JOURNAL OF HEALTH PROMOTION ISSN: 2631-2441 (Print) Received: 31-03-2021
Volume 9, 2021, pp: 8-18 ISSN: 2822-1591 (Online) Accepted: 25-07-2021 DOI: doi.org/10.3126/jhp.v9i01.40958

The smoking behavior of women of reproductive age in Nepal

Ramesh Adhikari[1,2*]; Aakriti Wagle[2]; Min Raj Adhikari[1]

[1]Mahendra Ratna Campus, Tribhuvan University, Kathmandu
[2]Center for Research on Education Health and Social Science (CREHSS), Kathmandu
*Correspondence: rameshipsr@gmail.com; ORCID: 0000-0002-6085-6068

ABSTRACT

Smoking, the leading cause of preventable deaths worldwide, which is more detrimental to women not only increases the chances of infertility and miscarriage, but hastens the onset of menopause and causes women to be more susceptible to depression, decreased bone density, cataracts, and skin diseases. This paper investigates the smoking behavior and factors influencing smoking among women of reproductive age in Nepal. The study used secondary data from the 2016 Nepal Demographic and Health Survey. A total of 12,862 women of the reproductive age group were covered in the survey. The association between smoking and the explanatory variables was first assessed in bivariate analysis using the Chi-square test. The associations were further explored using multivariate logistic analysis. Nearly two-fifths (38%) of women were aged 15-24 years. Overall, 8% of women used tobacco products (smoking/chewing). Multivariate analysis showed that women aged 35 and above were almost seven times (aOR=6.52, CI=4.75-8.94) to be smokers than younger women. Separated/divorced/widowed women were nearly twice (aOR=1.86, CI=1.14-3.01) as likely to be smokers than their counterparts. Education is a significant predictor of smoking as women having primary (aOR=0.65, CI=0.54-0.78) and secondary/higher education (aOR=0.21, CI=0.16-0.26) were less likely to smoke than women with no education. Dalit women were nearly two times more likely to be smokers than higher caste Brahmin/Chhetri. Similarly, the richest and richer women were less likely to smoke than the poorest women. Age, education, marital status, caste/ethnicity, and wealth index were significant determinants of smoking among women. Hence, tobacco control interventions need to be focused on women of higher age groups and uneducated and poorer women.

Keywords: Education, married women, Nepal, smoking, wealth status

INTRODUCTION

Smoking, the leading cause of preventable morbidity and mortality worldwide, possesses serious health risks for everyone. Many diseases like cancers, bronchitis, and hypertension can lead to cardiovascular diseases linked to smoking. However, smoking is more detrimental to women, as their health risks are even more significant. Smoking not only decreases chances of

fertility but also increases miscarriage and hastens the onset of menopause. It also causes women to be more susceptible to depression, decreased bone density, cataracts, and skin diseases (WHO, 2015; Subedi, 2017). Traditionally more men used to smoke than women, but a study conducted in the U.K. showed that differences in smoking behavior between women and men have decreased over time (Peters, Huxley, & Woodward, 2014).

World Health Organization has estimated that about six million people worldwide each year die due to tobacco use (smoking and smokeless). Tobacco use is associated with ill-health, disability, and death from non-communicable chronic diseases, and tobacco smoking is also associated with an increased risk of death from communicable diseases (WHO, 2015). It is also estimated that the world's one billion smokers are women. Most (75%) of these women live in low- and middle-income countries (WHO, 2010). Many more girls than boys had misconceptions about smoking as they think it is an excellent way to control weight. Research evidence shows that low self-esteem is associated with smoking, and studies also showed that girls from developed countries have lower self-esteem than boys. The findings from the research showed that women are more susceptible to smoking-related morbidity and mortality (Allen, Oncken, & Hatsukami, 2014).

In Nepal, about 16 billion NRs (Nepali Rupees) are spent annually on treating tobacco-induced diseases. In Nepal, smoking-related problems are being tackled in various ways. Tobacco-control and -regulation laws restrict people from smoking in public places or even in open spaces like parks, schools, gyms, and bus stops. In 2014, Nepal introduced a law that states that 90 percent of a cigarette pack should be covered with pictures depicting the harmful effects of smoking (Subedi, 2017).

This study investigates the smoking behavior and factors influencing smoking among women of reproductive age in Nepal. The findings of this study aim to guide program planners and policymakers to understand various factors influencing smoking behavior and assist in implementing the tobacco control program, decreasing tobacco consumption and reducing the risk of morbidity and mortality. Though there are very few papers/studies on smoking behavior in Nepal, this type of research that focuses on smoking behavior among women has not yet been undertaken.

MATERIALS AND METHODS

This paper is based on the secondary data analysis from the 2016 Nepal Demographic and Health Survey (Ministry of Health, Nepal; New ERA; & ICF, 2017) conducted under the Family Health Division, Department of Health Services, and the Ministry of Health and Population Nepal. The survey was implemented by New ERA, a local research organization with technical support from ORC Macro assistance through its MEASURE DHS+ program.

The sample for the NDHS, 2016, was based on a two-stage, stratified sampling, a nationally representative household sample. Wards (the smallest administrative units of Village Development Committee) in the rural area and sub-ward in the urban area (municipality or metropolitan) were primary sampling units (PSU) for the NDHS. The survey was conducted in 11,040 residential households, 6978 in urban areas and 4062 in rural areas, about 12,862 women aged 15-49.

This paper analyzed all women of reproductive age in the sample (N=12,862). This study represents the country because the sample population is drawn from the national representative

survey. Details of the methodology used in the survey can be found in the published report of the Nepal Demographic and Health Survey (MoH et al., 2017; Adhikari, 2018).

Initially, univariate or descriptive analysis was used to describe the percentage and number of respondents according to sociodemographic characteristics. Association between smoking behavior and the explanatory variables was assessed in bivariate analysis using Chi-square tests. Furthermore, binary logistic regression was used to assess the effect of several independent variables on smoking behavior. Before the multivariate analysis, multicollinearity between the variables was assessed, and the least important variables were removed from the logistic model. Statistical Package for Social Science (SPSS-26 version) was used for analysis (IBM Corp. Released 2019).

RESULTS

Background characteristics

Thirty-eight percent of women were aged 15-24 years. More than three-fourth (77%) of women were currently married at the time of the survey. Half of the women had completed secondary or higher education. Similarly, more than a third were Janajatis (including Newar). The majority of the women were Hindu, and more than two-fifths were from Bagmati Province. Likewise, more than three-fifths (63%) of women resided in an urban area.

Similarly, more than two-fifths (44%) of women had no autonomy in their household decisions. More than half of women of reproductive age were currently working. Sixty-nine percent of households were headed by males (Table 1).

Table 1: *Percentage distribution of the sample of respondents aged 15-49, by selected background characteristics*

Background characteristics	%	N
Age group		
Below 25 (15-24)	37.7	4849
25-34	30.6	3941
35 and above	31.7	4072
Marital status		
Never married	20.8	2669
Currently married	76.8	9875
Separated/divorced/widowed	2.5	318
Education		
None	33.3	4281
Primary	16.7	2150
Secondary or higher	50.0	6431
Ethnicity		
Brahmin & Chhetri	31.7	4072
Dalit	12.4	1596
Indigenous nationalities (Janjati)	35.8	4600
Other Terai castes	20.2	2594
Religion		
Hindu	85.8	11040
Buddhist	5.1	652

Background characteristics	%	N
Muslim	5.0	644
Kirat/Christian	4.1	526
Province		
Province 1	16.9	2173
Province 2	19.9	2563
Bagmati Province	21.2	2732
Gandaki Province	9.7	1249
Lumbini Province	17.7	2274
Karnali Province	5.6	724
Sudurpaschchim Province	8.9	1145
Place of residence		
Urban	62.8	8072
Rural	37.2	4790
Household wealth index (quintiles)		
Poorest	16.9	2176
Poorer	19.6	2525
Middle	20.2	2595
Richer	21.5	2765
Richest	21.8	2801
Women's autonomy in household decision		
No autonomy	44.3	5700
Moderate autonomy (involved in 1-2 issues)	26.7	3440
High autonomy (involved in all three issues)	28.9	3722
Currently working		
No	43.1	5540
Yes	56.9	7322
Sex of household head		
Male	68.9	8866
Female	31.1	3996
Total	100.0	12862

Types of smoking

It was found that overall, 8% of women used tobacco products, 6% of women smoked cigarettes, 3% chewed tobacco, and 0.5% smoked tobacco in a pipe (Table 2).

Table 2: *Types of smoking by women of reproductive age*

Types of smoking	%	N
Smokes cigarettes		
No	94.5	12153
Yes	5.5	709
Smokes pipe full of tobacco		
No	99.5	12793
Yes	0.5	69

Chews tobacco		
No	97.5	12545
Yes	2.5	317
Snuffs by nose		
No	100.0	12858
Yes	0.0	4
Smokes cigars, cheroots, or cigarillos		
No	100.0	12858
Yes	0.0	4
Smokes water pipe		
No	100.0	12860
Yes	0.0	2
Smoking (at least one behavior from the above)		
No	91.6	11780
Yes	8.4	1082
Total	100.0	12862

Bivariate analysis

A bivariate analysis was conducted to find associations between women's smoking status and sociodemographic characteristics (Table 3). Smoking was significantly associated with age since more older women (35 and above) used tobacco than women aged 25-34 years and 15-24 years (19% versus 6% and 2% respectively). Moreover, significantly higher proportions of separated/divorced/widowed women (27%) used tobacco than those currently married (10%) or never married (2%). Smoking had an inverse relation with women's education, as smoking behavior was more common among uneducated women (18%) than their counterparts. Similarly, ethnicity also had a significant association with smoking in which Dalits (13%) smoked more frequently than their counterparts. Likewise, religion also had a significant association with smoking since more Buddhist (14%) and Christian (13%) women used tobacco than women of other religions. Furthermore, significantly higher proportions of women from Karnali Province (16%) and Sudurpaschchim Province (12%) were smokers than in other provinces.

Similarly, significantly higher proportions of rural (10%) and poorest (19%) women were smokers than their counterparts. Similarly, higher proportions of working women (11%) and women who were household heads (10%) had smoking behavior, and the association was statistically significant as well (Table 3).

Table 3: *Background characteristics of women of reproductive age by smoking status*

Background characteristics	Smoking (%)		Total N
	No	Yes	
Age group ***			
15-24	98.5	1.5	4849
25-34	93.6	6.4	3941
35 and above	81.4	18.6	4072
Marital status ***			
Never married	98.4	1.6	2669

Background characteristics	Smoking (%)		Total N
	No	Yes	
Currently married	90.3	9.7	9875
Separated/divorced/widowed	73.1	26.9	318
Education ***			
None	82.0	18.0	4281
Primary	90.6	9.4	2150
Secondary or higher	98.3	1.7	6431
Ethnicity ***			
Brahman & Chhetri	93.0	7.0	4072
Dalit	86.7	13.3	1596
Indigenous nationalities (Janjati)	89.1	10.9	4600
Other terai castes	96.8	3.2	2594
Religion ***			
Hindu	91.9	8.1	11040
Buddhist	86.2	13.8	652
Muslim	95.1	4.9	644
Kirat/Christian	87.3	12.7	526
Province ***			
Province 1	89.7	10.3	2173
Province 2	97.1	2.9	2563
Bagmati Province	91.0	9.0	2732
Gandaki Province	89.4	10.6	1249
Lumbini Province	93.3	6.7	2274
Karnali Province	84.3	15.7	724
Sudurpaschchim Province	87.6	12.4	1145
Place of residence ***			
Urban	92.4	7.6	8072
Rural	90.3	9.7	4790
Household wealth index (quintiles) ***			
Poorest	81.1	18.9	2176
Poorer	89.4	10.6	2525
Middle	93.7	6.3	2595
Richer	94.1	5.9	2765
Richest	97.3	2.7	2801
Women's autonomy in household decision ***			
No autonomy	94.6	5.4	5700
Moderate autonomy (involved in 1-2 issues)	89.5	10.5	3440
High autonomy (involved in all three issues)	89.0	11.0	3722
Currently working ***			
No	95.2	4.8	5540
Yes	88.9	11.1	7322
Sex of household head ***			
Male	92.4	7.6	8866
Female	89.7	10.3	3996
Total	91.6	8.4	12862

*Note *** Significant at chai-square test p < 0.001*

Multivariate analysis

The results from the multivariate analysis showed that women aged 35-49 years were almost seven times (aOR=6.52, CI=4.75-8.94) more likely to be smokers than women aged 15-24 years. Similarly, separated/divorced/widowed women were nearly two times (aOR=1.86, CI=1.14-3.01) more likely to smoke than never married, keeping all other variables constant in a logistic model. Furthermore, education is a significant predictor of smoking as women having primary (aOR=0.65, CI=0.54-0.78) and secondary/higher education (aOR=0.21, CI=0.16-0.26) were less likely to smoke than women with no education. Regarding caste/ethnicity, Dalit women were nearly two times more likely to be smokers than Brahmin/Chhetri. Similarly, the richest and richer women were less likely to smoke than the poorest women. Likewise, working women and women who were also household heads were more likely to smoke than their counterparts (Table 4).

Table 4: *Adjusted odds ratios (aOR) and 95% confidence interval (CI) of smoking by predictors among women of reproductive ages in Nepal*

Background characteristics	aOR	95% CI	
		Lower	Upper
Age group			
15-24 (ref.)	1.00		
25-34	2.63***	1.918	3.595
35 and above	6.52***	4.755	8.941
Marital status			
Never married (ref.)	1.00		
Currently married	1.01	0.672	1.514
Separated/divorced/widowed	1.86*	1.148	3.010
Education			
None (ref.)	1.00		
Primary	0.65***	0.543	0.787
Secondary or higher	0.21***	0.160	0.265
Ethnicity			
Brahman & Chhetri (ref.)	1.00		
Dalit	1.79***	1.432	2.227
Indigenous nationalities (Janjati)	1.42***	1.179	1.717
Other terai castes	0.808	0.560	1.167
Religion			
Hindu (ref.)	1.00		
Buddhist	1.40*	1.055	1.864
Muslim	1.40	0.869	2.256
Kirat/Christian	1.47*	1.083	1.996
Province			
Province 1 (ref.)	1.00		
Province 2	0.25***	0.184	0.350
Bagmati Provience	0.96	0.776	1.212
Gandaki Province	1.02	0.787	1.320
Lumbini Provience	0.64***	0.505	0.819
Karnali Province	1.11	0.826	1.500
Sudurpaschchim Provience	0.97	0.742	1.259
Place of residence			

Background characteristics	aOR	95% CI	
		Lower	Upper
Urban (ref.)	1.00		
Rural	0.916	0.788	1.063
Household wealth index (quintiles)			
Poorest (ref.)	1.00		
Poorer	0.65***	0.540	0.793
Middle	0.46***	0.368	0.574
Richer	0.43***	0.339	0.535
Richest	0.23***	0.167	0.305
Women's autonomy in household decision			
No autonomy (ref.)	1.00		
Moderate autonomy (involved in 1-2 issues)	1.17	0.955	1.441
High autonomy (involved in all three issues)	1.16	0.941	1.439
Currently working			
No (ref.)	1.00		
Yes	1.19*	1.018	1.409
Sex of household head			
Male (ref.)	1.00		
Female	1.26**	1.078	1.477
Constant		0.063***	
-2 Log likelihood		5563.60	
Cox & Snell R Square		.135	

*Note *** Significant at p < 0.001; ** = p < 0.01 and * = p < 0.05, All variables mutually adjusted*

DISCUSSION

Our study shows that almost one in ten married women of reproductive age used tobacco. However, the prevalence of smoking is low compared with women in the USA (Nighbor Doogan, Roberts, Cepeda-Benito, & Higgins, 2018) and South America (Mendoza-Romero, Urbina, Cristancho-Montenegro, & Rombaldi 2019) and almost double than the women of Pakistan (Khan et al., 2015) and the prevalence was equal with the women of Iran (Mirahmadizadeh & Nakhaee, 2008). Our study investigated socioeconomic and demographic factors associated with smoking behavior among women. The findings showed an inverse relationship between education and smoking behavior; many studies showed similar findings, for example, studies conducted in Sri Lanka (Fernado, Wimaladasa, Sathkoralage, Ariyadasa, & Kumarasinghe 2019), Turkey (Sahan et al., 2018), China (Cai, Wu, Goyal, Han, & Jiao 2012) and India (Rani et al., 2003). A similar finding was observed in another study on gender roles, and smoking behavior also had a lower prevalence of smoking among highly educated women than low-educated women (Flandorfer, Wegner, & Buber, 2010). Showing similarities and differences with our study is another secondary data analysis of NDHS 2006, which showed that women's smoking status had an inverse relation with education, age, and employment status (Pandey & Lin, 2013). This could be because less educated people had less knowledge of the health effects of smoking.

Similar to our study findings, a study by Sahan and others showed that working women were more likely to be smokers than non-working women (Sahan et al., 2018), but conversely, another study revealed that unemployed people had the highest rates of smoking (Ponniah & Bloomfield, 2008). Similarly, our study found an inverse relationship between household wealth

quintile and smoking, which is supported by a study in India (Rani, Bonu, Jha, Nguyen, & Jamjoum 2003). Likewise, a study in New Zealand showed the highest smoking rate among females in 20– 24 years old, decreasing gradually with increasing age (Ponniah & Bloomfield, 2008). Nevertheless, our study showed inverse findings in which older women were more likely to smoke than younger women. No significant differences were seen in smoking prevalence among Hindus, Muslims, and Christians in another similar study (Rani et al., 2003), but our research showed Christians were more likely to smoke than Hindus. Similar findings were found that Muslims smoke substantially less than Christians (Hussain, Walker, & Moon 2019; Anthony, Chowdary, Dyson, & Thankappan 2013). Most Nepalese are not aware of risk factors leading to cancers and other diseases. Therefore, the fight against tobacco use becomes challenging, difficult, and complex because of socio-cultural and economic factors (Sharma Subedi, & Sharma, 2013).

CONCLUSION

The study found that the prevalence of tobacco use among women in Nepal was not uncommon. In addition, age, education, marital status, caste/ethnicity, wealth index, and employment were significant predictors of smoking behavior among women. Hence, tobacco control interventions should mainly focus on women of higher age groups, uneducated, poorer, and separated/divorced/widowed.

Acknowledgments

The authors thank MEASURE DHS + for providing access to the data.

REFERENCES

Adhikari, R. (2018). Child marriage and physical violence: Results from a nationally representative study in Nepal. *Journal of Health Promotion*, *6*(1), 49-59. doi: https://doi.org/10.3126/jhp.v6i0.21804

Allen, A.M., Oncken, C., & Hatsukami, D. (2014). Women and smoking: The effect of gender on the epidemiology, health effects, and cessation of smoking. *Current Addiction Reports, 1*(1), 53-60. doi: https://doi.org/10.1007/s40429-013-0003-6

Anthony, D., Chowdary, Q., Dyson, P., & Thankappan, KR. (2013). Does ethnicity or religion affect and/or explain the relationship between knowledge, attitudes and beliefs, and smoking behavior? *Diversity and Equality in Health and Care, 10*(1): 31-40

Cai, L., Wu, X., Goyal, A., Han, Y., & Jiao, F. (2012). Patterns and socioeconomic influences of tobacco exposure in tobacco cultivating rural areas of Yunnan Province, China. *BMC Public Health*, *12*(1):842. doi: https://doi.org/10.1186/1471-2458-12-842

Fernando, H. N., Wimaladasa, I. T. P., Sathkoralage, A. N., Ariyadasa, A. N., & Kumarasinghe, N. (2019). Socioeconomic factors associated with tobacco smoking among adult males in Sri Lanka. *BMC Public Health, 19*(1):778. doi: https://doi.org/10.1186/s12889-019-7147-9

Flandorfer, P., Wegner, C., & Buber, I. (2010). Gender roles and smoking behavior Vienna Institute of Demography Working Papers, No. 7/2010, Austrian Academy of Sciences (ÖAW), Vienna Institute of Demography (VID), Vienna. Retrieved from http://hdl.handle.net/10419/96986

Hussain, M., Walker, C., & Moon, G. (2019). Smoking and religion: Untangling associations using English survey data. *J Relig Health, 58*(6): 2263-2276. doi: https://doi.org/10.1007/s10943-017-0434-9

IBM Corp. Released. (2019). IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp. Retrieved from https://www.ibm.com/support/pages/how-cite-ibm-spss-statistics-or-earlier-versions-spss

Katulanda, P., Wickramasinghe, K., Mahesh, J.G., Rathnapala, A., Constantine, G.R., Sheriff, R, Matthews, D.R., & Fernando, S.S. (2011). Prevalence and correlates of tobacco smoking in Sri Lanka. *Asia Pacific Journal of Public Health*, *23*(6):861-9.

Khan, M. T., Hashmi, S., Zaheer, S., Aslam, S. K., Khan, N. A. & Shafique, K. (2015). The burden of waterpipe smoking and chewing tobacco use among women of reproductive age group using data from the 2012-13 Pakistan Demographic and Health Survey. *BMC Public Health, 15*: 1113. doi: https://doi.org/10.1186/s12889-015-2433-7

Mendoza-Romero, D., Urbina, A., Cristancho-Montenegro, A., & Rombaldi, A. (2019). Impact of smoking and physical inactivity on self-rated health in women in Colombia. *Preventive Medicine Reports, 16*:100976.doi: https://doi.org/10.1016/j.pmedr.2019.100976

Ministry of Health, Nepal; New ERA; & ICF. (2017). *Nepal demographic and health survey 2016*. Kathmandu: Ministry of Health, Nepal.

Mirahmadizadeh, A. & Nakhaee, N. (2008). Prevalence of waterpipe smoking among rural pregnant women in Southern Iran. *Med Princ Pract, 17*(6):435-439. doi: https://doi.org/10.1159/000151563

Nighbor, T. D., Doogan, N. J., Roberts, M. E., Cepeda-Benito, A., & Higgins, S. T. (2018). Smoking prevalence and trends among a U.S. national sample of women of reproductive age in rural versus urban settings. *PLoS One, 28*(11) :e0207818. doi: https://doi.org/10.1371/journal.pone.0207818

Pandey, S., & Lin, Y. (2013). Tobacco use among married women in Nepal: The role of women's empowerment. *Maternal and Child Health Journal, 17*(3):530-8. doi: https://doi.org/10.1007/s10995-012-1027-6.

Peters, S. A. E., Huxley, R. R. & Woodward, M. (2014). Do smoking habits differ between women and men in contemporary Western populations? Evidence from half a million people in the U. K. Biobank study. *BMJ Open, 4(*12), 1-8. doi: https://doi.org/10.1136/bmjopen-2014-005663

Ponniah, S., & Bloomfield, A. (2008). Sociodemographic characteristics of New Zealand adult smokers, ex-smokers, and non-smokers: Results from the 2006 Census *The New Zealand Medical Journal, 121*(1284): 34-42. PMID: 18953385

Rani, M., Bonu, S., Jha, P., Nguyen, S. N., & Jamjoum, L. (2003). Tobacco use in India: Prevalence and predictors of smoking and chewing in a national cross-sectional household survey. *Tobacco Control, 12*(4):e4. doi: https://doi.org/10.1136/tc.12.4.e4.

Sahan, C., Gunay, T., Simsek, H., Soysal, A., & Ergor, G. (2018). Socioeconomic factors associated with tobacco smoking in Turkey: a cross-sectional, population-based study.

Eastern Mediterranean Health Journal, 24(8): 705-713. doi: https://doi.org/10.26719/2018.24.8.705

Subedi, J. (2017). *The trend of smoking among urban Nepalis.* Retrieved from http://mnsvmag.com/news/2017-12-02/feature-smoking-among-urban-nepalis

Sharma Subedi, K, & Sharma, P. (2013). Tobacco-attributed cancer incidence is rising in Nepal due to the increasing prevalence: A major challenging burden for Nepal. *Austral-Asian Journal of Cancer, 12*(2): 89-95.

World Health Organization. (2010). *Ten facts on gender and tobacco.* World Health Organization. Retrieved from https://www.who.int/gender/documents/10facts_gender_tobacco_en.pdf

World Health Organization. ((2015 .*WHO global report on trends in prevalence of tobacco smoking 2015.* World Health Organization. Retrieved from https://apps.who.int/iris/handle/10665/156262