for extra income, also showed no association with smoking behavior. Average family income per month was nearly associated with smoking behavior (value=0.054). However, there was a significant association between place of residence of student (P-value=0.005) during the study period with smoking behavior.

This study showed that the student's knowledge about health hazards of smoking had no association with smoking behavior. However, there was significant association between student's attitude towards smoking behavior and smoking behavior. Targeted college-based intervention by counseling and education is necessary to increase awareness against health effects of smoking.

The students could purchase cigarettes from teastalls and shops near their homes and colleges, and from street vendors. Students could also get cigarettes from friends and parents when they needed cigarettes. Getting cigarettes was easy for them. Most of the students had sufficient pocket money to purchase foreign brands of cigarettes. Students were influenced by family members as well as peers in the colleges, in rental rooms, in hostels, and around their homes to smoke. The students were influenced not only by other people, they also indulged in smoking due to personal inquisitiveness. The students are equally exposed to advertisements in the electronic media such as the internet, movies, television and newspapers.

Smoking is prevalent among college students. Attitude towards smoking behavior, peer influence, and smoking by family members were each associated with their smoking behavior. Similarly, occupation of fathers of the students, place of residence of the students, and visual media specially the movies were also equally influential to start smoking by students. College-based counseling and education are necessary. Strict regulation of the sale and advertising of cigarettes may help. Policies on use of cigarettes need to be enforced to decrease availability, accessibility and

affordability of cigarettes. Parents and teachers also need to act to prevent the use of cigarettes by college students.

## **6.2 Recommendations**

On the basis of the result, to break the trend of smoking by students, the following recommendations can be given to the authorities at different levels.

In modern society certain socio-economic factors are found to be responsible for students indulging in behavior such as smoking. In this regard, family members, particularly parents, can be recommended as follows:

### **Recommendation at family level:**

1. Parents should spend time with their children in the family as much as they can, whatever profession they are engaged in. In the study majority of students who smoked had their father engaged in business which demanded much hours to spend outside the home.
2. Students should not be sent to hostels, dormitories or rental rooms to stay during study unless it is very necessary. Students who lived by themselves had more freedom of exposure to smoking mostly when they were in company of friends who smoked.
3. Students regard cigarette smoking as socially acceptable norm when they see it's use at home. So, homes should be smoke free. Parents should be role model to their children regarding tobacco use and should counsel their children about health hazards of smoking cigarettes with the help of audio, audio-visual and print media to discourage them from their use.

### **Recommendation at academic institution level:**

In order to prevent and control smoking by students, the following suggestions can be recommended to academic institutions:

1. Activities on anti-tobacco programs should be conducted in colleges regularly in order to educate students about the health hazards of smoking.

2. Counseling is necessary to develop good attitude regarding negative impact of smoking and to help those students who want to stop smoking. Colleges can manage documentary show on health hazards of smoking, organize debate program on the smoking cigarettes and taking students to the hospitals to see patients suffered from smoking cigarettes.

3. Teachers in the colleges should be role models to students regarding smoking cigarettes. Colleges should be “No smoking” zones.

### **Recommendation at national level:**

Smoking by young adults increases the prevalence in the future. If the government takes no action to prevent young people starting to smoke, or to control smoking by young people, it will have to bear a huge socio-economic burden in the future. Therefore, the following steps at a national level are recommended.

1. There should be regular campaigns and anti-smoking programs at a national level. The “No-smoking day on May 31”, should be observed every year with different activities with the participation by youth. at all levels of government units throughout the country.

2. Different levels of education curricula should include lessons about the health hazards of smoking. This can develop awareness against the hazards of smoking among the students.

3. The legislation regarding sale and advertising, and regular up-dating taxes on cigarettes should be enforced. Movies should be censored for the use of cigarette.

4. Ministry of health should use bill-boards, radio, television and print media extensively to make people aware about health effects of smoking cigarettes

5. All public places should be “No smoking” zones.

### **Recommendation for further study**

A further study should be conducted on students at secondary and higher secondary levels to explore the reasons for adopting smoking. The results of such studies will help to understand the reasons for starting smoking and the factors influencing smoking. They may also lead to more effective steps to prevent the

students from smoking, and help authorities to take appropriate intervention in time. A qualitative study should be conducted on current smokers to identify the ways of facilitating them to quit smoking cigarettes.



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## QUESTIONNAIRE

### SMOKING BEHAVIOR OF STUDENTS IN PRIVATE HEALTH SCIENCE COLLEGES IN KATHMANDU VALLEY, NEPAL

**Instruction:** The purpose of this study is to collect data based on your information. Analysis of this will provide guidelines for authorities to formulate policy interventions to support anti-smoking programs. Therefore you are requested to answer the questions carefully and to the best of your knowledge. You are assured that the information will be kept confidential and your name will not be revealed under any circumstances.

#### PART I: SOCIO-DEMOGRAPHIC FACTORS

PLEASE ANSWER EVERY QUESTION BELOW

Please mark “✓” in box  or fill in the blank as appropriate

1. Age \_\_\_\_\_ years
2. Sex  
1.  Male                      2.  Female
3. Year of study  
1.  First year              2.  Second year      3.  Third year
4. Your father's education  
1.  No education              2.  Primary school      3.  Secondary school  
4.  Diploma                      5.  Bachelor degree      6.  Master degree  
7.  Doctoral degree              8.  Other (please specify).....

**5. Your father’s main occupation (please mark one answer only)**

- 1.  Agriculture
- 2.  Business
- 3.  Laboring
- 4.  Government service
- 5.  Private service
- 6.  Teaching
- 7.  Unemployed
- 8.  Other (please specify).....

**6. Your mother’s education**

- 1.  No education
- 2.  Primary school
- 3.  Secondary school
- 4.  Diploma
- 5.  Bachelor
- 6.  Master degree
- 7.  Doctoral degree
- 8.  Other (please specify) .....

**7. Your mother’s main occupation (Please mark one answer only)**

- 1.  Agriculture
- 2.  Business
- 3.  Laboring
- 4.  Government service
- 5.  Private service
- 6.  Teaching
- 7.  Unemployed
- 8.  Other (please specify).....

**8. Where are you living now?**

- 1.  Parents’ house with family
- 2.  Hostel
- 3.  With friends
- 4.  Rental room
- 5.  With relatives (e.g. aunt, uncle,)
- 6.  Other (please specify) .....

**9. Average income of your family**

Approximately (please specify) .....Rupees/month

**10. Average monthly pocket money you get.**

.....Rupees/month

**11. Besides studying, do you work for extra-income?**

- 1.  Yes
- 2.  No

If yes, type of work (Please specify) .....

**12. What is your examination system?**

- (1) Grading system (Go to question 12.1)
- (2) Percentage system (Go to question 12.2)

**12.1 Your average grade after your last exam (Please specify) .....**

**12.2 Your average percentage after your last exam (Please specify) .....%**

**PART II: SMOKING BEHAVIOR****PLEASE ANSWER EVERY QUESTION BELOW****Please mark “✓” what best fits your opinion****13. Do you smoke?**

1.  No, I have never smoked in my life. (Go to questions 26- 46)
2.  No, I used to smoke but I quit. (Go to questions 15 -16)
3.  Yes, I smoke (please answer every question below)

**14. How often do you smoke?**

1.  Every day
2.  Once a week
3.  Twice a week
4.  Three times a week
5.  Other (please specify) .....

**15. When did you start smoking?**

.....years ago

**16. How did you start smoking? (If you are ex-smoker, go to question 26-46)**

1.  Friends in the college influenced me
2.  Friends around my home influenced me
3.  Parents influenced me
4.  Other (Please specify)

**17. Which brand of cigarette do you smoke, presently?**

1.  Local brand
2.  Foreign brand
3.  Both
4.  Other (Please specify) .....

**18. How many cigarettes do you smoke in a day?**

1.  Occasional smoking
2.  1 - 3 cigarettes
3.  4 - 6 cigarettes
4.  7 -10 cigarettes
5.  More than 10 cigarettes (please specify number) .....

**19. From where do you obtain cigarettes?**

- 1.  Purchase myself from a shop
- 2.  Usually from friends
- 3.  From parents
- 4.  From family members
- 5.  Other (Please specify) .....

**20. When do you usually smoke in a day? (can answer more than one)**

- 1.  After breakfast
- 2.  After lunch
- 3.  After dinner
- 4.  When feel stressed
- 5.  Other (please specify) .....

**21. With whom you usually smoke? (can answer more than one)**

- 1.  Alone
- 2.  With college friends
- 3.  With friends around home
- 4.  With family members
- 5.  Other (please specify) .....

**22. How much do you spend on cigarettes in a day?**

.....Rupees

**23. Do you think you can quit smoking cigarettes?**

- 1.  Yes
- 2.  No
- Why?.....

**24. Have you ever tried to quit smoking?**

- 1.  Yes
- 2.  No
- Why? .....

**25. To quit smoking, do you think you need help from others?**

- 1.  Yes
- 2.  No

**PART III: PREDISPOSING FACTORS****Knowledge about smoking hazards****PLEASE ANSWER EVERY QUESTION BELOW**

**Please mark “✓” what best fits your opinion. (Please mark one answer only)**

**26. What are the hazardous substances in cigarettes?**

1.  Nicotine and codeine
2.  Nicotine and carbon monoxide
3.  Morphine and codeine
4.  Morphine and carbon monoxide

**27. What is the addictive substance in cigarettes?**

1.  Nicotine
2.  Carbon monoxide
3.  Tar
4.  Caffeine

**28. What is the effect of cigarette smoking by a pregnant woman on her fetus?**

1.  Deformities of legs and arms
2.  Low growth rate
3.  Pulmonary tuberculosis
4.  No effect

**29. What substance in breast milk of a mother who smokes affects the infant?**

1.  Nicotine
2.  Carbon monoxide
3.  Tar
4.  Ammonia

**30. What is the effect of cigarette smoking on the nervous system?**

1.  Stimulates nervous system
2.  Firstly stimulates nervous system then suppresses
3.  Suppresses nervous system
4.  Does not stimulate or suppress

**31. Inhaling second hand cigarette smoke adversely affects the following types of people who inhale smoke.**

1.  Anybody around the smoker
2.  Only pregnant women
3.  Only small children
4.  All family embers

**32. Which of the following is not a side effect of smoking?**

1.  Having bad breath
2.  Discoloration of teeth
3.  Hair loss
4.  Coughing

**33. Which of the following statements is correct?**

1.  Nicotine has no severe effect on second hand smokers.
2.  Tar cannot cause cancer.
3.  Smoking can develop high blood pressure in smokers.
4.  Low nicotine and tar contained in cigarette is good for health.

**34. Expensive cigarettes are:**

1.  Less harmful
2.  Equally harmful
3.  Not harmful
4.  Good in taste

**35. Why do smokers not quit smoking cigarettes?**

1.  They help maintain personality
2.  They drives away stress
3.  They maintains the level of addictive substances in the blood
4.  They are habit

**36. A shopkeeper cannot sell cigarettes to a person, aged below:**

1.  13 years
2.  15 years
3.  16 years
4.  18 years

**Attitudes towards smoking behavior**

Please mark “✓” what best fits your opinion (Please mark one answer only)

	Statements	Agree	Not sure	Disagree
37.	Smoking makes smokers feel tough.			
38.	Smoking can relieve tension and anxiety in smokers.			
39.	Confident people adopt smoking.			
40.	Quitting smoking cigarettes improves smokers' general health.			
41.	Smoking makes smokers confident.			
42.	Smoking by teenagers is a sign of maturity.			
43.	Smoking by women is a matter of being smart.			
44.	People should enjoy their right to smoke.			
45.	Smoking makes smokers warm in the winter.			
46.	Occasional smoking is not harmful.			







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