



Assessment of Nicotine Dependence among Adult Tobacco Users in Selected Urban Population of Ahmedabad City

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ABSTRACT

Background: Tobacco consumption is considered as a major public health problem in India. However, nicotine dependency is an area which has not been given much importance. The FTND score is considered as an easy tool to assess the dependence through physiological and behavioural symptoms.

Aim and Objectives: To assess the nicotine dependence of the tobacco users in urban slums of Ahmedabad city.

Methodology: Nicotine dependence among tobacco users (18-60 years) was studied by means of six-item (Fagerstrom Test for Nicotine Dependence) in a community based interventional cluster randomized trial which was conducted through house to house survey from 20 clusters (slums) of Ahmedabad district.

Result: Among 1968 people surveyed, a total of 400 subjects in intervention and control arm were interviewed. The prevalence of tobacco use was 20.3%. 23 % of the tobacco users had high to very high dependence. The overall FTND score was 4.5 and score for smoking was high 5.4 (2.2).

Conclusion: A medium level of dependence was observed among the tobacco users in the current study. Tobacco intervention study can be more effective and productive if a baseline assessment of nicotine dependence is measured before any intervention.

Key Words: Tobacco, Urban slums, Fragerstrom test for nicotine dependence.

INTRODUCTION

Tobacco use is an important preventable public health problem of the world and is projected as a single important cause of high mortality due to various diseases world-wide. In India the numbers of tobacco users are substantial in numbers despite of numerous health awareness campaigns, pictorial warnings on tobacco products, smoke free policies and the legislative measures adopted by the Government of India. The prevalence of tobacco use in India among adults is 28.6% according to GATS (2016-17)¹

India has maximum number of people suffering from oral cancer purely attributed to tobacco use.

Tobacco smoke added with other environmental carcinogens increases the risk of developing lung cancer.² It has been estimated by WHO that by 2020, 13.3% of all deaths in India will be attributed to tobacco use.³

Tobacco use is a complex multistage behaviour, influenced by the genes and environment. The active content of tobacco 'nicotine' leads to physical and psychological dependence, similar to the dependence of heroin and cocaine dependence which is hard to quit.⁴ Hence nicotine dependence is a substance related disorder which is an obstacle in the tobacco cessation programs. However, in our country intervention programs are implemented

without assessing the nicotine dependence of the users which is not cost-effective in terms of time, money and human resources. At the same time there is paucity of data that can explore the nicotine dependence in general population. As a result the smoking cessation interventions are not effectively implemented in community as well as in the hospitals.⁵

Fagerstrom test for Nicotine dependence is a non-invasive and easy to obtain self-report tool that conceptualizes dependence through physiological and behavioural symptoms. The current version includes six items and though the test is brief, its completion requires a few minute.⁶

Many studies have been conducted in our country on prevalence of tobacco use and its different correlate, but detailed information on nicotine dependence relationship with its correlate is relatively scarce. The present study was conducted to assess the nicotine dependence and its relationship with other variables.

METHODS AND MATERIAL

Study setting: The study was conducted in urban slums of Ahmedabad. During the time of the present study the city was divided into 6 zones, North, South, Central, East, West and New West encompassing the 6 administrative zones and total of 64 wards. The study was conducted in slums of different wards by random technique.

Study design: The present study is a part of large community based interventional study in which cluster randomized trial was done in 20 slums selected as clusters. Through randomization 10 slums (clusters) were allocated each in intervention and control group. A total of 400 tobacco users were included in the study by studying 20 participants

per cluster.

Sample size: The sample size was calculated based on the primary outcome, quit rate. The study was designed to have 90% power at the 5 % significance level to detect 15% quit rate at six months after intervention. The expected quit rate for control arm was 2 percent.⁷ Ratio (Number of people in the intervention: Number of people in the control arm) was 1:1 taking in account an Intra Cluster Correlation Coefficient of 0.05, 20 clusters with 20 participants in each cluster were taken, including the design effect of two. 200 participants were studied each in intervention and control group making a total of 400 participants.

At the first visit baseline data was collected and nicotine dependency was assessed using the Fagerstrom test for nicotine dependency. ⁶ The FTND scale consists of 6 items and has total score of 10. The items were first translated into Gujarati and before the start of the study pilot testing was done in a subset of population. The questionnaire has been used in various regions of India and countries, and its reliability has been confirmed in different settings and population. The questionnaires were completed through house to house survey and were checked by the investigators for completeness. It was tried to see the correlation between the socio-demographic factors and FTND score.

RESULTS

A total of 424 households and 1968 people were surveyed through house to house survey conducted in twenty clusters (slums) of the intervention (n=10) and control arms (n=10) from 20 different wards selected randomly.

Table 1: Summary of tobacco use status

	Intervention group (%)	Control group	Total
Subjects	200	200	400
Tobacco (cases (%))			
SLT	169 (84.5%)	167 (83.5%)	336 (84%)
Smoking	15 (7.5%)	23 (11.5%)	38 (9.5%)
Both	16 (8%)	10 (5%)	26 (6.5%)
Age of initiation (Years) (Mean (SD))	21.75 (8.53)	22.25 (8.73)	22 (8.63)
Years of tobacco use (Years) (Mean (SD))	16.46 (11.12)	15.26 (11.38)	15.86 (11.25)
Total dependency score (Mean (SD))	4.5 (1.72)	4.5 (1.98)	4.5 (1.81)

Table 2: Overall Nicotine dependence of Tobacco users

Variable	Intervention (%)	Control (%)	Overall (%)	P value
Very low and low dependence	94 (47)	93 (46.5)	187 (46.8)	0.92
Medium dependence	59 (29.5)	61 (30.5)	120 (30)	0.83
High and very high dependence	47 (23.5)	46 (23)	93 (23.2)	0.91
Total	200 (100)	200 (100)	400 (100)	

Table 3: Distribution of FTND total score for tobacco users based on background characteristics

Variables	Cases	Mean ±SD	P value
Group			
Intervention	200	4.5±1.72	1.00±
Control	200	4.5±1.98	
Type of Tobacco			
Smokeless	336	4.4±1.8	0.00
Smoking	38	5.4±2.2	0.02
Both	26	5±1.97	0.21
Sex			
Male	322	4.47±1.8	0.01
Female	78	4.63±1.3	
Marital status			
Unmarried	62	3.81±1.57	0.00
Married	314	4.61±1.85	0.43
Widow	18	5.00±1.65	0.21
Divorced	3	4.33±1.15	0.80
Separated	2	5.00±0.00	0.00
Education			
Illiterate	94	4.7±1.65	0.30
Primary	163	4.60±1.87	0.52
Secondary	99	4.34±1.81	0.43
Higher Secondary	31	4.23±1.91	0.45
Graduate	12	3.58±1.88	0.09
Occupation			
Service	37	3.70±1.65	0.00
Business	43	4.42±1.67	0.77
Shopkeeper	23	5.09±1.97	0.16
Labourer	234	4.52±1.84	0.89
Housewife	30	5.03±1.96	0.15

Table 4: Correlation between age, years of schooling and FTND score (n=400)

Correlation	Age in years	FTND score
Pearson Correlation	1	0.24
Sig. (2-tailed) p value		0.00
Correlation	Years of Schooling	FTND score
Pearson Correlation	1	-0.12
Sig. (2-tailed) p value		0.02

The sociodemographic profile of 400 participants, 200 subjects each in intervention and control arm were interviewed on their tobacco consuming habits through a house to house survey and base line data was collected. Overall, the mean (SD) age of the participants was 37.74(11.74). Overall prevalence of tobacco use was 20.3%. The prevalence of smokeless tobacco use was 17.1% and smoking was 1.9%. Both form of tobacco was used by 1.3% of the population.30% of the males consumed tobacco as compared to 8.7% of the females. Among Smokeless tobacco users Guthka was the most common form (69.9%) whereas in smoking form Bidi was the commonest form of tobacco consumption (78.9%).

Summary of Tobacco use is depicted in Table 1. Out of the total tobacco user’s majority consumed (84%) smokeless form of tobacco, 9.5% smoked tobacco and 6.5% of them used both form of tobacco.

Mean age of initiation was 22 years and average years of tobacco use was found to be 15.86 years. The Total dependency score for tobacco use was 4.5

Table 2 indicates that overall, 23.2% of the tobacco users had high and very high dependence followed by 30% of medium dependence .46.8% of the tobacco users had medium dependence. Very low and low dependence for tobacco use was found in the 47.0 % and 46.5 % of the intervention and control group respectively. Medium dependence was observed in 29.5% of the intervention and 30.5 % of the control group tobacco users. Very high and high dependence was observed in 23.5 % and 23 % of the intervention and control group respectively and the difference was insignificant in both the groups.

As per Table 3, FTND score was measured according to the different status of all the 400 participants and some significant association was found. However, the FTND score for intervention and control group was found to be same (4.5). The FTND score for was higher among males and for smoking form but the difference was found to be insignificant. FTND score was found to be low for unmarried person (3.81) and high dependence (5) for separated participants and the difference was found to be significant. FTND score was measured according to the educational status of the participants and it was found to be high for illiterate and primary school educated population. However, the difference was insignificant. FTND score was measured according to the occupation of the participants and it was depicted that FTND score was found to be low for service class and very high for farmers and the difference was found to be significant by SEP and fisher’s test (F=2.013, p<0.05)

Pearson’s correlation coefficient was also measured to see the correlation between age and FTND score and it was found that there was mild correlation (**r=0.24**) between FTND score and age which signifies that as age increases the dependency on tobacco increases. It also indicates that there is negative correlation between years of schooling and dependency score which means that as years of schooling increases the FTND score decreases. (**r=0.12**) (Table 4)

DISCUSSION

In the present study the nicotine dependency status of tobacco users (400) was explored residing in urban slums of Ahmedabad district, India.

India is the second largest consumer of tobacco.¹ In the present study, the prevalence of tobacco use (any form) in intervention group was 20.8% in and

19.9% in control group. In the present study compared with GATS 2010, GATS 2017, NFHS-3 and NFHS-4 there has been a decline in the tobacco consumption.⁸ The prevalence rate was almost similar to a study done in rural Gujarat 18.2%⁹. However, a similar study done in urban area of Jamnagar reported prevalence rate of 32.9% of current tobacco users.¹⁰ On the contrary the prevalence rate in the present study was lower than the state average of 25.1 % among Gujarati's aged ≥ 15 years as reported by the GATS 2015-2016 India survey. Furthermore, the smokeless tobacco consumption (17.3%) was below the state prevalence of 19.2%, while smoking (1.4 %) was also lower than the reported state prevalence of 7.7 %¹¹. It can be speculated that the lower prevalence rates in our study may be due to underreporting as the community health workers live in their communities.

Evaluation of nicotine dependency is an important step before planning any treatment of nicotine dependency. However, while treating and rehabilitating the tobacco users' physicians are bound to fail as nicotine dependency is not measured. However, in a country like India with diverse culture, ethnic and demographic background, where tobacco uptake is very high, a better understanding of nicotine dependency is need of an hour and will increase the possibility of correct treatment. Though very few studies have been conducted in India to assess the nicotine dependency before any intervention, in the present study FTND score was calculated based on the sociodemographic characteristics and association and correlation was studied.

In this study the nicotine dependence was 4.5 in both the intervention and control group which can be classified as moderate dependency. 23.2 % of smokers and smokeless tobacco users had high and very high dependence for tobacco use. However, Parashar *et al.* reported maximum number of tobacco users to have medium dependence for tobacco use.⁴ A significant proportion of tobacco users are physically dependent on tobacco. Similarly, other studies have also reported high physical dependence on tobacco (Fagerstrom Test of Nicotine Dependence score >7) varying from 10% to 27% among tobacco users.^{12,13,14,15,16} The baseline information related to tobacco use and nicotine dependence are very crucial for policy makers and the government to implement effective tobacco control programs in India.¹⁴ The difference between the intervention and control group was found to be insignificant.

The FTND score was high in the widow and separated participants however the difference was found to be insignificant. However a study conducted by Schmidt *et al.*, a higher level of nicotine

dependence was found among unmarried.¹⁷ However, contrary to our finding, Saha *et al.* noticed a higher FTND score among married individuals.¹⁸ The reason for increase in dependency among separated and widow participants may be due to increase stress level leading to tobacco use and further increase in dependency.

Among all the educational groups, the FTND score was more for illiterate and educated up to primary level and the findings were more or less similar to a study compared to Saha *et al* Jayakrishnan *et al.*^{18,19} but there was a huge difference in the score among those who were educated up to secondary level or above it. However, Wu *et al.* also noted a similar increase in the FTND score among the college students.²⁰

Depending on the literacy status a better understanding with attitude change can be developed in society and family by increasing the awareness level regarding the adverse effects of tobacco use. It will influence the tobacco users in a much more responsible way as perceived by them.

Given marginal significance of association between occupation and FTND score it was found that farmers had higher level of FTND as compared to other occupation. The present study indicates that stressful occupation leads to high dependency on tobacco whereas in some other studies it was depicted that high workload leads to less time for tobacco uptake.²⁰ Another reason may be due to growing workplace tobacco use ban leading participants to decrease in tobacco consumption.²⁰

Our finding that the FTND score increased with age is an indication that duration of tobacco use has a linear effect on dependency whereas higher literacy was inversely related. In a study conducted among migrant population in China also reported similar findings.²⁰ A possible reason is that coping with stressful conditions could become difficult among tobacco users with age resulting in an increased tobacco dependency when compared to younger age groups.

Conclusion: A significant proportion of tobacco users (one fourth) were dependant on tobacco according to the FTND score. The Dependency was high for smoking form as compared to the smokeless form. The FTND score was found to be high in widow, separated, farmers and illiterate and primary school educated participants. Linear correlation between dependency on tobacco and increase in age while negative correlation with less schooling and FTND score.

Recommendation: FTND dependency should be measured before giving any intervention in the community so as to plan area/Individual specific interventions and activities. Measuring FTND

score before imparting any health intervention will also be beneficial as the intensity and degree of the health intervention will vary with the dependency score. It will also be time saving as proper planning for intervention can be done in each community depending on the degree of dependency.

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