The pattern of tobacco use and the associated socio-demographic factors among Transgenders living in Chennai city of Tamil Nadu, India

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ABSTRACT

Introduction: The tobacco epidemic is one of the biggest public health threats the world has ever faced, which kills more than 8 million people a year around the world. Transgenders are prone to use and abuse substances including tobacco and alcohol as a coping mechanism to manage minority stress experienced due to high levels of discrimination and lack of acceptance by society.

Objectives: Among transgenders living in Chennai city, Tamil Nadu, (1) we aimed to estimate the prevalence and describe the pattern of tobacco use and (2) identify the sociodemographic factors associated with tobacco use.

Methods: A community-based cross-sectional analytical study was conducted among 734 transgender adults living in the Chennai city of Tamil Nadu. A pre-tested, semi-structured interview schedule was used. Descriptive statistics such as frequency and proportions were used for categorical variables. Chi-square test was applied to find the significance of the association between tobacco use and sociodemographic factors.

Results: The prevalence of the current use of any form of tobacco products among transgenders was 64.4%. About 27% had tried to stop using tobacco during the past 1 year. Education status, socioeconomic class, and occupation were significantly associated with the current use of any form of tobacco and trying to quit tobacco use. Conclusion: The prevalence of tobacco use among transgenders is alarming. The present study findings highlight the need to increase awareness activities by health authorities and non-government organizations (NGOs)/community-based organizations (CBOs) to generate awareness about the health hazards of tobacco use among transgenders. Tobacco control programs focussing on transgenders are essential.

Keywords: SLT, smokeless tobacco, smoking, tobacco use, transgenders

Introduction

The tobacco epidemic is one of the biggest public health threats the world has ever faced. Globally, more than 7 million deaths are resulted due to direct tobacco use.¹

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Current peer-reviewed literature about tobacco use especially smokeless tobacco and other substance of abuse remains very limited in this high-risk vulnerable population in South India. However, to our knowledge, published literature to date from South India is predominantly comprised of quantitative, cross-sectional studies including small sample sizes (100-120) and did not explore the multiple tobacco product use by an individual and the associated factors. To better understand this understudied problem, the present study was conducted among transgenders living in the Chennai city of Tamil Nadu with the objective to estimate the prevalence and describe the pattern of tobacco use and identify the associated sociodemographic factors.

Materials and Methods

The present study is a part of an ongoing larger study conducted to estimate the prevalence of tobacco use and its associated factors among transgenders in the Chennai city of Tamil Nadu by the principal author.

Study area

The present study was done in the Chennai city of Tamil Nadu.

Study design

Community-based cross-sectional analytical study.

Study population

Transgender adults (both male to female and female to male) aged above 18 years living in Chennai, Tamil Nadu.

Sample Size

According to Mathivadani et al.'s study, considering the prevalence of addiction to smokeless tobacco (p) as 26% with a precision (d) of 4% and 95% confidence interval \( (Z_{1-\alpha/2} = 1.96) \), the sample size was calculated as:

\[
N = \frac{Z(1-\alpha/2)^2 \times p \times (1-p)}{d^2}
\]

\[
N = 1.96^2 \times 0.26 \times (1-0.26)/0.0016
\]

\[
N = 462
\]

By adding a 10% non-response rate, the adequate sample size required for the study was calculated as 508. However, the present study included all eligible transgenders who were identified through non-governmental organizations (NGOs), community-based organizations (CBOs), and social welfare trusts. Hence, the total number of samples included in the study was 734.

Sampling strategy

Non-probability, purposeful sampling technique was deployed to recruit eligible and consenting transgender adults through NGOs, CBOs, and social welfare trusts working with transgender communities in Chennai, Tamil Nadu.

Inclusion criteria

1. Transgender adults aged \( \geq 18 \) years.
2. Both male to female and female to male transgenders.

Exclusion criteria

1. Those who were not willing to give consent to participate in the study.
2. Those who did not self-identify themselves as transgenders.

Study period

Six months (April–September 2021).

Pilot study

Pilot testing was carried out on 75 participants for standardizing the questionnaire. Based on the observations during the pilot testing, necessary changes were made in the questionnaire. The results of the pilot test were not included in the final analysis.

Study tools

A pre-tested, semi-structured interview schedule was developed and used for obtaining information from study participants on sociodemographic profile, current gender identity, current use of tobacco products, the age at starting to use tobacco products, and willingness to quit using tobacco products.

A current tobacco user was defined as a person reporting the use of any smoked or smokeless tobacco product daily or less-than-daily at the time of the survey. A current tobacco smoker was a person who reports smoking any tobacco product on a daily or less-than-daily basis at the time of the survey, and a smokeless tobacco user was a person who reports the use of any smokeless tobacco product on a daily or less-than-daily basis at the time of the survey.

Data collection

The principal investigator and co-investigators met the NGOs, CBOs, and social welfare trusts working with transgender communities and explained to them the objectives of the study, and sought support in data collection utilizing their network. A sensitization session was held at the offices of the consenting NGOs, CBOs, and social welfare trusts on pre-scheduled days. The study subjects fulfilling the eligibility criteria were interviewed in the Tamil language by the researchers using the interview schedule after obtaining the written informed consent from them. Each study participant was interviewed separately and their responses were recorded. Confidentiality of the collected data was maintained.

Data analysis

Collected data were entered and analyzed using the SPSS software version 23.0. Descriptive statistics such as frequency
and proportions were used for categorical variables, and mean and standard deviation were used for quantitative variables. Chi-square test was applied to find the significance of the association between tobacco use and sociodemographic factors. All tests were performed at a 5% level of significance; thus, an association was considered significant, if the P value was less than 0.05.

Ethics consideration
The study was approved by the Institutional Ethics Committee. Written informed consent was obtained from study participants after explaining the objectives of the study.

Results

Sociodemographic profile
A total of 734 transgender adults participated in the present study. The mean age of study participants was 33.5 ± 10.9 years. The majority (40%) of the study participants belonged to the age group 21–30 years. Almost four-fifths (78%) of the study participants had their residence in rural areas [Table 1].

According to the distribution of study subjects as per their education, it was observed that the majority (29%) had completed their schooling and 22% under-graduation, respectively. About 69% of the study subjects had full-time occupations and 21% were involved in begging, and 3% were commercial sex workers (CSW) [Figure 1]. Around 80% belonged to the Class I socioeconomic class as per the BG Prasad SES classification.[11]

Tobacco use
The prevalence of the current use of any form of tobacco products among transgenders was 64.4%. Among them, 13.2% were current smokers, and 52.55% were currently using smokeless tobacco products [Figure 2]. Around 60% of the study subjects started using tobacco products when they were below 20 years of age [Figure 3]. About 16% of the study subjects confirmed poly use of tobacco products with 7.2% of them using more than two tobacco products in a day on an average. Around 28% of study subjects were in the habit of using tobacco products within 5 min of waking up [Figure 4]. The majority (39.5%) of the study subjects had a health issue because of tobacco use. More than half (53%) of the study participants had noticed health warnings on packages of tobacco products [Table 2].

About 27% of the study subjects had tried to stop using tobacco products during the past 1 year. Around 28% were interested in quitting tobacco use. Still, 25% were firmly not interested to quit. Only 3% had knowledge about the availability of low-risk alternatives for tobacco in the market. Only very few (1%) had shown interest to try the low-risk alternatives to tobacco forms as a part of the research study [Table 3].

Association
The education status of study participants had a statistically significant association with the current use of any form of tobacco, the current use of smokeless tobacco products, and

Table 1: Distribution of study participants according to sociodemographic characteristics (n=734)

| Variable                  | Frequency | Percentage |
|---------------------------|-----------|------------|
| Age group                 |           |            |
| 20 and below              | 48        | 6.5        |
| 21–30                     | 296       | 40.3       |
| 31–40                     | 228       | 31.1       |
| 41–50                     | 125       | 17.0       |
| 51–60                     | 29        | 4.0        |
| 61 and above              | 8         | 1.1        |
| Residence                 |           |            |
| Rural                     | 579       | 78.9       |
| Urban                     | 101       | 13.8       |
| No response               | 54        | 7.4        |
| Current gender identity   |           |            |
| Transfemale               | 726       | 98.9       |
| Transmale                 | 8         | 1.1        |
| Education                 |           |            |
| Illiterate                | 3         | 0.4        |
| Primary                   | 93        | 12.7       |
| Middle                    | 27        | 3.7        |
| Secondary                 | 178       | 24.3       |
| HSC                       | 217       | 29.6       |
| Graduate/diploma          | 163       | 22.2       |
| PG/professional           | 24        | 3.3        |
| No response               | 29        | 4.0        |
| Socioeconomic class*      |           |            |
| I (upper class)           | 595       | 81.1       |
| II (upper middle class)   | 76        | 10.4       |
| III (middle class)        | 4         | 0.5        |
| IV (lower middle class)   | 0         | 0          |
| V (lower class)           | 59        | 8.0        |
| Marital status            |           |            |
| Unmarried                 | 586       | 79.8       |
| Married                   | 10        | 1.4        |
| Separated                 | 93        | 12.7       |
| No response               | 45        | 6.1        |

*Modified BG Prasad Classification 2021.
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Similarly, a statistical association was observed between education status and trying to quit tobacco use. The association of distribution of the socioeconomic class of study participants with the current use of tobacco of any form, current use of smokeless tobacco, and trying to quit tobacco use was found to be statistically significant [Table 5].

There was a statistically significant association between the occupation of the study subjects with the current use of any form of tobacco, current smoking, and the current use of smokeless tobacco products and trying to quit tobacco use [Table 6].

**Discussion**

Transgenders are at great risk of tobacco abuse and nicotine dependency. Studies related to tobacco use done in Tamil Nadu, India, have shown a higher prevalence of tobacco use in transgenders compared to the general population. The data available on smoking, smokeless tobacco use, and nicotine dependency among transgenders in India are very limited. Such studies available on tobacco use in India are small sample-sized studies. This is the first study to our knowledge to pursue the prevalence and patterns of tobacco use among transgenders with larger sample size.

In the present study, the majority (41%) belonged to the 21–30 years age group. In similar studies conducted by Madhavan M et al.[6] (42%) and Selvakumari[12] (43%) reported comparable results in this age group in their study participants.

In our study, about 29% have completed their higher secondary education and 22% were graduates. This is comparable with the study conducted by Madhavan et al.[6] in which about 33.5% received college-level education and another 33% had higher secondary education. Selvakumari[12] also reported a low percentage (29%) of graduates. This low percentage of graduates among transgenders may be due to the fear of discrimination and harassment, in addition to poor career guidance and/or

| Variable                                                                 | Frequency | Percentage |
|-------------------------------------------------------------------------|-----------|------------|
| Current use of any form of tobacco products                              | 473       | 64.4       |
| No                                                                      | 170       | 23.2       |
| No response                                                             | 91        | 12.4       |
| Current use of smoking tobacco                                          | 97        | 13.2       |
| Yes                                                                     | 243       | 33.1       |
| No                                                                      | 394       | 53.7       |
| Current use of smokeless tobacco products                                | 385       | 52.5       |
| Yes                                                                     | 131       | 17.8       |
| No                                                                      | 218       | 29.7       |
| No response                                                             | 341       | 46.5       |
| No of tobacco products used in a day on an average                       |           |            |
| 1                                                                       | 104       | 14.2       |
| 2                                                                       | 66        | 9.0        |
| 3                                                                       | 17        | 2.3        |
| 4                                                                       | 36        | 4.9        |
| No response                                                             | 341       | 46.5       |
| Does smoking tobacco or using smokeless tobacco or both cause any health-related illness? |           |            |
| Yes                                                                     | 289       | 39.4       |
| No                                                                      | 52        | 7.1        |
| Do not know                                                             | 20        | 2.7        |
| No response                                                             | 373       | 50.8       |
| Have you noticed any health warnings on cigarette packs or smokeless tobacco packages? |           |            |
| Yes                                                                     | 395       | 53.8       |
| No                                                                      | 40        | 5.4        |
| No response                                                             | 299       | 40.7       |

**Table 2: Distribution of study participants according to information about tobacco use**
Table 3: Distribution of study subjects according to the information about interest, attempt to quit the use of tobacco products, and interest to use low-risk alternatives

| Variable                                                                 | Frequency | Percentage |
|-------------------------------------------------------------------------|-----------|------------|
| During the last 1 year, have you tried to stop using tobacco of any form? |           |            |
| Yes                                                                     | 199       | 27.1       |
| No                                                                     | 142       | 19.3       |
| No response                                                             | 223       | 30.4       |
| Are you currently interested in quitting tobacco use?                    |           |            |
| Definitely                                                              | 130       | 17.7       |
| Possibly                                                                | 67        | 9.1        |
| Probably                                                                | 28        | 3.8        |
| Definitely not                                                           | 188       | 25.6       |
| No response                                                             | 151       | 20.6       |
| Do you know of any lower-risk alternatives to tobacco forms or medications that are available in the market? |           |            |
| Yes                                                                     | 22        | 3.0        |
| No                                                                     | 88        | 12.0       |
| Do not know                                                             | 75        | 10.2       |
| No response                                                             | 549       | 74.8       |
| Are you interested to try any lower-risk alternatives to tobacco forms or medications as part of the research study? |           |            |
| Yes                                                                     | 7         | 1.0        |
| No                                                                     | 44        | 6.0        |
| Do not know                                                             | 100       | 13.6       |
| No response                                                             | 413       | 56.3       |
importance of tobacco control programs targeting transgenders to spotlight their focus by including cessation strategies along with preventive approaches.

Education, socioeconomic status, and occupation were significantly associated with the current use of any form of tobacco, both smokeless and smoking tobacco products. The prevalence of tobacco use was high among transgenders with primary and secondary education in comparison with higher education. Similarly, transgenders involved in begging and commercial sex workers had a higher prevalence of tobacco use [Tables 4–6].

Sawyer et al.[19] reported that low income and low educational status were associated with higher tobacco use, which is similar to our findings. Singh et al.[20] also confirmed similar findings, where the prevalence of smoking was higher among the uneducated and the poor as compared to the educated, and the rich among the general population. This higher prevalence of tobacco use among less-educated transgenders and those involved in begging/CSW is a matter of concern as these people lack the resources required to combat the morbidity associated with tobacco use to prevent premature death.

These low-income highly marginalized groups mostly access government-funded health care centers, especially primary health centers in metro cities (Chennai). Enabling the first-contact health system to provide much-needed transgender-specific primary care and counseling to reduce the uptake of tobacco will enhance and promote positive health in this community. The primary care physicians and family physicians being the first point of contact for common

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Table 4: Association of education status of study participants with current use of tobacco of any form, current smoking, current use of smokeless tobacco, and trying to quit tobacco use

| Variable | Frequency (%) | Significance |
|----------|---------------|--------------|
|          | Yes           | No           | Total        | χ²          | P             | df  |
| Education status | Current use of any form of tobacco products | | | | |
| Illiterate | 3 (100) | 0 | 3 (100) | 68.6764 | <0.001* | 6  |
| Primary school | 68 (82.9) | 14 (17.1) | 82 (100) | | | |
| Middle school | 21 (80.8) | 5 (19.2) | 26 (100) | | | |
| Secondary school | 137 (95.1) | 7 (4.9) | 144 (100) | | | |
| Higher secondary school | 115 (62.5) | 69 (37.5) | 184 (100) | 60.8615 | <0.001* | 6  |
| Graduate/diploma | 93 (60.8) | 60 (39.2) | 153 (100) | | | |
| Post-graduation/professional education | 12 (52.2) | 11 (47.8) | 23 (100) | | | |
| Total | 449 (73) | 166 (27) | 615 (100) | | | |
| Current smoking tobacco | | | | | | |
| Illiterate | 0 | 0 | 0 | 47.254 | <0.001* | 5  |
| Primary school | 2 (7.7) | 24 (92.3) | 26 (100) | | | |
| Middle school | 0 (0) | 6 (100) | 6 (100) | | | |
| Secondary school | 9 (37.5) | 15 (62.5) | 24 (100) | | | |
| Higher secondary school | 22 (16.5) | 111 (83.5) | 133 (100) | | | |
| Graduate/diploma | 62 (47.7) | 68 (52.3) | 130 (100) | | | |
| Post-graduation/professional education | 0 (0) | 14 (100) | 14 (100) | | | |
| Total | 95 (28.5) | 238 (71.5) | 333 (100) | | | |
| Current use of smokeless tobacco products | | | | | | |
| Illiterate | 3 (100) | 0 (0) | 3 (100) | 76.587 | <0.001* | 6  |
| Primary school | 66 (82.5) | 14 (17.5) | 80 (100) | | | |
| Middle school | 21 (84) | 4 (16) | 25 (100) | | | |
| Secondary school | 132 (95.7) | 6 (4.3) | 138 (100) | | | |
| Higher secondary school | 95 (61.7) | 59 (38.3) | 154 (100) | | | |
| Graduate/diploma | 34 (50.7) | 33 (49.3) | 67 (100) | | | |
| Post-graduation/professional education | 11 (50) | 11 (50) | 22 (100) | | | |
| Total | 362 (74) | 127 (26) | 489 (100) | | | |
| Trying to quit the use of tobacco products | | | | | | |
| Illiterate | 0 (0) | 3 (100) | 3 (100) | 13.332 | 0.038* | 6  |
| Primary school | 30 (56.6) | 23 (43.4) | 53 (100) | | | |
| Middle school | 9 (81.8) | 2 (18.2) | 11 (100) | | | |
| Secondary school | 60 (63.2) | 35 (36.8) | 95 (100) | | | |
| Higher secondary school | 50 (56.2) | 39 (43.8) | 89 (100) | | | |
| Graduate/diploma | 36 (50) | 36 (50) | 72 (100) | | | |
| Post-graduation/professional education | 8 (88.9) | 1 (11.1) | 9 (100) | | | |
| Total | 193 (58.1) | 139 (41.9) | 332 (100) | | | |
ailments, they have the chance of meeting transgenders frequently. So, these physicians can be sensitized about “WHO’s 5A model,” to enquire about tobacco use whenever they encounter transgenders. They should recognize the importance of provider-initiated interventions in reducing the uptake as well as the harmful effect of tobacco products and the health benefits of quitting, thereby providing them the needed support to quit this habit.

**Conclusion**

The prevalence of tobacco use among transgenders is much higher than the prevalence among the general population and is alarming. The present study findings highlight the need to comprehensively examine the socioeconomic patterns and involve community partnerships with NGOs/CBOs to generate awareness about the health hazards of tobacco use among transgenders. Integrated targeted tobacco programs focussing on transgenders are of essential value and way forward to reduce the burden of tobacco-related diseases among them. Tobacco-related surveys at the national and state levels are also recommended to monitor the tobacco epidemic among transgenders and evaluate the efficiency of tobacco control programs.

### Table 5: Association of the socioeconomic status with the current use of tobacco of any form, current smoking, current use of smokeless tobacco, and trying to quit tobacco use

| Variable                                | Frequency (%) | Significance |
|-----------------------------------------|---------------|--------------|
|                                        | Yes           | No           | Total    | \( \chi^2 \)  |
| Current use of any form of tobacco products |
| Class I                                | 372 (70.2)    | 158 (29.8)   | 530 (100) | 19.158, P<0.001*, df=3 |
| Class II                               | 68 (93.2)     | 5 (6.8)      | 73 (100)  | P<0.001*, df=3 |
| Class III                              | 4 (100)       | 0 (0)        | 4 (100)   | P<0.001*, df=3 |
| Class V                                | 9 (64.3)      | 5 (35.7)     | 14 (100)  | P<0.001*, df=3 |
| Total                                  | 453 (72.9)    | 168 (27.1)   | 621 (100) | P<0.001*, df=3 |
| Current use of smokeless tobacco products |
| Class I                                | 290 (70.7)    | 120 (29.3)   | 410 (100) | P<0.001*, df=3 |
| Class II                               | 65 (94.2)     | 4 (5.8)      | 69 (100)  | P<0.001*, df=3 |
| Class III                              | 4 (100)       | 0 (0)        | 4 (100)   | P<0.001*, df=3 |
| Class V                                | 8 (61.5)      | 5 (38.5)     | 13 (100)  | P<0.001*, df=3 |
| Total                                  | 367 (74)      | 129 (26)     | 496 (100) | P<0.001*, df=3 |
| Trying to quit the use of tobacco products |
| Class I                                | 153 (55.2)    | 124 (44.8)   | 277 (100) | P<0.001*, df=3 |
| Class II                               | 37 (77.1)     | 11 (22.9)    | 48 (100)  | P<0.001*, df=3 |
| Class III                              | 2 (66.7)      | 1 (33.3)     | 3 (100)   | P<0.001*, df=3 |
| Class V                                | 2 (50)        | 2 (50)       | 4 (100)   | P<0.001*, df=3 |
| Total                                  | 194 (58.4)    | 138 (41.6)   | 332 (100) | P<0.001*, df=3 |

### Table 6: Association of occupation with current use of any forms of tobacco products, current smoking, current use of smokeless tobacco, and trying to quit tobacco use

| Variable                                | Frequency (%) | Significance |
|-----------------------------------------|---------------|--------------|
|                                        | Yes           | No           | Total    | \( \chi^2 \)  |
| Current use of any form of tobacco products |
| Begging and commercial sex worker       | 113 (99.1)    | 1 (0.9)      | 114 (100) | 47.370, P<0.001*, df=1 |
| Other occupation                       | 342 (67.6)    | 164 (32.4)   | 506 (100) | P<0.001*, df=1 |
| Total                                  | 455 (73.4)    | 165 (26.6)   | 620 (100) | P<0.001*, df=1 |
| Current smoking                        |
| Begging and commercial sex worker       | 12 (66.7)     | 6 (33.3)     | 18 (100)  | 13.847, P<0.001*, df=1 |
| Other occupation                       | 81 (26)       | 230 (74)     | 311 (100) | P<0.001*, df=1 |
| Total                                  | 93 (28.3)     | 236 (71.7)   | 329 (100) | P<0.001*, df=1 |
| Current use of smokeless tobacco products |
| Begging and commercial sex worker       | 110 (99.1)    | 1 (0.9)      | 111 (100) | 43.305, P<0.001*, df=1 |
| Other occupation                       | 260 (67.5)    | 125 (32.5)   | 385 (100) | P<0.001*, df=1 |
| Total                                  | 370 (74.6)    | 126 (25.4)   | 496 (100) | P<0.001*, df=1 |
| Trying to quit the use of tobacco products |
| Begging and commercial sex worker       | 41 (83.7)     | 8 (16.3)     | 49 (100)  | 45.311, P<0.001*, df=1 |
| Other occupation                       | 96 (32.8)     | 197 (67.2)   | 293 (100) | P<0.001*, df=1 |
| Total                                  | 137 (40.1)    | 205 (59.9)   | 342 (100) | P<0.001*, df=1 |
Limitations
Non-probability purposive sampling technique was used in the selection of study participants in a single metro city though transgenders are a highly marginalized group. This could have a negative effect on the generalizability of the findings to a different setting in India as the representativeness is not ensured.

Key messages
The prevalence of the current use of any form of tobacco products among transgenders was high, that is, 64.4%. Education status, socioeconomic class, and occupation were significantly associated with the current use of any form of tobacco and trying to quit tobacco use.

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Conflicts of interest
There are no conflicts of interest.

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