



## Behavioural Risk Factor Profile of NCDs Among Adults Residing In Rural Areas Of Krishna District: A Study Based On WHO STEPS approach

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### Abstract

**Introduction:** Even after a lot of research that is being carried out in the area of non-communicable diseases, still there is a gap existing regarding the knowledge of clustering of cumulative risk factors which urges a constant survey in various study groups.

**Materials and Methods:** A community based cross sectional study was carried out among 750 participants selected residing in the rural field practice area of a medical college, using WHO-STEPs instrument. Data regarding socio demographic variables, behavioural risk factors, anthropometric measurements were collected.

**Results:** In this study prevalence of smoking was found to be 19.3%, alcohol consumption is 22% and all the women were never users of alcohol, only 58% had a habit of eating at least one serving of fruit per day, physical inactivity was more among women and unemployed people and 20% of them being habituated to sedentary lifestyle and abdominal obesity was found in 18.9% of the study population and most of the risk factors were found to have significant association with socio demographic variables

**Conclusions:** Community intervention approaches should be taken up in a large scale which should be focused more on behavioural change and not mere provision of information about the harmful effects.

**Keywords:** Non communicable diseases, WHO STEPS approach, Risk factors, Tobacco Usage, Alcohol Consumption

### Introduction

Non-communicable diseases (NCDs) refer to conditions which are chronic and life style related. Previously they were called as “diseases of affluence [1]”. Even now NCDs are still emerging as an important global public health challenge for the post 2015 era while threatening the achievement of millenium development goals (MDG) [2].

Most of the NCDs usually share four common behavioural risk factors: Tobacco use, harmful use of alcohol, unhealthy diet and physical inactivity,

which cause an underlying pathological process which is likely to continue progressively unless intervened leading to NCD.[3] Nearly 40 to 50 % of the NCDs are preventable by early detection and treatment or altering the risk attributed life styles. So, there is a need to understand and determine the “causes of the cause [4]” to understand primordial determinants of these risk factors and their clustering patterns

Though many projects are being carried out to address the same, still there is a huge gap in the available knowledge regarding their causative factors

and cumulative effects. To ensure uniformity and to reduce such gaps WHO has started an initiative in the form of WHO- STEP approach.[5]

As per the National Programme for Control of Cardio Vascular Diseases, Diabetes, Cancer & Stroke (NPCDCS), we are having very limited data available, which can be compared at national as well as global levels.[6] So, to avoid such paucities in data every effort must be kept to develop the national a sub-national level data at the regional levels so that it can be pooled to the national data and help in its application in planning control strategies.

Keeping in view about all these gaps in existing knowledge regarding the NCDs especially in the rural areas, a need was felt to carry out this study to know the pattern of the occurrence of various risk factors and the influencing factors in the study area.

### **Materials And Methods:**

This was a “community based cross- sectional study” which was carried out among 750 individuals aged 15-64 years, residing in rural areas catered under Rural Health Training Centre (RHTC) of a medical college for more than a year before the study period and are willing to participate in the study, while excluding Pregnant women and very sick persons.

### **Sample Size And Sampling Technique:**

Sample size was estimated based on study conducted by WHO-ICMR[7], of which the least prevalent risk factor is considered for calculating the sample size using the formula  $4pq/l^2$  considering an allowable error of 20% and the final sample size estimated was 750.

Study area had 7 villages in total, as only one participant was planned to study from each household, total number of households from each village are drawn by Probability Proportion to Size (PPS) method, and each house is selected by systematic random sampling. Finally one adult from each household, among all who are available at the time of visit has been selected for the study by lottery method

### **Data Collection:**

The data was collected at the patients residence using a Pre-tested, semi structured questionnaire based on WHO-STEPS approach to study various modifiable

risk factor[8]. Data regarding, sociodemographic variables like age, gender, education, marital status, income and occupation was collected. Whereas data regarding behavioural risk factors like tobacco usage, alcohol consumption, unhealthy diet and inadequate physical activity were collected and anthropometric measurements like height, weight, hip and waist circumference were measured. A pilot study was done on 10% of the sample to assess feasibility & acceptability of the questionnaire, and modifications were made where ever necessary

### **Measuring Anthropometric Variables:**

Height of the person is recorded in metres using a portable height measuring rod, with the person standing barefooted against the wall and head placed in the Frankfurt plane, eyes looking forwards. Weight of the person is recorded in kilograms. The supine waist measurement was taken at the level of umbilicus, while the person was breathing[9].

### **Operational Definitions:**

#### **Socio Demographic Variables:**

*Educational status:* Literacy status of a person was determined depending upon the years of attending to school and an illiterate is one who has never been to school.

*Occupation:* It is classified as house work, unemployed, manual worker, non- manual or professional worker[10].

*Socio-economic status:* Socio- economic class of the study subjects was decided by using modified B.G. Prasad classification 2019.[11]

#### **Behavioural Risk Factors:**

##### **Tobacco And Alcohol Usage:**

*Current user:* A person who used tobacco and/or alcohol in the past 30 days either occasionally or on a daily basis[3]

##### **Unhealthy Diet:**

As per WHO, healthy diet is consuming at least 400 grams of vegetables and fruits per day or 5 servings of 80 grams of fruits and vegetables per day.[12]

*Physical Inactivity:* The person is categorised as a heavy/ moderate/ sedentary worker basing on the guidelines followed in the STEPS approach, as the type of work during leisure and recreational activities

was difficult to elicit a composite index was taken which was the overall type of work by that person.[13]

**Overweight** was defined by BMI  $\geq 25\text{kg/m}^2$  and obesity as BMI  $\geq 30\text{kg/m}^2$  [3] and

**Abdominal obesity** was defined by waist circumference  $\geq 90$  cm in men and  $\geq 80$  cm in women.[3]

### **Ethical Considerations:**

Approval from IEC was obtained before the inception of the study.

### **Statistical Analysis:**

Data was managed and analysed using SPSS Statistics for Windows Version 22.0 (trial version). Categorical data were represented in proportions alongside confidence intervals and continuous data were expressed in mean with standard deviations (SD). Pearson's Chi-square test was applied as a test of significance to find associations amongst variables under consideration. Bivariate analysis was performed to find the relation between sociodemographic variables and risk factors and expressed as crude odds ratio (OR) with 95% Confidence intervals (CI). Multivariable logistic regression was done considering each risk factor as binary as dependent variable (0 = absence, 1 = presence) and sociodemographic factors were considered as independent predictor covariates. The final models were expressed in terms of adjusted OR (AOR) with 95% CI.  $P < 0.05$  was considered as statistically significant.

### **Results:**

#### **Socio-Demographic Characteristics [Table 1]:**

A total of 750 eligible adults have consented and participated in the study. Of them, 40.3 % were male & 59.7% were female and the mean age of the study population was  $39.67 \pm 13.70$  years. 33.7% of the study population were illiterates, among the literates majority were educated at least up to secondary education. Nearly 55.2% of the study population were manual workers, as this is a study done in the rural settings majority of the population were indulged in the agricultural work. 20.1% were housewives and 19% of the study participants were unemployed, students, and retired personnel. A very minority of 5% were professionals. Majority of the

study population belonged to class II and class III, whereas only a minority of 2% belonged to class V as per modified BG Prasad classification.

#### **Behavioural Risk Factors: (Table 2)**

The overall prevalence of tobacco use in the study population was 19.3% (95% CI: 16.6-22.3) of whom only 3% were female. Of the current tobacco users, 75.86% were smokers and majority of them (87%) claimed to be daily smokers and on an average 4-6 cigarettes were smoked. Majority of them claimed to use manufactured cigarettes whereas old aged smokers claimed to use hand rolled tobacco (chutta). Whereas, 13.7% used smokeless forms of tobacco and average consumption per day was 4-6 times. Mean age of initiation of tobacco usage in any form being  $20.27 \pm 4.95$  years Among the non-users, nearly 30% of them were exposed to second hand smoking.

Over all alcohol consumption was found to be 9.6% (7.6%-11.9%).The study found that 22% of men were alcoholics of whom, 37% were daily consumers of the beverage. Mean age of initiation of the habit being  $22 \pm 4.2$  years.

Of the study participants, 91.3% were taking mixed diet and were consuming vegetables daily, with 2.2 times as the mean number of servings, but are not very particular about adding leaf greens to their diet. Though fruits are readily available in the study area, only 42.8% (39.2%-46.4%) had a habit of eating at least one serving of fruit daily. 14.3% of the study population had a habit of eating fried foods. Average percapita salt consumption was on the higher sides in majority of the households.

Nearly 72% of the study participants were engaged in moderate physical activity and 20% being sedentary only a minority of 8% were engaged in high intensity work. Majority of them are not very keen on recreational physical activity and only a meagre 10% are involved in such activities.

#### **Metabolic Risk Factors: (Tables 3, 4 And 5)**

Nearly one fifth i.e, 18.9% of the study population were obese, 6% being males and 13.1% female. Of the 47.5% participants having abdominal obesity, 16.3% were male, and 31.2% female which clearly signifies a strong female preponderance for abdominal obesity.

Results of regression analysis are shown in Tables 3, 4 and 5. On bivariate analyses, increasing age, male sex and illiteracy were found to be significantly associated with tobacco use. Whereas, in case of alcohol consumption a statistically significant association was found with male gender and illiteracy. Unhealthy diet is seen more in people with SES more than class 3. Female, unemployed were sedentary. Increasing age has been found to be a significant factor for obesity. Finally, behavioural risk factors were found to be more with increasing age, male gender and illiterates.

On multivariate analysis for current tobacco use, male gender, educational status, occupation and marital status contributed significantly to the final model. For alcohol consumption, male gender and illiteracy were found to be significantly associated. For the tobacco model, 24.5% (Cox and Snell  $R^2$ ) and 39.1% (Nagelkarke  $R^2$ ) of variance in tobacco use was associated with the predictor covariates. Whereas, 14.0% (Cox and Snell  $R^2$ ) and 30% (Nagelkarke  $R^2$ ) of variance in alcohol use was associated with the predictor covariates in the alcohol model. Overall predicted values of 80.8% and 76.2% of tobacco and alcohol use was observed in participants. Multivariable logistic regression analysis of unhealthy diet and physical inactivity were not shown as none of the sociodemographic factors were found to be significant on bivariate analysis. In the adjusted model for abdominal obesity, sequentially increasing odds were observed in older age groups and women showed higher odds of abdominal obesity compared to men. For the overweight model, 9.8% (Cox and Snell  $R^2$ ) and 13% (Nagelkarke  $R^2$ ) of variance of being overweight was associated with the predictor covariates. Whereas, the predictor covariates in the abdominal obesity model were associated between 11.8% (Cox and Snell  $R^2$ ) and 16.2% (Nagelkarke  $R^2$ ) of variance of having abdominal obesity. Overall, these models predicted 53.1% and 64.4% of overweight and abdominal obesity in participants. The final regression models for tobacco and alcohol use and abdominal obesity were found to be adequately fitted, as the Hosmer and Lemeshow test was not significant for these models.

## Discussion:

This study mainly focuses on the NCD risk factor profile among rural adults. The mean age of initiation of tobacco usage in any form being  $20.27 \pm 4.95$  years and nearly in concordance with study done by Sugathan *et al* (21 years) [13]. Whereas, it was observed to be low [14,15] in comparison with few and high [16] when compared to a few. In this study overall tobacco usage was found to be 19.3% and it is in agreement with various studies done in various parts of India [3,15,17-19] but less than prevalence reported in various other studies [8,13,20-23]. The mean age of initiation of tobacco usage in any form being  $20.27 \pm 4.95$  years and nearly in concordance with study done by Sugathan *et al* (21 years) [13] and it was observed to be low in comparison to other studies [14,15] and high compared to the finding of Ansari *et al.*, ( $13.3 \pm 3.23$  years) [16] but more than national averages obtained by GATS 2 and NFHS 4.

Prevalence of tobacco usage in any form had shown a male preponderance with prevalence of 16.3% when compared to 3% in female, and this is in consonance with other studies [7,20,24]. This study showed increasing odds of tobacco usage with increasing age and this is in consonance with some and contradictory to some [3]. Prevalence of use of smokeless tobacco is found to be 17.9% and this was comparable to other studies and surveys [25]. Prevalence of usage of smokeless tobacco was comparatively high among female than smoking. Though 80.7% were non users, nearly 30% of them were exposed to second hand smoking. It was slightly lower than the finding of Palipudi KM *et al.* [26] (50%), which may be because of the preference smoking in the outdoors by the smokers in the study area and this finding is in consonance with other surveys [25]. In the present study, it was found that the habit of tobacco consumption was significant in elderly age groups, male and in the less educated populations, and this finding was supported by his finding is supported by studies conducted in Kerala [13,27] and few other studies [16,28]. Whereas, relations with occupation and socio economic status was found to be statistically insignificant and this finding is in contrast with the finding of the few studies done in various parts of India [13,29] which may be because most of the respondents in this study were in similar type of working conditions and social class. Though the participants are aware of harmful effects of tobacco, very meagre 6% considered

quitting tobacco and this calls for more widespread awareness programmes and IEC campaigns to be conducted in the rural areas focussing more on vulnerable groups i.e., agricultural and non-agricultural labourers as the usage was found to be more them when compared to other groups of population.

Prevalence of overall alcohol consumption in this study was found to be 22% and the mean age of initiation of alcohol consumption was found to be around 22 years and this was in concordance with findings made by other studies[13,19,30]. The reported prevalence was similar in comparison to the observation made by several other studies[20,28,31]. Few studies showed lower prevalence[24,29] and a few showed higher prevalence[13,17] which varies from a low as 7% in Gujarat to 75% in Arunachal Pradesh. In the study area All the female participants in the study were never users of alcohol because in our area because of social norms and customs only men indulge in such practices, and the finding was in concordance with few other studies[13,15,19,24]. Even though the alcohol users were aware of the ill effects due to alcohol consumption they were not quitting the habit and when enquired they responded saying that it is a means and source of recreation for them after long hours of strenuous work and this is also found in other studies done in siliguri area[3]. Most of the men who had habit of alcohol consumption also had the habit of tobacco usage. Gender and low educational status were proved to have statistically significant association with alcohol consumption where rest of the variables were not having any association of statistical significance.

In the present study it was reported that, nearly 72% of the study participants were engaged in moderate physical activity and 20% being sedentary only a minority of 8.3% were engaged in high intensity work. The result of the present study is having a slightly low level of sedentary population when compared with the report given by the WHO (31-51%)[17] as the majority of the study population were agricultural manual workers. The study findings are also in accordance with few other studies.[13,18,31] Studies conducted by Gupta R et al,[4] reported much high prevalence (> 70%) of overall sedentary activities in urban population as compared to our study. Variables like, gender and occupation were found to have an association with

physical inactivity, which was statistically significant. Women and unemployed people were found to be more inactive compared to men and people who are employed, and this was in concordance with the findings of Suganthan et al.[13]

Of the study participants, 91.3% are having a habit of taking mixed diet. 14.3% of the study population had a habit of eating fried foods which are prepared by vendors. All the study participants had a habit of consuming vegetables daily, with 2.2 times as the mean number of servings and it was in liaison with study by Anand K et al.,[20] Nearly 58% had a habit of eating at least one serving of fruit daily, and it was higher in comparison with the observation made by many surveys and studies[13,17,24], which may due to the habit of having plants and trees in the backyard of their homes which make them easily accessible to the fruits. Even with plenty of availability of resources just 58% are having fruit daily and none were on par with the recommendations of 5 servings of fruits and vegetables per day in adequate amounts. To avoid this we have to educate them about proper dietary habits and we should educate and encourage them in having their own kitchen gardens with appropriate fruits and vegetables of their choice and they should be encouraged to have the adequate and appropriate diets as per the recommendations to maintain a healthy lifestyle. Most of the socio demographic variables, have not shown any significant associations with fruit and vegetable consumption, where as a significant association was found with socio economic status, with subjects below Class III consumed low levels of fruit and vegetables, and was supported by Suganthan et al.,[13] Uma Iyer et al.,[31]

#### **Strengths And Limitations:**

Highlighting the NCD risk factors burden in rural populations is the greatest strength of the study, which often remains unaddressed and under assessed. However, few limitations are that still a larger sample needs to be approached. Biochemical analysis as per STEPS approach is not considered because of cost constraint. As, we relied upon the self-reported data for analysis, even now there might be a under reporting of risk factors.

#### **Conclusions:**

Overall prevalence of behavioural risk factors was found to be low in study area compared to state and national averages but unwillingness of users to quit the habit even on knowing the ill effects need a serious consideration. Unhealthy diet patterns were observed in terms of inadequate fruit and vegetable consumption even on having plenty of available resources in this lush green agricultural area preferring junk food which will set in a bad impact on their overall health. Inadequate physical activity was found to be more and very meagre population are involved in recreational physical activity.

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**Table 1: Socio-demographic characteristics of the study population.**

Variable (N=750)	Frequency(%)
<b>Age</b>	
15-24	119 (15.87)
25-34	168 (22.40)
35-44	167 (22.27)
45-54	142 (18.93)

55-64	154 (20.53)
<b>Sex</b>	
Male	302 (40.27)
Female	448 (59.73)
<b>Religion</b>	
Hindu	415 (55.33)
Christian	234 (31.21)
Muslim	70 (9.33)
Other minorities	31 (4.13)
<b>Marital status</b>	
Unmarried	75 (10)
Married	617 (82.27)
Widowed	9 (1.20)
Divorced	49 (6.53)
<b>Literacy</b>	
Illiterate	253 (33.73)
Primary	129 (17.20)
Secondary	304 (40.53)
Beyond secondary	64 ( 8.54)
<b>Occupation</b>	
Unemployed	141 (18.80)
House work	151 (20.13)
Manual work	414 (55.20)
Professionals	44 (5.87)
<b>SES</b>	
Class 1	81 (10.80)
Class 2	245 (32.67)
Class 3	251 (33.47)
Class 4	159 (21.20)
Class 5	14 (1.86)



**Table 2: prevalence of behavioural and physical risk factors among study participants**

Risk factors	Frequency(%)
<b>Tobacco usage:</b>	
Current tobacco use	145 (19.33)
<b>Alcohol consumption</b>	72(9.6)
<b>Daily users</b>	
<b>Eating vegetables and fruits –atleast one serving per day</b>	321(42.8)
<b>Physical inactivity</b>	
<b>Sedentary</b>	150(20)
<b>Moderate</b>	540(72)
<b>Heavy worker</b>	60(8)
<b>Overweight</b>	142(18.9)
<b>Abdominal obesity</b>	356 (47.5)

**Table -3: Association of Socio demographic variables with behavioral risk factors (n=750)**

Variables	Current Tobacco Use					Current Alcohol Use			
	<i>n</i>	Frequency (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*	<i>P</i> **	Frequency (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*	<i>P</i> **
<b>Age (Years)</b>									
< 30	251	23 (9.2)	1 (Referent)	1 (Referent)		22 (8.8)	1 (Referent)	1 (Referent)	
> 30	499	122 (24.4)	3.21 (2.00-5.16)	2.11 (1.18-3.78)	<b>0.012</b>	50 (10.0)	1.16(0.69-1.96)	0.64(0.33-1.24)	0.185
<b>Gender</b>									
Male	302	122 (40.4)	1 (Referent)	1 (Referent)		65 (21.5)	1 (Referent)	1 (Referent)	

Female	44 8	23 (5.1)	0.08(0.05-0.13)	0.07 (0.04-0.13)	<b>0.00</b> <b>0</b>	7 (1.6)	0.06(0.03-0.13)	0.05(0.02-0.12)	0.00 0		
<b>Education</b>											
Literate	25 3	60 (23.7)	1 (Referent)	1 (Referent)		29 (11.5)	1 (Referent)	1 (Referent)			
Illiterate	49 7	85 (17.1)	0.66(0.46-0.96)	0.60 (0.37-0.95)	<b>0.02</b> <b>9</b>	43 (8.7)	0.73(0.45-1.20)	0.50 (0.28-0.90)	0.02 0		
<b>Occupation</b>											
Unemployed	29 2	20 (6.8)	1 (Referent)	1 (Referent)		10 (3.4)	1 (Referent)	1 (Referent)			
Employed	45 8	125 (27.3)	5.11(3.10-8.40)	1.63(0.90-2.95)	0.10 5	62(13.5)	4.42(2.23-8.76)	1.26 (0.57-2.77)	0.57 3		
<b>Socioeconomic Status</b>											
> Class 3	57 7	118 (20.5)	1 (Referent)	1 (Referent)		50(8.7)	1 (Referent)	1 (Referent)			
Below Class 3	17 3	27 (15.6)	0.72 (0.46-1.14)	0.79 (0.46-1.34)	0.37 6	22(12.7)	1.54(0.90-2.62)	1.91(1.06-3.46)	0.03 2		
<b>Marital Status</b>											
Unmarried	75	4 (5.3)	1 (Referent)	1 (Referent)		5(6.7)	1 (Referent)	1 (Referent)			
Married	67 5	141 (20.9)	4.69(1.68-13.05)	4.71 (1.50-14.83)	<b>0.00</b> <b>8</b>	67(9.9)	1.54(0.60-3.96)	3.03(1.00-9.17)	0.04 9		
					<b>Cox &amp; Snell R<sup>2</sup></b>	<b>0.23</b> <b>4</b>				<b>Cox &amp; Snell R<sup>2</sup></b>	<b>0.13</b> <b>0</b>
					<b>Nagelkerke R<sup>2</sup></b>	<b>0.37</b> <b>5</b>				<b>Nagelkerke R<sup>2</sup></b>	<b>0.27</b> <b>7</b>
					<b>Over all %</b>	<b>82.3</b>				<b>Overall %</b>	<b>90.5</b>

**Table -4: Association of Socio demographic variables with behavioral risk factors (n=750)**

Overweight						Abdominal Obesity			
Variables	n	Frequency (%)	Unadjusted	Adjusted OR (95%)	P**	Frequency (%)	Unadjusted	Adjusted OR (95%)	P**

			OR (95% CI)	CI)*			OR (95% CI)	CI)*	
<b>Age (Years)</b>									
< 30	25 1	91 (36.3)	1 (Referent)	1 (Referent)		43 (17.1)	1 (Referent)	1 (Referent)	
> 30	49 9	307 (61.5)	2.81(2.05- 3.85)	2.47(1.71- 3.56)	<b>0.00</b> <b>0</b>	224 (44.9)	3.94 (2.71- 5.72)	3.24 (2.12- 4.95)	0.00 0
<b>Gender</b>									
Male	30 2	160 (53)	1 (Referent)	1 (Referent)		100 (33.1)	1 (Referent)	1 (Referent)	
Female	44 8	238 (53.1)	1.01 (0.7 5-1.35)	0.73 (0.50- 1.08)	<b>0.12</b> <b>0</b>	167 (37.3)	1.20 (0.88- 1.63)	1.03 (0.68- 1.56)	0.88
<b>Education</b>									
Literate	25 3	144(56.9)	1 (Referent)	1 (Referent)		113 (44.7)	1 (Referent)	1 (Referent)	
Illiterate	49 7	254 (51.1)	0.79 (0.58- 1.07)	1.07 (0.77- 1.50)	<b>0.68</b>	154 (31)	0.56 (0.41- 0.76)	0.80 (0.57- 1.12)	0.18 5
<b>Occupation</b>									
Unemployed	29 2	160 (54.8)	1 (Referent)	1 (Referent)		105 (36)	1 (Referent)	1 (Referent)	
Employed	45 8	238 (52)	0.89 (0.67- 1.20)	0.83(0.58- 1.17)	0.28 8	162 (35.4)	0.98 (0.72- 1.32)	0.96 (0.67- 1.39)	0.84 0
<b>Socioeconomic Status</b>									
> Class 3	57 7	310 (53.7)	1 (Referent)	1 (Referent)		210 (36.4)	1 (Referent)	1 (Referent)	
Below Class 3	17 3	88 (50.9)	0.89 (0.64- 1.25)	0.94 (0.66- 1.34)	0.72 6	57 (32.9)	0.90 (0.60- 1.23)	0.91 (0.62- 1.33)	0.62 8
<b>Marital Status</b>									
Unmarried	75	20 (26.7)	1 (Referent)	1 (Referent)		9 (12)	1 (Referent)	1 (Referent)	
Married	67 5	378 (56)	3.50 (2.05- 5.97)	2.38 (1.28- 4.42)	<b>0.00</b> <b>6</b>	258 (38.2)	4.54 (2.22- 9.26)	1.84 (0.82- 4.13)	0.13 7

<b>Tobacco usage</b>									
Non users	605	321 (53.1)	1(Referent)	1(Referent)		212 (35)	1(Referent)	1(Referent)	
Users	145	77 (53.1)	1.00 (0.70-1.44)	0.72 (0.46-1.15)	0.167	55 (37.9)	1.13 (0.80-1.65)	0.93 (0.58-1.5)	0.770
<b>Alcohol usage</b>									
Non users	678	362 (53.4)	1(Referent)	1(Referent)		244 (36)	1(Referent)	1(Referent)	
Users	72	36 (50)	0.87 (0.54-1.42)	0.93 (0.52-1.65)	0.797	23 (31.9)	0.84 (0.50-1.40)	0.85 (0.46-1.56)	0.593
<b>Diet</b>									
Healthy	429	233 (54.3)	1(Referent)	1(Referent)		150 (35)	1(Referent)	1(Referent)	
Unhealthy	321	165 (51.4)	0.89 (0.67-1.20)	0.89 (0.66-1.21)	0.460	117 (36.4)	1.07 (0.79-1.44)	1.06 (0.77-1.46)	0.724
<b>Physical activity</b>									
Sedentary	149	85 (57)	1(Referent)	1(Referent)		57 (38.3)	1(Referent)	1(Referent)	
Active	601	313 (52.1)	1.22 (0.85-1.76)	1.35(0.91-2.00)	0.137	210 (34.9)	1.15 (0.80-1.67)	1.24 (0.82-1.86)	0.312
					<b>Cox &amp; Snell R<sup>2</sup></b>	<b>0.072</b>			
					<b>Nagelkerke R<sup>2</sup></b>	<b>0.097</b>			
					<b>Over all %</b>	<b>62.4</b>			
							<b>Cox &amp; Snell R<sup>2</sup></b>	<b>0.086</b>	
							<b>Nagelkerke R<sup>2</sup></b>	<b>0.118</b>	
							<b>Overall %</b>	<b>65.9</b>	

**Table -5: Association of Socio demographic variables with behavioral risk (n=750)**

Physical Activity Use						Unhealthy Diet Use			
Variables	n	Frequency (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*	P**	Frequency (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*	P**

<b>Age (Years)</b>									
< 30	25 1	57 (22.7)	1 (Referent)	1 (Referent)		108 (43)	1 (Referent)	1 (Referent)	
> 30	49 9	92(18.4)	0.77 (0.53- 1.12)	0.96 (0.61- 1.54)	<b>0.87</b> <b>7</b>	213 (42.7)	0.99 (0.73- 1.34)	0.91 (0.63- 1.30)	0.59 8
<b>Gender</b>									
Male	30 2	36 (11.9)	1 (Referent)	1 (Referent)		119 (39.4)	1 (Referent)	1 (Referent)	
Female	44 8	113 (25.2)	2.49 (1.66- 3.75)	1.75 (1.08- 2.82)	<b>0.02</b> <b>3</b>	202 (45.1)	1.26 (0.94- 1.70)	1.33 (0.95- 1.87)	0.10 0
<b>Education</b>									
Literate	25 3	50 (19.8)	1 (Referent)	1 (Referent)		115 (45.5)	1 (Referent)	1 (Referent)	
Illiterate	49 7	99 (19.9)	1.01 (0.69- 1.48)	0.84 (0.55- 1.30)	<b>0.43</b> <b>7</b>	206 (41.4)	0.85 (0.63- 1.15)	0.89 (0.64- 1.24)	0.48 9
<b>Occupation</b>									
Unemployed	29 2	97 (33.2)	1 (Referent)	1 (Referent)		119 (40.8)	1 (Referent)	1 (Referent)	
Employed	45 8	52 (11.4)	0.26 (0.18- 0.38)	0.32 (0.21- 0.48)	0.00 0	202 (44.1)	1.15 (0.85- 1.55)	1.31 (0.94- 1.83)	0.11 5
<b>Socioeconomic Status</b>									
> Class 3	57 7	110 (19.1)	1 (Referent)	1 (Referent)		230 (39.9)	1 (Referent)	1 (Referent)	
Below Class 3	17 3	39 (22.5)	1.24 (0.82- 1.87)	1.12 (0.73- 1.73)	0.60 5	91 (52.6)	1.67(1.19- 2.36)	1.67 (1.18- 2.36)	0.00 4
<b>Marital Status</b>									
Unmarried	75	22 (29.3)	1 (Referent)	1 (Referent)		27 (36)	1 (Referent)	1 (Referent)	
Married	67 5	127 (18.8)	0.56 (0.33- 0.95)	0.48 (0.24- 0.94)	0.03 3	294 (43.6)	1.37 (0.84- 2.25)	1.26 (0.71- 2.24)	0.42 8
				<b>Cox &amp; Snell R<sup>2</sup></b>	<b>0.07</b> <b>9</b>				<b>Cox &amp; Snell R<sup>2</sup></b> <b>0.02</b> <b>0</b>

<b>Nagelker ke R<sup>2</sup></b>	<b>0.12 6</b>
<b>Over all %</b>	<b>79.7</b>

<b>Nagelker ke R<sup>2</sup></b>	<b>0.02 7</b>
<b>Overall %</b>	<b>58.9</b>