Quit Intentions and Attempts among Smokers in Sub-urban Nepal: Findings from the Dhulikhel Heart Study

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ABSTRACT

Background

The most effective way for smokers to avoid or minimize the harmful effects is to quit smoking. Smoking cessation has been attributed to multiple factors operating at physiological, psychological, environmental and social level. There is common consensus that smoking cessation programs should be tailored for specific populations. However, there has been lack of data regarding factors that influence smoking cessation in Nepal, which has hindered the development of effective smoking-cessation interventions.

Objective

To assess the prevalence of quit attempts, successful quitting and the factors associated with them in a randomly selected, population-based adult participants in sub-urban Nepal.

Method

This cross-sectional study utilized data from the first wave of the baseline survey of the Dhulikhel Heart Study (DHS). A total of 2225 households of Dhulikhel city were enumerated and a third of the households (n=735) were randomly selected. Questions on tobacco use were ascertained using the questions based on the WHO STEPS survey questionnaire and questions on past quit attempts.

Result

Out of 1073 participants, 248 (23.1%) were current smokers and 99 (9.2%) were former smokers. Only 58% of the current smokers mentioned that they had attempted to quit smoking. When asked if they were interested in quitting if helped, almost 90.5% mentioned they were willing. Brahmins were less likely to have quit smoking (former smoker) compared to Newars (OR: 0.41, 95% CI: 0.18-0.90). We also observed that those who had high alcohol consumption were less likely to have quit smoking (OR: 0.36, 95% CI: 0.17-0.76). We didn't find any meaningful significant association between socio-demographic factors or other CVD risk factors and the quit attempts.

Conclusion

As the country braces to address the burden of non-communicable diseases in Nepal, it is crucial to incorporate tobacco cessation programs in the national health system to meet the global target of bringing tobacco consumption to less than 5% by 2040. We recommend future studies to get a broader understanding of quit effort and factors associated with thereby supporting the development of evidence-based strategies to address tobacco cessation.

KEY WORDS

Dhulikhel, Tobacco cessation, Sub-urban

INTRODUCTION

Cigarette smoking is the leading cause of premature mortality, killing 3 million people annually.[1] Current data from Nepal and South Asia reveal a high prevalence of cigarette smoking among young people and adults.[2,3] About one fourth of the adult population reported to be smokers in a national survey in Nepal.[4] The most effective way for smokers to avoid or minimize the harmful effects is to quit smoking.[5] It has been estimated that for every year that a smoker over the age of 40 years continue to smoke their life expectancy reduces by 3 months.[6] Although in general, 25 to 48% of the smokers attempt to quit smoking in a year, only a small proportion succeed long term.[7]

Smoking cessation has been attributed to multiple factors operating at physiological, psychological, environmental and social level.[8] Physiological factors are relevant to smoking cessation as smokers develop nicotine dependence and exhibit withdrawal symptoms when they try to stop smoking.[9] It is also influenced by psychological factors such as readiness and motivation to change and self-efficacy.[10] So, smoking cessation is not a single event. Rather, it is a progressive process.

Factors such as past quitting attempts and successful quitting in the past are positively associated with smoking cessation process. The three specific transition of smoking cessation: (a) intention to quit (b) attempt to quit and (c) continue to abstain after quitting are important.[11] These underlying events of transitions could provide specific information, which could be inked to process of smoking cessation to initiate appropriate intervention. Moreover, the understanding of the determinants of these steps will assist in the design and implementation of population based smoking cessation programs. In another study, the factors associated with intention to quit, past quitting and continued absenteeism were being married, older, having received higher education, not smoking to kill time, and smoking because of curiosity.[12]

There is common consensus that smoking cessation programs should be tailored for specific populations. However, there has been lack of data regarding factors that influence smoking cessation in Nepal. The lack of evidence has hindered the development of effective smoking-cessation interventions. This may also be due to the lack of understanding of the specific characteristics of individuals who have an intention to quit smoking, those who made quitting attempts and those who were successful in quitting and of how to address them. In this study, we assessed the prevalence of quit attempts, successful quitting and the factors associated with them in a randomly selected, population-based adult participants in sub-urban Nepal.

METHODS

Study design and participants

We used the data from the baseline survey of the Dhulikhel Heart Study.[13,14] A total of 2225 households of Dhulikhel city were enumerated and a third of the households (n=735) were randomly selected stratified by 9 administrative wards in 2013. All of the eligible participants residing in the sample households were invited for participation. The eligibility criteria were: being a permanent resident of Dhulikhel; having lived in Dhulikhel for at least six months; non-pregnant at the time of data collection; and able to communicate in Nepali or Newari language.

A total of 1,372 eligible participants were enumerated, out of which the research staff were able to contact 1,103 (80%) participants. Eligible subjects who provided informed consent (n=1,073, 78%) were recruited into the study. Ethical approval was obtained from the institutional review committee of Kathmandu University School of Medical Sciences.

Data collection

We conducted a door-to-door survey using a tablet based pretested and standardized. The questionnaire contained questions on socio-demographic variables such as age, sex, ethnicity religion, marital status, monthly income, education, alcohol consumption, physical activity and smoking.

Smoking questions were ascertained using the questions based on the WHO STEPS survey questionnaire and questions on past quit attempts.[15] Participants were categorized into current, former and non-smoker status. Physical activity was measured using a global physical activity questionnaire, and expressed as the metabolic equivalent of task (MET) minutes per week.[16] A weekly MET equivalent of 600 would be 30 minutes brisk walking for 5 times per week or 15 minutes running for 5 times per week. Three measurements of systolic and diastolic blood pressure were taken using a Microlife automatic blood pressure measuring device. The mean of the three measurements was used in the analysis (mmHg). Hypertension was defined as systolic blood pressure 140 mm Hg or greater; or diastolic blood pressure 90 mm Hg or greater; or taking antihypertensive medication,[17] Fruits and vegetables consumption were calculated using a validated food frequency questionnaire. Weight was measured without shoes and while wearing minimum clothing using an Omron Model HBF-400 scale and recorded to the nearest 0.1 pounds. Height was measured without shoes using a standard tape measure with participants standing against a wall for measurement and recorded to the nearest 0.1 cm. BMI was calculated as weight in kilograms divided by height in meters squared. Overweight was defined as BMI of 25kg/m^2 or higher and obesity was defined as BMI of 30kg/m^2 or higher based on international cut points.[18]

Statistical Analysis

Sample characteristics were described for never, former and current smokers using means and standard deviations for continuous variables and percentages for categorical variables. We utilized logistic regression model to assess the factors associated with successful quitting (former smoker vs current smoker); and attempt to quit smoking (attempted vs not attempted). We conducted univariate analysis and multivariate analysis to assess the association of successful quitting and attempt to quit with age, sex, ethnicity, religion, marital status, income and education; alcohol consumption, physical activity, fruits and vegetable consumption, body mass index and hypertension. The odds ratios are reported with 95% confidence interval and corresponding p-values. We used Stata 15. (StataCorp. 2017. Stata Statistical Software: Release 15. College Station, TX: StataCorp LLC) for the data analysis.

RESULTS

Table 1 shows the characteristics of the study population by smoking status. Out of 1073 participants, 248 (23.1%) were current smokers and 99 (9.2%) were former smokers.

Table 1. Characteristics of the study population by smoking status*

	Never n = 726	Former n= 99	Current n=248	Total n = 1073
Age in years, mean (SD)	35.7 (14.7)	59.8(14.3)	46.2(14.1)	40.3(16.3)
Sex, n (%)				
Female	630(86.8)	60(60.6)	204(82.3)	446(41.6)
Male	82(11.3)	39(39.4)	32(12.9)	627(58.4)
Ethnicity				
Newar	376(51.8)	65(65.7)	86(34.7)	527(49.1)
Brahmin/Chhetri	215(29.6)	17(17.2)	66(26.6)	298(27.8)
Other	135(18.6)	17(17.2)	96(38.7)	248(23.1)
Religion				
Hindu	89(12.3)	9(9.1)	65(26.2)	163(15.2)
Non- Hindu	637(87.7)	90(90.9)	183(73.8)	910(84.8)
Marital Status				
Married	504(69.4)	75(75.8)	205(82.7)	784(73.1)
Not Married	222(30.6)	24(24.2)	43(17.3)	289(26.9)
Education				
No formal education	170(23.4)	54(54.5)	116(46.8)	340(31.7)
Less than high school	335(46.1)	40(40.4)	103(41.5)	478(44.53)
High School of more	221(30.4)	5(5.1)	29(11.7)	255(23.8)
Annual Income, NRs.				
Median (IQ range)	12110.9 (41779.0)	8564.5 (16688.1)	17426.3 (62036.9)	13101.7 (46192.4)
Alcohol				
Never drinkers	588(81.0)	55(55.6)	92(37.1)	735(68.5)
Low (<1 glass per week)	64(8.8)	17(17.2)	17(6.9)	98(9.1)
Moderate (1-3 glass per week)	26(3.6)	6(6.1)	27(10.9)	59(5.5)
High (3 or more glass per week)	48(6.6)	21(21.2)	112 (45.2)	181(16.9)
Fruits and vegetable consumption				
(servings per day), mean(SD)	3.4(2.0)	3.5(2.1)	3.1(1.9)	3.4(2.0)
Physical activity				
< 600 MET minutes per week	298(41.0)	44(44.4)	81(32.7)	423(39.4)
≥ 600 MET minutes per week	428(59.0)	55(55.6)	167(67.3)	650(60.6)
BMI				
Underweight (<18.5 kg/m^2)	415(57.2)	41(41.4)	155(62.5	611(56.9)
Normal (18.5 - 24.9 kg/m^2)	35(4.8)	6(6.1)	23(9.3	64(6.0)
Overweight (25.0-29.9kg/m^2)	220(30.3)	37(37.4)	58(23.4	315(29.4)
Obese (30.0 or more kg/m^2)	56(7.7)	15(15.2)	12(4.8	83(7.7)
Hypertension				
No	630(88.5)	60(60.6)	204(86.4)	894(85.4)
Yes	82(11.5)	39(39.4)	32(13.6)	153(14.6)

*All in n (%) unless otherwise stated

Table 2. Attempt to quit smoking among current smokers of community-based Nepalese adults participating in the Dhulikhel Heart Study

Characteristics	n (%)
Past Attempt to quit smoking	
Yes	106 (58.56)
No	75 (41.44)
Number of quit attempts	
One	33 (31.43)
Two	27 (25.71)
Three	20 (19.05)
Four or more	25 (23.80)
Interested in quitting if helped	96 (90.57)

Table 2 describes the attempt to quit smoking among current smokers of the study participants. Only 58% of the current smokers mentioned that they had attempted to quit smoking. When asked if they were interested in quitting if helped, almost 90.5% mentioned they were willing.

Table 3 describes the univariate and multivariate analysis of factors associated with successful quitting (former versus current smoker). Brahmins were less likely to have quit smoking (former smoker) compared to Newars (OR: 0.41, 95% CI: 0.18-0.90).

Table 4 shows the univariate and multivariate analysis of the factors associated with quit attempts among current smokers. Except for the fruits and vegetables consumption

Table 3. **Factors associated with successful quitting (former versus current smoker)**

Characteristics	Univariate analysis (n = 347)				Multivariate analysis (n = 335)			
	OR	95% CI		P-value	Odds Ratio	95% CI		P-value
Age, years	1.07	1.05	1.09	<0.01	1.06	1.04	1.09	<0.01
Sex								
Female	Ref				Ref			
Male	0.73	0.45	1.17	0.19	1.57	0.70	3.53	0.28
Ethnicity								
Newar	Ref				Ref			
Brahmin/Chhetri	0.34	0.18	0.64	<0.01	0.41	0.18	0.90	0.03
Other	0.23	0.13	0.43	<0.01	0.87	0.35	2.14	0.76
Religion								
Hindu	Ref				Ref			
Non- Hindu	3.55	1.69	7.45	<0.01	1.67	0.59	4.72	0.34
Marital Status								
Married	Ref				Ref			
Not Married	1.53	0.87	2.68	0.14	1.37	0.60	3.16	0.46
Education								
No formal education	Ref				Ref			
Less than high school	0.83	0.51	1.36	0.47	1.35	0.61	2.99	0.47
High School of more	0.37	0.14	1.01	0.05	0.92	0.22	3.87	0.91
Annual Income, NRs	1.00	0.26	1.00	-1.12	1.00	1.00	1.00	0.31
Alcohol								
Never drinkers	Ref				Ref			
Low (<1 glass per week)	1.67	0.79	3.54	0.18	1.09	0.43	2.75	0.85
Moderate (1-3 glass per week)	0.37	0.14	0.96	0.04	0.38	0.12	1.19	0.10
High (3 or more glass per week)	0.31	0.18	0.56	0.00	0.36	0.17	0.76	0.01
Fruits and vegetable consumption								
(servings per day), mean(SD)	1.02	0.90	1.16	0.71	1.04	0.89	1.22	0.63
Physical activity								
< 600 MET minutes per week	Ref				Ref			
≥ 600 MET minutes per week	0.61	0.38	0.98	0.04	1.07	0.59	1.96	0.82
BMI								
Underweight (<18.5 kg/m2)	Ref				Ref			
Normal (18.5 - 24.9 kg/m2)	0.99	0.38	2.58	0.98	1.17	0.38	3.62	0.79
Overweight (25.0-29.9 kg/m2)	2.41	1.41	4.13	0.00	2.68	1.36	5.29	<0.01
Obese (30.0 or more kg/m2)	4.73	2.05	10.88	0.00	4.04	1.34	12.17	0.01
Hypertension, n (%)								
No	Ref				Ref			
Yes	4.14	2.39	7.17	0.00	1.48	0.73	3.02	0.28

we didn't find any significant association between socio-demographic factors or other CVD risk factors and the quit attempts.

DISCUSSION

This study provides insights on quit intentions and attempts among smokers in a sub-urban population in Nepal. This is one of the first population-based studies to report these aspects of smoking behavior in Nepal.

Our finding that almost 60% of the current smokers said they had attempted in the past to quit smoking correlates with a study in Eastern Nepal that showed that among adolescent smokers 66.5% had attempted to quit in the past.[19] The finding that almost 90% of the current smokers intended to quit if supported is another encouraging finding. The study from Eastern Nepal showed that 92% of current smokers were willing to quit in the future.[19]

This also highlights the necessity of establishing robust system to support tobacco cessation in Nepal. Although

Table 4. Factors associated with attempt to quit among current smokers (those who had attempted quitting versus those who had never attempted quitting)

Characteristics	Univariate analysis (n = 181)				Multivariate analysis (n = 181)			
	OR	95% CI		P-value	Odds Ratio	95% CI		P-value
Age, years	0.99	0.97	1.01	0.46	0.99	0.96	1.03	0.88
Sex								
Female	Ref				Ref			
Male	1.6	0.88	2.92	0.12	0.98	0.37	2.58	0.97
Ethnicity								
Newar	Ref				Ref			
Brahmin/Chhetri	0.74	0.29	1.86	0.53	0.87	0.27	2.76	0.81
Other	0.46	0.19	1.08	0.07	0.61	0.17	2.2	0.45
Religion								
Hindu	Ref				Ref			
Non- Hindu	2.28	1.21	4.32	0.01	2.26	0.8	6.3	0.12
Marital Status								
Married	Ref				Ref			
Not Married	0.70	0.33	1.50	0.36	0.56	0.21	1.50	0.25
Education								
No formal education	Ref				Ref			
Less than high school	2.68	1.38	5.18	0.003	2.1	0.73	6.04	0.16
High School of more	1.66	0.50	5.44	0.39	1.7	0.26	11.02	0.57
Annual Income, NRs	1.00	0.99	1.00	0.65	0.99	0.99	1.00	0.71
Alcohol, n (%)								
Never drinkers	Ref				Ref			
Low (<1 glass per week)	4.02	0.81	19.95	0.08	4.42	0.68	28.4	0.11
Moderate (1-3 glass per week)	1.49	0.49	4.53	0.48	1.19	0.29	4.79	0.79
High (3 or more glass per week)	1.32	0.70	2.51	0.38	2.20	0.85	5.73	0.10
Fruits and vegetable consumption								
(servings per day)	0.95	0.93	0.98	0.002	0.96	0.93	0.99	0.01
Physical activity, n (%)								
< 600 MET minutes per week	Ref				Ref			
≥ 600 MET minutes per week	1.55	0.84	2.88	0.15	1.36	0.61	2.98	0.44
BMI, n (%)								
Underweight (<18.5 kg/m2)	Ref				Ref			
Normal (18.5 - 24.9 kg/m2)	0.63	0.24	1.60	0.33	0.58	0.18	1.77	0.34
Overweight (25.0-29.9 kg/m2)	1.24	0.58	2.63	0.57	0.98	0.38	2.49	0.96
Obese (30.0 or morekg/m2)	0.69	0.09	5.11	0.72	1.9	0.13	26.3	0.62
Hypertension, n (%)								
No	Ref				Ref			
Yes	0.77	0.26	2.23	0.63	0.70	0.20	2.40	0.57

Nepal has made significant strides in tobacco control, there is little progress in tobacco cessation related activities. Current government program in tobacco cessation is limited to WHO's Practical Approach to Lung Health (PAL). PAL has been rolled out in Primary Health Care Centres (PHCC) in 19 districts but still has several implementation challenges including lack of locally contextual materials, limited regular availability of staff, inadequate training to health workers on patient-centred communication, limited monitoring and supervision, and challenges in recording and reporting.[20]

We found distinct ethnic differences in successful quitting. In multivariate analysis Brahmins were less likely to have quit smoking compared to Newars (OR: 0.41, 95% CI: 0.18-0.90). This is an interesting finding because it suggests that the historical cultural restriction of alcohol consumption among Brahmins have not influenced corresponding low use of smoking. Another study in Nepal have also

showed similar relationship between smoking behavior and ethnicity in Nepal.[21] Future studies should also investigate these ethnic predispositions on smoking. In-depth epidemiological as well as qualitative studies on the socio-cultural and gender aspects on smoking in Nepal are necessary to develop effective public health measures to curb smoking.

We also observed that those who had high alcohol consumption were less likely to have quit smoking (OR: 0.36, 95% CI: 0.17-0.76). This is again suggestive of the clustering of harmful behaviors. Smoking cessation efforts should thus take this into account and aim for high-risk groups as priority groups for cessation interventions.

We also noticed a relationship between being overweight or obese and the likelihood of being a former smoker. Compared to the reference category of underweight, those in overweight and obese category were more likely to be former smoker. We do not have clear understanding of this relationship but assume that this might be because overweight and obese had been advised for quitting smoking due to other concurrent health conditions.

CONCLUSION

Although small sample size, single location and cross-sectional nature of this study are major limitations, this study provides important information on quit intentions and attempts among smokers in sub-urban Nepal. It also shows highlights the gaps in tobacco cessation efforts in Nepal. As the country braces to address the burden of non-communicable diseases in Nepal, it is crucial to incorporate tobacco cessation programs in the national health system to meet the global target of bringing tobacco consumption to less than 5% by 2040.[22] Furthermore, studies need to be conducted to get a broader understanding of quit effort and factors associated with thereby supporting the development of evidence-based strategies to address tobacco cessation.

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