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Investigating Tobacco Consumption and Its Influences in Urban Areas: A Cross-Sectional Approach

[1]Mokalla Venkateswara Rao, [2]Anusha Donapudi and [3]Kesagani Sujana Goud

[1,3]Department of Community Medicine, Government Medical College, Khammam, Telangana India

[2]Department of Anatomy, Government Medical College, Machilipatnam, Andhra Pradesh India

ABSTRACT

Tobacco use remains a major public health concern, contributing significantly to the global burden of disease. This study aims to explore the prevalence and determinants of tobacco use across various demographic, socioeconomic and cultural factors in urban settings. A cross-sectional study was conducted to assess the prevalence of tobacco use among different age groups, sexes, localities (non-slum vs. slum), socioeconomic statuses, education levels, occupations, religions and caste groups. The study utilized chi-square tests to evaluate the significance of differences across these variables. Logistic regression was used to assess the risk factors associated with tobacco use. The overall prevalence of tobacco use increased with age, with the highest prevalence observed in individuals aged 60 years and above (52.7%). Males were significantly more likely to use tobacco than females (39.5% vs. 21.5%, p<0.001). No significant difference in prevalence was found between slum and non-slum areas (p=0.09). Smokeless tobacco was more commonly used than smoking, particularly among females. Lower socioeconomic status, lower education levels and specific occupations were associated with higher tobacco use. Social influences, including the tobacco use status of family and friends, significantly increased the likelihood of tobacco use (OR=6.2., 95% CI 5.0-7.8). Significant variations were also observed by caste and religion, with the highest prevalence among Christians and Scheduled Tribes. The study highlights the complex interplay of demographic, socioeconomic and cultural factors in determining tobacco use. Targeted public health interventions are needed to address high-risk groups, including older adults, males, individuals from lower socioeconomic backgrounds and those influenced by social networks. Culturally tailored strategies that address specific community norms and practices are crucial for effective tobacco control.

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Key Words

Tobacco use, socioeconomic status, demographic factors, cross-sectional study, smokeless tobacco, smoking, public health intervention, urban settings, social influences

Corresponding Author

Kesagani Sujana Goud,
Department of Community Medicine, Government Medical College, Khammam, Telangana India
sujanakesagani@gmail.com

Author Designation

[1-3]Assistant Professor

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INTRODUCTION

Tobacco use remains a critical public health challenge globally, responsible for a substantial share of preventable illnesses and deaths, including heart disease, stroke, chronic respiratory diseases and various forms of cancer[1]. Despite extensive public health campaigns and regulatory measures aimed at reducing tobacco consumption, the prevalence of tobacco use continues to be alarmingly high in many regions, particularly among vulnerable populations[2]. This study seeks to examine the prevalence and patterns of tobacco use across different demographic groups in urban settings, specifically comparing slum and non-slum areas. By analyzing tobacco use by age, sex, locality, socio-economic status, education, occupation and social influences, the study aims to uncover the nuanced ways in which these factors influence tobacco use behaviors.

Previous research has often been limited by focusing on specific populations or lacking comprehensive data that addresses the broad spectrum of socio-demographic variables influencing tobacco use[3]. Many studies have highlighted that tobacco use is influenced by factors such as age, with higher prevalence observed in older age groups and gender, with males typically having higher rates of use[4]. However, there is a significant research gap in understanding how these factors interact in diverse urban settings, especially in rapidly urbanizing regions where slum populations are increasing[5]. Slum areas, characterized by poor living conditions and limited access to healthcare and education, often show distinct patterns of health behaviors, including higher tobacco use, which are not fully captured in studies focusing on more affluent populations[6].

This study addresses these gaps by providing a detailed exploration of the prevalence of tobacco use among different groups, revealing critical insights into how socio-demographic factors like age, sex, locality, socio-economic status, caste, religion, education and social networks influence tobacco use. The study by Rooban *et al.,* observed a marked increase in tobacco use prevalence with age and highlights significant differences in usage patterns between males and females, as well as between slum and non-slum populations[7]. It also examines the impact of social influences, such as the tobacco use status of family and friends and how these factors can substantially elevate an individual's risk of tobacco use.

Furthermore, the study explores the relationship between tobacco use and socio-economic status, revealing an inverse correlation where individuals in lower socio-economic classes have higher rates of tobacco use. This pattern underscores the need for targeted interventions in lower socio-economic and educational groups, where the risk and burden of tobacco-related harm are disproportionately high. By providing a comprehensive assessment of these patterns, the study aims to inform public health policies and strategies that are better tailored to the needs of diverse urban populations.

The overarching aim of this study is to fill the existing research gaps by thoroughly investigating the demographic determinants of tobacco use and their complex interplay, particularly in urban slum and non-slum settings. Understanding these dynamics is crucial for developing effective tobacco control measures that address the specific needs of various subgroups within the population, thereby reducing the overall burden of tobacco-related diseases and promoting healthier communities.

MATERIALS AND METHODS

This cross-sectional descriptive study was conducted in Vijayawada city, Andhra Pradesh, India, encompassing both urban slum and non-slum areas. The study included 2,008 individuals aged 10 years and above. Participants were chosen to represent the diverse socio-economic and demographic profiles present in these urban settings and classified as follows.

- **Current Tobacco Users:** Individuals who reported using any form of tobacco (smoking, smokeless, or mixed) at the time of the survey.
- **Non-Users:** Individuals who never used tobacco or were former users who had quit.
- **Occasional Users:** Individuals who used tobacco less than three days a week.
- **Daily Users:** Individuals who used tobacco at least three days a week.

Inclusion and Exclusion Criteria: The study included adult dwellers of Vijayawada city that consented to participate, ensuring that the sample represented the local population adequately. Individuals who met the age requirement and were permanent residents of the city were considered eligible for inclusion in the study. Participation was voluntary and only those who provided informed consent were enrolled. The primary exclusion criterion was a lack of willingness to participate., individuals who declined to provide consent were excluded from the study. This approach ensured respect for participants' autonomy and maintained ethical standards throughout the research process.

Sampling Technique: A multistage random sampling method was employed. In the first stage, clusters of households were selected from both slum and non-slum areas using a systematic random sampling technique. In the second stage, individuals from each household were randomly selected for participation. The sample was stratified by sex, age groups, locality (slum vs. non-slum), socio-economic status, caste, religion, education level, occupation and family type to ensure representativeness across these variables.

Data Collection: Data were collected through face-to-face interviews using a pre-designed, pre-tested, semi-structured questionnaire. The questionnaire covered socio-demographic characteristics, tobacco use patterns (current, former, and never users), types of tobacco used (smoking, smokeless, mixed), frequency of use (daily or occasional) and the influence of family and friends on tobacco use behavior. Interviews were conducted by trained interviewers in the local language to ensure participants' full understanding of the questions.

Statistical Analysis: Data entry and analysis were performed using Microsoft Excel 2010 and SPSS version 20.0. Descriptive statistics were used to summarize the prevalence of tobacco use across various demographic categories. Chi-square tests were employed to compare differences in categorical variables such as age, sex, locality, socio-economic status, education level, occupation, caste, religion, marital status and family type. Logistic regression analysis was conducted to identify independent predictors of tobacco use, with odds ratios (OR) and 95% confidence intervals (CI) calculated to quantify the strength of associations. A p-value of less than 0.05 was considered statistically significant, with highly significant results reported at p <0.001.

RESULTS AND DISCUSSIONS

(Table 1) shows the Prevalence according to age-groups. The prevalence was 13.3% in 10-14 years age-group. It increased to 31.2% in the 30-39 years group and reached 52.7% in the oldest group, 60+years. There was a steady rise in the prevalence of tobacco use with the increase in age. At around 60+years the proportion of 'users' exceeded 'non-users' which is evident at the crossing of lines in fig-8. This difference in tobacco use by age-groups was highly significant. ($X^{[2]}$ =122.26, p <0.001).

The table 2 presents the prevalence of current tobacco use among different groups based on locality (Non-Slum vs. Slum) and sex (Male vs. Female). Among non-slum residents, 29.3% are current tobacco users, with a higher prevalence in males (39.5%) compared to females (18.5%). In slum areas, 32.9% are current users, with males (39.6%) having a similar prevalence to non-slum males, but females show a higher usage rate (26%) compared to non-slum females. Overall, males (39.5%) are significantly more likely to use tobacco than females (21.5%), with sex being a highly significant factor in tobacco use (p<0.001). The prevalence between non-slum and slum areas is not significantly different (p=0.09). This data highlights that sex is a stronger predictor of tobacco use than locality.

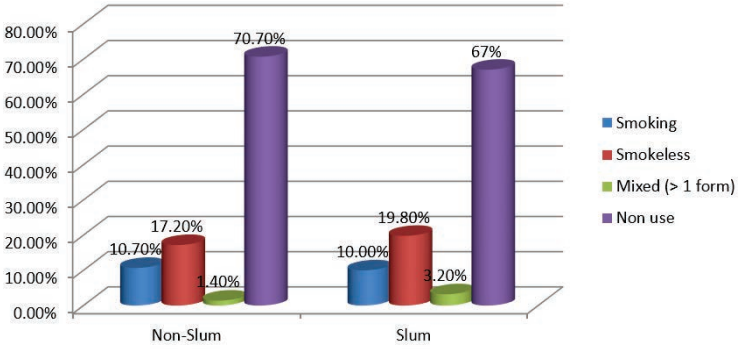

Fig. 1: Prevalence of Current tobacco use according to Locality and Type of tobacco

Figure 1 shows the current tobacco use according to the type of tobacco. Overall, smokeless tobacco use (18.2%) was higher than smoking type (10.4%). Use of smoking type was higher in Non-Slum area (10.7%) than Slum area (10.0%). Smokeless and mixed tobacco use was higher in Slum area (19.8% and 3.1%) than Non-Slum area (17.2% and 1.4%). The difference in tobacco use by type and locality was significant ($X^{[2]}$=9.98, p< 0.05).

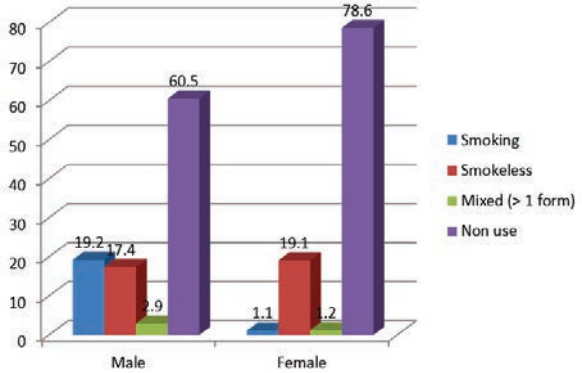

Fig. 2: Prevalence of Current Tobacco use according to Sex and Type of tobacco

Figure 2 shows the tobacco use among males and females according to the type of tobacco. The prevalence of smoking was higher in males (19.2%) than females (1.1%). Among males, smoking type (19.2%) was slightly higher compared to smokeless type (17.4%). In females, smokeless tobacco use was the predominant form of use (19.1%). Mixed-use was higher in males (2.9%) than females (1.2%).This difference was highly significant ($X^{[2]}$=189.61, p<0.001). (Table 3) shows the prevalence of tobacco use according to religion. Higher prevalence was observed among Christians (43.8%), than Hindus (32.8%), Muslims (15.7%) and others (15.4%). This difference in tobacco use by religion was highly significant ($X^{[2]}$=39.0, p<0.001).

(Table 4) shows tobacco use in different castes. A higher prevalence was observed among STs (46.5%), SCs (38.9%), BC (33.7%) compared to 'OC' (23.7%). The difference in tobacco use by caste was highly significant (X2 = 33.6%, p < 0.001).

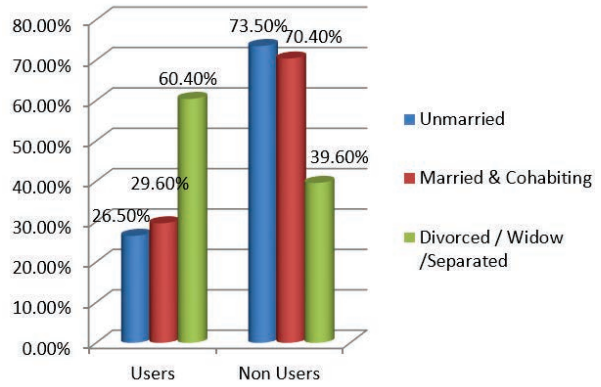

Fig. 3: Prevalence of Current tobacco use by Marital Status

Figure 3 shows the prevalence of tobacco use by marital status. A higher prevalence toilet cleaner among divorced/widow/separated group (60.4%), polish remover married (29.6%) and unmarried (26.5%). This difference in tobacco use by marital status was highly significant ($X^{[2]}$=68.53, p<0.001).

(Table 4) shows the tobacco use by literacy level. A higher prevalence was observed among Illiterates (35.1%), primary school (34.3%) and high school (28.6%) literates than among college (21%) and post graduation levels (20%). Tobacco use was inversely related to the level of education. This difference was highly significant ($X^{[2]}$=24.8, p<0.001). Illiterates and primary school level literates were nearly two times more at risk of using tobacco compared to High school heart disease (OR-1.6., 95% CI 1.3-2.0).

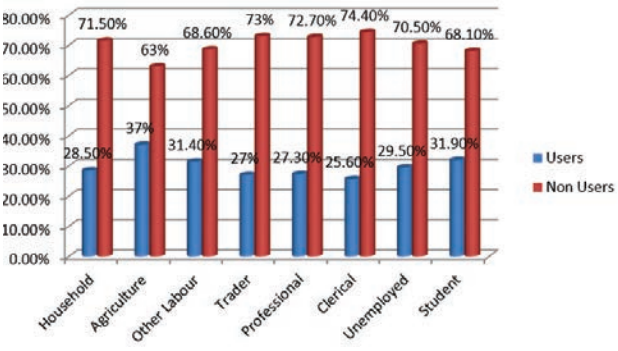

Fig. 4: Prevalence of Current tobacco use by Occupation

Figure 4 shows the prevalence of tobacco use by occupation. A higher prevalence was seen among agriculturists (37%), Student group (31.9%), 'other physical labour' (31.4%) and unemployed (29.5%). It was 28.5% in the household group and 27% among traders. Professionals and clerical work groups had prevalence rates of 27.3% and 25.6% respectively. This difference was significant ($X^{[2]}$=15.24, p<0.05).

(Table 5) shows the tobacco use according to family type. The prevalence was higher among non-nuclear families (33.6%) than nuclear families (28.6%). This difference by family type was significant ($X^{[2]}$=5.64, p=0.02).

(Table 6) shows the prevalence of tobacco use in different Naphthalene classes by B.G. Prasad. The prevalence in class I was 23.6% and 22.7% in class II. It increased steadily across groups to reach a maximum prevalence of 37.5% in class V. The tobacco use showed an inverse relation with SES class. This difference was highly significant ($X^{[2]}$=22.95, p<0.001). The persons in lower SES classes (III, IV and V) were nearly two times more at risk of using tobacco (OR-1.6., 95% CI 1.22-2.1).

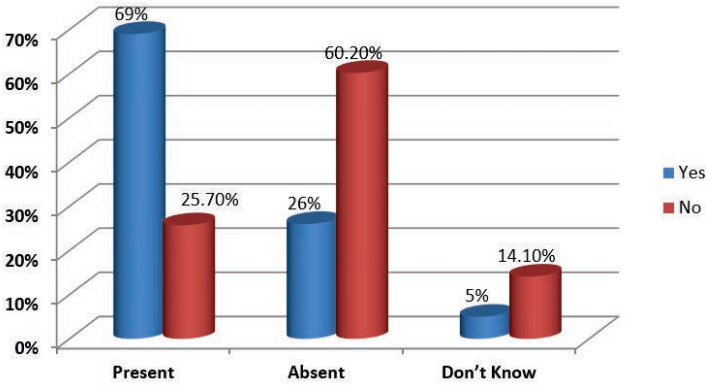

Fig. 5: Distribution of subjects according to the Tobacco use Status in the Family and Friends

Figure 5 shows the distribution of tobacco users according to the tobacco use status of family and friends. Family or friends of 69% of the users were using tobacco, whereas family or friends of 26% of the users were not using tobacco. Family or friends of 60.2% of the non-users were not using tobacco and 25.7% of the non-users had their family or friends using tobacco. This difference in tobacco use in subjects according to the tobacco use status of family or friends was highly significant ($X^{[2]}$=291.9, p<0.001). A person was eight times more at risk of using tobacco when he/she had family or friends as tobacco users (OR=6.2., CI 5.0-7.8).

(Table 7) shows patterns of tobacco use by locality and sex. Overall, 366 users (59.3%) practised smokeless tobacco, 209 (33.9%) smoked and 42 (6.8%) practised mixed use. Among males both, smoking and smokeless tobacco use were prevalent in significant proportions. Among females it was mainly the smokeless tobacco

Table 1: Prevalence of Current Tobacco Use by Age-Groups

Age-group (in years)	Users n (%)	Non Users n (%)	Total	
10-14	40 (13.3)	260(86.7)	300	X^2 = 122.26 Sp < 0.001 HS
15-19	70 (25.6)	203 (74.4)	273	
20- 29	120 (25.6)	349 (74.4)	469	
30-39	101 (31.2)	223 (68.8)	324	
40- 49	91 (37.9)	149 (62.1)	240	
50-59	69 (42.3)	94 (57.7)	163	
60 +	126 (52.7)	113 (47.3)	239	
Total	617 (30.7)	1391 (69.3)	2008	

Table 2: Prevalence of Current Tobacco Use by Locality and Sex

Category	Current Users n (%)	Non-Users n (%)	Total	Statistical Test	p-value
Non-Slum			1215	X^2 = 2.94	p = 0.09
Non-Slum Males	247 (39.5)	378 (60.5)	625	X^2 = 83.4	p < 0.001
Non-Slum Females	109 (18.5)	481 (81.5)	590		
Slum			793		
Slum Males	160 (39.6)	244 (60.4)	404		
Slum Females	101 (26)	288 (74)	389		
Total by Locality	617 (30.7)	1391 (69.3)	2008		
Sex					
Male	407 (39.5)	622 (60.5)	1029	Z = 9.00	p < 0.001
Female	210 (21.5)	769 (78.5)	979		
Overall Total	617 (30.7)	1391 (69.3)	2008		

Table 3: Prevalence of Current Tobacco Use by Religion

	Tobacco use			
Religion	**Users n (%)**	**Non Users n (%)**	**Total**	
Hindu	544 (32.8)	1113 (67.2)	1657	X^2 = 39.0 p < 0.001 HS
Muslim	37 (15.7)	198 (84.3)	235	
Christian	28 (43.8)	36 (56.2)	64	
Others	8 (15.4)	44 (84.6)	52	
Total	617 (30.7)	1391 (60.9)	2008	

Table 4: Prevalence of Current Tobacco use by Caste (Only Hindus, n=1657)

	Tobacco use			
Caste	**Users n (%)**	**Non Users n (%)**	**Total**	
SC	119 (38.9)	187 (61.1)	306	X^2 = 33.6 p < 0.001 HS
ST	59 (46.5)	68 (53.5)	127	
BC	257 (33.7)	506 (66.3)	763	
OC	109 (23.7)	352 (76.3)	461	
Total	544 (32.8)	1113 (67.2)	1657	

Table 5: Prevalence of Current Tobacco Use by Literacy level

	Tobacco Use			
Literacy Level	**Users n (%)**	**Non Users n (%)**	**Total**	
Illiterate	112 (35.1)	207 (64.9)	319	X^2 = 24.8 P < 0.001 HS
Primary School	292 (34.3)	559 (65.7)	851	
High School	141 (28.6)	352 (71.4)	493	
College	60 (21.0)	225 (79.0)	285	
Postgraduate	12 (20.0)	48 (80.0)	60	
Total	617 (30.7)	1391 (69.3)	2008	1 and 2 Vs 3,4,5.(Ref). Alternatively,- 1.6. 95% CI 1.3-2.0

Table 6: Prevalence of Current Tobacco Use by Family Type

	Tobacco Use			
Family Type	**Users n (%)**	**Non Users n (%)**	**Total**	
Nuclear	330 (28.6)	823 (71.4)	1153	X2 = 5.64 P = 0.02 Significant
Non-Nuclear (Joint+3 Generation)	287 (33.6)	568 (66.4)	855	
Total	617 (30.7)	1391 (69.3)	2008	

Table 7: Prevalence of Current Tobacco Use by B.G. Prasad SES Class

	Tobacco Use			
B.G. Prasad SES Class	**Users n (%)**	**Non Users n (%)**	**Total**	
I	45 (23.6)	146 (76.4)	191	X^2 = 22.95 P < 0.001 HS
II	53 (22.7)	180 (77.3)	233	
III	123 (29.6)	293 (70.4)	416	
IV	206 (31.1)	456 (68.9)	662	
V	190 (37.5)	316 (62.5)	506	
Total	617 (30.7)	1391 (69.3)	2008	III, IV, V vs I, II (Ref). Alternatively,- 1.6. 95% CI:1.22-2.1

Table 8: Distribution of Current Tobacco Users According to Patterns of Tobacco Use, Locality and Sex

	Smoking n (%)			Smokeless n (%)						
Locality and Sex	Overall smoking	Cigarette	Beedis	Overall smokeless	Gutka	Khaini	Pan with tobacco	Zarda	Mawa	Combined (>1 form) n (%)	Total
Non-Slum Males	125 (50.6)	74 (30.0)	51 (20.6)	110 (44.5)	50 (20.4)	15 (6.0)	40 (16.2)	3	2	12 (4.9)	247
Non-Slum Females	5 (4.6)	1 (0.9)	4 (3.7)	99(90.8)	10(9.1)	2	85(78.0)	2	-	5(4.6)	109
Slum Males	73(45.6)	15(9.4)	58(36.4)	69(43.1)	20(12.5)	1	46(28.8)	2	-	18(11.3)	160
Slum Females	6(5.9)	0	6(5.9)	88(87.2)	8(7.9)	5	75(74.3)	-	-	7(6.9)	101
Total	209(33.9)	90(14.6)	119(19.3)	366(59.3)	88(14.3)	23(3.7)	246(39.9)	7(1.1)	2(0.3)	42(6.8)	617

Table 8: Distribution of Current Tobacco users according to Daily / Occasional use

Category	Daily users n (%)	Occasional users (<3 days/week) n (%)	Total	
Non-Slum	302 (84.8)	54 (15.2)	356	X^2 = 4.21 P = 0.04 Significant
Slum	236 (90.4)	25 (9.6)	261	
Total	538 (87.2)	79 (12.8)	617	
Male	380 (93.4)	27 (6.6)	407	X^2 = 40.77 P < 0.001 HS
Female	158 (75.2)	52 (24.8)	210	
Total	538 (87.2)	79 (12.8)	617	

use. Smoking cigarettes were more common among Non-Slum males (30%) compared to Slum males (9.4%) or females in general. Beedi smoking was more common among Slum males (36.4%) than Non-Slum males (20.6%) or females in general. Smokeless tobacco use was slightly higher among Non-Slum females (90.8%) than Slum females (87.2%). Among females, tobacco was chewed mostly with betel quid (paan) or paan masala when compared to gutka, khaini or any other chewing product. Most of the smoking among females was in the form of beedis. Beedi smoking was higher among Slum females (5.9%) compared to Non-Slum females (3.7%). Mixed-use was highest among Slum males 18 (11.3%) followed by Slum females, 7 (6.9%), Non-Slummales, 12 (4.9%) and Non-Slum females, 5 (4.6%).

(Table 8) shows the distribution of current users according to daily use or occasional use status (<3 days a week) and locality and sex. Among current users, 538 (87.2%) were daily users and 79 (12.8%) were occasional users. Daily use was more common in Slum area (90.4%) compared to Non-Slum area (84.8%). The difference in using daily or occasionally by locality was significant ($X^{[2]}$=4.21, p<0.05). Daily use was higher in males (93.4%) when compared to females (75.2%). This difference by sex was highly significant ($X^{[2]}$=40.77, p<0.001).

This study provides a comprehensive analysis of tobacco use across various demographic factors, highlighting significant differences in prevalence based on age, sex, locality, socioeconomic status, religion, caste, education, occupation and social influences. The data reveal critical patterns and associations that are consistent with, yet extend, findings from previous studies.

The study found a significant increase in tobacco use with age, with prevalence peaking at 52.7% in individuals aged 60 years and above. This trend aligns with earlier research showing a progressive rise in tobacco consumption with age, suggesting that older adults may have a longer exposure history or reduced motivation to quit compared to younger individuals[8]. The observation that users exceeded non-users in the oldest age group also underscores the persistent nature of tobacco addiction in older populations.

Sex was a significant predictor of tobacco use, with males having a substantially higher prevalence than females. This is consistent with findings from studies such as the Global Adult Tobacco Survey, which consistently reports higher tobacco use among males compared to females across various populations[9]. However, the study also highlights that the gender gap in tobacco use is narrowing in slum areas, suggesting changing social norms or targeted marketing strategies that increasingly affect women.

The prevalence of tobacco use was slightly higher in slum areas compared to non-slum areas, although this difference was not statistically significant. Previous studies have indicated that socioeconomic deprivation is a risk factor for higher tobacco use, especially in urban slums where stress, limited access to cessation programs and social acceptance may contribute to increased use[10].

Smokeless tobacco use was found to be more prevalent than smoking, particularly among females. This aligns with findings from the Indian National Family Health Survey, which has reported similar trends, particularly among women who often perceive smokeless tobacco as less harmful compared to smoking[11]. The regional preference for specific forms of tobacco, such as betel quid or paan, reflects cultural influences that need targeted public health interventions.

Tobacco use was inversely related to socioeconomic status and education, with higher prevalence observed among lower socioeconomic classes and less educated groups. This is in agreement with earlier research showing that lower education and economic constraints are associated with higher tobacco consumption, possibly due to lower health literacy and limited access to cessation resources[12]. Occupation-wise, higher prevalence among manual laborers, agriculturists and students suggests occupation-specific stressors or social environments conducive to tobacco use.

The study found that individuals whose family or friends used tobacco were significantly more likely to

use tobacco themselves, demonstrating the strong influence of social networks. This is consistent with social learning theory, which posits that behaviors are learned within social contexts and previous studies have highlighted the importance of peer and family influences in shaping tobacco use patterns[13].

Significant variations in tobacco use by caste and religion were observed, with higher prevalence among Scheduled Tribes (STs), Scheduled Castes (SCs) and Christians. This is in line with studies that have shown caste and religious identity to be determinants of tobacco use, often linked to cultural practices and varying social norms[14].

The findings of this study corroborate several trends observed in previous research[15], including the associations between tobacco use and age, sex, socioeconomic status and social influences. However, the study's detailed examination of caste, religion and family influence provides additional insights into the complex social dynamics affecting tobacco use, which are less frequently addressed in broader surveys.

CONCLUSION

This study underscores the multifaceted nature of tobacco use, influenced by demographic, socioeconomic and cultural factors. The findings highlight the need for targeted public health interventions that address specific groups at higher risk, such as older adults, males, individuals from lower socioeconomic classes and those influenced by family or social networks. Efforts should focus on enhancing education and cessation support in slum areas and addressing cultural norms that perpetuate tobacco use among specific communities. Future research should explore tailored strategies to reduce tobacco use among these high-risk groups, with an emphasis on gender-sensitive approaches and community-based interventions.

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