Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20194016

Prevalence and determinants of smoking among rural young males of Kancheepuram district, Tamil Nadu: a cross sectional study

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Received: 28 June 2019 Accepted: 13 August 2019

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ABSTRACT

Background: Tobacco is the leading global cause of preventable death which kills millions of people and causes huge economic damage every year. Smoking form of tobacco is a major modifiable risk factor for number of chronic non-communicable diseases. In spite of various statutory warnings, smoking still remains a major Public health problem especially in young males. In order to reduce the magnitude and for effective control, the risk factors and distribution should be well known. This study was planned with the objective of assessing the prevalence and determinants of smoking among rural young males of Kancheepuram district, Tamil Nadu, India.

Methods: This community based cross sectional study was carried out between March and May 2018 among rural young males aged between 18 to 29 years. Sample size of 431 was calculated by using $4PQ/L^2$ and the respondents were selected from sampled households using systematic random sampling. Data were collected using a pre-tested, structured questionnaire, which were analyzed using SPSS version 16.0 and presented using descriptive and analytical statistics.

Results: Among 422 participants interviewed, the prevalence of smoking was 23%. Factors found to be protective against smoking were employment status and sedentary type of jobs. Factors found to be significantly associated with smoking were individuals with smoking friends and family members, habit of alcoholism, employment and low education status.

Conclusions: Since smoking is a preventable cause of morbidity and mortality, efforts should be made to control its use by intensive health education, implementing counselling facilities and rigorous enforcement of anti-tobacco legislation.

Keywords: Tobacco, Youth, Risk factors

INTRODUCTION

Tobacco is the leading global cause of morbidity and mortality.¹ Tobacco use not only affects the health but also impedes economic and social development.² Globally India is the second leading country in production and consumption of tobacco products. Both smoking and smokeless forms are prevalent in India. Among the smoking form the most common is cigarette. While other smoking form includes bidis, kreteks and

water pipes. Smokeless forms are of wide varieties which include khaini, gutkha and pan masala with tobacco and betel quid with tobacco. Smoking forms are major contributors of ill health than other forms. Smoking is prevalent in all age groups and are more common among young males.^{1,3,4}

One of the astonishing facts about smoking is the magnitude of the disease it causes. Tobacco use is a modifiable risk factor for non-communicable diseases like cancers, diabetes, cardio vascular diseases and

chronic respiratory diseases. Tobacco use is a major contributor of preventable death which contributes for more than two third of all non-communicable disease incidence cases. Alone it contributes for 1 in 6 of death due to non-communicable disease. Considering Communicable disease about 5% of death due to infections in lower respiratory tract and 4% of death due to tobacco use. One in five tuberculosis deaths could be avoided if the affected individuals undergo smoking cessation.¹

Tobacco not only imperils the health of those who are actively smoking but also the individuals around them who breathe the smoke in the form of second-hand smoke. Nearly 6 lakhs premature death takes place as a result of exposure to second-hand smoke which is nothing but the mixture of smoke from burning end of tobacco and mainstream smoke exhaled by smokers. Children and infants are especially vulnerable to the effects of second-hand smoke. Pregnant women exposed to second-hand smoke are at higher risk of preterm birth and Intrauterine growth restriction.^{1,3}

About 1.3 billion people use tobacco in any form globally. Tobacco use kills more than 15,000 world population daily. It is estimated that global death toll due to tobacco use in 20th century was around 100 million. World Health Organization predicts that tobacco use will cause 7.5 million annual deaths or one in ten annual deaths by 2020.³ Almost half of the smokers die from their tobacco use between 35 to 69 years of age which is economically productive years of their life span. In most of the low and middle income countries, it is the poor who smoke the most and the money spent on smoking is the money not spent on basic necessities such as food, education and health care.²

Diseases associated with tobacco consumption contribute 8-9 lakhs death among Indian residents per year. As per data from Global Adult Tobacco Survey India 2016-17, the overall prevalence of tobacco use is 28.6%. While the prevalence of smoking form of tobacco is 10.7% and smokeless form is 21.4%. Considering urban and rural level, 19.9 crore adults in rural area and 6.8 crore adults in urban area were using tobacco respectively. Exposure to second hand smoke at public places and home are 23% and 39% respectively. Age at initiation of smoking is 18.9 years.^{1,4} According to the data from National Family Health Survey-4, the overall prevalence of tobacco use among men in Tamil Nadu is 31.7%.⁵

The problems concerned with tobacco use are more complex in India due to multiple forms of tobacco. In spite of statutory warnings in all advertisements and all packages of tobacco, tobacco use still remains to be a burden for India, mainly in the rural areas. ^{1,4} For taking effective prevention and control measure against any risk factor, its magnitude and distribution should be well known in advance. Based on the above background the

present study was conducted with the aim of assessing the prevalence and determinants of smoking among rural young males of Kancheepuram district, Tamil Nadu, India, to ascertain the gaps existing in the study area and to plan appropriate control measures.

METHODS

Study design

This is a community based descriptive cross-sectional study.

Study area and population

The study was conducted in Serappanachery, the rural field practice area attached to a Medical College in Kancheepuram district, Tamil Nadu. Totally there are twenty villages in the study area, the total population is 21187 (males-10,817 and females-10,370) and the total number of households are 4489. The study population included male individuals residing in the study area and aged between 18 and 29 years.

Study period

The study was done for a period of three months from March 2018 to May 2018.

Sample size

The sample size was calculated based on the prevalence of smoking identified in a study done by Patel et al in the year 2016 as a community based study among 100 youth individuals in the age group of 15-29 years, which showed 43% of prevalence of smoking among the study population.⁶ Using the formula $4pq/L^2$,with 95% confidence level and 5% allowable error, the sample size was calculated to be 392. Adding 10% as non-response rate, the sample size was calculated to be 431.

Sampling technique

Systematic random sampling was used to identify the study participants. Sampling interval was calculated as follows: total number of households in Serappanachery (N)=4489, sample size (n)=431, sampling interval is N/n=4489/431=10.4. Thus every 10th household from the first randomly visited household in the center of the study area was selected for identifying an eligible study subject. If there was no eligible respondent in the selected household, the next house with the eligible study subject was selected. From that house, the next 10th household was selected. This procedure was followed till the desired sample size was reached.

Selection criteria

Resident individuals aged between 18 and 29 years and willing to participate were included in the study.

Individuals who stayed as guests in the selected households, those who were <18 and >29 years of age and those who were not willing to participate were excluded from the study.

Data collection

Data was collected from eligible and willing participants using a pre-tested, structured interviewer-administered questionnaire. Socio-demographic information including age, marital status, education, occupation and socioeconomic status were collected. In addition to this, information regarding smoking and drinking habit was also collected. 9 individuals who gave insufficient data were excluded from the study.

Statistical analysis

Collected data were entered in Microsoft Excel and analyzed by using SPSS software version 16.0. Data were presented using descriptive and analytical statistics. Chisquare test was used as the test of significance and was used to compare the differences in proportions with the significance level set at p \leq 0.05. Odds ratio (OR) with 95% confidence interval was used to describe the association between exposure and outcome variables.

Ethical approval and informed consent

Ethical approval was obtained from Institutional Ethics Committee of Sree Balaji Medical College and Hospital. After explaining about the study and its objectives, written informed consent was obtained from the study participants before the commencement of data collection.

RESULTS

The study included 422 young males aged between 18-29 years from, Serappanachery, the rural field practice area attached to a Medical College in Kancheepuram district, Tamil Nadu. The outcome of the study is presented below in the form of tables and charts.

In this study, it was found that among the 422 young males, 196 (46.4%) participants belonged to the age group between 18-23 years and 226 (53.6%) participants belonged to the age group between 24-29 years. This study includes 180 (42.7%) married and 242 (57.3%) unmarried individuals. In this study, 126 (29.9%) individuals were educated up to high school level and 296 (70.1%) individuals were educated above high school level. Among the study participants 318 (75.4%) members were employed and 104 (24.6%) were unemployed. In terms of socio-economic class 50 (11.8%) participants were in the level of middle class and 372 (88.2%) participants were in the level of the study participants are given in the Table 1.



Figure 1: Prevalence of smoking (in percentage) among the study participants.

Table 1: Socio-demographic characteristics of the study participants.

S. no.	Characteristics	Number (n=422)	Percentage (%)					
1	Age (in years)							
1	18–23	196	46.4					
	24-29	226	53.6					
2	Marital status							
2	Married	180	42.7					
	Unmarried	242	57.3					
	Education							
3	Above high school	296	70.1					
	Up to high school	126	29.9					
	Occupation							
4	Employed	318	75.4					
	Unemployed	104	24.6					
	Socio economic class							
5	Up to middle class	372	88.2					
	Above middle class	50	11.8					

In this study, it was found that 248 (58.8%) study participants were alcoholic while 174 (41.2%) of the study participants do not have the habit of consuming

alcohol. It was also found that 232 (55%) study participants were having friends with smoking habit and 218 (51.7%) study participants were having family members with smoking habit. The details of determinants of smoking among the study participants are given in the Table 2. In our study, the prevalence of smoking was

found in 97 (23%) participants and 325 (77%) participants were free from smoking (Figure 1).

Table 2: Determinants of smoking among the study participants (n=422).

S. no.	Characteristics	Number (N)	Percentage (%)						
	Habit of alcoholism								
1	Yes	248	58.8						
	No	174	41.2						
	Family members with smoking habit								
2	Yes	232	55.0						
	No	190	45.0						
	Friends with smoking habit								
3	Yes	218	51.7						
	No	204	48.3						

Table 3: Smoking related characteristics among smokers in the study participants (n=97).

S. no.	Characteristics	Number (N)	Percentage (%)						
1	Age of initiation (in years)								
	<25	58	59.8						
	≥25	39	40.2						
	Average quantity of consumption of cigarette/bidis per day								
2	≤10	86	88.7						
	>10	11	11.3						
	Usual place of smoking								
3	Home	7	7.2						
	Outdoor	90	92.8						
4	Aware of harms of smoking								
	Yes	91	93.8						
	No	6	6.2						
5	Willingness to stop smoking								
	Yes	68	70.1						
	No	29	29.9						

Table 4: Association between the determinants and smoking.

S. no.	Factors		Smoking present (n=97)		Smoking absent (n=325)		Total	Chi- square value	P value	OR (95% CI)
			Ν	%	Ν	%	N (%)			
	Age (in	18-23	40	20.4	156	79.6	196 (100)			0.76
1	years)	24-29 (ref)	57	25.2	169	74.8	226 (100)	1.12	0.29	(0.48-1.20)
	Marital	Married	35	19.4	145	80.6	180 (100)			0.70
2	status	Unmarried (ref)	62	25.6	180	74.4	242 (100)	1.89	0.17	(0.44-1.12)
	Education	Above high school	57	19.3	239	80.7	296 (100)	_	0.008*	0.51
3	Education	Up to high school (ref)	40	31.7	86	68.3	126 (100)	7.1	0.008*	(0.32-0.82)
		Employed	61	19.2	257	80.8	318 (100)	_		0.45
4	Occupation	Unemployed (ref)	36	34.6	68	65.4	104 (100)	9.69	0.002*	(0.27-0.73)
	Socio	Up to middle	90	24.2	282	75.8	372 (100)			1.96
5	economic class	Above middle class (ref)	7	14	43	86	50 (100)	2.04 (0.15	(0.85-4.5)

Continued.

S. no.	Factors		Smoking present (n=97) N (%)		Smoking absent (n=325) N (%)		Total N (%)	Chi- square value	P value	OR (95% CI)
	Habit of	Yes	80	32.3	168	67.7	248 (100)	27.06	<0.0001*	4.4
6	alcoholism	No (ref)	17	9.8	157	90.2	174 (100)	27.90	<0.0001*	(2.49-7.75)
	Family	Yes	78	33.6	154	66.4	232 (100)			
7	members with smoking habit	No (ref)	19	10	171	90	190 (100)	31.6	<0.0001*	4.56 (2.64-7.87)
8	Friends	Yes	80	36.7	138	63.3	218 (100)	_		
	with smoking habit	No (ref)	17	8.3	187	91.7	204 (100)	46.3	<0.0001*	6.38 (3.61-11.25)

OR: Odds ratio; CI: confidence interval; Ref: reference; P<0.05: statistically significant at 95% confidence interval.

Among the smokers in the study population, 58 (59.8%) smokers initiated the habit of smoking before the age of 25 years, 11 (11.3%) smokers were consuming more than 10 cigarettes per day and 90 (92.8%) smokers used to smoke at outdoor places. In the present study it was also found that 91 (93.8%) smokers were aware of toxic effects of smoking and 68 (70.1%) smokers were willing to stop the habit of smoking. The details of smoking related characteristics among smokers in the study population are given in the Table 3.

In the present study, it was found that there is a significant association between level of education, occupation, habit of alcoholism, smoking friends and family members and the smoking habit. Factors found to be protective against smoking were level of education and employment status. Odds of smoking were more among individuals with habit of alcoholism, smoking friends and family members. The details of association between the determinants and smoking are given below in the Table 4.

DISCUSSION

Tobacco use is a major contributor of preventable death. Tobacco use kills more than 15,000 world population daily. Globally India is the second leading country in production and consumption of tobacco products. This study outcome from Kancheepuram district shows interesting findings, which is discussed below.

In the present study, the prevalence of smoking among 18-29 years aged individuals was found to be 23% which is concordant with the study by Konduru et al among rural adults in which the prevalence of smoking was 23.4% for the individuals between 19-30 years of age.⁷ Patel et al, in their study among 15-29 years aged youth population reported the prevalence of smoking to be 43% and Annadurai et al in their study among males in rural Tamil Nadu, found the prevalence of smoking to be 36.7%.^{6,8} According to Gupta et al in their study among law students in Indore city the prevalence of smoking

form of tobacco was 32% and the study by Aryal et al reported the prevalence of smoking as 72.4%.^{9,10} These studies showed higher prevalence of smoking than our study. This indicates the addictive nature of tobacco products. In general, young adults use the undesirable habit of smoking as a strategy to cope up with stress and anxieties rather than inculcating beneficial pastimes in other recreational activities.¹¹

Chockalingam et al in their study, found the prevalence of smoking to be 14.3% in rural areas. This is far below the prevalence in the present study.¹² Similarly the study on prevalence and determinants of cigarette smoking among college students by Ngahane et al showed 11.2% prevalence while Muzammil et al reported the prevalence of smoking as 4.09%. This discrepancy can be attributed to different age group, different methodologies and different geographical locations of that study.^{13,14}

Socio demographic variables

Age

In the present study, the prevalence of smoking among individuals in the age group of 24-29 years (25.2%) was higher than the prevalence of smoking among individuals of 18-23 years age group (20.4%). But this difference is not statistically significant (p=0.29). This shows that the prevalence of smoking increases with increase in age and is not statistically associated with the age of the participants. Similar results were observed in the studies done by Khader et al, Chockalingam et al and Ngahane et al which also states that the odds of smoking increase with increase with increase age. This difference might be due to the fact that the self-affirmation and the risk behaviors increases with increasing age, which ultimately leads to the increased prevalence of smoking with the progression of age.¹¹⁻¹³

In contrary to the above, Konduru et al in their study reported that the prevalence of smoking increases with age up to 60 years followed by gradual decline in the prevalence, which might be due to health education and life style modification to get rid of the complications of smoking. This difference is also statistically insignificant.⁷

Marital status

In the present study, the prevalence of smoking was found to be comparatively higher among unmarried (25.6%) than that of married individuals (19.4%) and this difference is not statistically significant (p 0.17).

Similarly, Gupta et al in their study, also found that there is no statistical association between tobacco use and marital status.⁹ Annadurai et al, in their study reported lower prevalence among married participants (33.98%) than single, divorced and separated individuals. But, the difference is statistically significant in this study.⁸ Likewise, Islam et al in their study on the prevalence and correlates of nicotine dependence among adolescents, observed high nicotine dependence among unmarried participants (97.6%) with statistical significance (p<0.01).¹⁵ The higher prevalence of smoking among unmarried individuals might be due to lack of family responsibilities and frequent interaction with peer groups.

Education

In the present study, the prevalence of smoking decreases with better educational status. This study shows 31.7% prevalence among individuals with education up to high school level and 19.3% among individuals above high school level of education and this difference is statistically significant (p 0.008). Participants with better educational status are less likely to smoke than those of their low education level counterparts (OR: 0.51, 95% CI: 0.32-0.82).

Similarly, Konduru et al in their study reported a strong inverse relation between level of education and tobacco use and also found that only 12.5% of the participants with educational level of diploma and above had the habit of smoking in comparison with the participants with education up to secondary level of education and this difference is also statistically significant.⁷ In the same way Annadurai et al also reported that the prevalence of smoking was higher among illiterate participants (49.4%) than the literate participants (35%) which was also statistically significant.⁸ Islam et al also reported that nicotine dependence was high among the participants educated only up to primary level of education.¹⁵ This significant variation in the prevalence of smoking can be because of increased level of knowledge and awareness on harmful effects of tobacco among the individuals with better educational status.

Occupation

In the present study, the prevalence of smoking was lower among employed individuals (19.2%) than unemployed individuals (34.6%) and this difference is statistically significant (p=0.002). Employed participants are less likely to smoke than unemployed participants (OR: 0.45, 95% CI: 0.27-0.73).

The increased prevalence of smoking among unemployed participants could be because of spending plenty of time with peer groups. It seems that young individuals use the undesirable habit of smoking as a strategy to cope with stress and social anxieties due to unemployment.

Similarly, Annadurai et al in their study reported that there is a significant association between occupation and smoking and also found that the prevalence of smoking was low among professionals and semi-professionals when compared with unemployed, daily and monthly wagers. ⁸ In contrary to this Islam et al, in their study reported a strong inverse relation between occupation and nicotine dependence, with higher dependence among working individuals (87.8%).¹⁵ In the same way Konduru et al in their study reported a statistically significant inverse relation between occupation and smoking, with least prevalence among unemployed individuals.⁷ This variation might be due to the attainment of financial independence among employed individuals, which may lead to getting addicted to this habit.

Socio-economic status

In the present study, the prevalence of smoking decreases with better socio-economic status. This study shows 24.2% prevalence among participants up to middle class and 14% among participants above middle class and this difference is not statistically significant (p=0.15).

Annadurai et al in their study also reported that there is no significant association between smoking and socioeconomic status.⁸ Similarly, Islam et al, in their study reported a high nicotine dependence among participants belonging to lower socio economic status (64.5%).¹⁵ In contrast to this Khader et al in their study reported increased prevalence of smoking with increased family income and status.¹¹ This variation and statistical insignificance between smoking and socio-economic status might be due to the fact that type of tobacco use and the pattern of smoking may change with socio economic status but not the habit of smoking.

Other variables

Habit of alcoholism

In this study, the prevalence of smoking was higher among the participants with the habit of alcoholism (32.3%) than those without alcoholism (9.8%) and this difference is statistically significant (p<0.0001). The odds of being smokers were 4 times more among individuals with the habit of alcoholism than those without the habit of alcoholism (OR: 4.4, 95% CI: 2.49-7.75).

Gupta et al in their study among law students found that the prevalence of smoking was higher among alcohol users (36.3%).⁹ Similarly, Chockalingam et al in their study reported that alcohol users were 11 times more prone to smoke than non-alcoholics and this difference is also statistically significant.¹² This association between prevalence of smoking with the habit of alcoholism may be due to changing lifestyle practices among young individuals.

Family members with habit of smoking

In the present study 78 smoking individuals were having family members with smoking habit and only 19 smokers were without any family history of smoking. This difference is statistically significant (p<0.0001). The odds of smoking were 5 times more among individuals with family history of smoking than those without any family history (OR:4.56, 95% CI: 2.64-7.87).

In the same way Makwana et al in their study found that the prevalence of smoking was higher among individuals with family history of smoking.¹⁶ Similarly, Gupta et al in their study reported that individuals with family history of tobacco use were at higher risk of consuming the tobacco products (OR:3.1) and Khader et al in their study reported that increased prevalence of smoking was significantly associated with the family history of smoking (p=0.008).^{9,11}

In general children and young adults are more likely to reproduce the behaviors and attitudes of their parents and family members who are considered as models by them. This brings the association between smoking and family history.

Friends with habit of smoking

In the present study 80 smokers were having friends with smoking habit and only 17 smokers were having friends without habit of smoking. This difference is statistically significant (p<0.0001). The odds of smoking were 6 times more among individuals with smoking friends (OR:6.38, 95% CI: 3.61-11.25).

Muzammil et al in their study reported that accompanying friends was the main cause of using tobacco.¹⁴ Similarly, In the study conducted by Makwana et al, 61.69% of tobacco consuming adolescents reported their friends as the inducing factor to use tobacco products.¹⁶ Gupta et al in their study found that individuals who spent more time with their friends were more likely to be smokers.⁹ In the same way Aryal et al, Khader et al and Ngahane et al in their study reported a significant association between the habit of smoking and friends with smoking habit.^{10,11,13}

In general young individuals used to spend most of their times socializing with friends. This in turn leads to the

initiation and continuation of smoking for the sake of enjoyment, fun and peer pressure.

Limitations

The main limitation of this study was self-reported information on cigarette smoking. Since smoking is a sensitive issue in our culture especially in societies and families, some participants reluctant to disclose their smoking status. This might either over estimate or under estimate the actual burden of the problem. This study was done in the rural field practice area of our Institution, among rural men in the age group of 18 to 29 years and so the outcomes could not be generalized. It would be better if the study had been planned on a larger scale, covering general population of all age group, to have a better understanding on magnitude of the problem, so that the outcomes could be generalized to a larger study area.

CONCLUSION

Smoking is a major public health concern among young men. Education, occupation, habit of alcoholism, presence of smoking habit among friends and family members are the factors responsible for smoking among young men. Since smoking is a preventable cause of morbidity and mortality, efforts should be made to control its use by intensive health education, implementing counselling facilities and rigorous enforcement of anti-tobacco legislation. Active involvement of both health professionals and communities is mandatory in helping individuals and communities to stop smoking and advocate strong legislation.

Recommendations

Intensive health education programs to vulnerable groups like rural population, young men, unemployed and illiterate individuals should be encouraged. Anti-tobacco measures like school and college based tobacco prevention programs, banning tobacco products in public places and increasing the awareness about ill effects of tobacco should also be promoted. It is important to increase the awareness about anti-tobacco legislation and policies among general population, especially rural population. Only then this scourge of humanity will stop taking its toll.

ACKNOWLEDGEMENTS

We would like to thank the College Management, Faculty of Department of Community Medicine and staffs of Rural Health Training Centre, Serappanachery, for helping us in every possible way to successfully complete this study. My sincere thanks to the study participants for their valuable time in carrying out this study. A special gratitude to my co-postgraduates and family members for their moral support. Funding: No funding sources Conflict of interest: None declared Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Arunkumar M, Gopalakrishnan S, Umadevi R. Prevalence and determinants of smoking among rural young males of Kancheepuram district, Tamil Nadu: a cross sectional study. Int J Community Med Public Health 2019;6:4054-61.