

## Original Research Article

# Prevalence of hypertension and its associated risk factors among office employees working at BSNL and LIC offices of Bhopal city

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## ABSTRACT

**Background:** Hypertension is one of the leading causes of the global burden of disease. In India, the prevalence of hypertension is 33.8% in urban areas and 27.6% in rural areas. Hypertension is fairly common among white collar workers, owing to long working hours, sedentary lifestyle and due to lack of physical activity. This study was carried out among the office employees, who constitute one type of white collar workers. The aims and objectives of the study were to find out the prevalence of hypertension among office employees and to find out the various risk factors associated with hypertension among them.

**Methods:** Descriptive cross-sectional study was carried out amongst 240 employees of two offices of Bhopal city from September to November 2016. Information regarding socio-demographic characteristics and various risk factors was collected. Measurement of blood pressure, height and weight of all participants were taken.

**Results:** The prevalence of hypertension was found to be 53.33%, out of which 25.7% cases were newly diagnosed. Hypertension was positively associated with cigarette smoking, alcohol intake, adding extra salt to food.

**Conclusions:** The prevalence of hypertension among office workers is alarmingly high (53.33% hypertensives and 25% prehypertensives) which calls for implementation of some interventional measures by the concerned authorities.

**Keywords:** Cohen's perceived stress scale, Hypertension, Office employees

## INTRODUCTION

Hypertension (HTN) is a major public health problem and an important cause of morbidity and mortality worldwide.<sup>1</sup> By the dawn of the third millennium, non-communicable diseases are sweeping the entire globe, with an increasing trend in developing countries. By 2020, it is predicted that the non-communicable diseases will be causing 7 out of every 10 deaths in developing countries.<sup>2,3</sup> People with hypertension possess two fold higher risk of developing coronary artery disease, four times higher risk of congestive heart failure and seven times higher risk of cerebrovascular disease compared to normotensive people.<sup>4,5</sup> In India, the prevalence of hypertension is 33.8% in urban areas and 27.6% in rural areas.<sup>6</sup> Hypertension is comparatively more prevalent in

executive and service categories in all states of India.<sup>7</sup> There are evidences that long term mental stress is associated with hypertension but more research is needed in this area.<sup>8</sup> Office employees constitute one of the white collar workers and hypertension is fairly common among them, owing to long working hours, sedentary lifestyle and increasing incidence of obesity due to lack of physical activity. A study of this kind will help us to understand the problem and to make appropriate interventions on a larger scale for the benefit of such a vulnerable group.

### *Aims and objectives*

- To find out the prevalence of hypertension among office employees of Bhopal.

- To find out the various risk factors associated with hypertension among them.

## METHODS

This was a cross-sectional study carried out in 2 purposively selected BSNL and LIC offices of Bhopal (non-probability sampling), over a period of 3 months from September to November 2016. All employees present at the time of visit and who gave consent for the study were included. The total employees included were 240. After obtaining permission from the heads of the BSNL and LIC offices, the study was started. During the visit, informed verbal consent was obtained from the study participants after explaining them the purpose of the study. Information regarding socio-demographic characteristics, various risk factors was collected through a pre-designed semi structured questionnaire. Weight, height and blood pressure of all participants were measured and recorded. Height was measured using a non-stretchable measuring tape, with an accuracy of 0.1 cm, standing against a wall bare foot; weight was measured using an electronic weighing scale with an error of  $\pm 0.1$  kg. Blood pressure was measured using a mercury sphygmomanometer with the patient in sitting position. Care was taken that the subject avoided caffeine, smoking or exercise for at least 30 min prior to measurement. Phase I (appearance of sound) was taken as systolic blood pressure and phase IV (disappearance of sound) was taken as diastolic blood pressure. Two readings were taken 2 minutes apart and the average of the 2 readings was calculated. Subjects having Systolic Blood Pressure 140 mm Hg and/or Diastolic Blood Pressure 90 mmHg (JNC-VII) or on anti-hypertensive medications were classified as hypertensive. For classifying obesity, body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup> was considered obese. Moderate physical activity level was assessed by the number of hours spent on moderate

physical activities in the preceding week. Stress level was assessed by Cohen's perceived stress scale. The questionnaire consists of 10 questions and the responses were entered in a 5-point Likert scale. Stress level was classified into "low" (score: 0–11), "average" (score: 12–15), "high" (score: "16–20"), and "very high" (score  $\geq 21$ ).<sup>9</sup> Awareness session was conducted regarding ill effects of hypertension and the benefits of lifestyle modifications. Data was entered into MS Excel 2007 and analysed using Epi Info 7. Chi-square test was used to find out association between blood pressure and selected socio demographic and behavioural variables. A P value  $\leq 0.05$  was considered as statistically significant.

## RESULTS

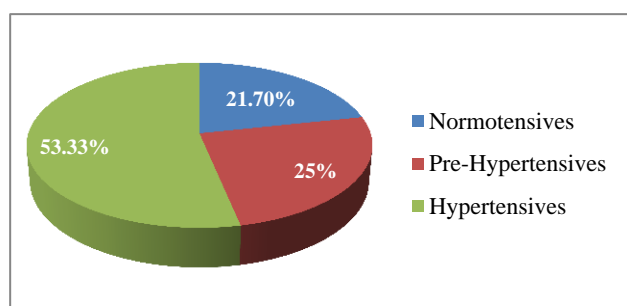
Out of total 240 study participants, 198 (82.5%) were male and 42(17.5%) were female with the mean age of  $48.6 \pm 8.5$  years. 95 (39.6%) study participants were known case of hypertension and on anti-hypertensive medication. 44 (18.33%) participants gave previous history of diabetes. Majority of the prehypertensive were found in the age group of  $>50$  years (45.7%), followed by 41-50 years of age. Figure 1 shows the prevalence of Hypertension among the study participants. The overall prevalence of hypertension in our study was found to be 53.3% out of which 39.6% study participants were already known case of hypertension and on anti-hypertensive medication and 25% were found to be pre-hypertensive. Among 95 (39.6%) known hypertensives, 57 (60%) were on regular treatment and among them 43 (75.44%) were having normal B.P during the study indicating control of blood pressure with medication. In the present study, significant positive association was found between hypertension and alcohol use, adding extra salt while eating food and gender. Age, physical activity BMI, Stress score of participants did not significantly affect the prevalence of HTN in our study. (Table 1 and 2), (Figure 1).

**Table 1: Distribution of study participants according to socio-demographic characteristics.**

	Variables	Frequency (n=240)	Percentage (%)
<b>Age (in years)</b>	21-30	8	3.33
	31-40	32	13.33
	41-50	95	39.58
	$>51$	105	43.75
<b>Sex</b>	Male	198	82.5
	Female	42	17.5
<b>Education</b>	Primary	36	15
	Higher secondary	35	14.58
	Graduate	98	40.83
	Post-graduate	71	29.58
<b>Marital status</b>	Married	231	96.25
	Unmarried	9	3.81
<b>Religion</b>	Hindu	193	80.41
	Muslim	43	17.91
	Christian	4	1.66

**Table 2: Association of hypertension with various risk factors.**

		As per JNC VII classification of blood pressure				P value
		Normal	Pre-HTN	HTN	Total	
Age (in years)	21-30	3 (37.5)	4 (50)	1 (12.5)	8	0.460
	31-40	6 (18.8)	20 (62.5)	6 (18.8)	32	
	41-50	21 (22.1)	42 (44.2)	32 (33.7)	95	
	>50	22 (21)	48 (45.7)	35 (33.3)	105	
	Total	52 (21.7)	114 (47.5)	74 (30.8)	240	
Gender	Male	38 (19.2)	92 (46.5)	68 (34.3)	198	0.018
	Female	14 (33.3)	22 (52.4)	6 (14.3)	42	
	Total	52 (21.7)	114 (47.5)	74 (30.8)	240	
BMI	Underweight	0	2 (100)	0	2	0.677
	Normal	28 (23.3)	58 (48.3)	34 (28.3)	120	
	Overweight	18 (18.4)	45 (45.9)	35 (35.7)	98	
	Obese	6 (30)	9 (45)	5 (25)	20	
	Total	52 (21.7)	114 (47.5)	74 (30.8)	240	
Moderate physical exercise	Nil	19 (20.43)	46 (49.46)	28 (30.11)	93	0.38
	≤2 hrs	10 (28.57)	19 (54.29)	6 (17.14)	35	
	2.1–4 hrs	10 (27.03)	16 (43.24)	11 (29.73)	37	
	>4 hrs	13 (17.33)	33 (44)	29 (38.67)	75	
Extra salt to food	Rarely	28 (28.89)	62 (46.26)	44 (32.83)	134	0.032
	Often/with certain foods	4 (11.4)	25 (71.4)	6 (17.1)	35	
	Usually	16 (27.1)	21 (35.6)	22 (37.3)	59	
	Non-respondents	4 (33.3)	6 (50)	2 (16.7)	12	
	Total	52 (21.7)	114 (47.5)	74 (30.8)	240	
Alcohol intake	Yes	8 (15.1)	17 (32.1)	28 (52.8)	53	0.004
	No	41 (23.3)	91 (51.7)	44 (25)	176	
	Total	49 (21.2)	108 (47.2)	72 (31.2)	240	
Cigarette smoking	Yes	11 (18.3)	22 (36.7)	27 (45)	60	0.023
	No	41 (22.8)	92 (51.1)	47 (26.1)	180	
	Total	52 (21.7)	114 (47.5)	74 (30.8)	240	
Stress score	Low	12 (30.8)	19 (48.7)	8 (20.5)	39	0.543
	Average	11 (22.9)	24 (50)	13 (27.1)	48	
	High	15 (16.9)	43 (48.3)	31 (34.8)	89	
	Very high	14 (21.9)	28 (43.8)	22 (34.4)	64	
	Total	52 (21.7)	114 (47.5)	74 (30.8)	240	



**Figure 1: Proportion of study subjects with hypertension.**

**DISCUSSION**

In our study, the prevalence of hypertension was found to be 53.3% and pre-hypertensive was found to be 25%. Out

of 240 study subjects 95 (39.6%) were already known cases of hypertension. The prevalence of hypertension in our study was much higher when compared to that from various studies conducted among the office employees throughout India.<sup>10-13</sup> The reason for higher prevalence in our study could be higher mean age of our study group as compared to the general population and also 39.6% already known cases of hypertension which led rise to increased prevalence. In our study, significant association was found between cigarette smoking, alcohol drinking, extra salt intake and prevalence of hypertension. Similar findings were found in studies done in Pondicherry and Surat.<sup>14,15</sup> There is also evidence that long-term mental stress associated with white collar job is associated with the prevalence of HTN.<sup>8</sup> Nevertheless, we could not find any significant association between the level of perceived stress and the prevalence of HTN in our study. This may be due to the inherent errors in self-perception analysis of the stress level among the office employees. Also age,

gender, BMI, of participants did not significantly affect the prevalence of HTN in our study.

## CONCLUSION

In our study, the prevalence of hypertension was found to be 53.33% and pre-hypertension was 25%. Hypertension was found to be significantly associated with cigarette smoking, alcohol, lack of physical activity, extra salt intake.

## Recommendations

This is an important finding since such high prevalence of hypertension among office workers is alarming which calls for implementation of some interventional measures in lifestyle by the concerned authorities.

## Limitations

Employees from only 2 offices of Bhopal were included in study so the results could not be generalized.

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