Factors Associated with Smokeless Tobacco Use among Pregnant Women in Rural Areas of the Southern Terai, Nepal

Jitendra Kumar Singh,[1] Dilaram Acharya,[2] Rajendra Kadel,[3] Samaj Adhikari,[4] Daniel Lombard,[3] Sumitra Koirala,[5] Rajan Paudel[6]

[1]Department of Community Medicine, Institute of Medical Sciences, Banaras Hindu University, India, [2]Department of Community Medicine, Devdaha Medical College and Research Institute, Kathmandu University, Bhaluhi, Rupandehi, Nepal, [3]Personal Social Services Research Unit, London School of Economics and Political Science, London, UK, [4]Institute of Medicine, Kathmandu, Nepal, [5]Department of Nursing, Sanjeevani College of Medical Sciences, Rupandehi, Nepal, [6]Department of Community Medicine and Public Health, Institute of Medicine, Kathmandu, Nepal.

ABSTRACT

Background: Tobacco use among women during pregnancy leading to poor maternal and child health outcomes has been well documented. However, factors influencing use of smokeless tobacco in Nepal has not yet been well established. This study aims at exploring the factors related to smokeless tobacco use among pregnant women in rural southern Terai of Nepal.

Methods: A community-based cross-sectional study was performed at 52 wards within 6 Village Development Committee in Dhanusha district of Nepal. A total of 426 expectant mothers in their second trimester were selected using a multistage cluster sampling method. Descriptive and regression analyses were done to explore the factors that influence smokeless tobacco use.

Results: In a total of 426 pregnant mothers, one in five used tobacco in any form. Among the users, 13.4% used smokeless tobacco. Pregnant mothers who were smoking tobacco (AOR 6.01; 95% CI (1.88-19.23), having alcohol consumption (AOR 3.86; 95% CI (1.23-12.08), stressed (AOR 5.04; 95% CI (1.81-14.03), non-vegetarian (AOR 3.31;(1.84-13.03), not attending regular mothers' group meetings (AOR 4.63; (1.41-15.19), and not-exposed to mass media (AOR 5.02; (1.89-13.33) were significantly associated with smokeless tobacco use. Similarly, mothers of age group 20-34 years, *dalit, aadibasi* and *janajati*, hill origin, no education and primary education were more likely to use smokeless tobacco than their counterparts.

Conclusions: Factors such as smoking tobacco, alcohol consumption, stress, and poor education were found to be significantly associated with smokeless tobacco use among pregnant women in southern Terai of Nepal. This requires an immediate attention develop an effective strategy to prevent and control smokeless tobacco use among pregnant women in southern Terai of Nepal.

Keywords: Nepal; pregnant women; smokeless tobacco.

INTRODUCTION

Tobacco use is one of the major public health threats worldwide.[1] In 2010, smokeless tobacco use was attributable to 1.7 million Disability Adjusted Life Years(DALYs) lost and over 62,000 deaths in 113 countries, of which 85% of this burden was in South East Asian countries.[2]

Tobacco consumption among pregnant women have several adverse consequences on maternal and child health.[3] Several studies among pregnant women from Nepal and India showed that illiteracy, urban residence, manual occupation, husband's smoking habit, being divorced, and Terai heritage were associated with increased risk of smokeless tobacco use.[4-7]

Correspondence: Mr Dilaram Acharya, Department of Community Medicine, Devdaha Medical College and Research Institute, Kathmandu University, Bhaluhi, Rupandehi, Nepal. Email: dilaramacharya123@gmail.com, Phone: +977 9857036390.

Smokeless tobacco is a form of tobacco which is consumed without burning it through the mouth or nose. Some common smokeless tobacco products available in Nepal are "gutka", "pan masala", "betel-quid", "khaini or surti", "zarda", snuff and "gul". Our study aimed to explore the factors that influence smokeless tobacco use among pregnant women in rural southern Terai of Nepal.

METHODS

A cross-sectional survey was conducted in Dhanusha district of Nepal between July and September 2015. Dhanusha is one of the 75 districts of Nepal, situated in the southern Terai. This district is, administratively, comprised of one municipality and 101 Village Development Committees (VDCs), which is further divided into smaller administrative units called wards.[8]

This study employed multi-stage cluster sampling. First of all, two primary health care facilities (consisting of one primary health care centre and one health post) were selected purposively, which consisted of 12 VDCs. We selected these areas because there were no other health-related organizations to support government's tobacco control services among pregnant women. Furthermore, no research has been conducted yet relating to this field in those study sites.

Each health care facility consisted of six VDCs and the population in each VDC ranges from 3,500 to 19,000.[9] Secondly, these six VDCs from each health facility catchment area were then stratified into three groups on the basis of population size (<5000, 5000-10000, and >10000).[8,9] Then, one VDC was selected from each stratum in both health facility areas using simple random sampling method, which gave six VDCs in total for our study. These six VDCs consisted of 54 wards, we called here as study cluster. We excluded two of these clusters because these were situated in a town area. Hence, 52 clusters were included in this study. Finally, complete enumeration of all households with pregnant women between 13-28 weeks of gestation in the selected clusters was carried out for our study. We identified 453 participants eligible for the study, with the help from health facility staff and female community health volunteers (FCHVs). Twenty seven did not respond to the study that left 426 participants for the study (figure 1).

Participants who were women between 15 to 45 years of age, pregnant with gestation period between 13 to 28 weeks, living in rural areas, no serious health problem and willing to participate in the study were eligible for this study.
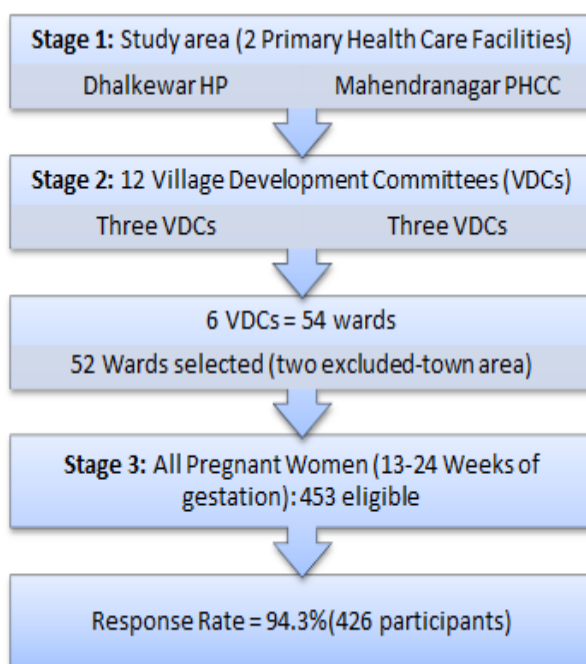

Figure 1. Sampling Strategy

Data were collected from six nursing students (research assistants) using a structured questionnaire during face-to-face interviews. All research assistants were trained before we sent them for data collection. The English version of the questionnaire was prepared, checked and pre-tested in 10% of the estimated sample in Kishannagar and Auragi VDCs of Mahottari district and necessary changes were made as needed. The questionnaire was then translated into Nepali and back into English by the researchers to ensure that the meanings of the questions were not modified. The questionnaire consisted of three parts: i) use of tobacco by pregnant women ii) respondents baseline characteristics, and iii) individual and obstetric characteristics, and maternal medical conditions.

The main outcome variable of this study was smokeless tobacco use among pregnant women. Independent variables included were: socio-demographic, occupational, maternal factors, participation and wealth index categorised as lower, second, middle, fourth, and highest. Altogether 29 household amenities/assets were considered in this study that were utilized by the family. Wealth Index was calculated by using Principal Component Analysis (PCA) using the same methodology as the Nepal Adolescent and Youth Survey.[10] Maternal factors such as age, caste/ethnicity, origin, maternal and their husband's education, dietary habits, dietary variety, additional food consumption (one extra meal than regular meal required for adult woman), smoking,

alcohol consumption, spousal violence, stress, exposure to mass media such as radio, television, printed media and hoarding board and attendance to mother's group meetings.

The socio-demographic characteristics such as religion, origin, maternal occupation, maternal education, husband's education, and husband's occupation were adapted from Nepal demographic and population health survey 2011.[11] Caste/ethnicity was based on the caste system in Nepal, and was divided into three major groups based on available literature and similarities between the caste/ethnic groups: *disadvantaged/dalit, disadvantaged/aadibasi/janajati*, and advantaged/ upper caste (Brahmin and Chhetri).[12,13] Dietary diversity was coded into three categories: low, medium, and high on the basis of food items consumed by pregnant women from 16 food groups as recommended by FAO.[14] The consumption of food from ≤3 food groups, 4-5 food groups, and ≥6 food groups was considered as low, medium and high dietary diversity respectively. [14,15] Spousal violence was defined as any experience of physical, sexual, verbal, and psychological harm or suffering among pregnant women occurring in public or private life adapted from NDHS 2011.[12]

Stress was measured by the General Health Questionnaire (GHQ-12), validated instrument (sensitivity: 85% and specificity: 79%) to measure a minor psychiatric disorders in many countries and translated into different languages, including Nepali.[16-18] Information on attendance to a mothers' group meeting was categorized as attended and not attended. Exposure to any of the mass media (either printed or electronic) was categorized as exposed and not exposed during past three months.

All completed questionnaires were checked for completeness and consistency and verified on the same day. The data were then entered into Epi Data 3.1 Software. All the data files were checked and cleaned before analysis. The analysis of the data was carried out using SPSS version 20 for windows. Univariate analysis was used to describe the distribution of sample by use of smokeless tobacco during pregnancy. An association of various factors with the use of smokeless tobacco during pregnancy was analyzed using the chi-square test in bivariate analyses. Multivariable logistic regression model was used to assess the independent association between use of smokeless tobacco during pregnancy and maternal socio-demographic characteristics. Factors which were significant (p<0.05) in bivariate analysis were selected for multivariable analysis and adjusted odds ratios (OR) and 95% confidence intervals were

obtained.

Ethical approval for the study was obtained from the Nepal Health Research Council, Nepal as well as the ethics committee of the Institute of Medical Sciences, Banaras Hindu University, India (approval no: ECR/526/ Inst/UP/2014 Dt.31.1.14) and District Public Health Office, Dhanusha, Nepal. The objectives, benefits and harms of the study was explained to the participants and their partner. Then informed consent was taken from them before taking interviews by the research assistants. We carried out this study in full compliance with national Ethical Guidelines for Health Research in Nepal and Standard Operating Procedures 2011.

RESULTS

Table 1 shows the current status of tobacco use among pregnant women. A total of 21.4% respondents reported the use of tobacco in any form, among them 13.4% used smokeless tobacco. Fifty-three percent of smokeless tobacco users used it 1-3 times a day and 25% of them used it once daily, while the remainder used it for more than 3 times a day.

Table 1. Pattern and frequency of tobacco use among pregnant women.		
Variables	**Number (N=426)**	**Percentage**
Use of tobacco (any form)	91	21.4
Smokes cigarettes*	49	11.5
Smokes pipe*	7	1.6
Smokes bidi*	25	5.8
Smokeless tobacco*	57	13.4
Frequency of smokeless tobacco consumption (n=57)		
Less than 1/day	14	24.5
1-3 times/day	30	52.6
more than 3 times /day	13	22.8

*Multiple Responses

The socio-demographic characteristics of the study participants are shown in Table 2. Results from the study showed that smokeless tobacco use was significantly associated with age, ethnicity, birth origin, education levels, woman's occupation, and household wealth index.

Table 3 demonstrates the personal history associated with smokeless tobacco use. The findings showed that smokeless tobacco use was strongly associated with the participant's personal and obstetric history, such as

Table 2. Baseline characteristics associated with smokeless tobacco use among pregnant women in rural area.				
Variable	Total	Use of smokeless tobacco		p-value
	n (%)	Yes(n=57) (%)	No(n=369 (%)	
Age (years)				
<20	102 (23.9)	14(13.7)	88(86.3)	0.001
20-34	290(68.1)	27(9.3)	263(90.7)	
35-45	34(8.0)	16(47.1)	18(53.9)	
Caste/ethnicity				
Dalit	71(16.7)	21(29.6)	50(70.4)	<0.0001
Adibasi/janajati	91(21.4)	22(24.2)	69(75.8)	
Upper caste group	264(62.0)	14(5.3)	250(94.7)	
Religion				
Hindu	391(91.8)	49(12.5)	342(87.5)	0.086
Muslim and Buddhist	35 (8.2)	8(22.9)	27(77.1)	
Women's education				
No education(illiterate)	108(25.4)	33(30.5)	75(69.5)	<0.0001
Primary (1 to 5 years of schooling)	149(35.0)	12(8.0)	137(92.0)	
Secondary (6-10 years of schooling)	79(18.5)	7(8.9)	72(91.1)	
Higher(Higher than 10 years of schooling)	90(21.1)	5(5.6)	85(94.4)	
Husband's education				
No education(illiterate)	64(15.0)	20(31.2)	44(68.8)	<0.0001
Primary (1 to 5 years of schooling)	131(30.8)	12(9.2)	119(90.8)	
Secondary (6-10 years of schooling)	91(21.36)	9(9.9)	82(90.1)	
Higher(Higher than 10 years of schooling)	140(32.9)	16(11.4)	124(88.6)	
Women's occupation				
Non agriculture	292 (68.5)	30(10.3)	262(89.7)	0.005
Agriculture	134 (31.5)	27(20.1)	107(79.9)	
Husband's occupation				
Non agriculture	280 (71.1)	35(12.5)	245(87.5)	0.082
Agriculture	146 (34.3)	22(15.0)	124(85.0)	
Wealth index				
Lower	124(29.1)	28(22.6)	96(77.4)	0.011
Second	100(23.5)	10(10.0)	90(90.0)	
Middle	84(19.7)	9(10.7)	75(89.3)	
Fourth	61(14.3)	5(8.2)	56(91.8)	
Highest	57(13.4)	5(8.8)	52(91.2)	
Total	426	57	369	

dietary habits, smoking, alcohol consumption, spousal violence, stress, and mothers' group meetings and mass media exposure.

The results of multiple logistic regression analyses are shown in Table 4. Pregnant women from age group 20-34 years were more likely to use smokeless tobacco (AOR 4.2; 95% CI (1.3-14.2)) than women in their below 20.

Table 3. Personal history associated with smokeless tobacco use among pregnant women in rural area.				
Variable	Total	Use of smokeless tobacco		p-value
	N=426 (%)	Yes (n=57)(%)	No (n=369) (%)	
Dietary habits				
Non Vegetarian	335(78.64)	51(15.2)	284(84.8)	0.032
Vegetarian	91 (21.36)	6(6.6)	85(93.4)	
Smoking				
No	383(90.15)	43(11.2)	340(88.8)	0.000
Yes	43 (9.85)	14(32.6)	29(67.4)	
Alcohol consumption				
No	369(86.62)	41(11.1)	328(88.9)	0.000
Yes	57 (13.38)	16(28.1)	41(71.9)	
Spousal Violence				
No	303 (71.13)	31(10.2)	273(89.8)	0.002
Yes	123 (28.87)	26(21.3)	96(78.7)	
Stress				
No	272(63.85)	29(10.7)	243(89.3)	0.028
Yes	154(36.15)	28(18.2)	126(81.8)	
Mother's group meeting				
Not attended	320 (75.1)	50(15.6)	270(84.4)	0.018
Attended	106 (24.9)	7(6.6)	99(93.4)	
Media exposure				
No	109 (25.59)	33(30.3)	76(69.7)	0.000
Yes	317(74.41)	24(7.6)	293(92.4)	
Total	426	57	369	

Expectant mother from *dalit* (AOR 3.9; 95% CI (1.1-13.8)) and *aadibasi/janajati*(AOR 3.1; 95% CI (1.2-19.6)) group were more likely to use smokeless tobacco than upper caste group. Similarly, participants from hill origin (AOR 3.8; 95% CI (1.6-9.2)) were more likely to use smokeless tobacco than Terai origin. Respondents with no education (AOR 9.6; 95% CI (2.5-32.7)) and primary education (AOR 4.5; 95% CI (1.1-17.7)) were more likely to use smokeless tobacco than higher education group.

Likewise, non-vegetarian (AOR 3.3; 95% CI (1.8-13.0)), smokers (AOR 6.0; 95% CI (1.9-19.2)), alcohol consumption group (AOR 3.9; 95% CI (1.2-12.0)), and stressed women (AOR 5.0; 95% CI (1.8-14.0)) were more likely, respectively, to use smokeless tobacco. Furthermore, pregnant women who were not attending regular mothers' group meetings (AOR 4.6; 95% CI (1.4-15.2)), and those who were not exposed to mass media (AOR 5.0; 95% CI (1.9-13.3)) were more likely, respectively, to use smokeless tobacco.

Table 4. Multiple logistic regression model for factors of antenatal addiction among rural women.		
Characteristics	Crude OR (95% CI)	Adjusted OR (95% CI)
Age (years)		
<20	1	1
20-34	2.19 (0.9-4.9)	4.6 (1.3-15.5)
35-45	3.0 (1.5-6.0)	1.66 (0.6-4.9)
Caste/ethnicity		
Upper Caste	1	1
Adibasi/janajati	5.7 (2.8-11.7)	3.1 (1.2-19.6)
Dalit	7.5 (3.6-15.7)	3.9 (1.1-13.8)
Birth origin		
Terai	1	1
Hill	2.4 (1.4-4.3)	3.9 (1.6-9.2)
Participant's education		
Higher	1	1
Secondary	1.6 (0.5-5.4)	2.6 (0.8-7.6)
Primary	1.5 (0.5-4.4)	4.5 (1.1-17.7)

No education	7.5 (2.8-20.1)	9.6 (2.5-32.7)
Husband's education		
Higher	1	1
Secondary	0.8 (0.3-2.0)	1.7 (0.5-5.7)
Primary	0.78 (0.3-1.7)	0.8 (0.2-3.3)
No education	3.5 (1.7-7.4)	2.9 (0.7-11.4)
Dietary habit		
Vegetarian	1	1
Non-vegetarian	2.5 (1.0-6.1)	3.3 (1.8-13.0)
Smoking		
No	1	1
Yes	3.8 (1.9-7.8)	6.0(1.9-19.2)
Alcohol consumption		
No	1	1
Yes	3.12 (1.60-6.05)	3.86 (1.23-12.08)
Spousal violence		
No	1	1
Yes	2.4 (1.3-4.2)	2.4 (0.9-6.4)
Stress		
No	1	1
Yes	1.8 (1.0-3.3)	5.04 (1.8-14.0)
Mother's group meeting		
Attended	1	1
Not Attended	2.6 (1.1-6.0)	4.6 (1.4-15.2)
Mass media exposure		
Yes	1	1
No	5.3 (2.9-9.5)	5.0 (1.9-13.3)

DISCUSSION

This study reveals that the prevalence of smokeless tobacco use among pregnant women in this region is 13.4%, which is higher than national,[19] and South Asian countries' average.[20] This could be due to socioeconomic and cultural factors associated with smokeless tobacco use in rural areas. It is evident from the study that caste/ethnicity, birth origin, women's education, dietary habit, alcohol consumption, stress, attendance in mothers' group meetings, and exposure to mass media are risk factors for smokeless tobacco use among pregnant women in Nepal.

The ethnicity is an important predictor of smokeless tobacco use among pregnant women in our study. Those belonging to disadvantaged caste/ethnicity are more likely to consume smokeless tobacco compared to advantaged caste group women. This is consistent with studies from India, Canada and Australia and other countries.[21-23] The higher rate of smokeless tobacco use among disadvantaged group could be due to less awareness of negative maternal and child health consequences of tobacco consumption.

Interestingly, pregnant women from hill origin are more likely to use smokeless tobacco. This could be due to free access and social acceptance of smokeless tobacco than smoking cigarette among women in hill area. Smokeless tobacco use in women is often more socially acceptable than tobacco smoking.[24] Tobacco prevention strategies should focus on ethnic differences and cultural practices along with enforcement of laws and regulation in this regard.

Similarly, uneducated expectant mothers in our study are more likely to consume smokeless tobacco compared to educated group. The study findings concur with previous studies conducted in Bangladesh, Canada, and Nepal.[22,25,26] Several studies showed that educated women were more aware of health hazards of smokeless tobacco use during pregnancy and there was lower degree of family acceptance for tobacco use in the educated family compared to uneducated family. [27-30]

Our findings show that pregnant women who are vegetarian, participated in mothers' group meetings, and exposed to mass media are less likely to consume smokeless tobacco. Vegetarians could be absolute in their dietary habit and even some vegetarians are bound culturally, that is, they are restricted by the societies to get involved in unhealthy behaviour of smokeless tobacco use. Expectant mothers who are participated in mothers' group meetings and exposed to mass media could be more aware of the detrimental effect of smokeless tobacco. Studies based in India and Sub-Saharan Africa also revealed the positive impact of mass media on tobacco consumption. [31,32] Furthermore, our study shows that women in a stress situation are more likely to consume smokeless tobacco compared to unstressed. This reflects the findings of an experimental study,[33] highlighting the direct relation between stress level and tobacco consumption, and also women at a high stress level believe that smokeless tobacco consumption may temporarily reduce their work-or family-related stress.

There are number of limitations in this study: first, the status of smokeless tobacco use was self-reported which may be likely to have missed information. [34] Second, this study lacks the effect of smokeless tobacco use on maternal and child health outcome as the data were collected for one cross-sectional point. Third, due to smaller sample size, the study findings lack its

generalizability.

CONCLUSIONS

Low education, hill origin, disadvantaged ethnic groups, a habit of smoking and alcohol consumption, non-vegetarian diet, having high levels of stress, a lack of exposure to mass media, and non-attendance to mothers' group meetings are strongly associated with smokeless tobacco use. This signifies the need of formulation and implementation of effective strategies to prevent and control smokeless tobacco use for the overall improvement of maternal health and birth outcomes in southern Terai of Nepal

ACKNOWLEDGEMENTS

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