

ASSESSMENT OF PREVALENCE AND PREDICTORS OF SMOKING AMONG UNIVERSITY STUDENTS

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Abstract

Cigarette smoking has become a prevalent habit among youth particularly the university students. This is a serious matter of consideration as it propels these young students towards serious diseases in later years of their lives. This study has assessed various factors that influence the development of smoking habit among the university students in Lahore, Pakistan. A cross-sectional study design was followed in which (n= 183) university students from 18 to 25 years of age from the universities of Lahore, Pakistan were interviewed by using the pre-tested and self-reported questionnaire

as data collection tool. The findings were statistically tested by applying chi-square, univariate & multivariate logistic regression tests by using IBM Statistical Package for Social Sciences version 25.0.

This study included the university students (n= 183) showing the prevalence of smoking among male

(n= 157, 85.8%) university students were found higher than those of females (n= 26, 14.2%). Students aging from 18-20 years of age showed highest habituality (38.8%) to the smoking. There was a significant (OR=0.29; 95% CI: 0.12 - 0.73, p=0.008) association of parent education and other education related factors on adoption of smoking habit among female university students. Students aging from 21-23 years of age (OR= 4.14; 95% CI: 1.92-8.90, p=0.001) and students from 24-25 years (OR= 2.44; 95% CI: 1.12-5.31, p=0.03) of age showed significant correlation with their relationships and smoking habit. Students aging from 21-23 years of age showed significant (OR= 2.71; 95% CI: 1.14-6.42, p=0.02) association of development of the smoking habit and the impact of awareness they had about various aspects of the smoking habit. Smoking habit is not developed abruptly among the young university students instead there are certain contributing factors such as educative and demographic backgrounds along with awareness and perception about certain aspects of smoking are important factors that need to be considered by the governments and policy makers who intend to curb the smoking and tobacco consumption among the youth and students.

## INTRODUCTION

Tobacco smoking has become a common habit in youngsters which has shown various deteriorations in their health and being proven the leading cause of certain cancers particularly the lung cancer (1). Smoking related research describes that the male life expectancy reduces by 12 years and that of females reduces by 11 years (2). The chances of chronic diseases particularly lung cancer is higher among individuals who start smoking in the early years of their lives and continue it throughout their adulthood (3). Smoking not only causes increased death rate among smokers but also effects seriously the health of their closed ones who are exposed to the cigarette smoke (4). Smoking statistics reveal that there are about 1.07 billion smokers worldwide out of which 908 million are men while 162 million are women of which mostly belong to low- and middle-income countries (5). In United States of America (USA) 8 out of 100 adults are smokers while in England 14% adults have adopted this unhealthy habit (6). In Pakistan 12.4% people of more than 15 years of age are

habitual to smoking. Among youth from 13-15 years of age in Pakistan smoking is a common habit. In the province of Punjab which population wise is the biggest province of Pakistan the number of adult smokers is 12.4% according to the findings of Global Adult Tobacco Survey (GATS). In terms of young adults 23% of the Punjab youth is indulged in the habit of smoking (7).

The smoking related literature shows that smoking habit among the young university students develop mostly because of their company. Those students who have higher number of smoker friends in their company are most likely to adopt this habit from their friends (8). If there are smokers particularly the parents or elder siblings among the family members of the university students the chances of development of smoking habit in them are much higher as depicted by the studies covering the smoking perspective of the societies (9). Those students who have left their homes in early age for studies and live in hostels often develop smoking habit. Few students adopt smoking as a symbol of maturity and style while a smaller number of students adopt smoking as a social or academic stress busting habit (10). The family checks on the students who live with their parents minimize the chances of the development of smoking habit among them as compared to the hostel students not living with their parents and elders (4). The objective of this study is to evaluate various personal and social predictors that propels the young university students towards the habit of smoking in the young age which they continue during their lifetime.

### Methodology

This study utilized an analytical cross-sectional design to evaluate various personal and social factors that contribute to the adoption of smoking habit among university students in Lahore, Pakistan. The cross-sectional design enabled us to discover the contributing factors of smoking habit among young university students at a single point of time. This study was conducted at various public and private universities in Lahore. Data collection was performed over a period of five months, from January, 2025 to May, 2025. The study population included university students of 18 to 25 years of age who were using tobacco products particularly the cigarettes. The recruitment of the participants

for this study was based on convenient sampling method based on the inclusion criteria that the age of the smoker participants ranged from 18-25 years, must be enrolled as student in university, with their unconditional consent to participate in the survey. Students were accessed via university networks, student groups, social media platforms, and academic events. Non-university students, non-smokers and students below 18 years of age were excluded from this survey. The research tool was pilot tested on 20 university students with the Cronbach's Alpha obtained from the pilot data was 0.825 (11).

### Statistical analysis

In order to analyze the results, the IBM Statistical Package for Social Sciences version 25.0 for Windows (SPSS Inc., Chicago, IL, USA) was used to statistically analyze the data. The association of sociodemographic factors and the participant responses was analyzed by applying chi-square test. The univariate and multivariate logistic regression test were implied to ascertain the key factors responsible for the adoption of smoking habit among university students.  $P < 0.05$  was considered as the minimum level of significance for all statistical tests.

### Results

The demographic profile of the study participants highlights a diverse age distribution, with the largest group aged 18–20 years (38.8%), followed by those aged 21–23 and 23–25, both comprising 30.6% of the sample. The majority of respondents were male (85.8%), while female participants made up 14.2%, indicating a high gender difference. In terms of ethnicity, the sample was predominantly Punjabi (95.1%), with very few participants identifying as Sindhi (1.1%), Balochi (2.2%), or Pashtoon (1.6%). The wealth index classification revealed that most respondents were from an intermediate socioeconomic background (83.1%), with rich (10.9%) and poor (6.0%) groups being underrepresented. The distribution between urban and rural areas was relatively balanced, with 49.2% of participants residing in urban settings and 50.8% in rural areas (**Table 1**)

Table 1: Demographic variables of participants

Variable	Frequency (n=183)	Percentage (%)
<b>Age(years)</b>		
18-20	71	38.8
21-23	56	30.6
23-25	56	30.6
<b>Gender</b>		
Male	157	85.8
Female	26	14.2
<b>Ethnicity</b>		
Punjabi	174	95.1
Sindhi	2	1.1
Balochi	4	2.2
Pashtoon	3	1.6
<b>Wealth Index</b>		
Rich	20	10.9
Intermediate	152	83.1
Poor	11	6.0
<b>Area</b>		
Urban	90	49.2
Rural	93	50.8

As shown in Table 2, age demonstrated a statistically significant association with the studied outcome ( $\chi^2 = 58.9$ ,  $df = 20$ , effect size = 0.491,  $p < 0.01$ ), indicating a strong influence of age on the variable under investigation. Gender was also significantly associated with the outcome ( $\chi^2 = 8.02$ ,  $df = 10$ , effect size = 0.278,  $p = 0.005$ ). However, ethnicity, financial status, and background (urban

or rural) showed no statistically significant associations, as all corresponding p-values were greater than 0.05

Table 2: Association of Education with sociodemographic factors of the smoker university student based on chi-square test

Sociodemographic variable	Chi-Square coefficient ( $\chi^2$ )	Degree of freedom (df)	Effect Size	p-value
Age	58.9	20	0.491	p<0.01
Gender	8.02	10	0.278	p=0.005
Ethnicity	3.36	30	0.240	p=0.34
Financial status	5.86	20	0.312	p=0.54
Background (Urban or Rural)	0.24	10	0.214	p=0.62

According to Table 3, background (urban or rural) demonstrated a statistically significant association with relationships among smoker university students ( $\chi^2 = 3.96$ ,  $df = 6$ , effect size = 0.223,  $p = 0.04$ ). In contrast, age, gender, ethnicity, and financial status did not show statistically significant associations, as their p-values were greater than 0.05. Although age and gender showed relatively lower p-values, their associations were not statistically significant.

Table 3: Association of Relationships with sociodemographic factors of the smoker university student based on chi-square test

Sociodemographic variable	Chi-Square coefficient ( $\chi^2$ )	Degree of freedom (df)	Effect Size	p-value
Age	4.91	12	0.245	p=0.086
Gender	1.18	6	0.173	p=0.075
Ethnicity	1.58	18	0.139	p=0.66
Financial status	0.26	12	0.218	p=0.88
Background (Urban or Rural)	3.96	6	0.223	p=0.04

Table 4 indicates that age had a statistically significant association with awareness among smoker university students ( $\chi^2 = 8.02$ ,  $df = 12$ , effect size = 0.267,  $p = 0.005$ ). However, gender, ethnicity, financial status, and background (urban or rural) did not show statistically significant associations with awareness, as all p-values were greater than 0.05. Among these variables, gender and background showed relatively moderate effect sizes despite non-significant results.

Table 4: Association of Awareness with sociodemographic factors of the smoker university student based on chi-square test

Sociodemographic variable	Chi-Square coefficient ( $X^2$ )	Degree of freedom (df)	Effect Size	p-value
Age	8.02	12	0.267	p=0.005
Gender	0.24	6	0.234	p=0.63
Ethnicity	2.82	18	0.172	p=0.42
Financial status	0.19	12	0.114	p=0.90
Background (Urban or Rural)	2.33	6	0.177	p=0.13

Table 5 presents the unadjusted and adjusted odds ratios for the association between sociodemographic factors and the outcome among smoker university students. Age group 21-23 showed higher odds in both unadjusted and adjusted models; however, the association was not statistically significant after adjustment, while the 23-25 age group also remained non-significant. Gender was significantly associated with the outcome in the adjusted model, with females showing lower odds compared to males (AOR = 0.29, 95% CI: 0.12-0.73, p = 0.008). In contrast, wealth index and background (urban or rural) did not demonstrate statistically significant associations in either model, as their confidence intervals included 1 and p-values were above 0.05.

Table 5: Univariate and Multivariate regression analysis of the relation of education with the sociodemographic factors of Smoker University Students

Sociodemographic factors		Unadjusted Odds Ratio		Adjusted Odds Ratio	
		OR (95% CI)	p-value	OR (95% CI)	p-value
Age Group	18-20	Reference			
	21-23	19.5 (7.18 - 52.9)	0.21	20.21 (7.14 - 52.8)	0.32
	23-25	0.853 (0.39 - 1.86)	0.69	0.77 (0.35 - 1.74)	0.81
Gender	Male	Reference			
	Female	1.38 (0.67 - 3.97)	0.04	0.29 (0.12- 0.73)	0.008
Wealth Index	Poor	Reference			
	Mediocre	10.11 (1.07 - 93.4)	0.078	9.42 (0.98 - 90.7)	0.06
	Rich	1.20 (0.47 - 3.05)	0.698	1.13 (0.43 - 2.94)	0.81
Background (Urban or Rural)	Urban	Reference			
	Rural	0.86 (0.48 - 1.54)	0.622	0.78 (0.44 - 1.43)	0.734

OR= Odd Ratio; CI= Confidence Interval

Table 6 presents the results of univariate and multivariate regression analysis examining the relationship between sociodemographic factors and relationships among smoker university students. Age was significantly associated with the outcome, where both 21-23 years (AOR = 4.14, 95% CI: 1.92-8.90, p = 0.001) and 24-25 years (AOR = 2.44, 95% CI: 1.12-5.31, p = 0.03) showed higher odds compared to the reference group (18-20 years). Background (urban or rural) also showed a statistically significant association, with rural students having lower odds in the adjusted model

(AOR = 0.47, 95% CI: 0.25–0.90, p = 0.02). However, gender and wealth status were not significantly associated with the outcome in either crude or adjusted analyses, as their p-values were greater than 0.05.

Table 6: Univariate and Multivariate regression analysis of the relation of Relationships with the sociodemographic factors of smoker university students

Sociodemographic factors		Crude Odd Ratio (COR)		Adjusted Odd Ratio (AOR)	
		OR (95% CI)	p-value	OR (95% CI)	p-value
Age Group	18-20 years	Reference			
	21-23 years	3.66 (1.74 - 7.69)	0.001	4.14 (1.92 - 8.9)	0.001
	24-25 years	2.391 (1.12 - 5.11)	0.024	2.44 (1.12 - 5.31)	0.03
Gender	Male	Reference			
	Female	1.63 (0.67 - 3.98)	0.28	1.93 (0.75 - 4.97)	0.173
Wealth Status	Poor	Reference			
	Mediocre	1.43 (0.32 - 6.49)	0.642	1.48 (0.32 - 6.69)	0.535
	Rich	1.22 (0.48 - 3.12)	0.677	1.52 (0.56 - 4.11)	0.57
Background (Urban or Rural)	Urban	Reference			
	Rural	0.55 (0.30 - 0.90)	0.04	0.47 (0.25 - 0.90)	0.02

		0.99)			
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OR= Odd Ratio; CI= Confidence Interval

Table 7 presents the results of univariate and multivariate regression analysis examining the association between sociodemographic factors and awareness among smoker university students. Age group 21–23 years showed a statistically significant association with awareness in both crude and adjusted models (AOR = 2.71, 95% CI: 1.14–6.42, p = 0.02), indicating higher awareness compared to the reference group (18–20 years). In contrast, the 23–25 years age group did not show a significant association. Gender, wealth index, and background (urban or rural) were not significantly associated with awareness in either crude or adjusted analyses, as their p-values were greater than 0.05 and confidence intervals included 1.

**Table 7: Univariate and Multivariate regression analysis of the relation of Awareness with the sociodemographic factors of smoker university students**

Sociodemographic factors		Crude Odd Ratio (COR)		Adjusted Odd Ratio (AOR)	
		OR (95% CI)	p value	OR (95% CI)	p value
Age Group	18-20	Reference			
	21-23	2.58 (1.10 - 6.06)	0.03	2.71 (1.14 - 6.42)	0.02
	23-25	1.56 (0.67 - 3.61)	0.29	1.59 (0.68 - 3.71)	0.28
Gender	Male	Reference			
	Female	1.29 (0.57 - 3.67)	0.627	1.32 (0.55 - 3.77)	0.612
	Poor	Reference			

Welath Index	Mediocre	1.50 (0.23 - 9.41)	0.665	1.55 (0.24 - 9.51)	0.584
	Rich	1.11 (0.37 - 3.28)	0.844	1.14 (0.38 - 3.38)	0.828
Background (Urban or Rural)	Urban	<b>Reference</b>			
	Rural	0.58 (0.28 - 1.17)	0.129	0.55 (0.27 - 1.12)	0.1

OR= Odd Ratio; CI= Confidence Interval

### Discussion:

This study highlights an intricate relationship between personal, familial, and social variables in shaping cigarette smoking behaviors among university students. The data reveal that male students are disproportionately more likely to smoke compared to that of females, often influenced by peer behaviors and the presence of smokers within the household or family. These findings are similar to a study performed in Malaysia that analyzed various factors that influence the development of smoking habit in university students where 66% of the smokers were males and 34% were females (12). The influence of peers is notably consistent across all demographics, suggesting that social acceptance and normalization of smoking are important contributing factors. A study performed by Go et al., have described a moderate influence of peers on the development of the smoking habit among the young people (4). A similar study performed in United States of America (USA) analyzing the peer influence on adolescents declare that this factor particularly the impact of company plays a major role in the development of cigarette use among the said group of individuals (13). The collected data elaborated that educational stress was identified as the most common trigger for the adoption of smoking among the study population. The findings of a study being performed to assess the correlation of stress with tobacco craving declared that there was a significantly higher tendency of smoking among the group of individuals in a condition of some sort of social or professional

stress than those of relatively calm and tension free individuals (14). This underscores the emotional and psychological dimensions of tobacco use, pointing to the role of smoking as a coping mechanism for academic and personal pressures. This also explains why even students aware of the harmful effects of smoking continuously remain engaged to this habit (15). Parental factors, including the level of control and education of parents, played a vital role in the onset of smoking in young university students. Students who reported intermediate levels of parental control and shared decision-making between parents demonstrated relatively lower smoking rates. These findings suggest that a supportive, balanced home environment is more effective in preventing smoking than either authoritarian or permissive parenting styles. Mahabee-Gittens et al., stated that parental influences are important in protecting against smoking initiation across adolescence & youth. At the same time, association with elders in close relatives who smoke is a very strong risk factor regarding initiation of tobacco use among the youngsters (16). From a socioeconomic perspective, students from intermediate wealth backgrounds reported the highest rates of smoking. This group appeared most exposed to smokers in their social and family environments, indicating the need for targeted interventions that consider socioeconomic context alongside behavioral risk factors. Despite general agreement that cigarette pricing is high, this economic barrier did not effectively deter smoking, especially among those who view it as a fashion statement (17). This further affirms the role of perception and cultural norms in sustaining tobacco use. Contemporary studies analyzing the economic impact on smoking state that smoking is a norm in elite culture for being a fashion statement so do it is a cultural statement of wealthy countries as compared to those of low- and middle-income countries (18). In summary, this research confirms that smoking among university students is not merely a matter of individual choice, but is heavily influenced by psychological stress, peer networks, family dynamics, and socioeconomic conditions. In order to tackle this issue a holistic approach, an integrating mental health support, peer-led awareness programs, family engagement strategies and culturally responsive public health messaging is highly recommended.

The study acknowledges several limitations, including the use of a cross-sectional design, which restricts the ability to establish causal relationships between the predictors and smoking behavior. The reliance on self-reported data may introduce social desirability bias, potentially leading to underreporting of smoking habits. Additionally, the sample was predominantly male and from a single ethnic background (Punjabi), limiting the generalizability of the findings to more diverse populations. The convenience sampling method further constrains the representativeness of the results across all university students in Lahore or other regions.

### Conclusion

The study findings enable us to conclude that smoking is not just a physical or mental craving but it is a habit which is developed under the influence of multiple social, cultural, educational and economic circumstances. Since it is an accepted perception that smoking is a serious threat to the health and finance of the people and societies, the findings of this study could be highly helpful for the policy makers of the academic institutions who want to achieve the goal of tobacco free educational campuses and a youth well protected from the possible negative consequences of the tobacco consumption.

### Conflict of interest

The authors declare that there is no conflict of interest.

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Akhtar et al - 2026

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