

# Assessment of Tobacco dependence and Motivation to Quit Tobacco use among Undergraduate Students in Southern India: A Descriptive Cross-Sectional Survey

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## Abstract

**Background:** Tobacco dependence prevails to be silent force shaping the health trajectories of the young adult around the world. Institutional environment become pivotal door where habits are formed, swayed by academic stress, peer networks, and the perception of tobacco as a coping strategy.

**Aim:** The aim of the study was to assess tobacco dependence and motivation to quit tobacco use among undergraduate students of selected colleges in southern India.

**Method:** A cross-sectional study was conducted among 273 undergraduate students of selected colleges, in Bengaluru, Karnataka. Non probability convenient sampling method was used to select the participants. Fagerström test for nicotine dependence (FTND), Fagerström test for nicotine dependence-Smokeless tobacco (FTND-ST), and Motivation to stop scale (MTSS) were used to assess tobacco dependence and their motivation to quit tobacco respectively.

**Result:** Of the 273 respondents, the majority were aged 20–22 years (51%), and males constituted 68% of the sample. A positive family history of tobacco dependence was reported by 46% of participants. Among smoking tobacco users (n = 242), most (78.5%) exhibited low levels of dependence, while among smokeless tobacco users (n = 31), the majority (67.7%) demonstrated low to moderate dependence. Regarding motivation to quit, 28.9% of respondents reported a moderate level of desire and intention to stop tobacco use.

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**Conclusion:** The study findings reveal different levels of tobacco dependence among the students, coupled with measurable motivation to quit, which highlights on implementing systematic assessment and targets on forming tobacco cessation interventions at the institutional level which may improve quit attempts and improve student health.

**Keywords:** tobacco, smoking, smokeless, tobacco dependence, motivation to quit, undergraduate students.

## Introduction

Tobacco use remains one of the leading preventable causes of morbidity and premature mortality worldwide.<sup>1</sup> According to World Health Organization (WHO, 2023), more than 7 billion deaths annually are attributed to direct tobacco use, while 1.3 million deaths results from exposure to second-hand smoke. Notably, about 80% of the world's 1.3 billion tobacco user live in low and middle income countries. Globally, in 2020, 22.3% of the population used tobacco products- 36.7% of men and 7.8% of women.<sup>2</sup>

In the Indian Context, tobacco use presents a unique public health challenge. According to the Global Adult Tobacco Survey (GATS-2) conducted by the Ministry of Health and Family Welfare, Government of India, tobacco use among adults aged 15 and above has declined by 6 percentage points from the previous GATS-1 report. While national level data highlight overall trends, there remains a need to examine specific high-risk sub groups, such as university students to better understand their pattern of use and readiness to quit.<sup>3</sup>

One of the major threat to health worldwide is use of tobacco. Tobacco is primarily obtained from the leaves of *nicotiana tabacum* and to a lesser extent, *nicotiana rustica*. It is processed and consumed in various forms, including cigarettes, cigars, bidis, hookah, smokeless tobacco (chewing tobacco, gutka, snuff), and electronic nicotine delivery system (ENDS).<sup>4</sup> Even very mild level of tobacco use are harmful to our health, as there is no safe level of exposure in using tobacco.<sup>5</sup>

University life presents unique academic and social challenges. Students often face overwhelming course loads, frequent assessments, strict deadlines and the pressure of balancing academic, personal and social responsibilities. This demands can lead to stress, frustration, anxiety and burnout.<sup>6</sup> To cope with these challenges, some students resort to tobacco use as a maladaptive coping mechanisms.<sup>7</sup> Although they may perceive temporary relief, this often leads to dependence cycle rather than genuine stress management. The role of motivation in quitting tobacco is crucial. It helps individual adopt healthier habits, resist harmful behaviour, and persevere through challenges.

The transition to university life marks a critical period where lifelong health behaviors are often established. Tobacco use initiated during this phase can lead to long-term dependence, chronic health conditions, and difficulty in cessation later in life. Therefore, assessing the level of tobacco dependence among university students is essential for understanding the scope and intensity of the problem.<sup>8</sup>

Although various studies have evaluated the prevalence and the health impacts of tobacco use, there is a noticeable gap in research that explores the relationship between levels of tobacco dependence and motivation to quit, particularly among young adults in higher educational settings.<sup>5,9,11</sup> Hence, the present study was undertaken to assess tobacco dependence (smoking/smokeless) and motivation to quit among undergraduate students studying in selected colleges.

## Material and Methods

A descriptive cross-sectional survey was conducted among undergraduate students from different faculties of a private university, located at Bangalore, Karnataka (Southern India). Non probability convenient sampling technique was adopted to recruit participants from the selected colleges based on accessibility and willingness to participate. As the study was conducted within a limited timeframe and institutional setting, these method facilitated efficient data collection from a

readily available student populations. However, the findings may have limited generalizability beyond the study setting. Undergraduate students who self-report current use of tobacco in smoke or smokeless form and willing to participate with informed consent were included in the study. Data was collected using socio-demographic data sheet, and standardized tool such as Fagerstrom test for nicotine dependence (FTND)<sup>14</sup> and Fagerstrom test for nicotine dependence -smokeless tobacco (FTND-ST)<sup>15</sup> and Motivation to stop scale (MTSS).<sup>16</sup> These are standardized and validated instruments employed to ensure reliability and comparability of findings to quantify nicotine dependence levels among smoking and smokeless tobacco user, and to assess readiness to quit, respectively. These tools have widely established reliability in diverse population, including young adults. FTND and FTND-ST is a 6 item self rated scale with a total score range of 0-10 to measure intensity of physical nicotine dependence for smoking and smokeless tobacco respectively. Motivation to quit smoking scale (MTSS) includes 7 response options ordered by increasing motivation where 1 being the lowest and 7 being the highest. The research study was conducted after obtaining ethical clearance from MS Ramaiah University Ethics Committee, Bangalore for human trials on 08.10.2025 (Reference no: EC-25/128-UG-RINER).

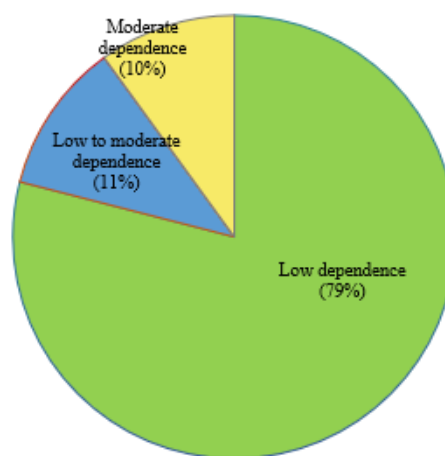
Data analysis was performed using IBM SPSS software (version 27) Frequency and percentage distribution were used to describe sociodemographic data, level of nicotine dependence, and level of motivation to quit tobacco use. Chi square test was done to determine association between demographic characteristics and the variables. Confidence interval was set at 95% and  $P < 0.05$  was considered statistically significant.

## Result

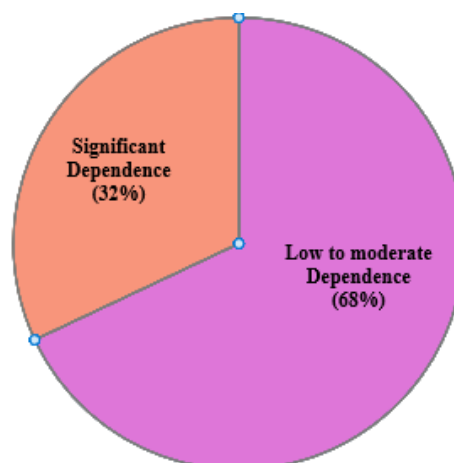
The majority of undergraduate students were aged 20-22 years (51%) and were predominantly male (68%). Most participants were in their second year of study (35%), with an academic performance range of 60-69% (41%). A family history of tobacco

dependence was reported by 46% of the students. Smoking was the most commonly used form of tobacco, reported by 89% of participants, and over half (53%) initiated tobacco use between 19 and 22 years of age. Peer pressure (22%), curiosity (27%), and personal concerns (23%) were identified as the primary factors contributing to tobacco use.

Of the 273 participants, 242 were active smokers, the majority (79%) of whom exhibited low nicotine dependence (Figure 1). Thirty-one participants reported using smokeless forms of tobacco, with most (68%) demonstrating low to moderate dependence (Figure 2). With respect to motivation to quit, the largest proportion of participants (29%) reported a moderate level of desire and intention to stop tobacco use (Table 1).



**Figure 1: Percentage distribution of tobacco dependence (smoking) among undergraduate student**



**Figure 2: Percentage distribution of tobacco dependence (smokeless) among undergraduate students**

**Table 1. Frequency and percentage of motivation to quit tobacco use among undergraduate students (n=273)**

Level	Frequency (%)
Absence of any belief, desire or intention	18 (7)
Belief	45 (16)
Moderate desire but no intention	53 (19)
Strong desire but no intention	43 (16)
Moderate desire and intention	79 (29)
Strong desire and medium -term intention	29 (11)
Strong desire and short-term intention	6 (2)

The study findings demonstrated a significant association between age, year of study, and contributing factors for tobacco use and tobacco dependence among smoking tobacco users and among smokeless tobacco users, age and year of study were significantly associated with tobacco dependence (Table 2). Furthermore, analysis of the

association between sociodemographic variables and motivation to quit tobacco use revealed that age, year of study, current academic performance, family history of tobacco use, number of close friends using tobacco, and contributing factors for tobacco use were significantly associated with motivation to quit (Table 3).

**Table 2. Association between tobacco dependence (smoking and smokeless) among undergraduate students with selected socio-demographic variables. (n=273)**

Socio-Demographic variables	FTND (n=242)			$\chi^2$ (df)	P value	FTND (ST) (n=31)		$\chi^2$ (df)	P value
	Low Dependence	Low to moderate dependence	Moderate dependence			Low to moderate dependence	Significant dependence		
<b>Age in years</b>				14.746 (4)	0.005*			6.071 (2)	0.048*
17-19	39	6	6			2	0		
20-22	108	10	6			12	2		
23-25	43	11	13			7	8		
<b>Gender</b>				3.534 (2)	0.171			0.13 (1)	0.713
Male	124	18	21			16	7		
Female	66	9	4			5	3		

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<b>Year of study</b>				14.984 (6)	0.02*			7.95 (3)	0.047*
1 <sup>st</sup> year	41	6	6			2	0		
2 <sup>nd</sup> year	67	5	6			8	9		
3 <sup>rd</sup> year	55	8	3			7	0		
4 <sup>th</sup> year	27	8	10			4	1		
<b>Current Academic Performance</b>				7.265 (8)	0.508			1.287 (2)	0.526
Below 50%	8	1	4			0	0		
50-59%	59	8	9			5	4		
60-69%	77	11	7			11	5		
70-79%	39	6	4			5	1		
80%and above	7	1	1			0	0		
<b>Family history of tobacco dependence</b>				1.112 (2)	0.574			1.546 (1)	0.214
Yes	80	13	13			12	8		
No	110	14	12			9	2		
<b>If Yes, which type of tobacco product used by family</b>				2.964 (4)	0.564			0.235 (2)	0.889
Smoking	57	10	8			4	3		
Smokeless	23	3	5			8	5		
<b>At what age did you first start using tobacco?</b>				0.394 (2)	0.821			0.828 (1)	0.350
15-18 yrs	94	15	12			5	1		
19-22 yrs	96	12	13			16	9		
<b>How many of your close friends use tobacco?</b>				9.287 (8)	0.319			5.079 (4)	0.279
1	14	2	3			6	4		
2-3	41	5	1			4	1		
4-5	35	2	6			3	4		
More than 5	56	13	9			3	1		
None	44	5	6			5	0		

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Which factors contribute to your use of tobacco?				20.803 (12)	0.05*			7.280 (6)	0.296
Peer pressure	40	9	8			1	3		
Stress	18	7	3			2	0		
Family Atmosphere	11	0	4			3	3		
Media influence	10	0	0			1	0		
Curiosity	55	4	4			8	2		
Personal concerns	47	5	4			5	1		
Others	9	2	2			1	1		

\*significant at  $p < 0.05$ , df= degree of freedom

Table 3. Association between motivation to quit tobacco use among undergraduate students with selected socio-demographic variables. (n=273)

Socio-Demographic variables	MTSS							$\chi^2$ (df)	P value
	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7		
<b>Age in years</b>								38.292 (12)	0.00*
17-19	9	13	10	5	11	3	2		
10-22	4	11	30	23	52	17	1		
23-25	5	21	13	15	16	9	3		
<b>Gender</b>								7.216 (6)	0.301
Male	14	35	38	27	53	15	4		
Female	4	10	15	16	26	14	2		
<b>Year of study</b>								42.612 (18)	0.001*
1 <sup>st</sup> year	8	15	11	4	11	4	2		
2 <sup>nd</sup> year	5	8	19	17	30	15	1		
3 <sup>rd</sup> year	3	7	13	14	31	4	1		
4 <sup>th</sup> year	2	15	10	8	7	6	2		

Continue....

<b>Current Academic performance</b>								36.839 (24)	<b>0.04*</b>
Below 50%	3	4	3	1	1	1	0		
50-59%	7	17	23	10	16	10	2		
60-69%	7	14	14	19	43	13	1		
70-79%	1	8	11	13	16	4	2		
80% and above	0	2	2	0	3	1	1		
<b>Family History of Tobacco Dependence</b>								14.59 (6)	<b>0.02*</b>
Yes	8	18	21	17	51	11	1		
No	10	27	32	26	28	18	5		
<b>If yes, which type of tobacco product is used by Family</b>								12.080 (12)	0.439
Smoking	5	13	15	10	37	5	1		
Smokeless	3	5	6	7	14	6	0		
<b>Which type of tobacco product do you use?</b>								9.697 (6)	0.138
Smoking	16	37	50	39	72	22	6		
Smokeless	2	8	3	4	7	7	0		
<b>At what age did you first start using Tobacco</b>								4.914 (6)	0.555
15-18 yrs	11	24	27	17	34	11	3		
19-22 yrs	7	21	26	26	45	18	3		
<b>How many of your close friends use tobacco?</b>								46.836 (24)	<b>0.004*</b>
1	0	0	4	3	15	7	0		
2-3	2	4	5	10	24	5	2		
4-5	3	12	12	8	8	5	2		
More than 5	8	16	21	14	15	6	2		
None	5	13	11	8	17	6	0		
<b>Which factors contribute to your use of Tobacco?</b>								50.90 (26)	<b>0.05*</b>
Peer pressure	4	15	5	11	17	7	2		
Stress	0	5	8	4	10	3	0		
Family atmosphere	0	3	5	2	7	4	0		
Media influence	0	1	7	0	1	1	1		
Curiosity	4	11	14	14	22	8	0		
Personal concerns	6	7	12	11	18	6	2		
Others	4	3	2	1	4	0	1		

\*significant at  $p < 0.05$ , df= degree of freedom.

## Discussion

### Findings related to socio-demographic variables

In the present study, among 273 undergraduate students, the majority were male (68%). Smoking tobacco use (89%) was more prevalent, than smokeless forms of tobacco (11%). These findings are consistent with a study conducted in Belgaum, which reported a higher prevalence of smoking than smokeless tobacco use, with a male-to-female ratio of 1.92:1.<sup>9</sup> The highest proportion of tobacco users belonged to the 20–22 year age group (51%), and tobacco use was most prevalent among second-year students (35%). Curiosity was identified as the most common contributing factor for tobacco use (27%), followed by peer pressure (22%). The predominance of tobacco use among students aged 20–25 years may be attributed to the transitional phase of early adulthood, characterized by increased independence, reduced parental supervision, and heightened curiosity.<sup>17</sup> Similar findings were reported in a study conducted at a university in Jordan, which demonstrated that smoking prevalence increased with advancing year of study and identified pleasure, stress, and curiosity as major contributing factors.<sup>10</sup>

### Findings related to assessment of tobacco dependence among undergraduate students

Of the 273 participants, 242 were current smokers. Among these, the majority demonstrated low nicotine dependence (79%), while 11% exhibited low-to-moderate dependence and 10% showed moderate dependence. In addition, 31 participants reported the use of smokeless forms of tobacco; of these, 68% had low-to-moderate dependence, whereas 32% demonstrated significant dependence. Overall, these findings indicate that tobacco use among the participants was predominantly experimental rather than habitual, with most users exhibiting low levels of nicotine dependence. Similar results were reported in an institution-based cross-sectional study conducted at the University of Delhi using the Fagerström Test for Nicotine Dependence, which found low dependence in 59.7% of participants.<sup>11</sup>

### Findings related to assessment of motivation to quit tobacco use among undergraduate students

Assessment of motivation to quit tobacco use among current users revealed varied levels of desire, belief, and intention to quit. Nearly one-third of participants (29%) reported a moderate desire and intention to quit, while 19% expressed a moderate desire without intention to quit. Additionally, 16% believed that they would quit tobacco use, and an equal proportion (16%) reported a strong desire but no intention to quit. A smaller proportion demonstrated stronger readiness, with 11% expressing a strong desire and medium-term intention to quit, and only 2% reporting a strong desire with short-term intention to quit. Notably, 7% of participants reported an absence of belief, desire, or intention to quit tobacco use. In contrast to the present findings, an analytical observational study conducted among undergraduate students in Indonesia using the Richmond Test reported a high level of motivation to quit smoking among participants.<sup>12</sup>

### Findings related to association between tobacco dependence and motivation to quit tobacco use among undergraduate students

The present study demonstrated significant associations between age, year of study, and contributing factors for tobacco use with tobacco dependence among smoking tobacco users. Among users of smokeless tobacco, age and year of study were also found to be significantly associated with tobacco dependence. Further analysis examining the relationship between sociodemographic variables and motivation to quit tobacco use revealed that age, year of study, current academic performance, family history of tobacco use, number of close friends using tobacco, and contributing factors for tobacco use were significantly associated with motivation to quit. These findings are consistent with evidence from a population-based, cross-sectional household survey conducted in Germany, which reported significant associations between sociodemographic characteristics and motivation to quit smoking as measured using the Motivation To Stop Scale.<sup>13</sup>

This study highlights a substantial prevalence of tobacco use among undergraduate students studying in private university with smoking being the predominant form and most users exhibiting low levels of tobacco dependence, suggesting early-stage or experimental use. Despite this, motivation to quit varied considerably, with a sizable proportion of students expressing desire to quit but lacking clear intention, underscoring a critical gap between awareness and action. Significant associations between age, year of study, sociodemographic factors, tobacco dependence, and motivation to quit emphasize the influence of developmental and social contexts on tobacco use behaviors. These findings underscore the need for targeted, stage-specific tobacco cessation interventions within undergraduate settings to prevent progression to long-term dependence and to strengthen quit intentions at an early stage. However, the findings are limited by restricted institutional representation and reliance on self-reported, cross-sectional data, which may affect generalizability and introduce bias.

### Conclusion

Nurses play a critical role in tobacco use prevention through routine screening, counseling, and health education, while nursing education and administration should support tobacco-free policies, awareness programs, and accessible cessation services. These measures can facilitate early identification of dependence and promote behavioral change among undergraduate students. Strengthening tobacco-control program, policy enforcement, and cessation support in educational settings is essential. Future research should include diverse populations and evaluate the long term effectiveness of targeted cessation interventions.

**Ethical Clearance:** *MS Ramaiah University Ethics Committee, Bangalore for human trials on 08.10.2025 (Reference no: EC-25/128-UG-RINER).*

**Conflict of Interest:** Nil

**Source of Funding:** Nil

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