

## RESEARCH ARTICLE

# Multiple Approaches and Participation Rate for a Community Based Smoking Cessation Intervention Trial in Rural Kerala, India

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## Abstract

**Background:** To illustrate multiple approaches and to assess participation rates adopted for a community based smoking cessation intervention programme in rural Kerala. **Materials and Methods:** Resident males in the age group 18-60 years who were 'current daily smokers' from 4 randomly allocated community development blocks of rural Thiruvananthapuram district, Kerala (2 intervention and 2 control groups) were selected. Smoking status was assessed through house-to-house survey using trained volunteers. Multiple approaches included awareness on tobacco hazards during baseline survey and distribution of multicolour anti-tobacco leaflets for intervention and control groups. Further, the intervention group received a tobacco cessation booklet and four sessions of counselling which included a one-time group counselling cum medical camp, followed by proactive counselling through face-to-face (FTF) interview and mobile phone. In the second and fourth session, motivational counselling was conducted. **Results:** Among 928 smokers identified, smokers in intervention and control groups numbered 474 (mean age: 44.6 years, SD: 9.66 years) and 454 respectively (44.5 years, SD: 10.30 years). Among the 474 subjects, 75 (16%) had attended the group counselling cum medical camp after completion of baseline survey in the intervention group. Among the remaining subjects (n=399), 88% were contacted through FTF and mobile phone (8.5%). In the second session (4-6 weeks time period), the response rate for individual counselling was 94% (78% through FTF and 16% through mobile phone). At 3 months, 70.4% were contacted by their mobile phone and further, 19.6% through FTF (total 90%) while at 6 months (fourth session), the response rate was 74% and 16.4% for FTF and mobile phone respectively, covering 90.4% of the total subjects. Overall, in the intervention group, 97.4% of subjects were being contacted at least once and individual counselling given. **Conclusion:** Proactive community centred intervention programmes using multiple approaches were found to be successful to increase the participation rate for intervention.

**Keywords:** Face-to-Face (FTF) - counselling - smoking - cessation

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## Introduction

The rise in population growth concomitant with the increase in tobacco use will result in more than 80% of tobacco related deaths in low and middle income countries by the year 2030 (Mathers and Loncar, 2006). India, the second largest consumer of tobacco products in the world, has more than one third of adults using tobacco in one form or the other (GATS: India, 2010). In a nationally represented case control study of smoking and death in India, it was reported that the annual death rate due to tobacco use in India is around 1 million of which 70% deaths will occur among the 30-69 age group (Jha et al., 2008). The tobacco use prevalence was found to be significantly higher in the rural areas and among the poorer

social class when compared to urban and high socio-economic groups (Rani et al., 2003). The health impact of smoking is enormous considering the wide spectrum of diseases associated with it. In India, the economic impact of three most common tobacco related diseases namely cancer, coronary artery disease and chronic obstructive lung disease for the year 2002-2003 exceeded the combined revenue and capital expenditure at the national and state level on medical and public health, water supply and sanitation (Gajalakshmi et al., 2003). Nearly half of all cancers among males and one fourths of cancers among females are tobacco related (GATS: India, 2010). A large proportion of cancer deaths in India particularly in the age group of 30-69 years were tobacco related (Dikshit et al., 2012). Smoking contributes to more than 80% of

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lung cancers (Mackay et al., 2006). Quitting smoking is the best possible measure to avert mortality due to lung cancer. It has been reported that quitting the habit at age 30 avoids 90% of the subsequent risk of death from lung cancer (Peto et al., 2000).

Smoking cessation virtually benefits every smoker regardless of age, sex, disease state or years of smoking. The benefits of smoking cessation was reported to be so high that the risk of dying due to tobacco can be reduced by 50% among quitters when compared to continuing smokers in the next 15 years, if the person is able to do so below 50 years of age (Murthy and Sadichha, 2010). The effectiveness of individual smoking cessation has been reported elsewhere (Lancaster and Stead, 2005).

In a country like India, where majority of the population are residing in rural areas, high smoking prevalence and minimal accessibility to health systems network, it seems imminent to introduce smoking cessation programmes in the rural community so as to reach a wider audience. The importance of initiating community based cessation programmes in India has to be looked-after, since clinic based initiative is confined predominantly to urban and educated users (Murthy and Sadichha, 2010). Loss to follow up was also a major concern in tobacco cessation clinics. It was reported that educating the community on the importance of tobacco cessation is essential to retain them in tobacco cessation programmes (Cherian et al., 2012). Considering the fact that loss to follow-up will be a barrier for community based smoking cessation strategies, proactive approaches are required to counter the problem. Hence the feasibility of using multiple approaches to deliver health education messages and counselling against smoking cessation needs to be assessed. Currently there is scarcity of information on the effectiveness of community based smoking cessation intervention in rural India. With this background, a community based smoking cessation intervention programme was conducted using multiple intervention approaches in a rural population in Kerala, India. The present paper mainly illustrates these multiple approaches and assessed its participation rate of the programme.

## Materials and Methods

### *Settings and participants*

Of the 12 Community Development Blocks (CDB's) in rural Thiruvananthapuram district of Kerala state, 4 CDB's whose socioeconomic status are relatively similar was selected for the study and randomised to 2 intervention and 2 control groups. CDB's are lower level of administrative systems in the state. A total of 11 wards (5 from intervention and 6 from control area) were selected from the selected CDBs. Briefly, each ward represents a cluster thus forming 11 clusters for the study. Details regarding the sample selection procedure were published in Jayakrishnan et al. (2011). Males in the age group 18-60 years who had reported of using at least one cigarette/bidi (bidi is locally made by wrapping coarse tobacco in dried temburni leaf) daily during the study period was considered as eligible for the study. Subjects who could not speak, mentally disabled and terminally ill patients were

excluded for the study. Ethical clearance was acquired from the institutional ethics committee of the Regional Cancer Centre (RCC), Thiruvananthapuram prior to the commencement of the study. The rationale for conducting the study was explained to the study participants and a written informed consent was obtained. The participation to the study was purely voluntary. Estimated sample size in each group was 450.

### *Initial survey*

Initial data collection to identify smokers was taken by trained female Accredited Social Health Activists (ASHA). An ASHA is a trained female community health worker selected from the respective villages under the National Rural Health Mission programme of Government of India. Other than socio-demographic factors, details of personal habits particularly smoking status viz; type and duration of smoking and nicotine dependency status using revised Fagerstrom scale of Nicotine Dependence (FTND) were also collected. Details regarding internal consistency, validity and test-retest reliability of FTND were published (Jayakrishnan et al., 2012).

### *Multiple Intervention approaches*

A total of four different approaches such as i) distribution of education materials on tobacco hazards during baseline survey, ii) sending invitation letters to the study subjects and communication over phone to key personnel in the locality for attending medical camp cum group counselling, iii) conduct of medical camp cum counselling and iv) individual counselling at four time points (2-4 weeks after the base line survey (if the person was not contacted through group counselling), 4-6 weeks, 3 months and 6 months). Tobacco status from both intervention and control groups were assessed at 12 months.

### Distribution of Information, Education and Communication (IEC) materials on tobacco hazards:

Smokers in the intervention and control group were given multi-coloured anti-tobacco leaflets in 'Malayalam' (the local language). Each leaflet provided information about the descriptions of ingredients in tobacco, smoking induced health hazards, passive smoking hazards for women and children and thereby the importance of smoking cessation. The leaflets also showed the importance of 'role modelling' against tobacco use in the community. In the intervention group, other than the multi-coloured anti-tobacco leaflets, ASHA volunteers distributed a quick reference guide for tobacco cessation titled "How to quit tobacco?" The reference guide was developed by the Tobacco Cessation Clinic of RCC, Thiruvananthapuram in vernacular language (Malayalam), which contains information about the advantages of quitting, barriers for quitting, different methods for quitting and relapse prevention strategies.

Invitation letter to study subjects, invitation over the phone to local administrative heads and health care providers to attend a medical campaign cum group counselling: After completion of initial data collection

from each cluster, communication messages were sent by the health care provider (RJ) via post to smokers of the respective clusters in the intervention arm to attend a group counselling session cum medical examination at a specific date. The letter provided information about the hazards of tobacco and to attend a general medical camp cum group counselling. Telephonic communications were sent to the local administrative heads of each cluster, health workers and the medical doctor in the government health centre nearest to each study area requesting their support for successfully conducting the programme. Key community volunteers of each cluster were also sensitised to assure their support for the intervention programme.

**Conduct of medical camps and group counselling sessions:** For each cluster, health education session and medical camps were conducted on different days to get maximum participation. Each session was conducted at 2-4 weeks time period after completion of the base line survey in each cluster. Each health education session was carefully planned so as to incorporate topics related to hazards of tobacco, benefits of quitting, barriers to quitting and plan to quit. The session had three components (1) a twenty minute documentary film in the vernacular language (Malayalam) on tobacco and cancer which was produced by the RCC, Thiruvananthapuram. The documentary film gave emphasis on common tobacco related cancers occurring in Kerala, social and economic consequences of tobacco in the community and family, perceptions of local people to tobacco use, confession of a lung cancer patient and an oral cancer patient about their smoking and smokeless tobacco habits and its consequences. This was followed by messages of a noted Malayalam actor and a Malayalam litterateur against substance abuse and its implications in the society. Secondly, a group intervention session for participants was conducted that stressed on the benefits of quitting tobacco, plan for quitting tobacco, common withdrawal symptoms and measures to overcome them, coping and relapse prevention strategies were also discussed. A health professional and a medical social worker conducted the group counselling session. Thirdly, a general medical camp was conducted after completing the above sessions.

**Individual counselling through multiple approaches:** After completing the health education session and medical camp in each intervention area, 2 medical social workers, trained at the Tobacco Cessation Clinic of RCC, conducted individual counselling sessions. Individual counselling was conducted at 2-4 weeks among those who did not attend group counselling. Subsequently all the subjects were followed up at 4-6 weeks, 3 months and 6 months time period after the completion of baseline survey. The final survey to assess the outcome of intervention was conducted at 12 months. During each visit, permission was taken from the subject prior to counselling. Each counselling stressed on developing coping skills, harm reduction strategies and stress reduction methods for quitting. Flip charts were used by the counsellor in the initial two visits to show the hazards of smoking in general and pre-post treatment photographs of oral cancer patients

who were treated at the RCC, Thiruvananthapuram. Informed consent was obtained from the patients to show their photographs along with their messages in the local language.

Individual counselling at 2-4 weeks, was provided through Face-to-Face (FTF) interview. In the absence of a participant in the first house visit, an attempt was made to contact the person in the next 2-3 days or the person was given counselling via mobile phone. If the person could not be contacted after these two attempts, he was considered as "loss to follow up". In this session, the above mentioned strategies for counselling and tips for quitting the habit as well as setting up a quit date was provided. In the subsequent follow-up session (at 4-6 weeks), FTF and mobile phones were used for contacting the subject. In this session, if the person was unable to quit on the target date, a revised plan which included a motivational intervention based on the 5 R's approach (relevance of quitting, risks associated with continued smoking, rewards of quitting, roadblocks to quit, and repetition for educating subjects) was given. The subject was also requested to set up a new quit date. On an average FTF took 15 minutes. In the third session (follow-up at 3 months), the subjects were contacted to their mobile phones as they were already acclimatized with the interviewer. If the person was unable to contact over mobile phone, an attempt was made to contact through house visit. The interviewer enquired about the smoking status and assessed the barriers for quitting the habit among those who still continued the habit. Quitting tips were given over phone among those who were unable to quit the habit. For each individual, telephone counselling took 5-10 minutes

In the fourth session (follow-up at 6 months), FTF and those who were unable to contact through FTF, mobile phones were used for contacting the subject in the intervention group. In this session also, a motivational intervention based on the 5 R's approach was given, if the person was unable to quit the habit. At this time point all subjects in the control group were contacted through house visit and mobile phone for those who were not able to contact through house visit in order to obtain their smoking status. In the final survey at 12 months-time, smoking status of both the groups were obtained through house visit followed by mobile if not able to contact through house visit.

## Results

A total of 928 'current daily smokers' (28.2%) were identified from 3304 subjects interviewed through a house to house survey and were included in the study. Mean age of 474 subjects in the intervention group was 44.56 years (SD: 9.66 years) and the mean age of 454 subjects in the control group was 44.47 years (SD: 10.30 years). The smoking prevalence in the intervention and control areas was 31% and 26% respectively. Among smokers, more than 50% smoked cigarette alone (58.08%) and 14% smoked bidi; while over a quarter of the smokers had the habit of consuming both bidis and cigarettes (28%). Cigarette users were 53.8% and 62.5% in the intervention and control areas respectively. Average

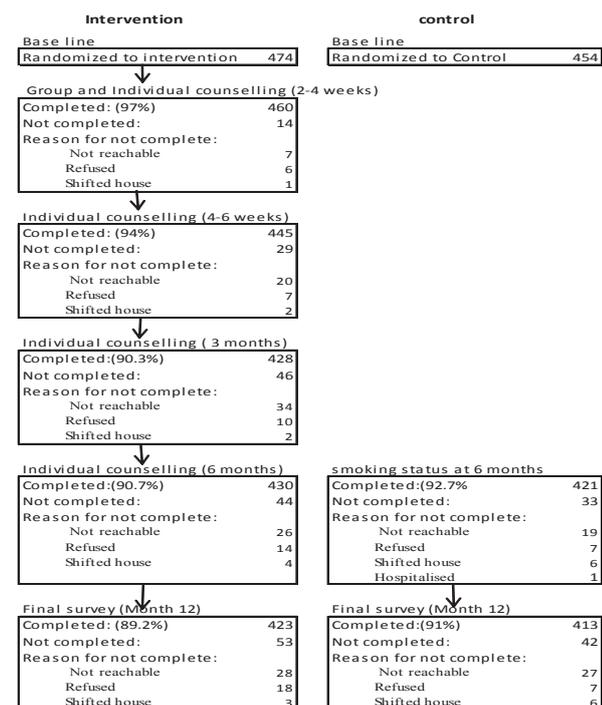
number of cigarettes and/or bidis consumed per day was 13.19 (SD: 8.4) in the intervention and 10.90 (SD: 6.8) in the control groups. Average age at which the habit started was 15 years (SD: 8.28 years) in the intervention and 15.8 years (SD: 9.1 years) in the control group (Table 1).

In the intervention area, a total of 5 camps were conducted at 2-4 weeks time period after completion of baseline survey in 5 clusters and only 75 subjects (16%) attended medical camp and received group counselling. An attempt was made to provide individual counselling to the remaining subjects (n=399) in the intervention area. Among these subjects 351 (88%) were contacted through FTF and 34 (8.5%) through mobile phone. Thus a total of 460 (97%) subjects received either group or individual counselling at 2-4 weeks time period.

In the second session at 4-6 weeks time period, 78% of subjects were contacted through FTF and further 16% through phone (total 94%). In the third session, at 3 months, 70.4% were contacted to their mobile phone

**Table 1. Summary of Smoking and Socio-economic Status**

Smoking & socio-economic status	Control group	Intervention group	Total
Number of Subjects	454	474	928
Smoking Status			
No. of Smokers	454 (100%)	474 (100%)	928 (100%)
Type of Smoking			
Bidi	57 (12.56%)	73 (15.40%)	130 (14.01%)
Cigarette	284 (62.56%)	255 (53.80%)	539 (58.08%)
Both	113 (24.89%)	146 (30.80%)	259 (27.91%)
Years Since Smoking			
Mean (SD)	15.05 (8.28)	15.78 (9.09)	15.42 (8.71)
Median (Min-Max)	15.00 (1-40)	15.00 (1-45)	15.00 (1-45)
Number of Cigarette and Bidi per Day			
Mean (SD)	10.90 (6.81)	13.19 (8.94)	12.07 (8.05)
Median (Min-Max)	10.00 (1-40)	12.00 (2-52)	10.00 (1-52)



**Figure 1. Participant Flow to Intervention at Different Time Periods**

and further, 19.6% through FTF (total 90%). In the fourth session, at 6 months in the intervention group, 74% through FTF and 16.4% through mobile phone (90.4%) and in the control group 71.4% through FTF and 21.3% through mobile phone (92.7%). In the final survey, 89.2% of the intervention and 91% of the control groups were contacted. Overall, 97.4% of the subjects were being contacted at least once in the intervention group and individual counselling given. Number of subjects participated in each visit is given in the Figure 1. In all the sessions, the major reason for those not being attended the counselling was “unable to contact” (Figure 1).

**Discussion**

The present paper illustrated multiple approaches and assessed its participation rate for a community based smoking cessation programme in rural Kerala. The main objective of this cessation programme was to participate all the selected subjects in the group counselling and among the failures, individual counselling through FTF and mobile phones within a period of 2-4 weeks after the baseline survey. In the baseline survey, it was observed that the overall tobacco smoking prevalence was 28% which was marginally higher than the prevalence reported among adult males (22.4%) in the Global Adult Tobacco Survey Report, 2010. The possibility of higher smoking rates in rural areas could justify the prevalence rate mentioned in the present study.

In the present study, the group counselling included a session with the display of a documentary film on tobacco hazards and also confessions of a lung and an oral cancer patient treated at RCC. However, the response to attend group counselling was only 16%. The poor acceptance to group counselling intervention in terms of low participation rate might be due to the fact that social attitudes to smoking have changed in general and the awareness on smoking as a public health problem is widely understood (Graham, 2012). Hence, the chance of stigmatisation if a subject had attended the session might have resulted in less participation. Another possible factor for lower participation may be underestimation of the personal risk to contract a potential smoking related illness (Weinstein et al., 2005). In the present study, the rest of all the subjects except 3% could be provided individual counselling through FTF and mobile phones within a period 2-4 weeks after the baseline survey. Medical social workers, who were trained on tobacco cessation programme, conducted FTF and mobile phone counselling and thus they could deliver the message on tobacco hazards and quitting tips.

In order to obtain, good support from the community, other than the study subjects, communication messages were given over phone to 20 key personnel which included community workers, medical doctor and a local politician (ward member) of each cluster about the importance of this camp cum group counselling and further invited them to attend the medical camp cum group counselling programme. 15 of them responded by participating in the camp. Community workers such as primary care health workers attached to health centres

are engaged in preventive activities like immunisation and health education on risk factors on communicable and non communicable diseases. Hence, in community settings they are in a position to identify and intervene with patients as well as healthy individuals to give advice on health risk behaviours. A doctor has a greater chance for interaction with patients in clinical settings. It was also reported that simple advice on the part of a medical professional has the potential to increase the quit rate by 2-3% (Stead et al., 2008). Political leader at the decentralised level of the administrative system was invited to inaugurate the programme at each cluster and to seek his/her assistance for implementation of succeeding intervention programmes.

In the present study, follow-up sessions were also conducted by the social workers before the final survey. The technical 'know-how' on the subject influenced the social workers for conducting follow-up counselling. It was assumed that if subjects could be retained for a longer period in the intervention area, greater was the chance of making a change in the smoking pattern from the category of "no improvement" to "improvement" category. Considering the fact that tobacco dependence is a chronic condition also necessitates repeated interventions to succeed in quitting the habit (Anderson et al., 2002). Moreover retaining smokers for a longer period would help to understand the factors associated with abstinence from smoking and relapse. Reduction in tobacco use was reported among patients attending cessation clinics when they were retained in follow-up group for a longer period (Murthy and Saadicha, 2010).

In all the follow-up sessions, around 90% subjects were contacted through FTF or mobile phone. Our study was effective in increasing the participation rate due to the main reason that proactive counselling was done using multiple modes mainly FTF and mobile phone. Though mobile phone services were utilised for patient's follow-up in tobacco cessation clinics (Kumar et al., 2007), the current study being conducted in community settings explored the possibility of using mobile phones in all the follow-up sessions as either an alternative to FTF or at 3 months time point where it was used as the prime mode of counselling.

In the present study, behavioural counselling was given by FTF and mobile phone counselling on an individual basis. However priority was given for FTF on the assumption that it will be useful to develop a good rapport between the subject and the interviewer. Another factor for using FTF was to elicit information by communicating questions with greater care to get the best possible response which were useful for succeeding interventions for comparison. In the first two sessions of individual counselling, we used pictorial representation to illustrate the hazards of smoking particularly tobacco associated oral and lung cancers. The effective utilisation of pictures of smoking associated illness were reported by other studies as well (Pai and Prasad, 2012; Kumar et al., 2012). The wider acceptance of using the 5 A's approach in clinic settings to assess various smoking associated factors viz ask about the habit, advice to quit, assess willingness to quit, assist to quit and arrange follow up in

clinical settings and the 5 R's approach (relevance to quit, risks of habit, rewards of quitting, road blocks in quitting, repetition of motivation) were demonstrated by other studies (Cornuz et al., 2007; Fiore et al., 2009; Thankappan et al., 2013). Reports of increased quit rate through face to face counselling had already been reported (Lancaster and Stead, 2006, King et al., 2008). The Cochrane review of behaviour therapy programs acting as an adjunct to pharmacotherapy for smoking cessation observed that behaviour support increased the success of quit chance from 10-25% (Stead and Lancaster, 2012).

In the present study, at 3 months follow-up time, the primary mode of contact used was mobile phone counselling for which a response rate of more than 70% was observed. The method was used to understand the smoking status of the individual at that time period and to provide a brief advice based on the status. To our knowledge, no study was reported from India to establish the effectiveness of telephone counselling. Though FTF was given priority as a whole in this study, proactive telephone counselling was found to be useful to increase the coverage. Telephone counselling was commonly used in western countries because of its wide reach and cost effectiveness. Quit lines were found to increase smoking abstinence rates (Perera and Lancaster, 2006). Though the response to telephone counselling was high in the present study when compared to FTF, it was observed that the enthusiasm to seek advice through telephone counselling was not encouraging. In all other sessions FTF was given priority to telephone counselling, while telephone counselling was used when the person was lost to follow up in FTF.

Motivational counselling was conducted in second and fourth sessions of this study. The importance of motivational counselling was substantiated by the guide lines recommended by United States Public Health Service (USPHS) in the backdrop of those who are not ready to set a target quit date (Fiore et al., 2008).

In the control group, smoking status assessment was done at 6 months and 12 months time point like in the intervention area. The intention was to explore whether any change in behaviour pattern was seen in their smoking status in the interim phase and to know how it would reflect when the pattern is assessed after 12 months.

Notwithstanding the limitations of this study particularly the time and manpower involved, the socio-demographic profile of Kerala with its high literacy compared to the rest of the country, complemented to increased participation to this intervention.

In conclusion, proactive community centred intervention programmes using multiple methods were found to be successful to increase the coverage for intervention. Community specific suitable methods for tobacco intervention strategies may be adopted in a country like India where diverse socio-demographic and political systems prevails.

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