

Community-based Interventional Study for Tobacco Cessation in Urban Slums of Ahmedabad City: A Cluster-Randomized Trial

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Abstract

Background: Tobacco is one of the most important preventable causes of death and a leading public health problem all over the world. The present study was conducted to determine the effect of community-based intervention for tobacco cessation in urban slums of Ahmedabad city. **Materials and Methods:** A total of 20 slums (10 slums each) in the intervention and control group were randomly selected through the process of randomization. A total of 200 participants each in the intervention and control group were studied through a cluster-randomized trial. **Results:** The outcome of the community-based tobacco intervention measured after 6 months depicted that the odds ratio (OR) of the prevalence of tobacco abstinence, quit rate, and reduction of more than 50% of tobacco use was significantly higher (30.37 times, 2.84 times, and 2.19 times respectively more) in the intervention as compared to the control group. However, after 1 year of the first and immediately after the second intervention, the OR of tobacco point prevalence abstinence, quit rate, and reduction of more than 50% was more pronounced (5.11 times, 3.52 times, and 4.31 times, respectively, more) in the intervention group than the control group. Post intervention, it was also observed that there was a significant increase in the average quit attempt. **Conclusion:** The community-based intervention was very effective in reducing the consumption of tobacco in urban slums in any form. As per the study findings, there is a wide possibility for the integration of tobacco cessation activity into the health program.

Keywords: Cluster-randomized trial, community intervention, smokeless tobacco, smoking tobacco, urban slums

INTRODUCTION

Tobacco is one of the most important preventable causes of death and a leading public health problem all over the world. Every year 0.8–0.9 million Indians die due to tobacco-related diseases.^[1] According to the National Cancer Registry Program, India has the highest number of oral cancers in the world, and 80% of them are attributed to tobacco use.^[2]

According to the Global Adult Tobacco Survey (GATS)-2, in Gujarat, the current use of tobacco uptake by slum dwellers is (19.3%) leading to various noncommunicable diseases.^[3]

Urban India constitutes a major part of tobacco consumption. Evidence suggests that tobacco use in the urban slums starts as early as the age of 6 years because they lack the necessary skills to resist social influences to use tobacco. Hence, there is an urgent need to bring tobacco cessation to their doorstep and break the social norms which enhance tobacco consumption. There are very few studies from India about the efficacy of

community-based group intervention programs for tobacco cessation in urban slums. Therefore, this study was undertaken to study the effect of community-based intervention in urban slums of Ahmedabad city. Lack of adequate information to form the basis of effective preventive strategies prompted me to conduct this study to determine the effect of health education interventions on tobacco use among the adult population.

MATERIALS AND METHODS

The study was conducted in the urban slums of Ahmedabad city. The study was started in January 2018 and was completed

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in March 2019. The study design was a cluster-randomized trial.^[4]

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 a 15% quit rate at 6 months after the intervention. The expected quit rate for the control arm was 2%.^[5] The sample size was calculated to be 97 and considering a design effect of two = $97 \times 2 = 194$ and so 200 tobacco users in both intervention and control group were taken making a total of 400 participants.

The ratio of number of people in the intervention to number of people in the control arm was 1:1 taking into account an intra-cluster correlation coefficient of 0.05 and 20 clusters with 20 participants in each cluster were included.

Out of 64 wards of Ahmedabad city, a total of 20 wards were randomly selected by lottery method from the six zones in proportion to the population of zones. Similarly, through the lottery method from the selected wards, one slum was randomly selected to incorporate a total of 20 slums in the study. To follow the process of randomization, and to allocate 10 slums each in the intervention and control group, 20 small chits were made with the name of the slum on each chit. Chits were picked up randomly and two heaps were made each of 10 slums. These selected slums were considered clusters. In each cluster, 20 participants were included in the study.

The inclusion criteria were taken as age ≥ 18 –60 years, residing in the slums for the last 20 years, the current user of any form of tobacco (number of current daily and less than daily tobacco smokers and/or smokeless tobacco users), and willing to participate in the study.

The exclusion criteria were taken as bedridden patients with a debilitating illness, planning to migrate in the next year, and known cases of cancer patients. The inclusion and exclusion criteria were followed stringently to assure no dropouts in the study subjects and 100% participation.

Baseline data were collected for sociodemographic details and tobacco use patterns using structured interview scheduled in February 2018 through house-to-house visits. Ensuring appropriate representation from clusters, an equal number of households were covered from different quadrants of slums till we could include 20 participants who consumed tobacco in each slum.

Immediately after the baseline data collection, convenient time and place for group intervention were fixed. The first session of health education was imparted in February 2018 and the second session was imparted in January 2019. The method of health education was Roleplay, talk, and posters (vernacular language).

The content for this intervention was designed based on the formative research done by the quit tobacco international project with some basic modifications.^[6,7]

Follow-up-effect on tobacco intervention outcome was studied at 6 months and 1 year after the first intervention and immediately (1 month) after the second intervention.

There was no loss to follow-up. If people could not come for the intervention, multiple visits were undertaken.

Components of the intervention at the first level (45 min)

They included tobacco-related myths, facts and awareness, consequences and benefits of quitting tobacco, and a detailed plan as to how to quit the same. The role play was also included to show the given facts of tobacco use.

Components of the intervention at the second level (30 min)

They included a brief discussion of hazards of active and passive tobacco use and its control followed by the experience of group members in quitting tobacco, withdrawal symptoms, and measures to overcome them and coping strategies/prevention of relapse.

Components of control group

Health intervention was given in the control group at the end of the study using the same materials and methods.

Measurement of outcome

Data for outcome measurement were collected at 6 months and 1 year after the first health intervention:

1. Assessment of the type of tobacco exposure
2. Point prevalence abstinence—no tobacco use in past 7 days
3. Quit attempt – Any attempt to quit tobacco that lasts more than 24 h
4. Reduced tobacco consumption among the initial users – reduction of tobacco use by more than 50% of the baseline consumption.

Ethical Committee clearance was obtained. Written informed consent and confidentiality was maintained for all participants.

Data analysis

The data were analyzed using the SPSS version 17 (IBM SPSS, Statistics for Windows, Version 25.0. Armonk, New York, IBM Corp). Appropriate statistical tests (Chi-square test, Z-test) were applied.

RESULTS

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

We studied 400 tobacco users who were identified from the selected slums through the house-to-house interview. It was depicted that the mean (SD) age of participants was 37.74(11.74) years. The mean (SD) age of intervention (200) and control group (200) was 38.21 (12.06) years and 37.27 (11.4) years, respectively. The majority of the participants were male, currently married, illiterate, or educated up to the primary level in both the groups. The monthly expenditure of more than 2000 rupees on tobacco was made by 9.5% of the

tobacco users. The two arms were homogenous regarding the above characteristics.

The overall prevalence of tobacco use was 20.8% and 19.9% in the intervention and control groups, respectively. The difference between both the group was found to be statistically insignificant ($\chi^2 = 3.0807, P > 0.05$).

Findings in Table 1 depicted the effect on tobacco cessation at 6 months after the intervention. The point prevalence of tobacco abstinence was 19% and 6.5% in the intervention and control groups, respectively. The rate of quitting tobacco was 2.84 times more in the intervention group as compared to the control group (odds ratio [OR]: 2.84, 95% confidence interval [CI]: 1.62–4.99). Reduction of >50% of baseline tobacco uptake status was higher (67.5%) in the intervention compared to the control group (51%). The average quit attempt was more in the intervention group ($z = 4.34, P = 0.00$). The outcome was significantly higher in the intervention group after 6 months of intervention.

The effect on tobacco cessation at 1 year after the first and immediately after the second intervention was more pronounced and noticeable [Table 2]. Overall, 29.2% of users in the intervention and 7.5% in the control group had reported point prevalence abstinence (OR: 5.11, 95% CI: 2.80–9.40). Similarly, a successful quit rate was 3.52 times more in the intervention group as compared to the control group (95% CI: 2.06–6.01). More than 50% reduction of tobacco uptake was higher in the intervention group (72.2%) as compared to the control group (51%). The outcome measured after 1 year and immediately after the second intervention reiterates the effect of immediate intervention being highly effective and significant.

DISCUSSION

The community-based intervention was targeted at an urban slum population of Ahmedabad city between 18 and 60 years of age who are widely affected by the tobacco epidemic in India. In the present study, the prevalence of tobacco use (any form)

when compared with GATS 2010, GATS 2017, National Family Health Survey (NFHS)-3, and NFHS-4 has depicted a decline in tobacco consumption.^[8] It was almost similar to a study done in rural Gujarat showing a prevalence rate of 18.2%.^[9] Both the groups are comparable.

The study concludes that two-third of the subjects were either illiterate or educated up to the primary level. Hence, through community-based intervention, the whole community got access to the services regardless of their educational or economic background. Hence, this acted as a sensitization tool for the community for availing of the services for quitting tobacco.

The effect of the intervention was compared with the control group. Similar to the present methodology, few randomized controlled studies under the project mobilizing youth for tobacco-related initiative have been conducted in schools.^[10] These studies indicated that school-based group-randomized trials have reduced tobacco use in school students receiving the intervention. In India, for the first time, a community-based multicomponent, peer-led study was conducted in Delhi by Arora *et al.*^[11] The added benefit of community-based interventions is that they may also reach young people who may not be attending school.^[12]

Similarly, the present study in slums certainly suggests that through community-based intervention, there is a significant increase in the point prevalence abstinence, quit rate, and reduction of tobacco use by more than 50% of initial use compared to the control. Similar outcomes were measured in other studies too. Cochrane review of group behavior therapy programs for smoking cessation included 13 trials that compared a group program with the self-help group, also suggested an increase in cessation with the use of a group program.^[13] Similarly, a meta-analysis of behavioral intervention for smoking cessation reviewed 12 randomized control trials on group counseling and estimated that the treatment effects was 1.76.^[14]

The quit rate was 2.84 times more in the intervention group as compared to the control group in the present study. However,

Table 1: Effect on tobacco cessation at 6 months after intervention (n=400)

Outcome	Intervention (n=200), n (%)	Control (n=200), n (%)	95% CI	OR	P
Abstinence	38 (19)	13 (6.5)	1.74-6.55	3.37	0.00
Quit rate	48 (24)	20 (10)	1.62-4.99	2.84	0.00
Reduction >50%	135 (67.5)	102 (51)	1.45-3.29	2.19	0.00
Average quit attempt mean (SD)	2.6 (1.5)	2.1 (0.6)	Z=4.34		0.00

SD: Standard deviation, CI: Confidence interval, OR: Odds ratio

Table 2: Effect on tobacco cessation at 1 year after first intervention and 1 month after second intervention (n=400)

Outcome	Intervention (n=198), n (%)	Control (n=200), n (%)	95% CI	OR	P
Abstinence	58 (29.2)	15 (7.5)	2.8-9.40	5.11	0.00
Quit rate	60 (30.3)	22 (11)	2.06-6.01	3.52	0.00
Reduction >50%	143 (72.2)	102 (51)	1.65-3.78	4.31	0.00
Average quit attempt mean (SD)	2.9 (1.5)	2.3 (0.9)	Z=4.47		0.00

SD: Standard deviation, CI: Confidence interval, OR: Odds ratio

in a meta-analysis of 58 studies that included biochemically verified trials, the estimated OR was 1.3 for group counseling when compared to the control.^[15] When compared to these meta-analyses, the OR was found to be higher in the present study.

Reduction of tobacco use more than 50% of the initial use was found to be 2.19 times more in the intervention group than the control group. On the contrary, few studies depicted only a 20%–22% reduction in tobacco consumption after the intervention.^[16,5] Similarly, the second intervention was done after 1 year of the first and immediately after the second intervention, the abstinence was 5.1-times more, the quit rate was 3.5 times more, and reduction of more than 50% was 4.3 times more respectively in the intervention group as compared to the control group.

A large community-based intervention tested in rural areas of three states of India contributed to more quit attempts in the intervention group (9.4%) as compared to the control group (3.2%) after 5 years of intervention.^[17,18] Similar effect was also observed in a study done in the Kolar district of Karnataka wherein the intervention cohort quit rate for ST use was 30.2% in males and 1.15% in the control group.^[19]

The effectiveness of health education for tobacco cessation outside routine clinical settings by counselors or health educators was already reported in the Cochrane review.^[20] From the Indian context, studies conducted in Tamilnadu and Mumbai also reported quit outcomes, which are comparable to the present study.^[5,21]

No intervention was administered in the control group, but the wider influence of mass media and the effect of our visit for data collection cannot be ruled out. A similar effect was seen in a study conducted by Arora *et al.* in Delhi.^[11] The peer-led intervention also had an indirect effect on the reduction of exposure to passive smoking.^[22]

CONCLUSION AND RECOMMENDATION

The findings of the study evoke a wide possibility for integration of tobacco cessation programs into the health programs like national tobacco control programs for community-based brief group interventions. Brief tobacco intervention should be integrated within the primary health-care delivery system and also screen and refer the patients who are highly dependent on tobacco to higher centers.

Limitation

Due to resource and time constraints, this study was done for only short-term self-reported outcomes and physical variation. It should be focussed more on biochemical verification of cotinine levels in saliva and urine. Blinding should be done.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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