

RESEARCH ARTICLE

## Prevalence of Risk Factors for Cardiovascular Diseases among Adults in Slum area of Cuttack City, Odisha

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### Abstract

A study was conducted to identify the risk factors of cardiovascular diseases among adults of urban slum areas of Cuttack city, Odisha. Adults (n=300) from 20 slums were selected among study subjects. Males constituted 45% of study subjects and females constituted 55%. Current smokers were found to have more prevalence of hypertension than their non-smoking counterparts. About 54.2% of study subjects were found to be in overweight and obese categories. Nearly 40% of the respondents had physical activity of  $\geq 3,000$  MET-min/week. Prevalence of hypertension was more among the adults with a physical activity of  $\geq 3,000$  MET-min/week than those with a physical activity  $< 3,000$  MET-min/week and was found to have a highest prevalence of stage 2 hypertension.

**Keywords:** Cardiovascular diseases, Odisha, smokers, hypertension, overweight, physical activity.

### Introduction

Non-communicable diseases are responsible for a high proportion of death and disabilities. By 2020 non-communicable diseases are predicted to account for 73% of all deaths and 60% of disease burden will be the result of cardiovascular diseases (Anand *et al.*, 2007). It is predicted that there will be nearly 64 million cases of cardiovascular diseases by 2015. In India about 50% of coronary heart disease related deaths occur in people younger than 70 years (Shah and Mathur, 2010). It is now established that cluster of major risk factors (tobacco, inappropriate food intake, physical inactivity, obesity, hypertension, diabetes and dyslipidemias) govern the occurrence of cardiovascular disease (Shah *et al.*, 2010). There are very few studies that have been conducted in urban slum areas regarding the prevalence of cardiovascular risk factors so, against these backdrops, this study was aimed with the following objectives:

1. To study the prevalence of cardiovascular risk factors among adults in urban slum areas of Cuttack city.
2. To study the associated epidemiological risk factors.

### Materials and methods

**Study area:** The study was conducted in Cuttack city over a period of 12 months starting from 1<sup>st</sup> Oct 2011 to 30<sup>th</sup> Sep 2012.

**Experimental design:** The present study was a cross-sectional study and the sampling design adopted for the study was based on probability sampling, because probability samples are more likely to be representative of the population.

The type of probability sampling adopted for this study is simple random sampling. The process of sampling in the study was conducted in two steps:

**Step one:** The sample size was calculated by using the formula  $4pq/d^2$  where,  $p=21.8\%$  (Ramchandran *et al.*, 1998),  $q$  is  $1-p$ ,  $d=0.05$  with 95% confidence interval. Sample size which was 273 and adding 10% for dropouts, the total sample size became 300.

**Step two:** Two wards (34 and 51) of Cuttack Municipal Corporation were randomly chosen. Both the wards contained 20 slums having a population of 20,000. List of the slums was obtained from slum improvement officer of Cuttack Municipal Corporation. Each slum has approximately 120 households and 15 households were randomly chosen from each slum from the list of house numbers that was given to them. The adults (30-74 years age group) of these households were taken as study population.

**Pre-testing:** The study instrument was pre-tested in two non-sampled areas on two separate days. Study instruments included questionnaire in English containing the questions according to WHO STEPS questionnaire (2004). The respondents were interviewed first and physical measurements like measurement of weight, height, waist circumference and blood pressure were recorded.

**Inclusion criteria:** All individuals of age group 30-74 years were taken as study subjects.

Table 1. Distribution of blood pressure of study subjects according to sex, BMI, alcohol consumption, smoking and physical activity (n=300).

Risk factors	Blood pressure (mm Hg)				Total	P value
	Normal	Pre HTN	Stage 1 HTN	Stage 2 HTN		
Sex						
Male	56 (41.5%)	46 (34.1%)	17 (12.6%)	16 (11.8%)	135 (45%)	0.580
Female	76 (46.1%)	46 (27.9%)	26 (15.8%)	17 (10.2%)	165 (55%)	
Total	132 (44%)	92 (30.7%)	43 (14.3%)	33 (11%)	300	
BMI (kg/m <sup>2</sup> )						
<25	88 (45.8%)	64 (33.3%)	20 (10.5%)	20 (10.5%)	192	0.176
25 to 29.9	34 (41.5%)	21 (25.6%)	16 (19.5%)	11 (13.4%)	82	
30 to 39.9	10 (38.5%)	7 (26.9%)	7 (26.9%)	2 (7.6%)	26	
Alcohol consumption for the past one year						
Yes	37 (49.3%)	20 (26.7%)	11 (14.7%)	7 (9.3%)	75	0.699
No	95 (42.2%)	72 (32.0%)	32 (14.2%)	26 (11.6%)	225	
Smoking						
Yes	18 (39.1)	15 (32.6%)	4 (8.6%)	9 (27.3%)	46	0.159
No	114 (44.9%)	77 (30.3%)	39 (15.3%)	24 (9.0%)	254	
Physical activity (MET)						
<600	6 (46.2%)	5 (38.5%)	1 (7.7%)	1 (7.7%)	13	0.042
600 to 3000	66 (48.2%)	48 (35.0%)	15 (10.9%)	8 (5.9%)	137	
>3000	60 (40.0%)	39 (26.0%)	27 (18.0%)	24 (16.0%)	150	

HTN-Hypertension (According to JNCVII Criteria), BMI-Body Mass Index, MET-Metabolic Equivalents.

**Exclusion criteria:** The study subjects having a history of heart attack or being diagnosed with heart disease, diabetes mellitus, an attack of stroke or TIA (Transient Ischemic Attack), history of bypass surgery or angioplasty, history of kidney disease, peripheral artery disease, abdominal aortic aneurysm and carotid artery disease were excluded from the study. Ethical clearance for the study was obtained from the Ethics Committee of SCB Medical College.

**Statistical analysis:** Statistical analysis was done using SPSS 17.0 version. Pearson chi-square was used for analysis and a p value <0.05 was taken to be statistically significant.

## Results and discussion

Among 300 study subjects, males were 45% and females constituted 55%. Among males, 28.1% were from 40-49 year age group and among females, 28.5% were from the 30-39 year age group. About 63.7% males were literate whereas, 30% of females were literate. About 92.6% of males and 66.1% of females were married. Most of the males were laborers in 89% of the respondents interviewed belonged to upper lower and lower socio-economic class according to Kuppuswamy's classification (Park, 2013). Most of the people were eating fruits and vegetables for 5 to 7 d/week (88.2% males and 90.3% females). Taking the amount of consumption into consideration none of the respondents ate  $\geq 5$  servings of fruits and vegetables/d. About 56.3% of males and 57% of females ate two servings of fruits and vegetables/d. About 70.4% males and 68.5% females interviewed were using vegetable oils followed by refined oil as the cooking medium (data not shown).

Table 1 show that more number of females were found to be normotensive. About 34.1% males and 27.9% females were in pre-hypertension category and 15.8% females and 12.6% males were in stage 1 hypertension. Stage 2 hypertension was found to be more in males. However, the finding was not statistically significant. A study by Lee *et al.* (2011) showed that pre-hypertension was more prevalent in males as compared to females. In another study by Gupta *et al.* (2012) showed that hypertension to be more prevalent in males than in females. Similar study by Mann *et al.* (1988) also showed the same fact. Also another study by Anand *et al.* (2007) showed similar results. Many confounding factors like age, psychosocial factors, genetic factors and other factors play a role in determining the blood pressure.

Distribution of blood pressure according to BMI shows that 192 study subjects had normal BMI, among them, 45.8% were normotensive and the rest were hypertensive of various categories (Table 1). In the pre-obese group, 41.5% were normotensive, similarly in obese class 1 with BMI 30-39.9, the proportion of normotensive is still less i.e. 38.5%. However, this difference is not statistically significant. Regarding alcohol intake as a risk factor the findings shows no association between alcohol intake and blood pressure. Nearly 49.3% of the respondents who consumed alcohol were found to be normotensive. Regarding smoking as risk factor for cardiovascular diseases, 44.9% were found to be normotensive in non-smoking category whereas, 39.1% of smokers were found to be normotensive reflecting the fact that prevalence of hypertension is higher in smokers than non-smokers (Table 1).

Study by the Multiple Risk Factor Intervention Trial Research Group (1996) showed positive interaction between cigarette smoking with hypertension. But the present study shows that there was no statistically significant difference between the smokers and non-smokers. More number of persons performing >3,000 MET-min/week was found to be hypertensive than the groups having physical activity <3,000 MET-min/week. Taking pre-hypertension into consideration the prevalence was more in both the categories i.e. subjects having physical activity <600 MET-min/week and 600-3000 MET-min/week. Stage 1 and 2 hypertension was found to be more associated with study subjects performing >3,000 MET-min/week which might be explained by presence of other confounding factors. This finding was statistically significant ( $p=0.042$ ) showing that those having physical activity >3,000 MET-min/week had a higher prevalence of hypertension. In a study by Sadeghi-Bazarani *et al.* (2011) found no association between physical activity and hypertension levels. While in another study by Erem *et al.* (2008) found out that pre-hypertension was more prevalent among those having moderate activity and hypertension was more common among those having no or minimal physical activity.

## Conclusion

This study shows that hypertension was more prevalent among males as compared to that of females and also was more among smokers than non-smokers. Higher proportion of individuals having physical activity  $\geq 3000$  MET-min/week were found to be hypertensive than their counterparts with a physical activity <3,000 MET-min/week. Prevalence of hypertension was higher in pre-obese and obese groups. Regular monitoring of blood pressure and other risk factors will be helpful for early detection of cardiovascular disease and its subsequent treatment for this under privileged group. Proper counseling for quitting smoking, alcohol and adopting healthy life-style should be undertaken to delay the development of risk factors.

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