

# Tobacco Use among Women in Dharan, Eastern Nepal

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## ABSTRACT

The study was undertaken to assess the prevalence and patterns of tobacco use and also assess the factors affecting tobacco use among the female population of Dharan. A cross-sectional survey of a representative sample of 2,340 female participants aged 15 years and above was conducted in Dharan municipality in 2001. Cluster sampling with probability proportionate to size technique was used. Of the 2,340 subjects, 12.9% were cigarette smokers and 14.1% were smokeless tobacco users. The smoking habit had a significant relationship with the habit of tobacco chewing. About 50% of the smokers had been continuously smoking for more than 20 years. Smokers aged 50 years and above were more likely to smoke more than 10 cigarettes per day than those at the reproductive age (15-49 years). Health problems among females did not have any significant relationship with tobacco-chewing, but smokers were nearly twice as likely to suffer from any health problem than non-smokers. Gastrointestinal problems were the most common complaint among the tobacco users. An effective awareness programme is required to discourage the use of tobacco and encourage women to take regular health check-ups.

**Key words:** Tobacco; Chewing; Smoking; Prevalence; Health; Cross-sectional studies; Nepal

## INTRODUCTION

The use of tobacco is a major cause of preventable mortality. Three million people die every year because of tobacco-related diseases (1). The estimated number of smokers is 1.1 billion. Of these, 700 million men and 100 million women are in developing countries (2). Smoking causes cancer of the lung, mouth, throat, larynx, esophagus, bladder, etc.; smoking is associated with cancer of the cervix, breast, stomach, and kidney and is a major risk factor for heart disease. Tobacco causes 73% of premature deaths from coronary heart disease (3).

Maternal smoking before, during, and after pregnancy contributes to numerous adverse health outcomes, including ectopic pregnancy, placenta previa, low-birth-weight babies, premature deliveries, perinatal deaths, and

sudden infant death syndrome. Decreasing the number of pregnant women who smoke is a critical public-health issue (4).

Nepal is a developing country. Although the prevalence of tobacco users and the tobacco-dependent population of Nepal have not been studied extensively, a few studies have shown that the prevalence of tobacco smoking ranges from 20% to 70% (5). Results of a study conducted in 1994 showed that the prevalence of smoking in Sunsari district was 17.5%, in which the prevalence of female smokers was 15.4% (6). The use of tobacco by females in Dharan, a town in Sunsari district situated in eastern Nepal, is alarming. Smoking directly affects not only the health of pregnant mothers, but also their foetuses. Moreover, there are risks after the baby is born. Cigarette-smoke is more dangerous for children than for adults because their (children) lungs are smaller and more sensitive. Children who live with smokers are more likely to have serious chest infections, such as bronchitis and pneumonia, especially during the first year of life. They are also more at risk of developing asthma and dying from cot death (3). Therefore, smoking

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is one of the major health problems if we seriously consider the magnitude of the problems it creates among females.

The changing demographics of smoking, particularly the unfavourable smoking patterns among younger women, may contribute substantially to the future burden of coronary heart disease and other smoking-related illnesses among women (7).

To take effective action, it is essential to know the magnitude and patterns of the problem. Our study, part of a survey on the prevalence of alcohol consumption among adult females conducted in a sample of the Dharan population, was designed to assess the prevalence and patterns of tobacco use among the female population and also assess the factors affecting tobacco use.

## MATERIALS AND METHODS

### Population and sampling

The study is a cross-sectional survey, conducted in Dharan municipality in 2001 through 2002. Dharan municipality has an estimated 66,457 people, distributed in 19 different wards (8). Tobacco smoking is more prevalent (9.7%) among women compared to alcohol (8.3%) in Sunsari district (9). Data for this study were drawn from a cross-sectional survey on the prevalence of alcohol use among females in Dharan. The sample size was preliminarily estimated based on the prevalence of alcohol use among females in an urban area of Sunsari district, which includes Dharan. As the population is heterogeneously distributed in the wards, the cluster sampling with probability proportionate to size technique was used so as to represent the target population. Considering the design effect 2 and 10% of non-response rate, 2,340 subjects were required to represent the females for tobacco use in Dharan. Thirty clusters, each with 78 subjects, were selected from 19 wards.

### Data-collection procedure

Houses were selected randomly using numbers from 11 to 49; the first digit was taken as a direction from a junction of streets, and the second digit was taken as the number of house to be included in the survey. Three trained female enumerators interviewed the participants separately in the absence of other occupants. Interviews were continued until 78 females for each cluster had been included.

### Instrument

The instrument consisted of various questions about age, marital status, occupation, ethnicity, religion, tobacco chewing and cigarette smoking, frequency and duration of cigarette smoking, pregnancy, and self-reported health problems of the respondents. The data-collection instrument was a self-designed questionnaire in the Nepali language, which was pre-tested on 20 females at the nearby Village Development Committee, 'Tarahara', to verify data-collection methods. Reliability was tested using the Guttman split-half reliability coefficient. It was calculated as 0.68, indicating that, overall, the participants responded consistently to questionnaire items. The term 'Tobacco use' was referred to a female who used tobacco daily either by chewing or by smoking, or both.

### Data analysis

Trained persons entered data into dBASE IV software using data entry format. To avoid entry error, it was regularly examined by an analyst. Data were analyzed using SPSS version 10.0. For calculating frequencies and percentages, preliminary analysis was done. Simple and multiple bars were used for presenting data for some variables. In the case of qualitative data, proportions, the 95% confidence interval (CI), odds ratio, and chi-square test were calculated to establish the significance of the variables. The significance was set at the 5% level.

### Consent

The study was approved by the Ethical Review Board of the Research Committee of B.P. Koirala Institute of Health Sciences, one of the authorized institutions of the Nepal Health Research Council. The Board follows the National Ethical Guidelines for Health Research in Nepal. Before data collection, written permission from Dharan municipality and verbal consent from each respondent were obtained. Females who refused to participate in the study were excluded.

## RESULTS

Of the 2,340 respondents, 39.9% were aged 15-24 years, 58.8% married, 56.1% housewives, 52.1% hill native caste, and 70.9% Hindus.

### Smoking habit

Nearly 13% of the respondents reported that they smoked. Of the total subjects, 7.2% of those at the

reproductive age (15-49 years) (95% CI=6.1-8.4%) compared to 37.7% (95% CI=33.2-42.3%) of those aged 50 years and above were smokers ( $p<0.0001$ ).

The prevalence of smoking increased with increasing age from 1.1% in the 15-24-year age group to peak at 42.1% in the 55-64-year age group, after which it declined. This trend was highly significant ( $p<0.0001$ ). Only 0.1% of the smokers were unmarried women. The highest prevalence of smoking was observed among divorced women (62.5%), followed by separated (57.1%), widow (43.9%), and married women (13.7%). The prevalence of smoking was higher among labourers (26.3%) than among businesswomen (21.4%) and housewives (18.1%). Unemployed females and female students did not smoke. Smoking was more common among hill occupational castes (17.3%) and low among Terai castes (7.8%). The prevalence among the castes was significantly different ( $p<0.0001$ ). Kirats were more likely and Christians were less likely to smoke than others. Among the participants, no Muslim female was found to have smoking habit (Table 1).

The smoking habit had a significant relationship with the habit of tobacco-chewing. Female smokers were twice as likely to use tobacco-chewing than female non-smokers (OR=2.1, 95% CI=1.5-2.8,  $p<0.0001$ ). The number of women who smoked during pregnancy was significantly lower compared to non-pregnant female smokers ( $p<0.0001$ ). Female smokers were nearly twice as likely to suffer from any health problem than non-smokers (OR=1.6, 95% CI=1.3-2.1,  $p<0.0001$ ) (Table 2).

More than half (50.2%) of the smokers had been continuously smoking for more than 20 years (Fig. 1). Smokers aged 50 years and above were more likely to have more than 10 cigarettes per day than those who were in the reproductive age group of 15-49 years (OR=2.7, 95% CI=1.2-6.2,  $p<0.01$ ) (Fig. 2).

### **Tobacco-chewing**

Tobacco-chewing was observed among 14.1% of the respondents. The prevalence of tobacco-chewing increased with increasing age from 6.0% in the 15-24-year age group to peak at 25.3% in the 35-44-year age group, after which it decreased gradually. A highly significant difference ( $p<0.0001$ ) was observed in that trend. Tobacco-chewing among women of reproductive age (15-49 years) was 13.9% (95% CI=12.4-15.5%), whereas it was 15.1% (95% CI=11.9-18.6%) among

the older age group (50 years and above). No significant relationship was observed between the age groups ( $p>0.05$ ). Tobacco-chewing was comparatively more common among females involved in business (30.5%) compared to others. Muslims were more likely and Christians were less likely to use tobacco than others (Table 1).

Tobacco-chewing did not affect significantly the health status of females. The number of women who continued tobacco-chewing during pregnancy was significantly lower compared to non-pregnant women having the habit of tobacco-chewing ( $p<0.0001$ ). Surprisingly, three unmarried women and two widows were found to be pregnant (Table 2).

### **Self-reported health problems associated with tobacco use**

The leading health problems among the 2,340 females were gynaecological (27.8%), gastrointestinal (25.6%), headache (17.3%), muscular-skeleton (10.4%), and eye diseases (9.4%). It was observed that smokers were more likely to have gastrointestinal problems (33.3%), followed by muscular-skeleton problems (18.8%). Similarly, gastrointestinal problems were more common (33.7%) among smokeless tobacco users, followed by gynaecological problems (23.4%) (Table 3).

## **DISCUSSION**

The findings of the study showed that the prevalence of smoking and tobacco-chewing in Dharan among females aged 15 years and above was 12.9% and 14.1% respectively. Results of a study in Sunsari district in 1994 showed that the prevalence of smoking and tobacco-chewing among females was 15.4% and 4.9% respectively (6). This fact implies that the prevalence of smoking among females may be decreasing, while tobacco-chewing may be increasing during the past eight years. In the attempt to give up smoking, the group might have deviated from the habit of smoking to tobacco-chewing. A slow decrease in the prevalence of smoking was observed among women. The finding of the present study is inconsistent with the finding of a longitudinal cohort study of 257 Tunisian medical students, which reported that the prevalence of smoking among females rose from 7.3% in the first year of their course to 14.4% when it ended, i.e. nearly doubled (10). A study among U.S. women, which supports the finding of the present study, reported that smoking cessation rates had declined more slowly among women than

among men (11). In Greece and Lebanon, over 30% of women smoke; in Italy, Syria, and Turkey, the figure is 20% or more; and in Egypt and Islamic Republic of Iran, 5% or fewer women use tobacco (12).

women was very small and was considered a limitation.

Furthermore, employers and senior managers smoked less than manual workers and service personnel in the United States (13). Similarly, results of our study showed

**Table 1.** Prevalence of smoking and tobacco-chewing among females ( $\geq 15$  years) by sociodemographic characteristics, Dharan, 2002

Characteristics	No. of females	Percentage	Prevalence (%)	
			Smoking	Tobacco-chewing
All	2,340	100.0	12.9	14.1
Age group (years)				
15-24	933	39.9	1.1	6.0
25-34	582	24.9	8.2	21.1
35-44	250	10.7	18.4	25.2
45-54	279	11.9	30.5	23.3
55-64	190	8.1	42.1	9.5
65+	106	4.5	30.2	7.9
Reproductive age and old age				
15-49 years	1,902	81.3	7.2	13.9
50+ years	438	18.7	37.7	15.1
Marital status				
Unmarried	725	31.0	0.1	1.4
Married	1,376	58.8	13.7	21.1
Separated	35	1.5	57.1	22.9
Divorced	8	0.3	62.5	12.5
Widow	196	8.4	43.9	10.7
Occupation				
Housewife	1,312	56.1	18.1	18.3
Business	187	8.0	21.4	30.5
Service	137	5.8	2.9	10.2
Labourer	78	3.3	24.4	21.8
Student	605	25.9	0.0	0.5
Unemployed	21	0.9	0.0	0.0
Ethnicity*				
Hill Native castes	1,219	52.1	15.4	15.1
Major Hill castes	759	32.4	9.2	12.9
Hill occupational castes	156	6.7	17.3	14.1
Terai castes	206	8.8	7.8	13.1
Religion				
Hindu	1,659	70.9	12.6	14.4
Christian	157	6.7	2.5	3.8
Kirat	300	12.8	16.0	16.0
Buddhist	216	9.2	15.7	16.7
Muslim	8	0.3	0.0	25.0

\* Hill Native: Rai, Limbu, Magar, Tamang, Gurung, Sherpa; Major Hill: Brahmin, Chhetri, Newar  
Hill occupational: Bishwakarma, Pariyar, Sarki; Terai Caste: Marwadi, Yadav, Jha, Rauniyar, Gupta, Mallik, etc. (9)

In the present study, smoking was more common among women who were alone after being marriage, i.e. divorced, separated, or widowed, but in the case of tobacco-chewing, this was not true. This result might not be true as the number of divorced and separated

that the prevalence of smoking and tobacco-chewing was more common among labourers and businesswomen compared to others. None of 605 girl students was using tobacco, except a very few students (0.5%) reported to have the habit of tobacco-chewing.

In this study, the relationship between tobacco use and economic status of the family could not be assessed because most respondents did not want to reveal their family income although the participants were confirmed that the data would not be disclosed anywhere for any

at a high risk. The Cancer Association of South Africa had added in the same document that smoking affects fertility: women who smoke take longer to get pregnant and are more likely to miscarry. Smoking has a direct effect on the baby if a woman smokes during pregnancy.

**Table 2.** Smoking, tobacco-chewing, and health problems among females ( $\geq 15$  years), Dharan, 2002

Variables	No. of females (n=2,340)	Percentage	Prevalence (%)			
			Smoking	p value	Tobacco-chewing	p value
<b>Tobacco-chewing</b>						
Yes	331	14.1	21.1	<0.0001		
No	2,009	85.9	11.5			
<b>Pregnancy*</b>						
Yes	231	14.3	7.7	<0.0001	28.5	<0.0005
No	1,384	85.7	15.0		19.5	
<b>Health problems</b>						
Yes	1,250	53.4	15.4	<0.0001	14.7	>0.05
No	1,090	46.6	10.0		13.5	

\* Unmarried pregnancy=3 and pregnant widow=2

other purpose. It might be due to the fear of Maoists. During the survey, people were currently suffering from increasing attacks on properties and incidents of violence relating to a Maoist insurgency. Another reason might be the fear of income tax.

Our data confirm that more than half of the smokers had been continuously smoking for more than 20 years. Moreover, about 45% of them were at the reproductive age (15-49 years). A cluster randomized controlled trial also revealed that the median self-reported daily cigarette consumption among daily smokers was 10 cigarettes (14). Considering 10 cigarettes as a cut-of point, the frequency of smoking between the age groups of 15-40 years and above was significantly different, i.e. smokers aged 50 years and above were more likely to have more than 10 cigarettes per day than those aged less than 50 years.

Although the number of heavy female smokers who used to smoke 20 or more cigarettes per day was less compared to the Sunsari Health Interview Survey (6), it was a serious issue. The document titled "The diseases caused by smoking", published by the Cancer Association of South Africa, reports that most people who smoke more than 20 cigarettes a day have some degree of emphysema, a disease that slowly destroys the air sacs in the lungs, impairing their ability to expand and contract (3).

Similarly, although the number of women who smoked during pregnancy was significantly lower compared to non-pregnant female smokers, they were

The chemicals in the smoke decrease the amount of oxygen available to the foetus. This places a strain on the baby's heart and reduces the breathing movements the baby practises before birth. Babies born to mothers

**Table 3.** Common health problems associated with habit of smoking and tobacco-chewing among females ( $\geq 15$  years), Dharan, 2002

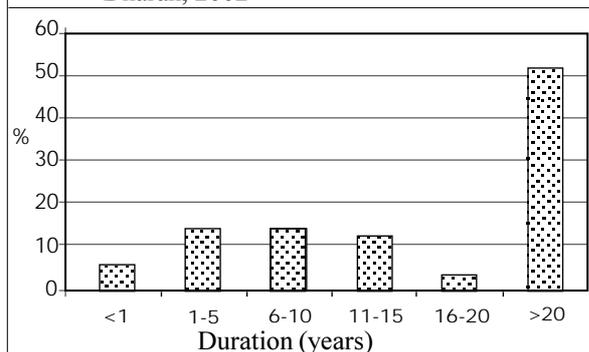
Common health problems	Smokers (%) (n=301)	Tobacco-chewers (%) (n=331)
Gastrointestinal	33.3	33.7
Muscular-skeleton	18.8	10.3
Gynaecological	16.7	23.4
Headache	14.6	21.2
Respiratory	12.5	5.4
Cardiovascular	10.9	12.5
Neurological	6.3	8.7
Eye diseases	5.7	7.6
Weakness	5.2	6.5
ENT	4.2	2.7

who smoke during pregnancy are more likely to be underweight, premature, or stillborn (3). There is, therefore, an urgent need to make pregnant smokers give up the tobacco habit.

The majority of people interviewed in Tunisia acknowledged the damage done by smoking and linked tobacco intake to cancer, particularly of the respiratory organs (10,15,16); in Canada (17) and Algeria (18), studies recognized its link to cardiovascular disease and chronic pulmonary disease respectively. The people of

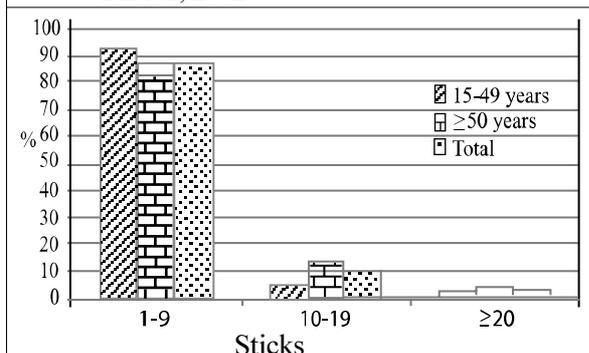
developed countries may be aware of health hazards due to tobacco use, but in most developing countries, such as Nepal, especially in the female community whose literacy rate is only 42.49% (19), people are not very aware of health hazards due to tobacco use. Therefore, an awareness-raising programme is equally important, which may help women to stop tobacco use in time.

**Fig. 1.** Percentage of female smokers (aged  $\geq 15$  years) (n=301) by duration of cigarette-smoking, Dharan, 2002



The study revealed that the most common self-reported health problems among female tobacco users were gastrointestinal, muscular-skeleton and gynaecological in nature. Respiratory and cardiovascular problems were at the fifth and sixth position among female smokers, whereas among smokeless tobacco users, they were in

**Fig. 2.** Percentage distribution of smokers by average number of sticks smoked daily by age group, Dharan, 2002



the ninth and fourth position respectively. This study may not give a true picture of the diseases linked to tobacco use because they were self-reported by the respondents, not clinically diagnosed by health professionals. Therefore, smokers should be encouraged to go for regular health check-ups, or a health camp should be conducted for screening health problems among female smokers.

The prevalence of smoking and tobacco-chewing among females aged 15 years and above was 12.9% and 14.1% respectively. Smoking was more common among the divorced, separated and widowed women than among others. Labourers and businesswomen were more likely to use tobacco than others. The smoking habit had a significant relationship with the habit of tobacco-chewing. More than half of the smokers had been continuously smoking for more than 20 years. The most prevalent age group for smoking was 55-64 years, and for tobacco-chewing, it was 35-44 years. Gastrointestinal problems were the leading self-reported health problems among smokers and smokeless tobacco users. Females who smoked more than 20 cigarettes per day were at high risk and those who smoked during pregnancy were not only at risk of damaging their health but also that of the foetus. Therefore, awareness should be created among women through effective programmes to discourage tobacco use. Females smokers who wish to quit smoking should be encouraged to go for regular check-ups. Smokers who wish to quit smoking should be provided help and support.

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