ORIGINAL ARTICLE

Effect of Cognitive Behavioral Therapy on tobacco usage and dependency among adult male tobacco users in Palam area of Delhi

Rajindra Kumar[1], Manish Kumar Goel[1], Tanmaya Talukdar[2]

[1]Department of Community Medicine, Lady Hardinge Medical College, New Delhi
[2]Department of Respiratory Medicine, Lady Hardinge Medical College, New Delhi

CORRESPONDING AUTHOR

Dr. Manish Kumar Goel, Professor, Department of Community Medicine, Lady Harding Medical College, New Delhi-110005
Email- dr.manishgoel2000@yahoo.co.in

ABSTRACT

Background: Tobacco use is a recognized risk factor for many chronic diseases such as chronic obstructive pulmonary disease (COPD), hypertension, cardiovascular disease, atherosclerosis, diabetes, cancer and microbial infections (respiratory tract infections, bacterial meningitis), etc. **Material and Methods**: A community-based "One group" interventional study was conducted to see the effect of cognitive behavioural therapy in reducing tobacco usage and its dependency among all the adult males population aged 18 years and above residing in Palam area of Delhi. Data was collected using a semi-structured, self-designed interview schedule to collect information from study subjects. Fagerstrom and Modified Fagerstrom questionnaire was used to assess the subject's nicotine dependence status. **Result**: The total population study was 274 out of which 105 were tobacco users. Out of 105,2 did not give consent for cognitive behaviour therapy.A total of 103 study subjects were given cognitive behavioral therapy and then followed at 2 weeks, 4 weeks, 3 months, and 6 months respectively, and analyzed for quitting at each follow-up. Study subjects who had quitted tobacco was 11 i.e. 10.6%. Change in Nicotine dependency was statistically significant. **Conclusion**: Cognitive behaviour therapy is found to be a very effective tool in reducing tobacco usage as well as nicotine dependency.

INTRODUCTION

According to the World Health Organization (WHO), around 80% of adult tobacco consumers start their utilization before 18 years old. Almost 25% of young smokers start by the age of 10 when they are dreadfully youthful to comprehend or oppose social desires(1).

International Classification of Disease (ICD-10) considered tobacco dependence itself as a chronic disease(2). There are two main forms of tobacco in common use: smoking tobacco

and smokeless tobacco. Smoking tobacco includes cigarettes, Bidis, Cigars, Pipes, hookah, hubble- bubble, and shisha. Smokeless-tobacco products consist of tobacco leaves and a wide variety of flavoring ingredients and are used either orally or nasally. They include chewing tobacco, pan-masala, gutkha, mishri, or gudakhu (powdered tobacco rubbed on the gums as toothpaste) (1) Globally, there are 1.3 billion tobacco users worldwide. The number of consumers might have been even larger if tobacco did not kill half of its users3. Tobacco was responsible for 8.71 million deaths and 229.77 million Disability-adjusted life years (DALYs) globally in 20194(3-4).

The current cost of tobacco use in India includes 1 million deaths per year (approximately 1/6 of all tobacco-related deaths worldwide), and billions of dollars of directly attributable health costs(5-7).

Behaviour strategies for tobacco cessation mainly involve the 5 "A" s and 5 "R"s. The Five A's (Ask, Advise, Assess, Assist and Arrange) and Five R's (Relevance, Risk, Rewards, Repetitions, Roadblocks) is a five to fifteen-minute research-based counseling approach that has proven global success. The 5 "A"s approach for tobacco users who are ready to make a quit attempt and 5 "R" s for tobacco users who are not ready to make a quit attempt, provide a brief intervention designed to promote the motivation to quit and information about harmful effects of tobacco. Since there have been very small number of studies on nicotine dependence among adult males, the current study is novel as it addresses effect of cognitive behaviour therapy on a different type of nicotine dependence among adults.

MATERIAL & METHODS

A community-based "One group" interventional study was conducted from January 2021 to September 2022 in an urbanized village of Delhi among adult male participants over 18 years of age and residing in the area for at least a year. Those study subjects who were having debilitating conditions and were known case of intellectual disability were excluded from the study.

The sample size was calculated by assuming the effect of cognitive behaviour therapy in cessation of tobacco usage by an average of 8% (8,9) (By averaging out the cessation/quitting rate from the studies) among tobacco users with a level of significance of 95% and power of 80%. The calculated sample size was 86. Assuming the attrition rate of 20%. The calculated minimum sample size was 103.

All the identified tobacco users identified by house-to-house survey using systematic random sampling; were enrolled in the study. Out of the 5 areas of Palam, Harijan Basti was selected for conducting the study by lottery method. The total population of Harijan Basti was 10,992 at the time of study. There were four ASHAs in Harijan Basti, who were looking after various areas of Harijan Basti. Again through the lottery method area related to ASHA, Bharti, was selected for the study. The total number of houses covered by ASHA, Bharti, was 380 and the total population of adult males residing in that area who were greater than 18 years were 660. As per GATS, the prevalence of tobacco users among the adult population in India is 40%1. To get the required sample size of 103 we had to survey approximately 260 adult male population. The first house was selected randomly from the area. Thereafter by systematic random sampling technique, every third house was selected and visited and to get the required, we surveyed every third house to enquire about the status of tobacco use. Permission for conducting the study was taken from the Institutional Ethics Committee for Human Research and a clinical trial registry number was taken. Written informed consent was taken from the study participants in the language they understood, and the confidentiality of the participants was maintained.

A self-designed, pre-tested, semi-structured interview schedule was used which consisted of the following segments: Socio-demographic particulars of the study population, details about tobacco usage and awareness about tobacco and tobacco cessation among study subjects, Nicotine dependence which was assessed by using fagerstrom and modified fagerstrom Test.

INTERVENTION

If a tobacco user was found to be present in the selected house, he was called for cognitive behavior therapy (CBT) at the health center, the next day, and the day was considered as day 0. The first CBT session was conducted on day 0 individually which was of a minimum 30-minute duration. Subsequently, the individual was followed up at 2 weeks and 4 weeks and additional cognitive behavior therapy sessions were held and these were of nearly 10 minutes duration. The individuals were followed up at 2 weeks, 4 weeks, 3 months, and 6 months for assessing tobacco quitting/usage and its dependency.

Operational definitions that were used were based on the following criteria:

Complete cessation: This was defined as if the person have not used any form of tobacco for the last 14 days. Partial cessation: This was considered if there was a reduction in tobacco usage >50% and a decline in dependency by 2 or more than 2 point score (both).

Data collected from proforma was coded and entered in Statistical Package for the Social Sciences (SPSS) v 20. All quantitative observations like age, income, and Fagerstrom nicotine dependency score was analyzed in terms of mean/standard deviation. The comparison among individuals who cessate (partial cessation) tobacco was done by unpaired 't' test. The change in nicotine dependency over time among individuals who were still using any tobacco was compared by using Repeated Measured Anova (Analysis of variance). The association between various socio-demographic variables and cessation (partial and complete) were assessed by using Chi square test .P-value <0.05 was taken considered statistically significant.

RESULTS

We surveyed 274 population adults more than 18 years of age and out of them 105(38.3%) were found to be tobacco users. The mean age of the study subjects was 36.51 ± 13.56 years (Range = 18 − 80 years). The majority of the subjects were Hindus (n=241, 87.9%). Most of the subjects (n=216, 78.9%) were currently married. More than one-third (n=92,33.6%) of the total subjects had completed at least middle school. More than 90 % (93.8%) of the study subjects belonged to the Upper-lower (48.2%, n=132) and Lower-Middle (45.6%, n= 125) class.The majority of the study subjects (70.1%,n=192) were living in nuclear families (Table 1).

Out of the total subjects i.e. 274, 38.3%, n=105 were tobacco users and 61.7%,n=169 were non tobacco users.The prevalence of any form of tobacco in our study is found to be 38.3%. Out of 105 tobacco users, 103 participated in the study and 2 did not give consent to be a part of the study (Table 2).

The prevalence of smoking tobacco was found to be 50.5%,n=52 and prevalence of smokeless tobacco use was 43.6%n=45 .5.9%, n=6 of the study subjects used tobacco in both forms-smoking as well as smokeless (Table 3).The majority of the smokers were taking Bidi (63.8%,n=37), followed by Cigarettes(32.8%,n=19) only 2 were smoking pipe(3.4%). The most commonly used smokeless form of tobacco was Khaini (56.8%, n =29) and the second most was Gutka (33.4%, n=17) and then pan masala (9.8%,n=5).

Total smoking tobacco users who had complete cessation of tobacco was 5(8.6%), and partial cessation of tobacco was 14(24.2%). Total smokeless tobacco users who had complete cessation of tobacco was 3(6.6%), partial cessation of tobacco was 9(20%). Tobacco users who were taking both forms of tobacco had complete cessation of 3(50%). (Table 4).

The mean score of the Fagerstrom test at baseline found to be 4.8 and then decreased to 4.2 at the first follow up and then again decreased to 3.6 at second follow up and again decreased to 3.4 in the third follow up and remain the same in fourth follow up. There were a significant Mean Fagerstrom Score reduction of 0.6 at first follow up, 1.2 reduction at second follow up and 1.4 reduction at third and fourth follow up. Repetitive Measured

Anova (Analysis of variance)–'F'value-273.422 and 'p' value-0.000.The reduction in fagerstrom score over time is statistically significant.(Table 5).

Table 1. Socio-demographic distribution of study participants (N=274)

SOCIO-DEMOGRAPHIC VARIABLE		Tobacco users (n=105)		Tobacco non users (n=169)		Total Number(N=274)	
		Number	%ages	Number	%ages	Number	%ages
Age	<20	5	4.7	9	5.3	14	5.2
	20-29	39	37.2	55	32.6	94	34.3
	30-39	33	31.5	49	28.9	82	29.9
	40-49	11	10.5	39	23.1	50	18.2
	50-59	8	7.6	6	3.6	14	5.2
	>60	9	8.5	11	6.5	20	7.2
Religion	Hindu	93	88.5	148	87.6	241	87.9
	Muslims	12	11.5	11	6.5	23	8.4
	Sikh	0	0	10	5.9	10	3.7
Marital Status	Single	9	8.5	49	28.9	58	21.1
	Married	96	91.5	120	71.1	216	78.9
Literacy level	Illiterate	19	18.1	32	18.9	51	18.7
	Literate ,less than middle school	27	25.8	39	23.1	66	24.1
	Middle school	35	33.4	57	33.7	92	33.6
	High school	15	14.3	26	15.3	41	14.9
	Graduate	9	8.5	15	8.9	24	8.7
Socio economic status	Upper	0	0	6	3.5	6	2.2
	Upper-Middle	1	0.9	2	1.2	3	1.1
	Lower-Middle	49	46.6	76	44.6	125	45.6
	Upper-lower	48	45.8	84	49.8	132	48.2
	Lower	7	6.7	1	0.5	8	2.9
Type of family	Nuclear	72	68.6	120	71.1	192	70.1
	Joint	27	25.7	46	27.1	73	26.7
	Three generation	6	5.7	3	1.8	9	3.2
Per capita monthly income(in Rupees)	<5 Thousand	11	10.5	18	10.9	29	10.6
	5-9 Thousand	13	12.3	22	13.1	35	12.7
	10-14 Thousand	48	45.7	74	43.7	122	44.6
	>15 Thousand	33	31.5	55	32.5	88	32.1

Table 2: Distribution of study subjects as per tobacco usage (n=274)

Subjects	Number(N=274)	Percentage
Tobacco user	105	38.3
Tobacco non user	169	61.7

Table 3: Distribution of study subjects as per type of tobacco: (n=103).

Type of tobacco	Number(n=103)	Percentage
Smoking	52	50.5
Smokeless	45	43.6
Both	6	5.9

Table 4: Distribution of study subjects as per cessation of different forms of tobacco : (n=103):

Cessation	Smoking		Smokeless		Both forms of tobacco	
	Number (n=58)	Percentage (%)	Number (n=45)	Percentage (%)	Number (n=6)	Percentage (%)
Complete cessation of tobacco	5	8.6	3	6.6	3	50
Partial cessation of tobacco	14	24.2	9	20	0	0

Table 5: Comparison of nicotine dependence at different follow up: (n=103):

Follow up	Mean + SD	Smokers	Smokeless
Baseline	4.8 + 2.4	5.0 + 2.5	4.6 + 2.4
First	4.2 + 2.6	4.5 + 2.6	3.8 + 2.4
Second	3.6 + 2.7	3.8 + 2.7	3.3 + 2.5
Third	3.4 + 2.6	3.4 + 2.7	3.1 + 2.6
Fourth	3.4 + 2.7	3.5 + 2.7	3.1 + 2.7
P value	.000	.000	.000
Repeated Measure Anova value(F)	273.422	100.438	172.984

DISCUSSION

The total population of adult males more than 18 years of age residing in the study area were 660.We surveyed 274 population adults more than 18 years of age and out of them 105(38.3%) were found to be tobacco users and 169(61.7%) were non tobacco users.The prevalence of smoking tobacco users was found to be 50.5%(n=52) and the prevalence of smokeless tobacco users was found to be 43.6%(n=45).

A total of 103 study subjects were given 3 sessions of cognitive behaviour therapy. The number of subjects who had attended the first, second, and third sessions was 103, 99, and 94 respectively. The total number of subjects who quit after having all sessions of cognitive behavioural therapy was 11(10.6%) out of 103 study subjects. In our study, early detection of dependency to tobacco resulted in partial (n=23, 22.3%) or complete cessation of tobacco (n=11, 10.6%). A similar type of finding was present in studies of Blocker J et al 10 in USA in 2019 which showed that after the 4-month project evaluation. 24 employees indicated that they desired to quit smoking and were enrolled with the national quit line, resulting in a 23.5% (n= 24) participation rate in the smoking cessation program. The 24 employees reported a cessation rate of 12.5%, and 21% had a decrease by 50% or more in the number of cigarettes smoked. Of the participants, 33.33% quit or significantly decreased the number of cigarettes smoked per day and in a study of Stefen s fu et al11 done in USA, 2014. The 6-month prolonged smoking abstinence rate at 1 year was 13.5% for proactive care compared with 10.9% for usual care (P = .02). In the study of Sorensen et al 12 done in India in 2011 after the intervention, the 30-day quit rate was 50% in the intervention and 15% in the control group (P=.001). At the 9-month post-intervention survey, the adjusted 6-month quit rate was 19% in the intervention and 7% in the control group(P=.06), The 6-month abstinence rates were 20% and 5% respectively, for the intervention and control group(P=.04).

Some researchers found a higher quitting rate than our study which were in the studies of Aghdam F B et al 9 in Iran in 2021 which showed that the frequency of hookah consumption decreased in 72.6% of participants in the intervention group (vs. 6.3% in the control group). The duration of hookah consumption per session decreased in 39.5%of participants in the intervention group (vs. 5.5% in the control group), the reason of high quitting rate was environmental change in the study area and making of virtual group on social media which increased the adherence of study subjects towards decreased tobacco consumption. In the study of C.M et al13 in Spain(2019). In that study abstinence rates at 12-month follow-up were 30% for behaviour therapy, and 18% for CBT .The higher quitting

rate might be due to longer period of follow up (12 months) than our study .

In the study of has J S et al 14 alone in 2015, USA. The intervention group had a higher quit rate than the usual care group (17.8% vs. 8.1%; odds ratio, 2.5; 95% CI, 1.5-4.0). Individuals who participated in the telephone counselling were more likely to quit than those who did not (21.2% vs. 10.4%; P < .001).The reason of high quitting rate was that they had combined counseling with free nicotine replacement therapy for 6 weeks. In the study of Artalejo F R ,et al done in Spain,2002.The rate of continuous abstinence at 12 months was 20.2% for the intervention versus 8.7% for the control group (OR: 2.58; 95% CI: 1.13 to 5.90; p = 0.025).The higher quitting rate might be also due to longer period of follow-up (12months) than our study.

Mild nicotine dependency (n=32, 55.2%) was found more among smoke tobacco users, and moderate (n=22, 43.2%) and severe dependency (n=11, 21.6%) was found more in smokeless tobacco users. Similar finding was also seen in the study of Krishna S et al 16 done in Dharan, Nepal in 2019 and Chellappa L.R et al 17 done in Tamil Nadu in 2019.In our study we observed that had no significant association of cessation with age, religion, marital status, literacy, socioeconomic status and income and the only significant association that our study had with type of family(p<0.05).Comparison of Mean fagerstrom test score at baseline and at first, second, third, and fourth follow-up in our study showed that there is a significant reduction of fagerstrom nicotine dependence scores of 0.6, 1.2, 1.4 and 1.4 respectively.

CONCLUSION

Cognitive behaviour therapy was found very important tool in making people quit tobacco. We also found that cognitive behaviour therapy substantially reduces nicotine dependency in smokers as well as smokeless users and that change was also statistically significant that's showed that cognitive behaviour therapy is very effective tool in reducing tobacco usage as well as nicotine dependency.

We should make cognitive behaviour therapy as a part of counseling in tobacco cessation programmes and also in curriculum of medical undergraduates which enable them to contribute more effectively in tobacco cessation.

If we are able to achieve a reduction in nicotine dependency it might later on result in better quit rates so we should trained our medical officers and health personal in cognitive behaviour therapy. We might think making cognitive behaviour therapy as a part of the medical curriculum so that all undergraduate students are exposed to provide cognitive behaviour therapy to tobacco users and this might help in reducing the tobacco burden and improving the life expectancy and morbidity and mortality of the Indian population.

LIMITATIONS

There may be the possibility of bias as it was self-reported asssesment of tobacco usage and cessation. The cultural and geographical variation in India might affect the generalizability of study results as it was conducted in a small field practice area of Delhi.

AUTHORS CONTRIBUTION

All authors have contributed equally.

CONFLICT OF INTEREST

There are no conflicts of interest.

DECLARATION OF GENERATIVE AI AND AI ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors haven't used any generative AI/ AI assisted technologies in the writing process.

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