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Consumption Patterns of Combusting Tobacco in Male Participants of Ahmedabad

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ABSTRACT

Consumption of combusting tobacco products is the largest preventable risk factor for morbidity and mortality in developed and developing countries. Monitoring and surveillance data in relation to tobacco use and its impacts is one of the main requirements of tobacco control. In relation to monitoring and surveillance, standardized estimates of smoking prevalence are needed to chart the progress of developing countries through the stages of the tobacco epidemic, and to determine specific strategies for intervention. The research objective of present study is to monitor and investigate consumption patterns of combusting tobacco products in male participants of Ahmedabad as the information regarding tobacco use and exposure is one of the sources of prevention of morbidity and premature mortality caused by tobacco use. The study sample of 933 male participants (age 15 to 64 Years) was selected by self organized population based survey. An un-weighted dataset is part of survey design and rates and ratios are estimated with 95% CI. For the evaluation of consumption of tobacco products, different socio-demographic characteristics of respondents were selected as covariates. For the data collection a pretested questionnaire was prepared in two languages English and Gujarati. The whole statistical analysis of the collected data was carried out by means of SPSS 21.0 using logistic regression for selection of the risk factors. From the study results it was concluded that a majority of the early age and old age male respondents were habituated with combusting tobacco use. Highest prevalence of smoking was found in Christians, Schedule cast, students, professionals and illiterates or less educated and lower income male participants. Age, religion and occupation are found to have a significant effect on consumption of combusting tobacco products in male users.

1. Introduction

Tobacco is an avoidable but major issue which causes illness and premature death in countries like India. There were an estimated approximate 5 million premature deaths attributable to tobacco use which is 12% of the total global adult mortality. If the patterns continue, it will cause some 10 million deaths each year by 2020. Tobacco use is neither an exclusive nor even principal problem in developed countries but it rapidly became a pandemic globally. About one in every three adult tobacco users and the majority are in developing countries and most of them are male. Tobacco is used in a number of forms in South Asia. The distribution of tobacco consumption is not uniform; it is disproportionately higher in lower socioeconomic groups, poor, semi-skilled manual occupation groups, unemployed and poor educational achievers. In countries of South Asia traditional values do not permit tobacco use to female, but there is no such taboo against usage to male. The use of tobacco is widespread in Indian rural and urban areas.

Monitoring and surveillance data in relation to tobacco use and its impacts is one of the main requirements of tobacco control. In relation to monitoring and surveillance, standardized estimates of smoking prevalence (that is, using the agreed standardized definitions of tobacco use) are needed to chart the progress of developing countries through the stages of the tobacco epidemic, and to determine specific strategies for intervention. Without these data, the extent and range of the impact of tobacco cannot be gauged. This study aimed to find out the magnitude of combusting tobacco product usage in Ahmedabad one of the key cities of India with particular focus on variation by socio-demographic factors. Major aims:

1. To determine the prevalence of consumption of combusting tobacco products in adult male participants who are residents of Ahmedabad and between the age of 15 to 64 years.
2. To identify risk factors of combusting tobacco consumption among male adults of Ahmedabad.

2. Material, Methods and Data collection

Design of study: It was a self organized cross sectional population based survey which included 933 adult male users of combusting tobacco products between age of 15 to 64 years from Ahmedabad city.

Selection of participants: To select the participants or respondents from male population of Ahmedabad city a random selection is used. In the procedure respondents were selected randomly by balancing the gender selection and subgroup probability proportional to population size.

Data collection: The face to face survey was conducted to collect required data using a predesigned and pretested questionnaire (prepared in local language Gujarati). It was given to selected participants of age between 15 to 64 years who are male and residents of Ahmedabad city. An unbiased assistance was provided to those respondents who were unable to fill questionnaire at their own (e.g.

illiterates, physically unable etc.). Non responses were excluded from the sample.

3. Statistical Analysis

The whole statistical analysis of the collected data was carried out by means of SPSS 21.0 using binary logistic regression.

3.1 Binary logistic regression with multiple independent variables

For m explanatory variables

$$\text{logit}(p(Y)) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_m X_m \ ,$$

$$\text{Where logit}(p) = \ln\left(\frac{p}{1-p}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots\ldots + \beta_m X_m$$

$$\text{and the odds} = \frac{p}{1-p}$$

Here parameter β_i = effect of covariate xi on the log odds that Y assumes 1, controlling other covariates x_j , for instance, exp (β_i) is the multiplicative effect on the odds of a unit increase in covariate x_i , at fixed levels of other covariates x_j .

3.2 Selection of the variables

3.2.1 Response variable: The present study focuses on the phenomenon of tobacco consumption therefore it was considered as response variable with two categories consumer (code 1) and non consumer (code 0).

3.2.2 Explanatory Variables: The following is a detailed review of explanatory variables which we believe have an effect on responses.

Table 1 Demographic variables

Variable name	Categories (Identity)
Age	55-64(A-1)
	45-54(A-2)
	35-44(A-3)
	25-34(A-4)
	15-24(A-5)
Occupation	Professionals(PRO)
	Employers(EMP)
	Employees(EMPL)
	Self employed workers / street vendors(SE/SV)
	Students(STD)
	Unemployed / Unpaid workers/ Housewives(UEM/UPW/HSW)
	Labourers (LAB)
Religion	Other religion(OTH)
	Christian(CHR)
	Sikh(SIKH)
	Muslim(MUS)
	Hindu(HIN)
Cast	Other backward Class (OBC)
	Schedule tribe(ST)
	Schedule cast(SC)
	General(OPEN)
Level of Education	16 or more years of education(ED-1)
	13-15 years of education(ED-2)
	8-12 years of education(ED-3)
	1-7 years of education(ED-4)
	No education(ED-5)
Annual Income	10 lakhs or more(I-1)
	5-9.99 lakhs(I-2)
	2.5-4.99 lakhs(I-3)
	0-2.49 lakhs(I-4)

Table 2 Analysis of association between covariates and daily consumption of combusting tobacco products in male participants of Ahmedabad (estimates of parameters according to the selected model)

Explanatory Variables		Prevalence Rates			Odds Ratio		
Variable	**Category**	**%**	**L.B.**	**U.B.**	**O.R. (Adjusted)**	**L.B.**	**U.B.**
Age	A-1	32.9	28.06	37.74	0.970	0.585	1.609
	A-2	27	22.71	31.29	0.604*	0.430	0.850
	A-3	19.6	15.89	23.31	0.379*	0.267	0.538
	A-4	24.1	19.47	28.73	0.510*	0.353	0.736
	A-5	34.7	29.66	39.74	1	-	-
Religion	OTH	22	11.43	32.57	0.684	0.350	1.338
	CHR	32.2	29.24	46.76	1.659*	1.049	2.624
	SIKH	20.9	12.55	29.25	0.979	0.557	1.721
	MUS	28.3	24.08	32.52	1.366*	1.026	1.820
	HIN	27.2	24.66	29.74	1	-	-
Cast	OBC	24.7	20.75	28.65	0.924	0.698	1.223
	ST	27.3	20.17	34.43	1.072	0.699	1.645
	SC	33.7	28.85	38.55	1.249	0.917	1.701
	OPEN	26	23.15	28.85	1	-	-
Occupation	PRO	33.8	27.82	39.78	0.828	0.430	1.597
	EMP	25.3	18.77	31.83	0.406*	0.206	0.800
	EMPL	20.4	17.1	23.7	0.268*	0.153	0.468
	SE/SV	17	10.8	23.2	0.246*	0.138	0.438
	STD	31.9	26.63	37.17	0.306*	0.160	0.586
	UEM /UPW /HSW	20.2	14.81	25.59	0.192*	0.108	0.343
	LAB	45.1	38.86	51.34	1	-	-

Level of Education	ED-1	23.4	19.54	27.26	0.734	0.405	1.330
	ED-2	29.2	24.31	34.09	1.152	0.666	1.992
	ED-3	26.3	22.19	30.41	1.048	0.625	1.757
	ED-4	25.2	21.18	29.22	0.820	0.528	1.272
	ED-5	39.8	33.03	46.57	1	-	-
Annual Income	I-1	23.6	19.08	28.12	0.802	0.483	1.331
	I-2	29	24.95	33.05	1.539	0.992	2.385
	I-3	23.7	19.9	27.5	1.104	0.723	1.684
	I-4	31.1	27.33	34.87	1	-	-

4. Discussion

Present study is a statistical study of consumption of combusting tobacco products in male participants (respondents) as effects of different socio-demographic predictors. In Young and old aged (A-1 and A-5) male smoking is highly prevalent. Similar patterns of smoking are found in Christian religion. Schedule cast, students, professionals and illiterates or less educated male participants found to have more consumption habits of combusting tobacco products. Male users with lower income seem to have greater proportion of consumption of combusting tobacco. But these study results may not clear the picture of combined effects of set of predictors as they are individual proportions. To overcome this problem an advance statistical analysis is needed.

Like all other regressions, multiple logistic regression is also a predictive analysis. Logistic regression is used to predict membership of categories of response variable. It can be considered as a zoomed profile of simple proportionate values of tobacco use in any form according to their socio-demographic characteristics and awareness of ill effects. Table 1 presents detailed review of explanatory variables which we believe have an effect on responses and Table 2 presents estimated odds ratios for use of combusting (smoking) tobacco products in male participants using MLR model. It can be seen that some of the categories of predictors are not statistically significant (without *). Odds ratios or EXP (b) of the independent variables are predicted changes in odds for the unit increase in respective dependent variable. The values greater than 1, less than 1 and equal to 1 of odds ratio represent corresponding increase, decrease and no effect on response variable respectively.

5. Results

Table 2 summarizes the analysis of data of current and former male users of combusting tobacco products found in selected sample according to their socio-demographic characteristics (or status) by using multiple logistic regression.

Explanation of odds ratios of Table 2

Odds ratios of male age categories 25-34, 35-44 and 45-54 years of variable age are 0.510*(0.353-0.736), 0.379*(0.267-0.538) and 0.604*(0.430-0.850) respectively compared to baseline age category of 15-24 years. That means male of age between 25 to 54 years are less likely than male of age between 15 to 24 years to get addicted by consumption of combusting tobacco. The odds of Christian male and Muslim male having exposure of combusting tobacco are 1.659(1.049 - 2.624) and 1.366 (1.026 – 1.820) times that of odds of Hindu male having exposure of combusting tobacco respectively .i.e. Christian male and Muslim male are significantly more likely than Hindu male to get addicted by consumption of combusting tobacco products. The odds of male employers, employees, self employed workers/street vendors, students and unemployed/unpaid workers having exposure of combusting tobacco are 0.406, 0.268, 0.246, 0.306 and 0.192 times that of odds of male laboures having exposure of combusting tobacco respectively. I.e. male with higher professions are significantly more likely than male labourers to get addicted by consumption of combusting tobacco products. All odds ratios of categories of education and income variables are not statistically significance.

Predicting Response Probabilities

Log odds (p) = 0.252 - 0.030 (A-1) - 0.503(A-2) - 0.970(A-3) - 0.674(A-4) - 0.380(OTH) + 0.506(CHR) - 0.021(SIKH) + 0.312(MUS) - 0.079(OBC) + 0.069(ST) + 0.222(SC) - 0.188(PRO) - 0.902(EMP) - 1.319(EMPL) - 1.404(SE/SV) - 1.184(STD) - 1.648(UEM/UPW/HSW) - 0.309(ED-1) + 0.141(ED-2) + 0.047(ED-3) - 0.198(ED-4) - 0.221(I-1) + 0.431(I-2) + 0.099(I-3)

For example, let's have a case of predicting probability of getting an exposure of tobacco if a person with following details

Age	Religion	Cast	Occupation	Education	Income
26 Years	Chr	Gen	Emp	17 Yrs	10.2 Lakhs

Log odds = 0.252- 0.674 (1) + 0.506 (1) - 0(1) -0.902 (1)- 0.309 (1)- 0.221(1)

= -1.348

Odds = EXP (-1.348) = 0.26

Predicted Probability = 0.26 /1+0.26 = 0.206

This value 0.206 is the probability of the considered case to get addicted by combusting tobacco products.

6. Conclusion

From the study results we can conclude that a majority of the early age and old age male respondents were habituated with combusting tobacco use. Highest prevalence of smoking was found in Christians, Schedule cast, students, professionals and illiterates or less educated and lower income male participants. Age, religion and occupation are found to have a significant effect on consumption of combusting tobacco products in male users. Very high prevalence rates found in study indicate urgent need of effective tobacco control programs to get rid of this deadly habit.

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