Prevalence of Tobacco Use and Its Different Determinants in a Rural Community of West Bengal: A Cross-Sectional Study Using Lot Quality Assurance Sampling (Lqas) Technique

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Abstract:

Background: *The tobacco epidemic is expanding, especially in less developed countries. Global Adult Tobacco Survey (GATS) India 2009-10, revealed that more than one-third of adults in India as well as West Bengal is addicted to tobacco in its various forms. Though many studies have been carried out in our country on prevalence of tobacco use and its different correlates, but very few of them have applied Lot Quality Assurance Sampling (LQAS) technique, which has a great potential for monitoring or assessing health programs and health conditions.*

Materials and Methods: *A rural community based descriptive observational study with cross-sectional design using Lot Quality Assurance Sampling (LQAS) technique was conducted among randomly selected 729 adults aged 15 years or more, from 81 villages of Amdanga Community Development (C.D.) Block, North 24 Parganas, West Bengal, India, during December 2014 to January 2015. Taking high threshold value of 60% and low threshold value of 30% it was decided that if 4 out of 9 individual in a particular village were found to be using tobacco then the village will be considered as poor performing.*

Results: *64 out of total 81 villages were found to be poor performing regarding tobacco use. 32.4% were tobacco Never user and 67.6% were tobacco Ever user which consists of Current tobacco user (59.0%) and Former tobacco user (8.6%). Tobacco use pattern was found to be significantly different among different genders, educational status, occupational status, marital status and type of family of the study subjects. Significant correlation between age of starting and age of regular use of tobacco was found.*

Conclusion: *The prevalence of current tobacco user in this present study was found to be more than the GATS 2009-10 figures. This study also gave valuable insights into the tobacco use pattern of the people of North 24 Parganas and its determinants. A larger study longitudinal in nature needs to be done to get the risk factors.*

Key words: *Lot Quality Assurance Sampling (LQAS), Never tobacco user, Ever tobacco user, Current tobacco user, Former tobacco user.*

I. Introduction

The consumption of tobacco is the leading preventable cause of death and disability worldwide [1]. The tobacco epidemic is one of the biggest public health threats the world has ever faced. The World Health Organization estimates that every 6 seconds somebody dies from a tobacco related disease and it kills around 6 million people a year globally [2]. More than 5 million of those deaths are the result of direct tobacco use while more than 600 000 are the result of non-smokers being exposed to second-hand smoke [2]. Nearly 80% of the more than 1 billion smokers worldwide live in low- and middle-income countries, where the burden of tobacco-related illness and death is heaviest [2]. Tobacco products imparts financial burden on the families of its users. Moreover the users who die prematurely not only deprive their families of income but also raise the cost of health care and hinder economic development.

The tobacco epidemic is expanding, especially in less developed countries.[3] India is the second largest consumer of tobacco products (after China) and recently has become the second largest (first China) producer of tobacco leaves in the world also (overtaking Brazil).[4,5] 20% of all global deaths attributed to tobacco occur in India; approximately more than 8,00,000 people die and 12 million people fall ill due to tobacco use each year.[6] India ranks second to China in tobacco related deaths.[6] The country has highest number of oral cancer cases due to high prevalence of chewing and smokeless tobacco use especially in rural areas.[7]

Global Adult Tobacco Survey (GATS) India 2009-10, [1] revealed that more than one-third (34.6%) of adults in India use tobacco in some form or the other. The prevalence of overall tobacco use among males is 47.9% and that among females is 20.3%. Among them 20.6% adults use only smokeless tobacco, 8.7% only

smoke and 5.6% smoke as well as use smokeless tobacco. Based on these, the estimated number of tobacco users in India is 274.9 million, with 163.7 million users of only smokeless tobacco, 68.9 million only smokers, and 42.3 million users of both smoking and smokeless tobacco. Prevalence of smoking among males is 24.3% whereas the prevalence among females is 2.9%. The extent of use of smokeless tobacco products among males (32.9%) is higher than among females (18.4%). Nearly two in five (38.4%) adults in rural areas and one in four (25.3%) adults in urban areas use tobacco in some form. Among both males and females, the prevalence of cigarette smoking is higher in urban areas but the prevalence of all other smoking products as well as smokeless tobacco use is higher in rural areas. Prevalence of tobacco use in Arunachal Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tripura, Assam and West Bengal is higher than the national average.

According to GATS, India report 2009-10, [1] in West Bengal more than one third of total adult population is addicted to tobacco in its various forms. Tobacco use is more prevalent among males (52.3%) than females (19.3%). Moreover tobacco use is more in rural than in urban areas.

Though many studies have been carried out in our country on prevalence of tobacco use and its different correlates, but very few of them, particularly in rural areas where the problem is highest, have applied Lot Quality Assurance Sampling (LQAS) technique, which has a great potential for monitoring or assessing health programs and health conditions. That's why the present study was conducted to assess the prevalence of tobacco use and its different correlates among persons aged 15 or more years, in a rural block of West Bengal, covering all the constitutive villages by LQAS technique with the objectives: To identify the socio-demographic and socio-economic profile of the study subjects and to study the prevalence of tobacco use and its different determinants along with nicotine dependence among study subjects.

II.   Materials And Methods

A rural community based descriptive observational study with cross-sectional design using Lot Quality Assurance Sampling (LQAS) technique was conducted among persons aged 15 years or more of Amdanga Community Development (C.D.) Block, North 24 Parganas, West Bengal, India, which is the rural field practice area of the department of Community Medicine, R.G.Kar Medical College, Kolkata, West Bengal, India, during December 2014 to January 2015. With the desired accuracy level of 5% and desired level of confidence of 95% a sample size of total 729 adults aged 15 years or more were randomly selected from 81 villages of Amdanga Community Development (C.D.) Block (9 individual from each village) using LQAS technique.[8] Taking high threshold value of 60% and low threshold value of 30% it was decided that if 4 out of 9 individual in a particular lot (i.e. a particular village) were found to be using tobacco then the lot (i.e. the village) will be considered as poor performing.[8] Data were collected by interviewing study subjects using a pre-designed, pre-tested, semi-structured schedule, after obtaining necessary clearance from Institutional Ethics Committee (IEC). Operational definitions were set according to Global Adult Tobacco Survey India (GATS India), 2009-10 [1]

Data were collected and entered in MS Excel 2010. Categorical data were expressed in proportions, while continuous data were expressed in mean values. In contingency tables, significance of association between the two attributes was analyzed using chi-square (χ^2) test. Degree and direction of relationship between two variables was computed by Pearson's product moment correlation co-efficient (r). Scores were assigned for categorical variables. $P < 0.05$ was considered significant. All the statistical analysis was done in SPSS software, version 16.0 (Statistical Package for the Social Sciences Inc, Chicago, IL, USA).

III.   Results

As per our pre-decided criteria of considering a lot i.e. a village, as poor performing, 64 out of total 81 villages were found to be poor performing regarding tobacco use. The mean age of the 729 study subjects were 41.29 ± 14.57 years, with minimum and maximum age of 16 and 90 years respectively. 76.4% (557 out of 729) were male and 23.6% (172 out of 729) were female. 32.4% were tobacco Never user (236 out of 729) and 67.6% were tobacco Ever user (493 out of 729) which consists of 430 Current tobacco user (59.0%) and 63 Former tobacco user (8.6%). 67.1% (374 out of 557) of males and 32.6% (56 out of 172) of females were current tobacco user. Among tobacco Ever users 68.0% uses smoking tobacco, 23.7% uses smokeless tobacco and 8.3% uses both forms of tobacco. Majority (77.5%, 334 out of 431) of the male ever user used smoking tobacco whereas majority (98.4%, 61 out of 62) of the female ever user used smokeless tobacco and none of the female ever user used both forms although both forms were used by 9.5 % (41 out of 431) of the male ever user. Tobacco use pattern was found to be significantly different (p value < 0.001) among different genders, educational status, occupational status and type of family of the study subjects.

According to table 1 significant statistical difference (p value < 0.05) was also found in tobacco use pattern and marital status of study subjects. No significant difference (p value > 0.05) was found among different religions in respect to tobacco use pattern. Highest proportion of tobacco ever user was found among age group 49 years and above (76.9%) where as it was lowest in age group 18 years and below (40.0). Mean age

of tobacco initiation was 19.8, 19.3 and 23.1 years for overall, male and female subjects, respectively. Tobacco use pattern was almost comparable among different castes and socio-economic classes. Majority (67.6%) of the study subjects were found to be tobacco ever user.

According to table 2 significant association of tobacco use pattern is found among study subjects and family members (p<0.05). Highest proportion (33.7%) of tobacco use among relatives of ever user study subject was found among sons followed by fathers (27.8%) of the users. Majority (66.94%) of the tobacco ever user used tobacco outside home/ home premises. Majority (35.8%) of the current tobacco user used tobacco 6 to 10 times a day whereas majority (30.2%) of the former tobacco users had had used tobacco equal to more than 21 times a day. 56.7% (72 out of 127) of the current tobacco user who consulted a doctor in last 12 months had been advised to quit tobacco. Most (58.7%) of the former users had quitted tobacco for more than 12 months. Majority (47.6%) of them had quitted in 1 to 2 attempts. Health problem or diseases and doctor's advice had been the reason for quitting in most (61.9%) of the cases. According to figure1significant correlation between age of starting and age of regular use of tobacco was found (Pearson Correlation co-efficient = 0.953).

Mean expenditure on tobacco products per month was found to be 148.96 ± 147.60. The expenditure on tobacco per month in percentage (%) of per capita income per month were found in 39.4%, 28.0%, 17.4%, 7.5% and 7.7% cases for <10 %, 10-20 %, 20-30 %, 30-40 % and >40 % expenditure respectively.

IV. Discussion

Current tobacco use in any form, in this present study, was found to be 59.0% among all study subjects and 67.1% and 32.6% among male and female study subjects, respectively. But according to GATS 2009-10 the percentage of current tobacco use in West Bengal among adults, males and females were 36.3%, 52.3% and 19.3 % respectively. So the prevalence of current tobacco user in this present study was found to be more than the GATS 2009-10 figures. The possible explanation could be that the present study was conducted in rural area only where the prevalence tobacco use is more in comparison to urban areas according to GATS 2009-10 and the respective figures in GATS 2009-10 were for both urban and rural area together. But the study conducted by Mondal TK et al in four villages of Bhatar block of Bardhaman district of West Bengal during 2011 showed the tobacco use prevalence among males aged 15 years and more was 61.2% which was 77.4% in this study, clearly showing a high prevalence among males in the present study area. Other comparative findings are given below in tabular form.

Variables		Findings	
		Present study	Past studies
Tobacco never user		32.4 %	62.3 % [1]
Tobacco current user		59.0 %	36.3 % [1]
Tobacco former user		8.6 %	1.4 % [1]
Prevalence of smoking tobacco among ever users		68.0 %	81.7 % [11]
Prevalence of smokeless tobacco among ever users		23.7 %	6.5 % [11]
Prevalence of both forms of tobacco among ever users		8.3 %	11.8 % [11]
Tobacco never user	Male	22.6 %	47.7 % [1]
	Female	64.0 %	80.7 % [1]
Smoking tobacco	Male	60.0 %	26.6 % [1]
	Female	0.01 %	1.5 % [1]
Smokeless tobacco	Male	10.1 %	12.8 % [1]
	Female	35.9 %	17.3 % [1]
Both	Male	7.3 %	12.9 % [1]
	Female	0.0 %	0.4 % [1]
Tobacco ever user	Hindu	64.5 %	36.5 % [11]
	Muslim	69.6 %	13.6 % [11]
Mean age of tobacco initiation(years)	Overall	19.8	17.8 [1]
	Male	19.3	18.0 [1]
	Female	23.1	17.1 [1]
Time since quitting for former tobacco users	Less than 12 month	41.3 %	12.6 % [1]
	More or equal to than 12 months	58.7 %	87.4 % [1]

V. Limitations

This study gave valuable insights into the tobacco use pattern of the people of North 24 Parganas and its determinants despite the fact that it was a cross sectional study and with limited resources. A larger study longitudinal in nature needs to be done to get the risk factors.

Conflict Of Interest: Declared none.

Sponsorship: Self sponsored

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Table 1: Showing the prevalence of tobacco use pattern according to various factor (n=729).

SEX				
MALE	126 (22.6)	431 (77.4)	557	1.025, 1, p<0.001
FEMALE	110 (64.0)	62 (36.0)	172	
AGE GROUPS (IN YEARS)				
LESS THAN 18	6 (60.0)	4 (40.0)	10	
18-28	71 (42.5)	96 (57.5)	167	
29-38	48 (30.4)	110 (69.6)	158	
39-48	59 (34.9)	110 (65.1)	169	
49 AND MORE	52 (23.1)	173 (76.9)	225	
RELIGION@				2.003, 1, p = 0.157
HINDU	100 (35.5)	182 (64.5)	282	
MUSLIM	136 (30.4)	311 (69.6)	447	
CASTE				
GENERAL	132 (29.1)	322 (70.9)	454	
SCHEDULE CASTE (SC)	70 (40.0)	105 (60.0)	175	
SCHEDULE TRIBE (ST)	1 (16.7)	5 (83.3)	6	
OTHER BACKWARD CLASS (OBC)	33 (35.1)	61 (64.9)	94	
EDUCATIONAL STATUS #				
ILLITERATE	47 (22.6)	161 (77.4)	208	
PRIMARY	98 (33.8)	192 (66.4)	290	12.707, 1, **p<0.001**
SECONDARY	62 (34.6)	117 (65.4)	179	
HIGHER SECONDARY	21 (50.0)	21 (50.0)	42	
GRADUATE	8 (80.0)	2 (20.0)	10	
OCCUPATIONAL STATUS #				
UNEMPLOYED	24 (55.8)		43	
UNSKILLED	164 (33.6)	324 (66.4)	488	11.469, 1, **p<0.001**
SEMI-SKILLED	44 (23.2)	146 (76.8)	190	
SKILLED	4 (50.0)	4 (50.0)	9	
MARIATAL STATUS #, ##				
MARRIED	172 (30.0)	402 (70.0)	574	7.150, 1, **p = 0.007**
UNMARRIED	46 (52.3)	42 (47.7)	88	
WIDOW	16 (44.4)	20 (55.6)	36	
WIDOWER	2 (6.5)	29 (93.5)	31	
TYPE OF FAMILY				12.609, 1 **p<0.001**
NUCLEAR	106 (40.6)	155 (59.4)	261	
JOINT	130 (27.8)	338 (72.2)	468	
SOCIO-ECONOMIC STATUS (CLASS)				
CLASS I	1 (100.0)	0 (0.0)	1	
CLASS II	6 (50.00)	6 (50.0)	12	12.609, 1 **p<0.001**
CLASS III	16 (30.8)	36 (69.2)	52	
CLASS IV	93 (33.3)	186 (66.7)	279	
CLASS V	120 (31.2)	265 (68.8)	385	
TOTAL	**236 (32.4)**	**493 (67.6)**	**729 (100.0)**	

@@ - PCMI = Per Capita Monthly Income; * - Chi-square test was not done in case of variables where the value is not given in respective columns; @ - There were only two religion (Hindu and Muslim) among the study participants.; # - Chi-Square test was done by grouping some variables i.e. illiterate and literate, unemployed and employed and married and others; ## - There were no participant who were divorced or separated or otherwise than mentioned.

Table 2: Showing comparison of tobacco use pattern among study subjects according to family member tobacco use pattern . (n = 729)

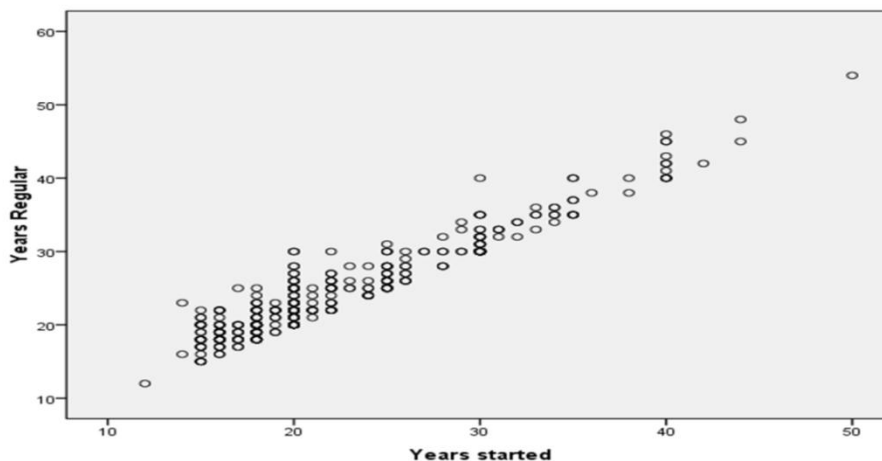| Family member tobacco use pattern	Never-user No (%)	Ever-user No (%)	Total No (%)
Never-user	122 (37.3)	205(62.7)	327 (100.0)
Ever-user	114(28.4)	288(71.6)	402 (100.0)
Total	236 (32.4)	493 (67.6)	729 (100.0)
Chi-square value-6.599 ,df-1, p value -0.010.(< 0.05)			

Figure-1: Scatter Dot diagram showing correlation between age of starting tobacco use and age of using tobacco regularly among tobacco ever users. (n = 493).