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Attitudes around Smoking Initiation at Tribhuvan University Hospital in Kathmandu, Nepal

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ABSTRACT

Introductions: The large prevalence of tobacco usage in Nepal is a significant public health concern. This cross-sectional survey investigates the differences in demographic and tobacco education levels between current daily, someday, and former smokers. Additionally, the study explores participants' motivations for initiating tobacco use and their smoking behaviors.

Methods: Recruitment took place at multispecialty clinics at Tribhuvan University Teaching Hospital in Kathmandu, Nepal, in August 2023. 250 participants were surveyed. Eligible participants were current smokers or had used tobacco in the last 15 years. Bivariate associations between smoking status and participant characteristics were assessed using Chi-squared tests or Fisher's exact test, as appropriate.

Results: Among participants, 34.4% of participants smoked daily, 20.8% of participants were someday smokers, and 44.8% were former smokers. Former smokers were older, with the highest proportion of participants (34.8%) aged 55-89. A significant proportion of former smokers reported higher rates of hypertension (22.3%) and kidney disease (13.4%). Educational attainment varied: daily smokers were most likely to have completed grade 12; someday smokers were more likely to have attended undergraduate school; former smokers had the highest proportion with no formal education. Overall, 59.6% of participants learned about tobacco through schooling. However, 57.2% reported never being informed by a physician about the dangers of tobacco usage. While 84.4% of participants believed smoking was very harmful to their health, 78% cited friends smoking as their primary motivation to start. Conversely, 66.8% delayed smoking initiation because their friends did not smoke, and 17.6% delayed due to social stigma.

Conclusions: More efforts are needed to raise awareness about the risks of tobacco in this patient population. Social influence plays a key role in both smoking initiation and delay, highlighting the need for targeted prevention and cessation programs addressing cultural and social dynamics in Nepal.

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Introduction

Nepal has the highest mortality rate from chronic lung diseases globally, with 182.5 Nepalese citizens dying from lung disease out of every 100,000 individuals [1]. Periods of social upheaval in the late 20th and early 21st century made passing comprehensive tobacco reform difficult [2]. Moreover, pushback from the tobacco industry has been strong [3-5]. Although the prevalence of daily smoking in Nepal decreased by 28% from 1990 to 2017, it still remains high, with 19.7% of Nepali adults smoking daily [6].

Dual use of multiple tobacco types is estimated to be 17.9% in men and 1.5% in women, higher than in many other low and middle-income countries (LMICs) [7-9]. Despite control efforts, the smoking epidemic is still active among the population in Nepal, and the associated respiratory morbidities are increasing in number. The incidence of chronic respiratory diseases was 913.6 per 100,000 person-years in 2019, compared to 848.6 in 1990 [10]. Estimates of chronic obstructive pulmonary disease (COPD) prevalence have been approximated from 8.5% to as high as 22.7% [11-15]. Annually, 27,100 Nepalese citizens die prematurely due to tobacco-related diseases [16].

There are a multitude of social, economic, and political factors that influence Nepali citizens' decision to initiate smoking. Nepali students with friends who smoke are up to 7.9 times more likely to smoke tobacco products compared to matched controls [17]. Tobacco consumption is also found to be associated with lower socioeconomic status, older age, and illiteracy [16,18-23]. A study conducted using the Nepal Demographic and Health

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Survey from 2011 showed that out of 4121 participants, 50% consumed tobacco products. Moreover, men with no education were more likely to smoke than those who had schooling [24]. Up to 54% of adults in Nepal have inadequate health literacy, which is associated with a history of smoking [25].

Smoking tobacco is one of the leading risk factors for developing chronic lung disease. Yet, the smoking epidemic is still under-researched in Nepal. Studies have shown that smokers are less likely to know the health risks of tobacco compared to non-smokers [26-28]. Adolescents who identify more risks related to tobacco consumption are less susceptible to smoking initiation compared to their peers [27]. Current smokers are much more likely to cite social benefits or coping with stress as reasons for tobacco usage [28].

This cross-sectional research study surveyed Nepalese citizens about their demographics, motivation to begin smoking, and attitudes around smoking behaviors. This manuscript specifically examines demographic and knowledge differences related to tobacco use across current daily, someday, and former smokers, as well as motivations for smoking initiation, in order to identify opportunities for targeted public health interventions.

Methods

This study was conducted at the Tribhuvan University Teaching Hospital in Kathmandu, Nepal, in August of 2023. The Colorado Multiple Institutional Review Board (COMIRB) (approval number 23-0763) and Nepali ethics committee approval were obtained. Participants were recruited from endocrinology, respiratory, gastroenterology, nephrology, and neurology outpatient specialty clinics. To be eligible to participate in the study, participants must be between 18 and 89 years old. All participants were either former or current smokers, and all participants had to have used a tobacco product in the past 15 years. Participants were recruited through consecutive sampling at Tribhuvan University Teaching Hospital, with approximately 50% of those approached agreeing to participate. A total of 250 participants were interviewed. Participation was voluntary, and both verbal and written consent was obtained. If participants could not read the consent form or write their signature, an impartial witness was present during the consent process and signed the consent form on the participant's behalf. Once informed consent was obtained, the survey was administered verbally using Nepali interpreters. Each survey took approximately 15 minutes to complete.

A comprehensive literature review of previously published smoking surveys was conducted to develop the smoking survey. The search criteria included full-text, English-language research articles that examined cigarette smoking and contained survey-based assessments. Multiple databases were used to identify the surveys, including DynaMed, PsycTests, PsycINFO, and PubMed. A total of 169 surveys published from 1966 to 2021 were identified that assessed smoking behavior, attitude, motivations, cessation, and smoking-related health perceptions across various populations. During the development of the survey, a detailed analysis of question structure, response format, and cultural applicability was conducted to ensure the creation of a culturally sensitive survey for LMICs. The wording of the survey questions was adapted based on what was commonly found across validated survey instruments, ensuring alignment with existing research while addressing the gaps in culturally relevant smoking assessments. The final survey used consisted of 46 questions relating to patient demographics, tobacco consumption amounts, tobacco education rates, as well as smoking attitudes, knowledge, and behaviors. 45 questions were multiple choice, and one question regarding patients' annual income required a free response answer.

All survey responses were entered and stored in the data management application Qualtrics. All analyses were conducted using R (version 4.3.3, R Foundation for Statistical Computing). Chi-square test was used to compare proportional differences for demographic and educational characteristics between current everyday smokers, current someday smokers, and former smokers. If fewer than 5 participants responded to a variable within the survey question, Fisher's exact test was used in place of the Chi-square test to evaluate proportional differences.

Smoking status was classified into everyday smokers, someday smokers, and former smokers. Cigarette consumption was stratified into five categories: 0 cigarettes, 1-5, 6-10, 11-20, 21-30, and 31 or more cigarettes smoked daily. Participant age was stratified into four groups: 18-24, 25-39, 40-54, and 55-89 years. These stratifications were used to facilitate analysis of patterns in age distribution and smoking intensity among the study population.

Results

Of 250 participants, 34.4% were current everyday smokers, 20.8% were current smokers who smoke some days, and 44.8% were former smokers.

Demographic Characteristics (Table 1)

The majority of the participants were male (92.4%). The largest proportion of participants was in the 25-39 age group (32.8%), while the smallest proportion was in the 18-24 age group (14.4%). Age varied significantly across smoking status (p: 0.0002). The largest proportion of former smokers were older, at 55-89 years old (34.8%), while current smokers tended to be younger, with most everyday smokers ranging from age 25-54 (59.3%), and half of someday smokers ranging from ages 25-39.

The sample reflected a broad range of educational backgrounds, with the largest proportion of participants having completed grade 12 (35.2%), while smaller subsets had attained primary education (14%) or no formal education (17.2%). Education rate varied significantly across groups (p=0.0002), with the highest proportion of everyday smokers having completed grade 12 (33.7%) and someday smokers being more likely to have completed undergraduate school (36.6%). Former smokers had the highest proportion with no school education (24.1%).

The most common professions overall were farmer (17.6%), student (13.6%), worker (12.4%), and personal business (12.4%); however, the largest proportion chose “other” to identify with careers not listed (28%). Occupational status was

widespread and varied significantly based on smoking status (p=0.0008); with every day and former smokers having the highest percentage of people involved in other occupations (33.7%, 33.6%) and farming (22.3%, 18.2%), while someday smokers had a high percentage of current students (36.5%).

The most reported health conditions were hypertension (15.6%), kidney disease (8%), and asthma (8%). Health status varied significantly within smoking groups (p <0.0001). A large proportion of everyday smokers (46.5%) and someday smokers (59.6%) reported no health conditions, while former smokers had higher reports of hypertension (22.3%) and kidney disease (13.4%).

Table 1: Demographic, Educational, Occupational, Health, and Tobacco Use Characteristics of Participants by Smoking Status (Everyday, Someday, and Former Smokers) at Tribhuvan University Teaching Hospital, Nepal.

Demographics	Everyday smoker n = 86		Someday smoker n = 52		Former smoker n = 112		Total n = 250		P value
	n	%	n	%	n	%	n	%	
Sex									0.6275
Male	78	90.7	50	96.2	103	92.0	231	92.4	
Female	7	8.1	2	3.3	9	8.0	18	7.2	
Other*	1	1.2	0		0		1	0.4	
Age									**0.0002**
18-24	12	14.0	14	26.9	10	8.9	36	14.4	
25-39	27	31.4	26	50.0	29	25.9	82	32.8	
40-54	24	27.9	6	11.5	34	30.4	64	25.6	
55-89	23	26.7	6	11.5	39	34.8	68	27.2	
Education Level									**0.0002**
No School Education	14	16.3	3	5.8	27	24.1	44	17.6	
Completed grade 5	15	17.4	2	3.9	18	16.0	35	14.0	
Completed grade 8	11	12.8	2	3.9	13	11.6	26	10.4	
Completed grade 12	29	33.7	23	44.2	36	32.1	88	35.2	
Undergraduate school (bachelor's degree)	14	16.3	19	36.6	10	8.9	43	17.2	
Graduate school (completed master's degree and above)	3	3.5	3	5.8	8	7.1	14	5.6	
Occupational Status									**0.0008**
Retired	4	4.7	2	3.9	7	6.4	13	5.2	
Worker	15	17.7	2	3.9	14	12.7	31	12.4	
Farmer	19	22.3	5	9.6	20	18.2	44	17.6	
Personal business	10	11.8	7	13.5	14	12.7	31	12.4	
Student	7	8.2	19	36.5	8	7.3	34	13.6	
Professional	1	1.2	3	5.8	6	5.5	10	4.0	
Other	29	33.7	14	26.9	41	36.6	84	33.6	
Health Conditions									**4e-6**
High blood pressure (Hypertension)	8	9.3	6	11.5	25	22.3	39	15.6	
Heart Disease	2	2.3	0	0.0	10	8.9	12	4.8	
Asthma	3	3.5	3	5.8	14	12.5	20	8.0	
Liver Disease	4	4.7	1	1.9	8	7.1	13	5.2	
Kidney Disease	4	4.7	1	1.9	15	13.4	20	8.0	
Other	35	40.7	15	28.8	49	43.8	99	39.6	
None	40	46.5	31	59.6	23	20.5	94	37.6	
Tobacco Consumption Amount									
5 or fewer cigarettes	47	54.7	52	100.0	3	2.7	102	40.8	
6-10 cigarettes	22	25.6	0		1	0.9	23	9.2	
11-20 cigarettes	11	12.8	0		0		11	4.4	
21-30 cigarettes	5	5.8	0		0		5	2.0	
31 or more cigarettes	1	1.2	0		0		1	0.4	
I do not currently smoke	0		0		106	94.6	106	42.4	

*One participant identified as neither male nor female.
P values less than 0.05 were deemed significant and are bolded in the table above.

Tobacco Consumption (Table 1)

42.2% of participants reported not currently smoking any cigarettes, 16.8% reported smoking 6-30 cigarettes daily, and 40.8% reported smoking five or fewer cigarettes daily.

Tobacco Education (Table 2)

Most participants reported learning about tobacco in schools (59.6%). A statistically significant association was found between tobacco education during schooling and smoking status (p=0.001). Among everyday smokers, 58.7% reported receiving tobacco education. In comparison, 75.5% of someday smokers reported receiving tobacco education and 47.8% of someday smokers received education on tobacco dangers during school. A larger majority believed that smoking is very harmful to health (84.4%), with 6.8% believing smoking is moderately harmful. When asked if people can get addicted to smoking as they can to other recreational drugs, 92.4% answered yes. When asked if any healthcare practitioners advised them to avoid tobacco, 57.2% selected that they had not been advised. A majority of participants acknowledged that smoking tobacco products can lead to respiratory disease (89.2%), lung cancer (88.8%), reduced life expectancy (77.2%), oral/dental problems (75.6%), and heart disease (73.2%). Lower percentages of participants identified that smoking tobacco products can cause sexual and fertility problems (45.2%) and skin-related conditions (31.2%).

Smoking Initiation

The main reasons participants-initiated smoking (Figure 1) were because their friends smoke (78%), due to curiosity (48%), and because their siblings or parents smoke (20.8%). Of those that are currently smoking, reasons participants continued smoking were smoking killing time if they have nothing to do (22.4%), cigarettes making the respondent feel good and energizing them (21.2%), cigarettes helping participants deal with anger or anxiety (18.8%), cigarettes tasting good (13.6%), smoking being good for inspiration or thinking (12.4%), and increased probability of a friend (8.8%). The most common reason respondents chose to stop or delay smoking initiation (Figure 2) was because most of their friends were not smoking (66.8%), followed by community and social stigma (17.6%), they believe smoking harms their health (16.8%), they hate the cigarette smell (14.4%), and their fear of cigarette dependence (6.8%).

Discussion

Tobacco consumption varied greatly across the sample size, with

Table 2: Tobacco Education, Healthcare Counseling, and Health Beliefs of Participants by Smoking Status (Everyday, Someday, and Former Smokers) at Tribhuvan University Teaching Hospital, Nepal.

Tobacco Education	Every day Smoker		Someday Smoker		Former Smoker		Total Sample Size		P Value
	n	%	n	%	n	%	n	%	
During school were you ever taught about why you should not use tobacco?									**0.001**
Yes	54	58.7	40	75.47	55	47.83	149	59.6	
No	32	34.78	11	20.75	57	49.57	100	40	
Did any doctor, dentist, or nurse advise you not to use tobacco of any kind?									0.06
Yes	36	39.13	15	28.3	55	47.83	106	42.4	
No	50	54.35	36	67.92	57	49.57	143	57.2	
Do you believe that smoking is harmful to your health?									0.277
Not Harmful	2	2.17	1	1.89	0	0	3	1.2	
Moderately Harmful	7	7.61	4	7.55	6	5.22	17	6.8	
Very Harmful	67	72.83	45	84.91	99	86.09	211	84.4	
I don't know	10	10.87	2	3.77	7	6.09	19	7.6	
Do you think people can get addicted to smoking just as they can to other drugs?									0.501
Yes	78	84.78	46	86.79	107	93.04	231	92.4	
No	4	4.35	4	7.55	3	2.61	11	4.4	
Unsure	2	2.17	2	3.77	2	1.74	6	2.4	
Do you think that smoking causes or leads to…									0.999
Lung Cancer	74	80.43	49	92.45	99	86.09	222	88.8	
Heart Diseases	56	60.87	41	77.36	86	74.78	183	73.2	
Reduced Life Expectancy	61	66.3	45	84.91	87	75.65	193	77.2	
Respiratory disease	70	76.09	51	96.23	102	88.7	223	89.2	
Skin Problems	20	21.74	16	30.19	42	36.52	78	31.2	
Reduction of physical capacity	54	58.7	43	81.13	85	73.91	182	72.8	
Oral and dental problems	63	68.48	44	83.02	82	71.3	189	75.6	
Sexual and fertility problems	33	35.87	23	43.4	57	49.57	113	45.2	
Burn a person's throat	49	53.26	40	75.47	71	61.74	160	64	
Disturbance of non-smokers	69	75	49	92.45	101	87.83	219	87.6	
Endangering Relatives	66	71.74	49	92.45	97	84.35	212	84.8	

P values less than 0.05 were deemed significant and are bolded in the table above.

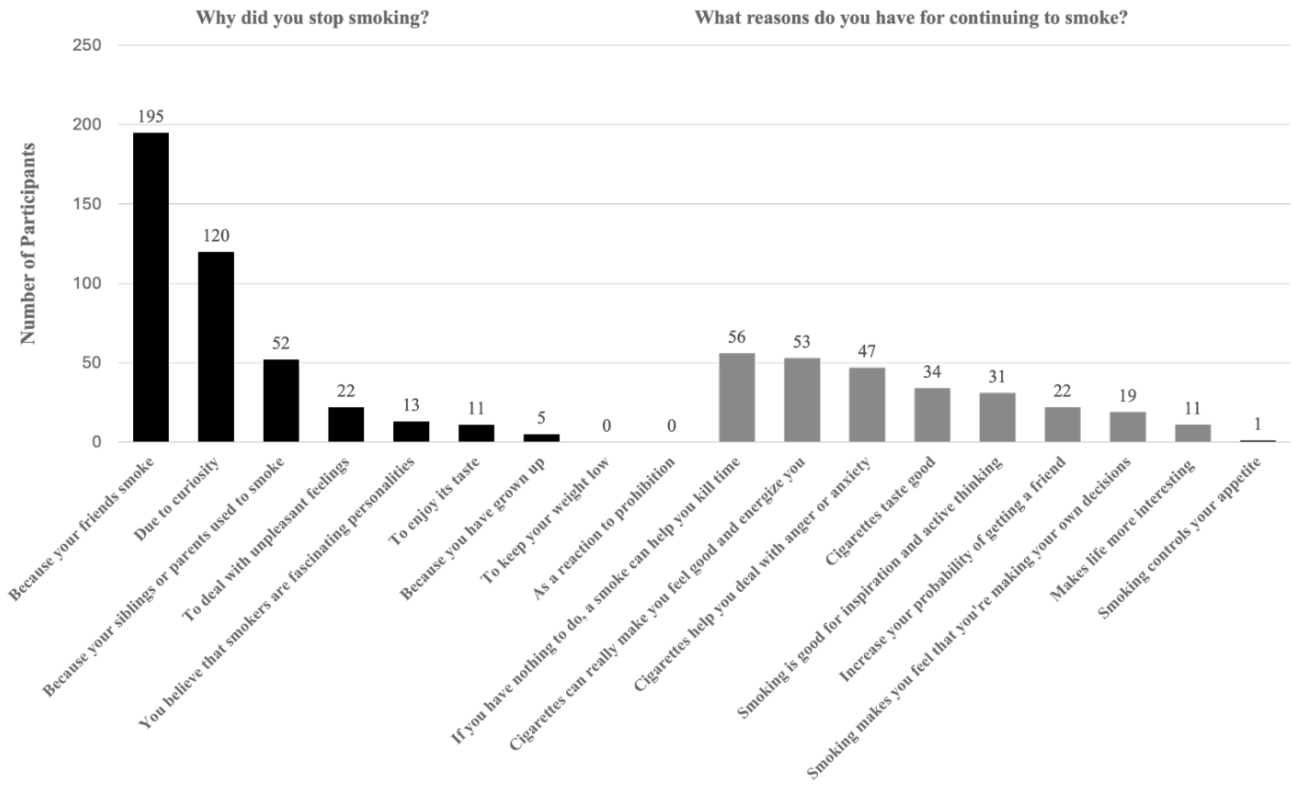

Figure 1: Reasons Participants Started and Continued to Smoke.

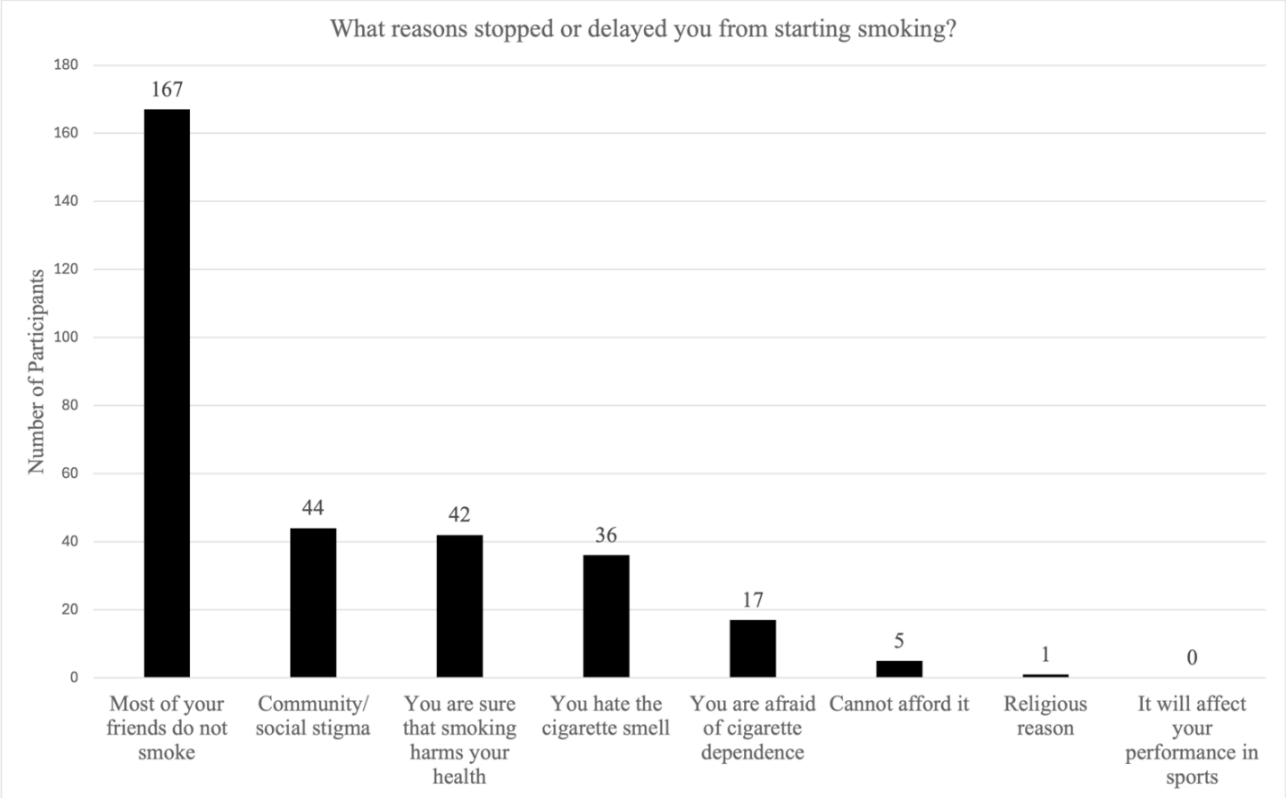

Figure 2: Reasons Participants Stopped or Delayed Smoking.

40.8% of participants smoking five or fewer cigarettes a day, while 42.4% had successfully quit smoking. The predominant male demographic in this study supports previous research that men are significantly more likely to smoke in Nepal compared to women [16,29]. Analysis using the Nepal Demographic and Health Survey further supports that the prevalence of tobacco usage was significantly higher in men compared to women (32.8% vs 15.8% in regard to tobacco smoking and 38% vs 5% in regard to tobacco chewing) [30]. Within Nepali culture, smoking is a widely accepted social behavior for men but not for women [23]. Therefore, it is possible that women are underreporting smoking behaviors. Although previous research has shown that smoking in Nepal is associated with older age [19,23], this study found a higher percentage of former smokers being older compared to everyday and someday smokers ($p = 0.0002$). Former smokers also had higher reports of hypertension and kidney disease compared to current smokers ($p< 0.0001$), suggesting that older individuals may be quitting tobacco usage due to health concerns.

Research in Nepal has shown an inverse association between education status and initiation of tobacco usage in both men and women [24,31]. In our survey, 35.2% of participants had finished 12th grade; however, 17.6% of participants had no formal schooling, and 14% of participants had only finished grade 5. There was a significant difference in education rates based on smoking status ($p=0.0002$), while every day and someday smokers had higher proportions of participants completing grade 12 and undergraduate school, respectively, former smokers had a larger proportion of no formal schooling. This relates to the significant difference in tobacco education from schooling ($p=0.001$), with former smokers having lower rates of learning about the dangers of tobacco from schooling (47.8%) compared to everyday smokers (58.7%) and someday smokers (75.5%). This difference in education rates may be confounded by age, as former smokers were also more likely to be older.

A vast majority of participants identified that smoking is extremely harmful to their health (84.4%), and 92.4% of participants reported that people could become addicted to smoking, comparable to other drugs. Cross-sectional research in Bhaktapur, Nepal, a small city just outside Kathmandu, reported that 55.4% of respondents demonstrated an adequate awareness of cigarette smoking and its detrimental health impacts [32]. Research by Aryal et al. Lohani in 2011 surveying 340 students throughout the Kathmandu Valley reported that 62.96% of participants believed daily cigarette smoking was harmful, while only 46.29% identified that tobacco products are addictive. In contrast, this survey found higher rates of public awareness, with 88% of participants acknowledging that smoking can lead to lung cancer, and 89.2% reporting they knew smoking was linked to respiratory disease. Previous literature from Bhaktapur, Nepal showed lower awareness levels, with only 65.2% of participants linking smoking to lung cancer, and 78.9% to respiratory illness. The Bhaktapur study reported considerably lower recognition of smoking-related health risks compared to the data from this survey, including associations with heart disease (30.5% vs. 73.2%), dental problems (29.5% vs. 75.6%), and fertility issues (8.4% vs. 45.2%) [32]. Differences in participant knowledge compared to previous research may be due to both differences in the populations of Kathmandu and Bhaktapur, as well as broader age range in the current study, whereas Rai et al. sampled 95 secondary school students [32]. However, these results signify that public knowledge of the multifactorial dangers of smoking may be increased in Kathmandu, Nepal due to the political and public health efforts to increase public knowledge of the dangers of smoking following the passage of the 2011 Supreme Court ruling which banned indoor smoking, restricted tobacco promotion, and implemented pictorial health warning labels on cigarette packages [3,16].

While public knowledge regarding the dangers of tobacco usage was high throughout the study sample, there is still a considerable gap in education from both schooling and healthcare providers surrounding tobacco usage. Almost 60% of participants reported learning about tobacco during their education, comparable to data from the Global Youth Tobacco Survey, which sampled 2,878 students within Nepal, reporting 66% of students were taught about tobacco within school [28]. 57.2% of participants in this survey reported that their healthcare practitioners never advised them to avoid tobacco. In a cross-sectional survey interviewing 92 students in secondary school in Kathmandu, Nepal, 37.2% of participants reported learning about tobacco morbidity and mortality from their teachers and 11% from health care professionals [33]. Elsey et al. found that only 2% of outpatient appointments included identification of patients' as smokers, raising the concern that either patients are reluctant to disclose smoking status to physicians, or that health care workers are hesitant or insufficiently trained to inquire about tobacco use during clinical encounters [34]. However, physician-delivered tobacco assessments of patients during any clinic or hospital visit in the past year were associated with significantly higher readiness to quit in smoking patients throughout Kathmandu in a study of patients infected with HIV [35]. Challenges to tobacco cessation discussions included a lack of physician training, time restraints, a lack of incentive, and poor standardization of protocols [34]. Overall, policy change and training are required in both the education and healthcare systems to implement protocols for quality discussion around smoking initiation.

The main reasons participants initiated tobacco product use were due to their friends smoking (78%) and curiosity (48%). This is supported by previous literature that having smoker friends was the highest independent predictor of initiating smoking in adolescent Nepali young adults [29]. Similar trends were found in other regions in Nepal, with participants in Dhankuta Municipality reporting peer pressure as the highest reason for initiating smoking. Further, almost a fourth of participants the Dhankuta study rated their siblings' and parents' smoking as a reason they initiated smoking [31]. Sreeramareddy et al. report that the risk of smoking tobacco increased by 1.5 times as the number of family members who smoked increased in adolescents throughout Western Nepal [30]. Curiosity, peer pressure, and family pressure were also reported as the main reasons for initiating smoking in a cross-sectional study of women in Kathmandu [36]. Peer pressure was also the main reason for smoking initiation listed by medical and dental students in Nepal [37,38]. Moreover, our study found a

significant difference between smoking status and occupational status (p=0.0008), with someday smokers having a higher rate (36.5%) of current students compared to everyday and former smokers. This may be due to societal pressures to initiate social smoking in Nepal during schooling. The reasons participants continued to smoke were primarily boredom (22.4%), as well as cigarettes helping them feel good (21.2%) or helping them cope with anxiety (18.8%). This is concordant with previous research in Nepali youth that showed boredom and feeling more relaxed were the primary reasons individuals continued to smoke [29].

Interestingly, social factors were not only the primary factor reported to influence smoking initiation but also the most common factor that delayed smoking initiation. Many participants (66.8%) reported they would delay or stop smoking due to their friends not smoking, and the second most popular response was delaying smoking due to social stigma (17.6%). The strong theme of social pressures influencing both participants' motivation to initiate and abstain from smoking emphasizes the importance of investigating tobacco prevention and cessation efforts that focus on groups and social structures to decrease the prevalence of smoking in Nepal.

The limitations of this study include the fact that it was a cross-sectional survey, and that all data were based on self-reports. Therefore, participants may have underreported their smoking-related behaviors due to the social stigma of tobacco use. The use of consecutive sampling introduces the potential for selection bias, which may limit the generalizability to the broader Nepali population. As all data collection took place in Nepal, there was a challenge of language barrier between researchers and participants. However, this was resolved by using in-person interpreters for each survey. This study recruited participants through Tribhuvan University Teaching Hospital, which is a public hospital. Although both patients of the clinics, as well as healthy patient family members, were surveyed, this participant cohort may have a lower smoking rate due to health concerns compared to the generalized population of Kathmandu. Moreover, this cohort's responses may differ from those of participants surveyed in a private hospital or a rural hospital, as opposed to central Kathmandu. Future research studies could replicate surveys on smoking behaviors with a broader cohort that includes both private and public hospital populations, as well as broaden the scope to rural communities.

This study underscores the multifaceted drivers of tobacco use in Nepal, including social influence, cultural acceptance, educational disparities, and health-related factors. These findings highlight the critical need for comprehensive, culturally tailored public health strategies and policy enforcement to effectively reduce smoking rates and support cessation efforts across varied demographic groups.

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