Behavioral risk factors of non communicable diseases: Experience from a village of Hoogly district, West Bengal

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Abstract: *Behavioral risk factors play an important role in causation of NCDs. Five of the top 10 risks worldwide is specific to non communicable disease. Ischemic heart disease and stroke are projected to increase further by 2020, and developing countries will experience the highest burden. The study was carried out to find out the prevalence of behavioral risk factors and their association with socio demographic variables. A cross sectional study was carried out among 730 subjects of 15-64 yr age group in a village of West Bengal with help of pre designed proforma. Data taken on socio demographic variables, behavioral risk factor and then analyzed using statistical software. Study population comprised of nearly 57% male, 70% Hindu, 20% illiterate and 35 % unemployed. Median PCI p.m. was Rs.1100/-. 22.9% used smoked and smokeless tobacco, 75.2% current tobacco users, 21% current drinkers, 38.5% had sedentary lifestyle, 27.1% heavily active, 46.2% took vegetables regularly, 40.8% took fruits regularly, nearly 50% added extra salt most of the times. Unsaturated oil was used by79.6%. Age, sex, PCI, employment, education seen to be associated significantly (p < .05, 95% CI) with physical activity. Education had significant association with many behavioral risk factors (p <.01). Healthy lifestyle and increase in level of education is the need of modern time.*
Keywords: *NCDs, Behavioral risk factors, Risk, Socio demographic variables, PCI, Healthy lifestyle.*

I. Introduction

Non communicable diseases (NCD) are defined as those diseases that are not transmissible or caused by injury. The increase in NCD cases result from an increasing life expectancy at birth, a reduction in the number of cases of communicable diseases and changing lifestyles. Behavioral risk factors such as tobacco use, alcohol consumption, low consumption of fruit and vegetables and a lack of physical activity lead to the intermediate risk factors such as obesity, hypertension, raised blood glucose and cholesterol levels, and contribute to cardiovascular diseases, cancer, diabetes. Risk, as discussed in the WHR (World health report) 2002 [1], is a probability of an adverse outcome, or a factor that raises this probability. Five of the top 10 risks worldwide are specific to non communicable disease.[1]These include raised blood pressure, tobacco use, alcohol consumption, cholesterol, and obesity or overweight. Individual behavior is only part of the problem. Seventy five percent of total deaths due to NCDs occur in the developing countries.[2] The burden of diseases due to NCDs in India became almost equal to that due to Communicable diseases in 1990. [3] Cardiovascular diseases was responsible for approximately half of NCD mortality and one quarter of NCD morbidity rate in 1999, mainly in low- and middle-income countries. [4] Based on current trends, by 2020, these diseases are expected to account for 73% of deaths and 60% of the disease burden in India. [2] The rising burden of non communicable diseases and its risk factors have consequences on health, social and economical situation of a country. In India, chronic diseases accounted for 53% of all the deaths in 2005.Of these, 29% were due to cardiovascular diseases.[5] Not only this, Indians succumb to diabetes, high blood pressure and heart attacks 5-10 years earlier than their western counterparts. [6, 7] Recently, there is also evidence that cardiovascular diseases are becoming the leading cause of death even in rural India. [8] Protecting the poor, rural and disadvantaged sections of India is going to be a huge public health challenge. Indians can escape from these diseases; prevent these diseases by changing their lifestyles. [9, 10, 11] There are limited data on prevalence of these risk factors in rural population. Controlling today's risk factors are important for controlling tomorrow's non communicable diseases. Therefore present study was carried out to estimate the prevalence of various behavioral and modifiable risk factors for common non communicable diseases and to identify their biosocial association in a village of West Bengal.The study was carried out keeping the following objectives in mind. Firstly, to find out the prevalence of behavioral risk factors and to determine presence of association, if any, between the socio demographic variables and the risk factors.

II. Materials and Methods:

A Descriptive epidemiological study using cross sectional design was carried out among 15-64 yr age group population residing in a village of Singur block of Hoogly district, West Bengal. The village under study

was selected by simple random sampling from a list of villages obtained from the register[12] of rural health unit and training centre, Singur Block of Hoogly district, West Bengal with a registered population of 1265. The community was very cooperative. All males and females between 15-64 year age group were considered as the eligible population to be included under study. There were some exclusion criteria like acute illness, deaf & mute person, communication barrier, pregnant woman. The final study population was 730. Interview was taken using pre designed, pre tested and semi structured schedule, modified in line with IDSP questionnaire.[2]The schedule was prepared in local language. Data was collected on socio demographic variables, behavioral risk factors of common non communicable diseases by house to house visit. Informed verbal consent was obtained from each subject. The behavioral risk factors considered under the study were tobacco use, alcohol consumption, physical inactivity, vegetable intake, fruit intake, extra salt intake with food, intake of oils.The sub groups under tobacco use,alcohol consumption, physical activity based on IDSP schedule. [3] There were 3 sub headings under extra salt-intake with food namely Low salt-intake group/never or rarely, moderate salt-intake group/sometimes, high salt-intake group/most of the times. [13]All data were coded, entered into MS Excel, double checked, and analyzed with EPI-INFO (version-3.4.3). For categorical risk factors, contingency tables were used and the strength of association was measured using the Chi-squared test (χ^2). P value was considered significant if $P < 0.05$.

III. Results:

The present study population comprised of 56.7% males and 43.3% females.45.9% were <35 yrs whereas around 15 % were >55yrs of age. Mean age of male is less (36.49yrs) than female (38.13yrs). Out of population under study, majority were Hindus (69.9%).19.9% of population were illiterate or just literate. Only 23.3% of study populations had more than secondary level education. Illiteracy were more prevalent among females than males (29.7% vs. 12.3%), whereas higher education were more or less similar among both sexes (5.8% vs. 7.3%). Males acquired more middle (37.7%) and secondary (22.2%) education in comparison to females (23.4% and 11.1% respectively).It was seen that, 34.8% of study population were unemployed.33.8% were unskilled labor,8.2% were skilled labor,2.7% engaged in service,12.1% had business and 8.4% were student. Prevalence of unskilled labors was more in males (37.4%) than females (29.1%). 55.4% of females were found to be homemaker. 419 subjects fall between 1st quartile and 2nd quartile (rs.750/- to rs.1100/-).43% belong to 3rd and 4th quartile. (rs.1650/- to rs.2500/-). The median PCI was Rs.1100/-per month.(table I)

12.3% of study population used smoked tobacco products whereas 40% used smokeless tobacco products. 22.9% of study population used both.(table II) Only 24.8% were not using tobacco products in any form.11.6% were using cigarette, 29.0% using bidi, 4.5% took snuffs and 18.8% took chewed tobacco, while 51% were users of gutkha.75.2% of study population was current tobacco users whereas 13.9% were past or ex users and 10.8% did not use tobacco products at all. Current tobacco usage was seen more among females (76.6%) than males (74.1%). Median age of starting of tobacco products was 16 years in male,18 years in females. It was seen in the present study that among current tobacco users, the mean number of years of current tobacco use was marginally higher among males (19.62) than females (18.0). The average years of tobacco use had been increased as age advanced in both sexes. It was seen that7.5% of study population was high risk drinkers whereas 21% were current drinkers and 9.9% were former drinkers.61.6% of study population were life time abstainers (table II). No females under study reported alcohol consumption. Among current drinkers, the mean age of commencing drinking was 18yrs. Sedentary habit or physical inactivity was present in 38.5% of study population. Heavy physical activity was observed in 27.1% of population (table II). Only 0.9% of population practiced yoga.6.2% considered their physical activity to be light, whereas 33.8% thought their physical activity to be moderate and 30.5% considered themselves to be heavily active physically. 38.7% of population (who work outdoors) spent 7-8 hours at work whereas 49.5%) spent more than 8 hrs at work. Only 2.9% of study population spent <=4 hrs at work (table IV). It had been observed that only 1.5% did slow walking, 0.9% did brisk walking,0.4% did jogging,1.9% did cycling at times, 4.8% involved in physically active games.

Regarding the dietary habit, it was seen that 46.2% of study population took vegetables regularly / 3-4 times a week and 40.8% of study population took fruits regularly / 3-4 times a week. Majority (49.5%) of study population added extra salt most of the times after food was served. Only 19.7% did not take extra salt with food. Unsaturated oil was used by majority (79.6%) of study population whereas 20.4% study population consumed saturated oils/fat (table II).Mustard oil was most commonly (64.4%) used followed by sunflower oil (8.5%) and white oil (6.7%) among unsaturated oils. Ghee was most commonly used (14%), followed by coconut oil (6.4%).
Tobacco use was associated significantly with age group, level of education and employment status while alcohol consumption had association with level of education, per capita income, employment status and it was found significant. Physical activity seen to be significantly associated with age group, sex, level of education, per capita income, employment status. A significant association was noted between vegetable intake with age group, level of education, and per capita income whereas fruit intake had association with age group, sex, level of education and per capita income. Extra salt intake with food was associated with sex, level of education and per capita income

and this was also significant. An association was noted between oil/fat intake with level of education and per capita income. (p<.05)

IV. Discussion:

In the present study, there were 730 subjects between 15-64 yrs age comprising of 56.7% males and 43.3% females. A project [14] done in a rural setting between 25-64 yrs age among which 47% were males and 53% were females. Another study [15] included 121 subjects of 15 – 64 yrs and among them 46.3% were males and 53.7% were females. So it was seen that in present study the percentage of females were less than reference studies and this is in true sense a matter of concern. In the present study, 84.9% of population were in 15-54 yrs which was quite similar (88%) to the study done by Mehan M B et al.[15] In present study, 69.9% were Hindus, 30.1% Muslims.42.6% lived in nuclear family. 10.8% were unemployed. 33.8% unskilled labor, 8.2% skilled labor, 2.7% engaged in service, 12.1% had business and 8.3% were students. 55.4% of females were homemaker. The study done by Mehan M B et al [15] revealed that, 84.3% lived in nuclear family. 94.2% were Hindus, 2.5% were Muslims.62.8% had graduate level education,14.9% had high school education.33.1% were homemakers, 28.1% non government employees, 13.2% self-employed, 10.7% government employees, 9.9% retired persons,5% students. Regarding level of education,19.9% of study population were illiterate,24.8% had primary, 17.4% had secondary,6.4% had higher level of education. Illiteracy were more prevalent among females than males (29.7% vs. 12.3%), whereas higher education were more or less similar among both sexes (5.8% vs. 7.3%). Another study done by Kaur P et al[16] found that 7.2% had primary, 47.3% had secondary, 45.5% had higher education. In the present study prevalence of tobacco use was 75.2% among which current daily users were 34.4% and occasional users were 40.8%. Similar results were elicited by various authors in their studies. [14, 17] Prevalence of tobacco use was less in some studies [15, 18] that might be due to different locations, huge variation in age range and socio cultural differences. There was not any difference at all regarding usage of tobacco between sexes in this study in contrast with most of the studies by various authors where the difference was remarkable. [14, 15, 17, 19] 12.3% of study subjects used smoked tobacco products whereas 40% used smokeless tobacco products and 22.9% of study populations used both and this was less than what found in another study carried out by Sinha D N et al. [17] The mean age of commencing daily tobacco use was less for males 16.37 yrs than in a state conducted study (19.9 yrs). [14] The median age of starting of tobacco products was 16 years in male, 18 years in females in this study which was less than findings by author Sugathan T N et al [19] in his study and this might be due to educational differences and family influences between two communities. Prevalence of current drinkers was 28.5% in present study and the result was similar as found by some authors in their studies. [20, 21] But on other hand the prevalence was more in comparison to a study done in similar setting done by Pandey et al[22] and this might be due to suppression of facts by the participants. No females under present study reported alcohol consumption and this was found in other studies done by various authors. [19,20,21,22] In studies by other authors, females were not drinkers and if drink, the percentage was almost nil. In the present study, the findings of physical activity were quite similar to a study carried out by Sugathan T N et al[19] but prevalence of physical inactivity/sedentary habits in present study was more than some studies carried out by other authors. [20, 27, 28] It can probably be inferred that physical inactivity is increasing in rural area also which is definitely a matter of concern. Physical inactivity was seen among 38.6% females and among 38.4% males. Prevalence of adequate vegetable and fruit intake in present study was 46.2% and 40.8% respectively. The prevalence was found to be more than prevalence found in a study done by Anand K et al. [26] Similar result was elicited in a study carried out by Pandey et al.[22] Majority (49.5%) of study population added extra salt Most of the times after food was served. In a study[22] carried out in similar settings, it was seen 27.7% of population added extra salt with food. 20.4% of present study population consumed saturated oils/fat which was far less than the percentage (47%) found in a study done in rural area by Agarwal V K et al. [25] In the present study age group was found to have significant association with tobacco use similar to the studies by Gupta et al[27] ˑKaur P et al[16] ,Alam AY et al. [28] Level of education was found to have significant association with alcohol consumption in the study like other studies. [19,29] Present study revealed that physical activity was associated significantly with age group, sex, level of education, per capita income, and employment status. Association of age group, employment status with physical activity was also found in a study done by Sugathan T N et al. [19]

There are very few studies regarding association of diet with socio demographic variables. In the present study, fruit intake and vegetable intake was associated with level of education and per capita income same as other study. [19] Females had lower intake of vegetables (42.4% vs.49%) and fruits compared to males (32.3% vs. 47.3%) in this study and the findings were similar with the findings of a study. [15]

V. Conclusion:

It has been concluded that the study population lacked healthy lifestyle in terms of behavioral risk factors. It was seen that one fifth of the respondents were either illiterate or just literate which is really a matter of concern.

Therefore the local administrative authority to take an active step in arranging some health awareness campaign in grassroots level at regular interval to improve the lifestyle of the respondents. Active participation of the people can be elicited by proper motivation.

Acknowledgements:

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TABLES:

TABLE [I]: Socio demographic profile of study population (n=730)

Variables	Number (%)
Age group	
< 35 yrs	335 (45.9)
35 - 54yrs	285 (39.0)
55-64yrs	110 (15.1)
Sex	
Male	414 (56.7)
Female	316 (43.3)
Religion	
Hindu	510 (69.9)
Muslim	220 (30.1)
Family type	
Nuclear	311(42.6)
Joint	419(57.4)
Level of education	
Illiterate/Just literate	145 (19.9)
Primary/middle	411 (56.3)
Secondary/ Higher	174(23.8)
Employment status	
Unemployed	254 (34.8)
Employed	415 (56.8)
Student	61(8.4)
Per capita income per month	
$1^{st} – 2^{nd}$ quartile	419 (57.4)
$3^{rd} – 4^{th}$ quartile	311(42.6)

TABLE [II]: Some socio demographic variables by sex (n=730)

Variables	Sex	
	Male (n=414) **N (%)**	**Female (n=316)** **N (%)**
Age group		
15-24yrs	108 (14.8)	82(11.2)
25-34yrs	84 (11.5)	61(8.4)
35-44yrs	92 (12.6)	57(7.8)
45-54yrs	80 (10.9)	56(7.6)
55-64yrs	50 (6.8)	60(8.2)
Level of education		
Illiterate/Just literate	51 (6.9)	94 (12.9)
Primary	91 (12.5)	90 (12.3)
Middle	156 (21.4)	74 (10.1)
Secondary	92 (12.6)	35 (4.8)
Higher	24 (3.3)	23 (3.2)
Employment status		
Unemployed	79 (10.8)	0
Unskilled labor	155 (21.2)	92 (12.6)
Skilled labor	36 (4.9)	24 (3.3)
Service	20 (2.7)	0
Business	88 (12.1)	0
Student	36 (4.9)	25 (3.4)
Homemaker	0	175 (23.9)

TABLE [III]: Prevalence of behavioral risk factors (n=730)

Behavioral risk factors	Number (%)
Type of tobacco use	
Only Smoked tobacco products	90 (12.3)
Only Smokeless tobacco products	292 (40.0)
Smoked and smokeless tobacco products(both)	167 (22.9)
Type of drinkers (Frequency of drinking)	
High risk drinker (Equal / > 5 days a wk)	55 (7.5)
Current drinker (1-4 days a week/ 1-3 days a month/less than once a month)	59 (8.1), 94 (12.9)
Former drinker	72 (9.9)
Life time abstainer	450 (61.6)
Physical activity	
Sedentary/Inactive	281 (38.5)
Medium	251 (34.4)
Heavy	198 (27.1)
Vegetable intake	
Regularly/3-4times a week	337 (46.2)
Sometimes/never	393 (53.8)
Fruit intake	
Regularly/3-4times a week	298 (40.8)
Sometimes/never	432 (59.2)
Extra salt intake with food	
Most of the times	361 (49.5)
Sometimes	225 (30.8)
Rarely/Never	144 (19.7)
Intake of oils/fat	
Unsaturated oils	581 (79.6)
Saturated oils/fat	149 (20.4)

TABLE [IV]: Association between the socio demographic variables and the behavioral risk factors

Socio demographic variables	Behavioral risk factors						
	Tobacco use	Alcohol consumption	Physical activity	Vegetable intake	Fruit intake	Extra salt intake	Fats/oils intake
			STATISTICS *				
Age group (yrs)	χ^2=46.92 P=.000	χ^2=6.57, P=0.16	χ^2=50.56 P=.000	χ^2=25.34 P=.000	χ^2=39.71, P=.000	χ^2=16.28 P=.03	χ^2=0.46 P=.97
Sex	χ^2=.44, P=0.50		χ^2=37.49, P=.000	χ^2=2.91 P=0.08	χ^2=16.22 P=0.000	χ^2=18.25 P=0.000	
Education	χ^2=18.26 P=0.001	χ^2=17.82 P=0.001	χ^2=72.285 P=.000	χ^2=20.32 P=.000	χ^2=26.41 P=.000	χ^2=70.71 P=.000	χ^2=20.99 P=.000
Per month per capita income	χ^2=5.43 P=0.14	χ^2=20.30 P=0.000	χ^2=38.92 P=.000	χ^2=17.08 P=.001	χ^2=54.84 P=.000	χ^2=23.73 P=.001	χ^2=15.83 P=.001
Employment status	χ^2=46.09 P=0.000	χ^2=148.8 P=0.000	χ^2=372.18 P=0.000				

*degree of freedom varies