

# Religiosity vs tobacco use: Religion's impact on tobacco use among adult Indian population – A cross sectional study

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## ABSTRACT

**Background:** Tobacco use is major serious threats to health and well-being killing approximately 1 million people each year. One of the better ways for tobacco cessation is by promoting the cultural-religious belief that may influence a person's tobacco-related habits. **Methods:** A Descriptive cross-sectional study was conducted among 174 adult subjects of smoking and smokeless tobacco users. The questionnaire consisted of demographic information and the Duke University Religion Index was used to assess the influence of religious belief and the use of tobacco products. The appropriate statistical tests were done using the Chi square test and ANOVA. **Result:** The study involved 174 participants of smoking and smokeless tobacco users. The participants were predominantly males (96%) with a mean age of 36 years, and more than half were Hindus (71.85). Among the study participants, 37.4% were graduates and 17.8% were illiterates. With regard to Occupation, the majority of the respondents were Professionals (24.7%). Majority of tobacco users had religious beliefs and strongly accepted that using tobacco during the fasting period was against their religious beliefs. **Conclusion:** The study concluded that there is a strong influence of religious belief on tobacco usage. Hence, there is a need to conduct community awareness programs for the adult population about the consequences of tobacco use.

**Keywords:** DUREL, intrinsic religiosity and religious conscience, religious attendance, religious belief

## Introduction

Tobacco use is one of the leading causes of potentially preventable morbidity and mortality, killing approximately 1 million people every year. According to the World Health Organization, deaths due to tobacco-related diseases increased from 1.4% in 1990 to 13.3% in 2020.<sup>[1]</sup> Globally, more than 7 million deaths result from direct tobacco use, while around 1.3 million result from non-smokers being exposed to secondhand smoke.<sup>[2]</sup>

The Global Adult Tobacco Survey-2 (GATS-2) reported that in Tamil Nadu 42.4% of men, 14.2% of women, and 28.6% (266.8 million) of all adults currently use tobacco (smoked and/or smokeless tobacco). In Puducherry, 17.7% of men, 5.1% of women, and 11.2% of all adults either smoke tobacco and/or use smokeless tobacco. According to the report on the economic burden of tobacco-related diseases in India, there are 275 million tobacco users, of whom 206 million use smokeless tobacco and 111 million use smoked tobacco.<sup>[3]</sup>

With the consumption of tobacco products both smoking and smokeless tobacco, tobacco-related problems remain peculiar in India.<sup>[4]</sup> Tobacco-related deaths are further expected to increase and account for 8.3 million deaths by 2030 if no proper tobacco control measures are implemented. The risk of dying due to

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tobacco use is expected to decrease by 9% in high-income countries and double in low to middle-income countries like India, from 3.4 million to 6.8 million deaths with the majority of deaths.<sup>[5]</sup>

One of the better ways for tobacco cessation is by promoting the cultural-religious belief that may influence a person's tobacco-related habits which can be used as an effective method for tobacco cessation.<sup>[6,7]</sup> Cultural values and social beliefs are important factors that affect the smoking status of individuals and influence whether smokers continue this behavior or succeed in quitting.<sup>[8]</sup> A study by Gomes *et al.* found that tobacco use was higher among students who did not attend religious groups or only attended occasionally compared to those who attended religious services at least once a month.<sup>[9]</sup> A systematic review of 125 studies evaluating the association between religiousness and spirituality with tobacco use showed that religiousness and spirituality were protective against smoking.<sup>[10]</sup>

Tobacco use remains a significant public health concern globally and primary care physicians (PCPs) play a critical role in tobacco cessation efforts. In India, where cultural and religious factors influence lifestyle choices, understanding the impact of religiosity on tobacco use can provide valuable insights for PCPs and family physicians. PCPs are at the forefront of delivering comprehensive healthcare. By identifying the influence of religiosity on tobacco use, PCPs can tailor their counseling approaches to be more effective. Although various studies are available on the relationship between religious attendance and smoking cessation, no studies have been conducted among the Indian population. Hence, this cross-sectional study aims to investigate how religious beliefs refrain them from the use of tobacco products among the adult Indian population.

## Materials and Methods

### Study design

Descriptive Cross - Sectional study.

### Study area

The present study was conducted in the tobacco cessation Centers and de-addiction centers from the Southern part of Tamil Nadu (Cuddalore district) and Pondicherry (Southwest), India.

### Duration of the study

The study was conducted between July 2022 and October 2022.

### Study population

Adults (Both males and females) aged above 18 years living in the Southern part of Tamil Nadu and Pondicherry, India.

### Sample size

According to Ali Unlu *et al.*,<sup>[11]</sup> study, considering the prevalence or proportion of 72.1,

$Q (100-P) = 27.9$ ;  $Z_{\alpha/2}$  (constant) = 3.84 (at 95% power) and  $L$  (allowable error) of 7.21, the sample size was using the formula,  $N = Z_{\alpha/2}PQ / L^2$ .

Where  $P$  (Prevalence or proportion) = 72.1;  $Q (100-P) = 27.9$ ;  $Z_{\alpha/2}$  (Constant) = 3.84 (at 95% power);  $L$  (Allowable error) = 7.21.

$$N = 3.84 * 72.1 * 27.9 / 7.21 * 7.21$$

$$N = 7724.50 / 51.98$$

$$N = 148$$

Considering 10% non-response rate, the sample size is recalculated as 162 and rounded off to 170. However, the present study included all eligible adult populations of smoking and smokeless tobacco users who were identified through Tobacco cessation centers of Pondicherry and de-addiction centers, non-government organizations (NGO's), and Community field visits.

### Sampling technique

Non-probability, purposive sampling technique was used to recruit eligible and consenting adults through NGOs, Tobacco cessation centers of Pondicherry and de-addiction centers of Pondicherry and the Southern part of Tamil Nadu in Cuddalore District.

#### Inclusion criteria

1. Adults aged  $\geq 18$  years, who are current and past tobacco smokers.
2. Adults aged  $\geq 18$  years, who are current and past users of smokeless tobacco.
3. Subjects who are willing to participate in the study.

#### Exclusion criteria

1. Subjects those who had not done religious fasting.
2. Subjects who were previous smokers or used smokeless tobacco but quit the habit recently.
3. Subjects using tobacco products other than smoking and smokeless tobacco users having alcohol habits and alcohol users or any other drug abuse.

### Ethical approval and consent

The nature and purpose of the study were elucidated to the Institutional Ethical Committee and Review Board and ethical clearance was obtained from the concerned authorities (IGIDSIEC2021NRP42PGPRPHD). Prior permission was obtained from the institutional ethical committee and review board. Participation in the study was voluntary. Informed consent was obtained from all participants before the start of the study. The anonymity and confidentiality of the study subjects were maintained.

### Study tools

A Duke University Religion Index (DUREL) questionnaire, with slight modifications has been conducted comprising of 20 closed-ended multiple choice questions in both English and

the local language (Tamil). The socio-demographic details such as age, gender, education, occupation and income, Current use of tobacco forms both smoking and smokeless were collected from the study participants.

The questionnaire was assessed for content Validity and reliability. Content validity was assessed with 11 expert members from the Department of Public Health Dentistry and was modified by their recommendations finally the questions were reframed accordingly, and Validity scores were found to be >3 (Good). The Cronbach's alpha reliability score was found to be 0.89 (Good). A Pilot study was conducted among 20 subjects to assess the influence of religious belief and the use of tobacco products. Socio economic status was assessed using the Modified Kuppuswamy socioeconomic scale 2021.

### Instruments

We used the DUREL modified Questionnaire to measure religiosity which is a five-item instrument used to assess the dimensions of religiosity using 3 domains: 1) Religious attendance, 2) Intrinsic religiosity and 3) Religious conscience.

Religious attendance refers to participation in formal activities of religious institutions by asking the question: "How often do you attend church or other religious meetings?"

Intrinsic religiosity (IR) refers to religious activities performed in private, and it is measured by asking the question: "How often do you use your time in religious activities, such as prayer, meditation, reading scriptures, etc?" IR is measured by three questions, relating to the presence of God as experienced in the lives of people, the relation between religious beliefs and approach to life, and the effort to live religion in all aspects of life. It is measured using a five-point Likert scale.

Religious conscience is measured by "Do you believe all good deeds and bad deeds that I do is watched by god", and "Do you believe that it is not a mistake to compromise on a few religious customs based on our need" and it was measured using a five-point Likert scale.

### Data collection

The principal Investigator met the Tobacco cessation centers of Pondicherry and de-addiction centers, non-government organizations (NGO's) and conducted the study. During Community field visits, participants who met the eligibility criteria were involved in the study after obtaining informed consent. The confidentiality of the collected data was maintained.

### Statistical analysis

Data were entered in MS Excel and analyzed with descriptive statistics such as mean, standard deviation, and percentage were used. The association was evaluated using Chisquare and ANOVA. The Pearson correlation test was used to find the correlation between religiosity and tobacco use.

Any *P* value less than 0.05 was considered significant. To analyze the data SPSS (IBM SPSS Statistics for Windows, Version 26.0, Armonk, NY: IBM Corp. Released 2019) is used. A significance level was fixed as 5% ( $\alpha = 0.05$ ).

## Results

### Demographic characteristic of the participants

The study involved 174 participants of smoking and smokeless tobacco users. The participants were predominantly male (96%) with a mean age of 36 years, and more than half were Hindus (71.8%) followed by Muslims (10.3%) and Christians (17.8%). The results also showed that 37.4% were graduates and 17.8% were illiterates. With regard to Occupation, the majority of the respondents were Professionals (24.7%). Socio-economic status was assessed using the Kuppuswamy scale 2021 and the majority of the respondents were from the upper lower class (35.6%) [Table 1]. The frequency of Smoking and Smokeless tobacco consumed per day among study subjects are shown in Table 2.

**Table 1: Demographic Distribution of the Study Participants**

Demographic variable	Frequency (n)	Percentage (%)
AGE (Mean±SD)	36±12.11	
Gender		
Male	167	96
Female	7	4
Religion		
Hindu	125	71.8
Christian	32	17.8
Muslim	18	10.3
Education		
Illiterate	31	17.8
Primary school	3	1.7
Middle school	16	9.2
High school	39	22.4
Diploma or Intermediate	20	11.5
Graduate	65	37.4
Occupation		
Unemployed	24	13.8
Elementary occupation	36	20.7
Plant and Machine operators and Assemblers	10	5.7
Craft and Trade related workers	6	3.4
Skilled agriculture and fishery workers	31	17.8
Skilled workers and shop and Market sales workers	16	9.2
Clerk	8	4.6
Professionals	43	24.7
Income		
<6,174	34	19.5
6175-18,496	48	27.6
18,497-30,830	76	43.7
30,831-46,128	14	8.0
46,129-61,662	1	0.6
Socio-economic status		
Lower (V)	15	8.6
Upper lower (IV)	62	35.6
Lower middle (III)	44	25.3
Upper middle (II)	53	30.5

### Domain 1 - Religious attendance and tobacco use

Table 2 depict the religious attendance, current users of smoking who visited religious places more than once per week (82.1%) and smoked more than 25 cigarettes (53.6%). In context with current or past user of smokeless tobacco, current users those who visited more than once/week (48.2%) and used less than 25 tobacco pouches (71.4%) [Figure 1]. There was no statistically significant difference found between current users/past users of tobacco users and religious attendance.

### Domain 2 – Intrinsic religiosity and tobacco use

Table 3 shows the intrinsic religiosity in context with current or past users of smoking and smokeless tobacco. Participants who often smoked Daily or almost daily were found to have a higher mean score of  $16.66 \pm 3.2$  and participants who often used smokeless tobacco Daily or almost daily were found to have a higher mean score of  $16.88 \pm 3.5$ . A statistically significant difference was found (*P* value 0.02).

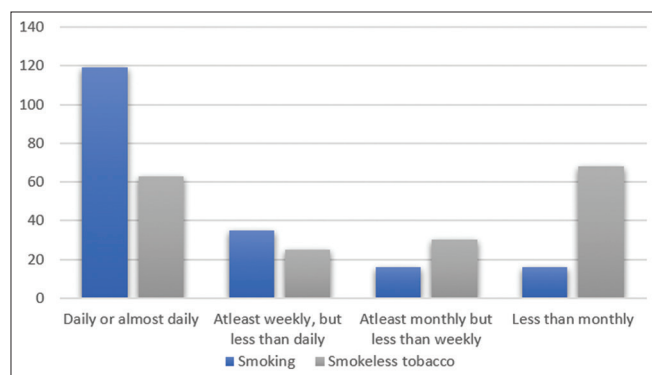
### Domain 3 – Religious conscience and tobacco use

Table 4 shows the religious conscience in context with current or past user of smoking and smokeless tobacco. Participants

who smoked cigarettes daily with >25 cigarettes with mean score of  $16.21 \pm 2.3$  and those who smoked <25 cigarettes were with mean score of  $15.32 \pm 3.4$ . A statistically significant difference was found. (*P* value 0.001). Participants who often used smokeless tobacco Daily or almost daily were found to have a higher mean score of  $17 \pm 2.6$ , whereas those used tobacco pouches at least weekly but less than daily with a mean score of  $16.05 \pm 3.9$ , at least monthly but less than weekly with a mean score of  $15.58 \pm 2.5$  and those who used less than monthly were found to have a lesser mean score of  $14.42 \pm 2.7$ . A statistically significant difference was found. (*P* value 0.00).

### Correlation between religiosity and tobacco use

With regard to Socio-economic status (SES) and number of cigarettes smoked, it was found to be highly significant. Smokeless tobacco and SES were found to be highly significant, and the relationship of SES and current users of smoking was found to be highly significant. Whereas, with regard to religious attendance and tobacco habits, a negative correlation was found. In context with intrinsic religiosity and tobacco habits, SES and intrinsic religiosity were found to be highly significant. However, the relationship of tobacco habits and religious conscience, with tobacco pouches used it was found to be significant, and the relationship between current or past users of smokeless tobacco and religious conscience was found to be highly significant. [Table 5].



**Figure 1:** Frequency of Smoking and Smokeless tobacco among study subjects

## Discussion

Tobacco use is one of the major serious threats to health and well-being.<sup>[11,12]</sup> This is the first study done among the Indian population which finds an association between religiosity and tobacco use. Although number of studies have been reported with a significant association between religiosity and tobacco use in other countries.<sup>[13,14]</sup> The present cross-sectional study was intended to find the association between religiosity and tobacco use among the adult Indian population. The sample size calculated was 170 because the data collected were 174, and the entire sample was calculated. The prevalence of tobacco was found to be significantly higher among males because of the reason that

**Table 2: Relationship Between Religious Attendance and Tobacco Use (Domain 1)**

Religious attendance	More than once/week	A few times in a year	Once a year/Less	Never	<i>P</i>
Current or past user of smoking					
a) Current user	46 (82.1)	70 (88.6)	15 (75)	17 (89.5)	0.530
b) Past user	9 (16.1)	7 (8.9)	5 (25)	2 (10.5)	
c) Not used	1 (1.8)	2 (2.5)	0	0	
Current or past user of smokeless tobacco					
a) Current user	27 (48.2)	27 (34.2)	10 (50)	15 (78.9)	0.021
b) Past user	20 (35.7)	29 (36.7)	5 (25)	3 (15.8)	
c) Not used	9 (16.1)	23 (29.1)	5 (25)	1 (5.3)	
How many cigarettes do you smoke daily					
More than 25 Cigarettes	30 (53.6)	29 (36.7)	7 (35)	9 (47.4)	0.213
Less than 25 cigarettes	26 (46.4)	50 (63.3)	13 (65)	10 (52.6)	
How many pouches of smokeless tobacco do you use daily					
More than 25 Pouches	16 (28.6)	9 (11.4)	5 (25)	8 (42.1)	0.011
Less than 25 Pouches	40 (71.4)	70 (88.6)	15 (75)	11 (57.9)	

*P*>0.05 is not significant

**Table 3: Relationship Between Intrinsic Religiosity and Tobacco Use (Domain 2)**

Variable	n	Mean	Standard Deviation	P
Are you a current or past user of smoking				
Not used	3	12.3	0.57	0.194
Past user	23	16.00	3.03	
Current user	148	16.08	3.62	
Are you a current or past user of smokeless tobacco				
Not used	38	14.81	3.48	0.017
Past user	57	15.77	3.44	
Current user	79	16.75	3.51	
How many cigarettes do you smoke daily				
<25 cigarettes	99	15.27	3.49	0.663
>25 cigarettes	75	16.98	3.39	
How many pouches do you use daily				
<25 Tobacco pouches	136	15.72	3.43	0.810
>25 Tobacco pouches	38	17.05	3.78	
How often do you use Smoke				
Less than monthly	12	13.75	3.95	0.002*
Atleast monthly but less than weekly	15	14.13	2.92	
Atleast weekly but less than daily	29	15.27	3.99	
Daily or almost daily	118	16.66	3.28	
How often do you use Smokeless tobacco				
Less than monthly	64	15.03	3.42	0.027
Atleast monthly but less than weekly	29	16.44	2.68	
Atleast weekly but less than daily	20	15.85	4.52	
Daily or almost daily	61	16.88	3.50	
Smoke at religious place	153	15.82	3.40	
No	21	17.38	4.32	0.315
Yes				
Smoke immediately after prayers				
No	108	15.45	3.16	0.087
Yes	66	16.92	3.96	
Use Smokeless tobacco immediately after prayer				
No	126	15.57	3.28	0.110
Yes	48	17.14	3.97	

\*P&lt;0.05 is significant

smoking or using smokeless tobacco is socially and culturally unacceptable for women because of social restrictions among the adult Indian population to consume tobacco in any form.<sup>[15,16]</sup>

Our study found that the majority of participants identified as Hindu (71.8%), reflecting the fact that Hinduism encompasses more than three-quarters of the Indian population, with smaller proportions belonging to Christian and Muslim. Most participants in the study were graduates (37.4%), potentially influenced by factors such as psychological stress, peer pressure, work-related stress, social environment, and curiosity, which could contribute to smoking behaviors among graduates.<sup>[17]</sup>

Socio-economic status emerged as a significant risk factor for tobacco use and poor oral health outcomes.<sup>[18]</sup> The majority of tobacco users in the study came from the upper-lower class (62%) and upper-middle class (53%). This trend may be attributed to lower socio-economic classes having limited access to education and awareness, leading to a higher inclination towards using tobacco-related products.

In literature, individuals with either partial or full religious commitment were less inclined to smoke, possibly due to their

engagement in private religious activities, which positively impacted their self-esteem and self-efficacy. Research indicates that those who frequently attend religious activities tend to experience greater social support, fewer depressive symptoms, and are more committed to health behaviors, including lower tobacco consumption.<sup>[19]</sup>

In contrast to these findings, our study observed that participants who held religious beliefs and attended religious gatherings more than once a week had a significantly higher prevalence of tobacco use, both in terms of smoking (82.1%) and smokeless tobacco (48.2%). This differs from a study conducted at a Christian university in Brazil, which found that higher levels of religious attendance were associated with lower tobacco use.<sup>[19]</sup>

Although the current study focuses on religious involvement and tobacco use, this study has certain limitations. Because it is a cross-sectional study design, it is not possible to find the causal relationship between religiosity and tobacco habits. Information obtained was self-reported it may be subjected to social desirability bias and recall bias which could influence the accuracy of the data collected on smoking habits and religious practices. Additionally, the study's scope was limited by its small

**Table 4: Relationship Between Religious Conscience and Tobacco use (Domain 3)**

Variable	n	Mean	Standard Deviation	P
Are you a current or past user of smoking				
Not used	3	14.00	4.35	0.497
Past user	23	16.13	2.80	
Current user	148	15.67	3.05	
Are you a current or past user of smokeless tobacco				
Not used	38	14.34	2.78	0.000*
Past user	57	15.12	2.91	
Current user	79	16.78	2.89	
How many cigarettes do you smoke daily				
<25 cigarettes	99	15.32	3.42	0.001*
>25 cigarettes	75	16.21	2.37	
How many pouches do you use daily				
<25 Tobacco pouches	136	15.41	3.11	0.278
>25 Tobacco pouches	38	16.73	2.53	
How often do you use Smoke				
Less than monthly	12	13.50	4.21	0.022
Atleast monthly but less than weekly	15	14.66	2.49	
Atleast weekly but less than daily	29	15.79	3.40	
Daily or almost daily	118	16.04	2.77	
How often do you use Smokeless tobacco				
Less than monthly	64	14.42	2.74	0.000*
Atleast monthly but less than weekly	29	15.58	2.52	
Atleast weekly but less than daily	20	16.05	3.96	
Daily or almost daily	61	17.00	2.69	
Smoke at religious place	153	15.37	2.86	
No	21	18.14	3.26	0.933
Yes				
Smoke immediately after prayers				
No	108	15.08	3.06	0.184
Yes	66	16.72	2.72	
Use Smokeless tobacco immediately after prayer				
No	126	15.07	2.98	0.445
Yes	48	17.35	2.54	

\* P&lt;0.05 is significant

**Table 5: Correlation between religiosity and Tobacco Use**

	SES	Religious attendance	Intrinsic religiosity	Religious conscience
SES	1.000	-0.008	0.215**	-0.028
How many Cigarettes do you smoke	0.577**	-0.051	0.239**	0.054
How many tobacco pouches do you use	0.285**	0.022	0.181**	0.132*
Current or past user of smoking	0.219**	-0.024	0.098	-0.045
Current or past user of smokeless tobacco	0.104	0.079	0.200**	0.303**
How often do you use smoke	0.277**	-0.121	0.255**	0.116
How often do you use tobacco	0.036	0.090	0.206**	0.332**

\*\*Highly significant, \*significant

sample size and geographical focus primarily on Pondicherry and the Southern part of Tamil Nadu. Consequently, the findings may not be fully represented other regions within the country. Furthermore, our study solely examined the association between religiosity and tobacco use, overlooking participants' religious beliefs during fasting periods, an area worthy of exploration in future research endeavors.

## Conclusion

The current study has determined a significant impact of religious beliefs on tobacco consumption, highlighting

the necessity for proactive measures to address this issue. Religiosity-based programs can influence the religious beliefs to motivate individuals to quit tobacco use. It highlights the importance of implementing community awareness programs targeting adults and the general public to educate them about the adverse effects of tobacco use and the effectiveness of interventions in addressing this problem. Additionally, religiosity may play a role in shaping social norms through religious institutions, influencing attitudes, knowledge, and health practices. Hence, initiatives based on religious principles can be leveraged to promote public health and combat tobacco-related issues.

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## Conflicts of interest

There are no conflicts of interest.

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