RESEARCH COMMUNICATION

A Community Based Smoking Cessation Intervention Trial for Rural Kerala, India

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Abstract

   Objectives: An attempt was made to compare tobacco prevalence and socioeconomic factors of two groups (intervention and control) from a selected rural community in Thiruvananthapuram, Kerala, India. **Methods**: Data were collected from resident males in the age group of 18.0 to 60.0 years from 4 randomly allocated Community Development Blocks of rural Thiruvananthapuram district (2 intervention & control groups). Trained Accredited Social Health Activists workers were utilised to collect data from both the groups through a face to face interview. **Results**: Among 3304 subjects were interviewed, the overall prevalence of smokers was 28% (n=928) (mean age=44.4 years, SD=9.2 years). Socio-economic status (SES) score points indicated that majority of smokers belonged to the upper lower SES category (61%) (mean SES score =10, SD= 3) and among non-smokers, the participants mainly belonged to the lower middle SES score (45%) (mean SES score =12, SD= 3) (p-value=0.0001). Among the 928 smokers, 474 subjects were in the intervention area (mean age =44.56 years, SD =9.66 years) and 454 in the control area (mean age= 44.47 years, SD =10.30 years). No significant difference was found between the intervention and control groups according to age (p=0.89) and SES (p=0.11). Majority of smokers in the intervention and control areas were from the upper lower SES group (64.14% and 57.17%). **Conclusion**: Smoking continues to be a predominant public health problem among males in rural Kerala particularly among lower socio-economic population. Apart from strengthening legislation, multiple cost effective intervention approaches are required to reduce tobacco consumption in the community.

Keywords: Prevalence - smoking - socioeconomic status - rural - Kerala

Introduction

India is the second largest consumer of tobacco products in the world in spite of the advances in public health campaigns complemented with tobacco control laws. Nearly 900,000 people die every year in India due to diseases attributed to tobacco. According to the Global Adult Tobacco Survey (GATS), the prevalence of tobacco use among males in India is 48% compared with 20% among females (GATS: India, 2010). Reports from the World Health Organisation predicts that deaths in India due to tobacco may exceed 1.5 million annually by 2020 (Murray and Lopez, 1996). The state of Kerala located in the south west corner of India representing 3% of its total population is known for better health indicator values than other states of India. However there are problems for Kerala in other spheres of public health. 'Tobacco control' is one area where the state is on par with other states in India. In Kerala, 35.4% of males aged 15 years and above are "current tobacco users" and the prevalence of current smokers alone is reported to be 22.4% (GATS: India, 2010).

Health professionals have got a major role in tobacco cessation. Studies have shown that tobacco cessation advice from health professionals has enhanced the quit rate among patients (Lancaster et al., 2000). Tobacco cessation centres are emerging in urban areas of India whereas rural areas with high prevalence of tobacco use are deprived of such facilities. Deeply embedded cultural habits concomitant with lack of knowledge on the risks associated with tobacco are considered as major hurdles for tobacco control in rural areas (Murty and Saadicha, 2010). Moreover, there is paucity of information related to the effectiveness of community based tobacco cessation intervention from rural areas. In this scenario, a study was initiated with the objective of evaluating the effectiveness of a community based smoking cessation intervention in comparison with a control population among males in a rural area in Thiruvananthapuram district, Kerala. Before initiating this study, an attempt was made to estimate tobacco prevalence among males in the age groups of 18-25, 26-35, 36-45, 46-55 and 56-60 years in the above same study population. Further, the socio-economic characteristics of the intervention and control groups

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were compared. In the present paper, tobacco prevalence and socio-economic characteristics of the two groups are presented.

Materials and Methods

Thiruvananthapuram district has 12 Community Development Blocks (CDBs) with a population ranging from 140,000 to 214,000 per CDB. Each CDB consists of 5-7 panchayaths and each panchayath is further divided into wards. The ward forms the lowest level of administrative system which has a population of approximately 1500-2000. Among the 12 CDBs in the district, 4 CDBs, whose socio-economic status are relatively similar, were selected and randomised into 2 intervention and 2 control groups. All wards of the panchayaths (91 in intervention area and 83 in control area) within the selected CDBs were numbered separately, and 11 wards (5 from intervention and 6 from control area) were selected from them using random sampling method. Each ward represents a cluster and thus 11 cluster units were identified for the study.

The study protocol was approved by the institutional ethics committee of the Regional Cancer Centre, Thiruvananthapuram and informed consent was obtained from each participant. Smoking prevalence was assessed using a pre-tested semi structured questionnaire. All men in the age group of 18.0-60.9 years were included in the house-to-house survey. Bedridden subjects, subjects who cannot speak and those who are mentally retarded were excluded prior to entry into the study.

Accredited social health activists (ASHA) of the respective clusters were identified for potential study aids. An ASHA is a trained female community health activist selected from the village itself under the National Rural Health Mission programme of Government of India. They are trained to work as an interface between the community and the public health system. Their main work is to create awareness on health and its social determinants and initiate the community towards increased utilisation and accountability of existing health services (Ray, 2005). Those ASHAs who were willing to take part in the study were then trained for the field work and they were instructed about the study protocol.

ASHA volunteers collected details on smoking and distributed multicoloured anti-tobacco leaflets in the community through house to house survey. The study protocol was explained to all eligible subjects. Information on the ward/cluster, house number, name of the participant, address, type of house (based on roof and floor of the house), facilities in the household (availability of refrigerator, television, washing machine, computer and vehicles), and household income were collected. Furthermore, age, education, occupation, marital status, parity, personal habits particularly smoking status viz; type of smoking, duration and initiating factors for smoking were collected. Smokers in the intervention arm were given multicoloured anti-tobacco leaflets in Malayalam (the local language) with descriptions of tobacco induced health hazards. The leaflets also spoke for the importance of 'role modelling' against tobacco use in the community. Each eligible subject was then assigned a unique number

Table 1. Smoking, Smokeless Tobacco and Alcohol Consumption by Age

Type of habits	Age – group	Never users	Ever users	Total
Smoking	<=25	484(92.9)	37(7.1)	521
	26-35	681(77.7)	196(22.3)	877
	36-45	549(64.2)	306(35.8)	855
	46-55	405(56.5)	312(43.5)	717
	56-60	166(49.7)	168(50.3)	334
	Total	2285(69.2)	1019(30.8)	3304
	<=25	470(90.2)	51(9.8)	521
Smokeless	26-35	756(86.2)	121(13.8)	877
tobacco	36-45	740(86.5)	115(13.5)	855
	46-55	598(83.4)	119 (16.6)	717
	56-60	258(77.2)	76(22.8)	334
	Total	2822(85.4)	482(14.6)	3304
	<=25	471(90.4)	50(9.6)	521
Alcohol	26-35	601(68.5)	276(31.5)	877
	36-45	542(63.4)	313(36.6)	855
	46-55	423 (59)	294(41)	717
	56-60	206(61.7)	128(38.3)	334
	Total	2243(67.9)	1061(32.1)	3304

Figures in parenthesis are row percentages

for future follow up.

Socioeconomic status (SES) was determined by categorizing the study subjects into upper, upper middle, lower middle, upper lower and lower income groups. Categorisation of SES was done by combining the subject's education, occupation and family income. For education, scores of 1, 2, 3, 4, 5, 6, 7 were given for illiterates and holders of primary school certificate, middle school certificate, high school certificate, intermediate/post high school diploma, graduate or post graduate and profession or honours respectively. For occupation, scores of 1, 2, 3, 4, 5, 6, 10 were given for those who belonged to the groups unemployed, unskilled-work, semi-skilled work, skilled-work, clerical/shop-owner/farmer, semi-profession and profession respectively. Similarly for family income, scores of 1, 2, 3, 4, 6, 10 and 12 were given for subjects whose family income per month in the Indian currency 'rupee' was <979, 980-2935, 2936-4893, 4894-7322, 7323-9787, 9788-19574 and >19575 respectively. A person's SES score therefore comes in the following categories. A score of 26-29 denotes upper SES group, 16-25 upper middle, 11-15 lower middle, 5-10 upper lower and <5 lower SES group. Age groups were classified as 18.0-25.9, 26.0-35.9, 36.0-45.9, 46.0-55.9 and 55.0-60.9 years.

Current daily smoker who use atleast one cigarette or bidi (locally made by wrapping coarse tobacco in dried temburni leaf) and with or without smokeless-tobacco chewing habits were included for the intervention study. Comparisons of intervention and control groups as well as comparison of smokers and non-smokers according to age and SES were carried out. Two sample t tests and chi-square tests were employed to compare the groups' characteristics.

Results

A total of 3304 subjects were interviewed in the house to house survey. The participation rate of eligible

Table 2. Smoking Status by Demographic and Socio-Economic Characteristics

Current smokers	Current	Non-smokers	Total
Number of subjects	928 (28.1%)	2376	3304
Age in years			
Mean (SD)	44.5(9.9)	36.8(11.6)	38.9(11.72)
Median	45.0(18-60)	35.0(18-60)	38.9(18-60)
p-Value[a]			<0.0001
Age Group			
18-25 years	26(3%)	495(21%)	521
26-35 years	177(19%)	700(29.4%)	877
36-45 years	285 (30.7%)	570(24%)	855
46-55 years	289 (31.1%)	428(18%)	717
56-60 years	151 (16.2%)	183 (7.7%)	334
Total socioeconomic score			
P – Value[b]			0.0001
<5 (lower)	0 (0%)	2 (0.08%)	2
5 – 10 (Upper lower)	566 (61%)	966(40.6%)	1532
11 – 15 (Lower middle)	305 (32.8%)	1064 (44.7%)	1369
16 – 25 (Upper middle)	54 (6%)	335 (14%)	389
26 – 29 (Upper)	3 (0.3%)	9 (0.3%)	12

[a]P-Value calculated using two sample t test; [b]p-Value calculated using chi-square test; Figures in parenthesis are column percentages

individuals interviewed for the baseline survey was 82% and 85% in the intervention and control groups, respectively. The participants in each ward varied from 215 to 363. In both intervention and control groups, the maximum number of participants belonged to 26-45 year age group (Table 1).

The overall prevalence of current daily smokers in the 18-60 year age group was 28.1% (mean age=44.4 years, SD=9.2 years) whereas the prevalence of current daily smokeless tobacco users and alcohol habitués were 9.8% and 18.1% respectively. Irrespective of the type of habits such as smoking, smokeless tobacco and alcohol use, consumption elevated with increased age (Table 1). Smoking (7.1%) and smokeless tobacco use (9.8%) were the lowest among the 18-25 year age group and the highest consumption was reported in 56-60 year age group (50.3%, 22.8%). Alcohol consumption was lowest among the 18-25 year age group (9.6%) and highest in the 46-55 year age group (41%).

The proportion of daily smokers was more in the 36-55 year age group (62%), than among non-smokers in the corresponding age group (p<0.0001) (Table 2). SES score points indicated that majority of smokers belonged to the upper lower SES group (61%) (mean SES score =10, SD = 3) and among non-smokers, the participants mainly belonged to the lower middle SES group (45%) (mean SES score =12, SD= 3) (p-value= 0.0001).

Among the 928 smokers identified, 474 subjects were in the intervention area (mean age =44.56 years, SD =9.66 years) and 454 in the control area (mean age= 44.47 years, SD =10.30 years). No significant difference was found between the intervention and control groups with reference to age (p=0.89) and SES (p=0.11). Majority of

Table 3. Summary of Smoking Status

	Control area	Intervention area	Total
Number of Smokers	454	474	928
Type of Smoking			
Beedi	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			
N	454	474	928
Mean (SD)	15.05 (8.28)	15.78 (9.09)	15.42 (8.71)
Median (Min – Max)	15.0 (1.00 - 40.0)	15.0(1.00 - 45.0)	15.0(1.0 - 45.0)
Total Cigarette & Beedi/ Day			
N	454	474	928
Mean (SD)	10.90 (6.81)	13.19 (8.94)	12.07 (8.05)
Median (Min – Max)	10.0(1.00 - 40.0)	12.0 (2.00 - 52.0)	10.0 (1.0 - 52.0)
Reasons for Smoking			
Craving	159 (35.02%)	164 (34.60%)	323 (34.81%)
Refreshment	114 (25.11%)	127 (26.79%)	241 (25.97%)
Work Relief	82 (18.06%)	43 (9.07%)	125 (13.47%)
Halitosis	14 (3.08%)	12 (2.53%)	26 (2.80%)
Fun	20 (4.41%)	56 (11.81%)	76 (8.19%)
Toilet Rituals	65 (14.3%)	72 (15.19%)	137 (14.76%)
No. of Cigarettes & Beedis /Day			
<10	234 (51.5%)	192 (40.51%)	426 (45.91%)
10-20	159 (35.0%)	185 (39.03%)	344 (37.07%)
21-30	47 (10.4%)	64 (13.50%)	111 (11.96%)
31 or more	14 (3.08%)	31 (6.54%)	45 (4.85%)

Figures in parenthesis are column percentages

smokers in the intervention and control areas were from the upper lower SES group (64.1% and 57.27%) (Table 4). 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 bidi and cigarettes (28%). Cigarette users constituted 53.8% and 62.5% in the intervention and control areas. Proportion of bidi users in the intervention group was 15.4%, while it was 12.5% in the control group. However, subjects who took both forms constituted 31% in the intervention and 25% in the control areas. 'Craving' was the major reason given for continuing smoking (34.6 % in intervention and 35.0% in control areas). Other reasons included refreshment, fun, work relief and toilet rituals (Table 3). It was observed that among subjects in the 55+ age group, 60% and subjects in the 46-55 age group, 41% initiated smoking habit after the age of 33 years.

Discussion

The present paper provides results of a house-to-house survey for identifying smokers for initiating a cluster-randomized behavioural intervention study. The overall prevalence of 'current smoking' (28.1%; in the intervention group 31% and the control group 26%) among the study population was slightly higher than in other recent studies in Kerala. The Global Adult Tobacco Survey (GATS) India (2010) reported 22.4% prevalence of smoking among men in Kerala. The National Family Health Survey (NFHS 2), a population based household survey done in 1998-99 (NFHS 2, 2001) reported almost similar tobacco prevalence and NFHS 3 a continuation

of NFHS 2 done in 2005-2006 (NFHS 3, 2007) reported a higher prevalence of tobacco smoking among men in Kerala and which were 28% and 35.8% respectively. Tobacco use prevalence in India is usually higher in the rural population. The present study was conducted exclusively among the rural population and the result thus are in line with what can be expected. It was observed that smoking was clearly lower in the younger age group compared to older age groups. A possible contributing factor to this result could be that the youngsters might have underreported their smoking habits, since the data collection was done through house to house survey or they might have enhanced their knowledge on smoking hazards through education or print and electronic media. Though smoking is predominantly among males, tobacco chewing has increased recently among men owing to the smoking ban in public places and tobacco industries targeting smokeless tobacco products (Thankapan and Thresia, 2007). This reason could have influenced younger generation in shifting their habit pattern from smoking to smokeless tobacco use. In the present study, it was observed that subjects in the older age groups initiated their habit at later ages. This could be one of the reasons for lower proportion of smokers in the younger age groups. It is expected that non-smokers may also turn to smoking at a later age and the study results highlights the importance of initiating tobacco controlled programmes in the community.

Variation in smoking prevalence might be due to the difference in the socio-economic characteristics as well. In the present study, similar scores as provided in the Kuppuswamy's SES scale are used as it is a validated scale (Kumar et al., 2007). The Kuppuswamy scale is primarily meant for urban population and has been used in the Indian scenario for public health research (Khandekar et al., 2006; Prasad et al., 2009). The present study is conducted among rural population. However, unlike other states in India, the urban-rural differentials in terms of the settlement pattern and occupational diversity are minimal in Kerala which is often represented as an urban-rural continuum (Parayil, 1996; Mridul, 1999) and thus the results in the present study using the same Kuppuswami's scoring system may not be much differed. A difference in socioeconomic background was observed between smokers and non-smokers on the present study. The mean SES score varied among smokers and non-smokers (10 and 12; p <0.0001). Though the difference was not too high, the findings revealed that majority of smokers belonged to the 'upper lower SES group' when compared to non-smokers who were mostly from the 'upper middle SES group'. This clearly refers to education, occupation and income as three major factors that can influence the initiation and continuation of smoking habit. The observation of smoking as a widely prevalent habit among people with lower standards of living in the present study was supported by evidences from other studies reported from India (Rani et al., 2003; Subramaniam et al., 2004; Sorensen et al., 2005). Though bidi smoking is predominantly common in rural areas in many parts of India, in the present study, a major proportion of smokers in both the intervention and control groups were

cigarette users, followed by a combination of cigarette and bidi users and bidi users alone. Studies have shown an increase in cigarette smoking in Kerala, Delhi and the North Eastern states of India (Gupta and Samira, 2008). This may be attributed to the availability of cheaper variety of cigarettes or replacement of bidi by branded smokeless tobacco products available at an affordable price in the market.

Studies have reported that female health volunteers within the community can be effectively utilised for tobacco control activities because of their accessibility and acceptability to the community (Sreedharan et al., 2010). In the present study also more co-operation and acceptability was obtained since trained female ASHA volunteers within the community had conducted the base line survey to identify tobacco habitués. General information on tobacco hazards to both the groups and specific information in the intervention areas was also delivered by them. However, the time and cost factors associated with succeeding visits of ASHA volunteers to the residence of subjects who were not covered in the initial visit are limitation of the study. Despite these limitations, this study reports the recent smoking status of the population in rural Kerala which could be generalised to other rural areas of Kerala state.

In conclusion, though legislation against smoking and other tobacco products has been intensified in India recently, smoking continues to be a predominant public health problem among males in rural Kerala particularly among lower socio-economic population. Considering the high priority given to tackle the tobacco menace, there is a need to develop multiple approaches where measures to strengthen existing regulations against tobacco combined with cost effective interventions for tobacco cessation particularly in rural areas has to be initiated and sustained.

Acknowledgements

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