

Tobacco Product use in Tribal Population of West Bengal with Special Emphasis on Tobacco Dependence Score: A Hospital-based Study

Rudrajit Paul*, Kunal Som**, Indranil Thakur***, Dipanjan Bandyopadhyay****

Abstract

Introduction: The use of tobacco, both smoking and smokeless forms (SLT), is quite common in India. Certain population groups in India, like the ethnic minorities, have higher prevalence of tobacco addiction. There is a significant literature gap in the quantification of the tobacco use behaviour in the tribal population of Eastern India. In this study, we aimed to generate data on the pattern of tobacco use and the level of tobacco dependence in this tribal community.

Patients and methods: This was a cross-sectional questionnaire-based survey, done in a rural hospital of West Bengal. For assessing the severity of tobacco addiction, the Fagerstrom test for nicotine dependence (FTND) was used. Only adult patients were included.

Results: There were 301 subjects with male: female ratio of 204: 97. 48% of the subjects belonged to the Mahato tribe and the rest were Santal. 63.5% (95% CI: 58.1 - 68.9%) of the subjects used tobacco, with 44% using more than one form simultaneously. 13.6% were pure smokers and the rest used either SLT or a combination. Tobacco use in males was much higher (73.5%) than females (42.3%), $p < 0.001$. Overall daily tobacco use frequency was 13.5 ± 5 with males having higher frequency (14.2 ± 5) than females (10.8 ± 3.9). Among male subjects, 48.7% had FTND score ≥ 5 , while for females this was present in 26.8%. There was significant correlation of FTND score with daily tobacco use frequency ($r = 0.69$; 95% CI: 0.607 - 0.757).

Conclusion: Very high level of tobacco use was found in the tribal population. The male group had significantly higher daily tobacco use frequency and tobacco dependence compared to females.

Key words: Tribal population; tobacco dependence; daily use frequency; addiction; smokeless tobacco.

Introduction

Tobacco addiction is one of the major public health problems in India¹. In the South Asian region, both smoking and smokeless forms of tobacco are used frequently. Recent nationwide survey in India has shown that 28.6% of adults use some form of tobacco with smokeless tobacco (SLT) being significantly more popular than smoking¹. Survey done in Bangladesh has also shown that 43% of adults use some form of tobacco with 27% using SLT². However, the pattern of use of tobacco is not uniform across all population groups.

Tobacco and other forms of addiction are significantly more prevalent in marginalised and disadvantaged groups³. Marginalised groups include ethnic minorities, lower socio-economic strata or a combination of both. A recent study from India found that the odds ratio (OR) of tobacco use was significantly higher in the poorest 20% of the population and among the scheduled tribes⁴. Also, lack of education increased the OR even further. In the tribal population of India, both the factors of poverty and illiteracy are prevalent. Tobacco addiction has been found to be significantly high

among the tribal population of India⁵. While the nationwide prevalence of tobacco use was 28.6%, the prevalence in tribal population was 74% in one survey⁵. This trend is not unique to India and studies from other South Asian countries like Bangladesh have also shown high prevalence of tobacco use among the tribal people⁶.

However, studies focussing on the tobacco use behaviour and pattern in marginalised populations like the tribal community are scarce in India. India is home to a multitude of tribal communities with widely varying cultures and socio-economic conditions. Hence, a study done in one region of the country cannot be generalised for all tribal communities. There is a need to do focussed studies on tobacco use behaviour of tribal communities in different parts of the country. While there are a few of such studies from South and Western part of India, there is a significant literature gap from Eastern India.

Quantification of tobacco addiction is a controvertible issue. Indicators like daily use frequency and types of tobacco product used can give an idea about the pattern. But addiction to a substance creates a physical and/or

*Associate Professor, Department of Medicine, Midnapore Medical College, Paschim Medinipur - 721 101,

Specialist Medical Officer, Salboni Rural Hospital, *Assistant Professor, Department of Critical Care Medicine, SSKM Hospital (Formerly of Medical College, Kolkata, ****Professor and HOD, Department of Medicine, North Bengal Medical College,

Corresponding Author: Dr Rudrajit Paul, Associate Professor, Department of Medicine, Midnapore Medical College, Paschim Medinipur - 721 101. Tel: 9433824341, E-mail: r.paul.medicalcollege@gmail.com.

psychological dependence which is often difficult to quantify. Assessment of the actual level of dependence on tobacco is important in order to understand the impact of this addiction on individual behaviour, because health programs often aim to modify this behaviour. There are some scoring systems which attempt to quantify and grade the level of tobacco addiction for research purposes.

The Fagerstrom test for nicotine dependence (FTND) is such a validated scoring system⁷. While there are other validated measures of nicotine dependence for smokers, the advantage of the FTND is that can be used both for smoking and SLT⁷. Thus, this scoring system is popular among researchers in Asia where SLT is an important substance of addiction⁸. We chose this system as it has also been used earlier in India in tribal population studies⁵.

In this survey, we aimed to collect data on the tobacco use pattern in a tribal community from Eastern India. Such data is vital in order to understand the priority areas for prevention programs in this population. The FTND was used to calculate the tobacco dependence score (TDS) in the study population.

Patients and methods

This was a hospital-based cross-sectional survey done in a rural hospital of West Bengal. The survey was done using a pre-validated structured questionnaire. The questionnaire was prepared and validated in the local Bengali language. The questionnaire had two parts. The first part was about the demographic characteristics of the patients and their tobacco use behaviour like daily frequency of tobacco use. The second part was the Fagerstrom test for nicotine dependence (FTND). There are 6 items in the questionnaire for this test and each item is given a score. Finally the six individual scores are added to give a final score for the test. Interpretation of the scores is given below:

Grading system for Fagerstrom test for nicotine dependence:

Score	Interpretation	Grade of dependence	Severity of addiction
1 - 2	Low dependence	Grade I	Low tobacco addiction
3 - 4	Low to moderate dependence	Grade II	Low tobacco addiction
5 - 7	Moderate dependence	Grade III	High tobacco addiction
8+	High dependence	Grade IV	High tobacco addiction

Full ethics permission for the study was taken. Local

permission was also taken from the health administrator of the concerned rural hospital. The study was done for a period of four months (February 2018 - May' 2018). Persons who were associated with the tobacco industry in any way, like vendors or local tobacco cottage industry workers, were excluded from the study.

The subjects for the study were chosen from the adult (>16 years) patients, of both genders, attending the outdoors of the hospital. In India, there are special certificates issued by the government for tribal population, called "scheduled tribe" certificates. These certificates were used to identify the study population. The subjects were chosen at random from patients registered in the OPD. The selection process is shown in Fig. 1. Each subject was explained about the study in his/her native language and informed consent was taken. Those who were literate in Bengali language were given the questionnaire to fill up on their own. For illiterate subjects, the questions were read out and responses marked. For those who did not know the Bengali language, oral interview was taken in their native language. For this, the help of an interpreter was taken. Since the authors did not have access to any registered interpreter (due to lack of funds), another unrelated person, belonging to the same tribal group, who agreed to volunteer was used for the purpose.

All interviews were taken by the same investigator. The data from the patient response sheets were converted to SPSS worksheets. All data entry was done by one person and cross-checked by another person. The data was checked for normalcy and then, suitable statistical tests were done. $P < 0.05$ was considered significant. All study related data was kept confidential.

Calculation of sample size: In a recent study involving the tribal population from India, the prevalence of tobacco use was found to be 73.8%⁵. Taking this as a reference, the sample size was calculated (from www.kck.usm.my/ppsg/statistical_resources/SSCPSversion1001.xls) to be 298 (for precision of 0.05).

Results

There were 301 subjects in our study with male: female ratio of 204:97. The average age of study subjects was 43.4 ± 8.8 years. The general demographic characteristics are shown in Table I. It is seen that 38.5% ($n = 116$) of the subjects belonged to the 31 - 40 year age group. Out of 97 female subjects, 64 (66%) were homemakers. Out of the male subjects, 28.9% were farm workers and 20.1% were businessmen. Among the study subjects, 145 (48.2%) belonged to the Mahato tribe and the rest belonged to different clans of the Santal tribe (like Tudu, Murmu, Mandi, Baskey and Hansda).

Table 1: Table showing the demographic characteristics of the study subjects (n = 301).

	Parameter	Male	Female	Total (n;%)
Age	≤20 years	1	0	1;0.33
	21-30 years	14	3	17;5.65
	31-40 years	74	42	116;38.53
	41-50 years	62	31	93;30.9
	≥51 years	53	21	74;24.6
Occupation	Farm worker	59	1	60;19.93
	Labourer	30	24	54;17.94
	Businessman	41	7	48;15.94
	Homemaker	0	64	64;21.26
	Office worker	18	0	18;6
	Miscellaneous	56	1	57;18.93

Out of 301 subjects, 191 (63.5%; 95% CI: 58.1 - 68.9%) used some form of tobacco. 58 (19.3%) used one form, 130 (43.2%) used two forms and 3 subjects used three forms of tobacco simultaneously. But there was significant gender difference in the pattern of tobacco use. Among male subjects 73.5% (n = 150) used tobacco while among female subjects, 42.3% (n = 41) used tobacco (p < 0.001, by chi Square test).

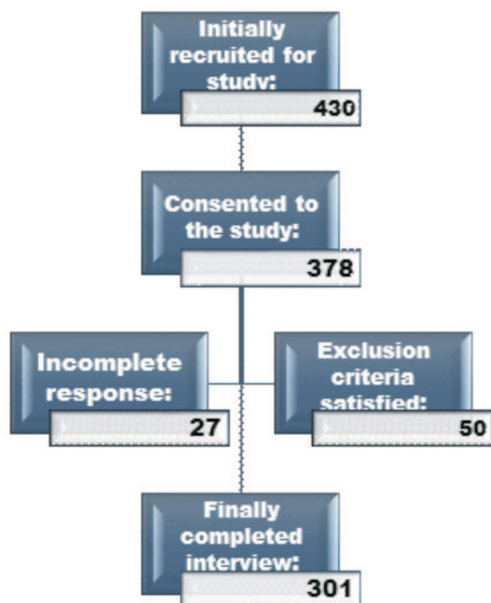


Fig. 1: The selection process of study subjects.

Among the 191 tobacco users, 13.6% were pure smokers. Altogether, 89 (46.6%) subjects used the smoking form (with or without SLT). The rest used only smokeless tobacco (SLT). Average daily frequency of tobacco product use was

13.5 ± 5. The average frequency in females (10.8 ± 3.9) was much less than males (14.2 ± 5) (t - value 4.06; p < 0.001). Fig. 2 shows the daily frequency of tobacco use in study subjects in a categorical fashion. 35% of the subjects used tobacco 6 to 10 times/day and 37% of the subjects used it 11 to 15 times/day. For smokers, daily use frequency was 14.4 ± 5.3. There was no statistical difference in daily use frequency between smokers and SLT users.

Number of times tobacco product consumed per day

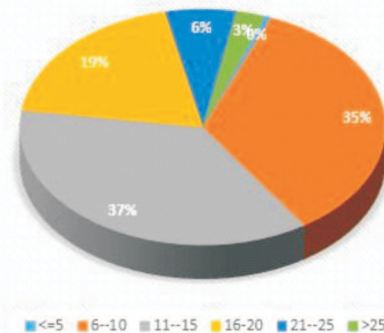


Fig. 2: Pie chart showing the daily frequency of tobacco use of study subjects.

The tobacco dependence score according to different grades are shown in Fig. 3. In male tobacco users (n = 150), 44.7% had grade 2 dependence and 46.7% had grade 3 dependence. In female tobacco users (n = 41), 63.4% had grade 2 dependence and 26.8% had grade 3 dependence. 2% of the male tobacco users showed grade 4 dependence while none of the female users had grade 4 status. Overall, in females, 11 (26.8%) had high tobacco addiction (Grades III or IV) while in males, 48.7% had high tobacco addiction (p = 0.013). The mean FTND score for tobacco users (n = 191) was 4.32 ± 1.4. For pure smokers (n = 41), the score was 4.31 ± 1.43. There was no correlation between age of subjects and the FTND score (r = 0.0008). The mean FTND

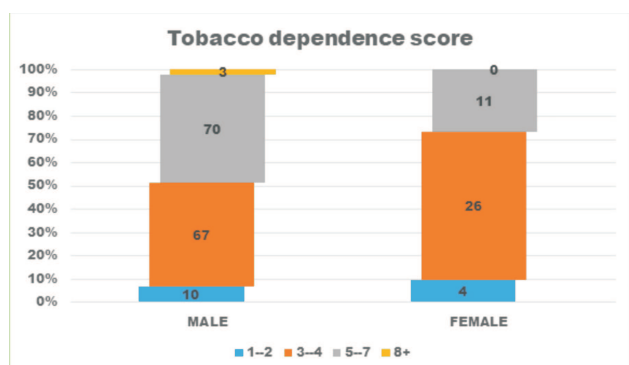


Fig. 3: Bar diagram showing the tobacco dependence score of the study subjects by gender.

score for those aged 40 years or less was 4.42 ± 1.5 ; for those above 40, it was 4.23 ± 1.3 .

There was significant positive correlation between daily tobacco use frequency and tobacco dependence score ($r = 0.69$; 95% CI: 0.607 - 0.757) (Fig. 4).

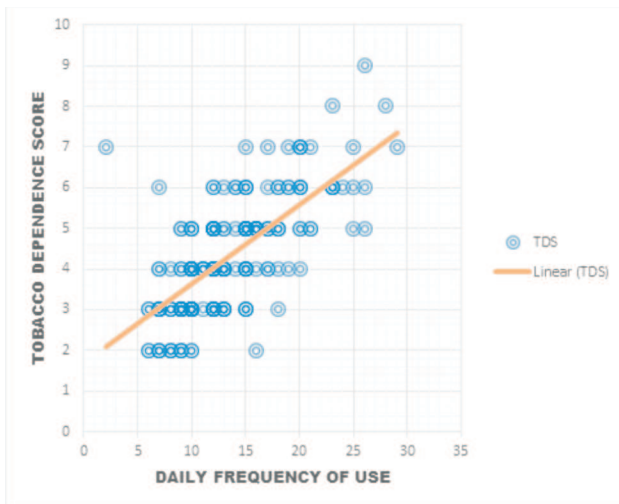


Fig. 4: X-Y graph for correlation between TDS and daily use frequency.

Discussion

In our survey, it was seen that more than 60% of the subjects used some form of tobacco. Average daily frequency of use was more in males compared to females. Male subjects also had higher tobacco dependence. Daily tobacco use frequency was positively correlated with tobacco dependence score.

In a study from Kerala, South India involving the local tribal population, it was seen that the mean FTND score for smoking was 3.85 and for SLT, it was 4.6⁵. But since scoring system is categorical, such data does not give an idea about the percentage of tobacco users who had high level of addiction. In our study, 47% of the male and 27% of the female subjects had FTND score more than 4, which is grade III or IV dependence. In the Kerala study, mean daily frequency of tobacco use was 5.3 for smoking and 6.2 for SLT. In our study, overall mean daily tobacco use frequency was much higher at 13.5, with the mean frequency being 14.4 for smokers. In another study from Madhya Pradesh, Central India, the FTND score did not show any correlation with age⁹. Similar conclusion was drawn from our data too. However, mean FTND score in the Madhya Pradesh study was found to be significantly more for SLT, compared to smoking, which means addiction for SLT was stronger than smoking⁹. Thus, persons using SLT were more likely to have dependence. But in our study, we, did not find any difference in the FTND score between smoking and SLT.

In another recent survey done in Kerala in a rural population, it was found that the FTND score for smokers was 5.04. The score increased with age and showed a positive correlation with the volume of use, that is pack-years of smoking¹⁰. In our study, we did not find any correlation with age. But the FTND score did show significant correlation ($r = 0.69$) with the volume of use, that is daily use frequency. Since biri was more popular than cigarette in our subjects, we did not use the indicator of "pack-year" as it is not standardised for home-made products like biri. Also, for SLT, this indicator would be useless. So, we used the daily use frequency as a parameter to measure the volume of tobacco use. However, the volume of tobacco use is not the only factor in nicotine dependence. Different studies have demonstrated that daily use frequency is just one of the factors affecting nicotine dependence¹¹. The other factors which affect this variance in nicotine dependence are largely unknown¹¹. Hence, more research into the factors affecting nicotine dependence are needed because unless such influencing factors are addressed, tobacco cessation programs are unlikely to be successful.

A similar study on tobacco dependence was done in China involving the rural-to-urban migrant population¹². This was done exclusively on smoking. The average daily smoking frequency was 15.8, which is similar to our study. In their study, the mean FTND score was 3.39. But there was a wide variation with age of migration, number of cities of migration and educational level affecting the FTND score¹². In India, where internal migration for economic reasons is quite high, like China, such factors must also be kept in mind while planning tobacco cessation programs. Economically disadvantaged and marginalised groups like the tribals are more likely to migrate for subsistence. Hence, when tobacco cessation programs are planned, such demographic factors should also be addressed.

A remarkable study on tobacco use was done from Andaman and Nicobar Islands, India¹³. This study involved both the general population, as well as the local aboriginal tribes. In this study, it was found that while overall tobacco use was reported by 49% of the study subjects, that among the Nicobarese tribe was 84%. Thus, tobacco use is significantly high among the tribal population in different parts of India. In this study, the authors had used a dichotomous interpretation for the FTND, with those scoring 5 or above marked as nicotine dependent and included in calculations¹³. In our study that would be similar to the grades III and IV of dependence. By that standard, concomitant alcohol use and belonging to a tribe were significant factors in predicting nicotine dependence. In their study, they found that in a mixed population of tribals and non-tribals, 5.7% of males and 3% of the females had FTND score ≥ 5 . In our study involving exclusively tribal

subjects, we found that 47% of males and 27% of females had scores ≥ 5 , that is grade III or IV dependence. In this Andaman study, it was also found that among those who used both forms (smoking, SLT) of tobacco together, nearly 30% had nicotine dependence¹³.

However, the FTND as a measurement for nicotine dependence is not without criticism¹³. Hence, more studies are needed to gauge their relevance in quantifying nicotine dependence in Indian population.

Our study is limited by the small number of parameters included in the survey. Parameters like socio-economic status, marital status and association of other addictions like alcohol have been found to be associated with nicotine dependence¹⁴. Inclusion of these parameters can give a better comprehensive picture of the factors affecting nicotine dependence. Moreover, this is a hospital based study. Such studies may not be representative of the whole community. However, our study was planned only as a pilot project and better, wider surveys are planned in future.

Conclusion

This study gives an idea of the pattern of tobacco use in a sample tribal population (involving Mahato and Santal tribes) in West Bengal. Smokeless tobacco use is far more popular than smoking. A high percentage of the population had significant levels of nicotine dependence. Tobacco dependence increased with frequency of use. Such issues must be addressed when planning tobacco prevention programs for such communities.

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