Original Research Article

Prevalence and risk factors of hypertension among the bank employees of Western Maharashtra – a cross sectional study

Tanuja R. Brahmankar*, Priya M. Prabhu

Rural Health Training Center, Tasgaon, Department of Community Medicine, Government Medical College, Miraj, Maharashtra, India

*Correspondence:
Dr. Tanuja R. Brahmankar,
E-mail: brahmankartanuja@gmail.com

ABSTRACT

Background: Hypertension, the "silent killer" - is a modern day's epidemic and is becoming a public health emergency worldwide, especially in the developing countries. Sedentary life-style and stress are important risk factors for hypertension. The job of bank employees is both sedentary in nature and accompanies high levels of mental stress, thereby at a higher risk of developing hypertension. Hence the present study was conducted to study the prevalence and risk factors of hypertension among the bank employees in Western Maharashtra.

Methods: A cross-sectional study was conducted during January 2014 to December 2015 to assess the prevalence and risk factors of hypertension among the bank employees in Western Maharashtra. By using multistage sampling method, total 340 bank employees from 40 branches were included in the study after fulfilling the inclusion and exclusion criteria. After all ethical considerations, the data were collected by using pre-designed, pre-tested and semi-structured questionnaire and then analysed using MS Excel, SPSS-22 and Primer of Biostatistics.

Results: Overall prevalence of hypertension was 39.7% and that of pre-hypertension was 41.8% among the study population. Socio-demographic factors like age, male gender, family history of hypertension, mode of travel, physical activity, overweight, years of service, intake of coffee and smoking had shown significant association with hypertension.

Conclusions: Prevalence of hypertension was found as significantly higher in bank employees than the general population of India. Among the non-hypertensives large part was pre-hypertensives which are also at high risk of developing hypertension in the future.

Keywords: Hypertension, Prevalence, Risk factors, Bank employees

INTRODUCTION

Hypertension, the "silent killer" - is a modern day's epidemic and is an increasingly important medical and global public health issue due to its role in causation of coronary heart disease, stroke and other vascular complications.[1] It is defined as systolic blood pressure measuring more than or equal to 140 mm of mercury and diastolic blood pressure measuring more than or equal to 90 mm of mercury recorded in an individual according to JNC 7.[2] The global prevalence of raised blood pressure in adults aged 18 years and over was around 22% in 2014.[3] Approximately 9.4 million deaths and 7% of disease burden as measured in DALYs (disability –adjusted life years) are caused by raised blood pressure in 2010.[3] Higher the blood pressure, higher the risk of both stroke and coronary events.[4] Overall prevalence for hypertension in India was found to be 29.8%. About 33% urban and 25% rural Indians have hypertension.[5]

Many modifiable factors contribute to the current high prevalence rates of hypertension. They include overweight and obesity, harmful use of alcohol, physical inactivity, psychological stress, eating food containing too much salt, inadequate intake of fruits and vegetables, socioeconomic determinants etc.[3]

Hypertension is one of the most common self-reported occupational health problem.[6] Sedentary life-style and mental stress are important risk factors for hypertension. The job of bank employees is both sedentary in nature and accompanies high levels of mental stress, thereby at a higher risk of developing hypertension. Studies on prevalence and risk factors of hypertension among bank employees are sparse in India and it is imperative that studies must be carried on to have an insight into the magnitude of the problem among the human resource employed and working there.

METHODS

Present study is a cross sectional study carried out among the bank employees in Western Maharashtra during January 2014 to December 2015. Multistage sampling technique was used in the study. A sampling frame of all nationalized banks in Western Maharashtra was prepared and one nationalized bank was selected randomly by using lottery method. The study was conducted in a single zone of the selected Nationalized Bank. After procuring the permission of the zonal level bank authority, a list of all the branches of that selected zone was obtained. A branch was selected from this list using lottery method. A list of all the employees working in the branch for the duration of more than 6 months was enumerated. All the eligible employees of next randomly selected branch of the bank were included until the adequate sample size was obtained. Considering the absolute error (d) of 5% and prevalence (P) as 30% based on a study among bank employees by Momin MH et al in 2012,[7] the sample size obtained was 336 by using the formula $4PQ/d^2$. Final sample size was 340, as all the eligible bank employees from the last branch were included in the study.

Bank employees involved in money related issues, who have served at least six months or more in the selected branches of the bank and those willing to participate, were included in the study. Bank employees of the cadre of peons and sub-staff, working for duration of less than six months, pregnant females and those who were unavailable for the study even after 3 visits were excluded.

Pre-designed, pre-tested and semi-structured questionnaire was used to collect the data. All eligible study participants in the selected branch were willing to participate in the study because they felt that it provided an opportunity to get medical advice on work-related and personal problems. Confidentiality was assured to all participants. After getting the informed written consent,

all the selected employees were instructed collectively about filling the proforma and their queries were fulfilled. After this all the physical examinations were done as per the standard procedures.

Data collected was compiled and analysed by using Microsoft excel, SPSS-22 and primer of biostatistics. Descriptive statistics were used to describe the prevalence of hypertension with respect to each variable and to test the significance, Chi-square test was employed. P value of <0.05 was considered statistically significant.

Measurements

The physical activity level was assessed using International Physical Activity Questionnaires (IPAQ) (Short).[8] IPAQ has been developed and tested for use in adults (age range of 15-69 years). It is reliable and reasonably valid instrument to assess and monitor habitual physical activity for older adults.[9,10]

Mental stress level was assessed by using Perceived Stress questionnaire of the International Stress Management Association.[11] It consisted of 25 questions which were answered as yes or no by the participants. Participants were divided into three categories according to the score i.e. 4 points or less (category 1), 5-13points (category 2) and 14 points or above (category 3).[11] The stress score questionnaire had a good internal consistency, with Cronbach's $\alpha = 0.812$.

Height

After removal of foot wear, the subject was asked to stand with the back against the wall and heels touching the ground, arms on the side and the eyes in front parallel to the ground. Reading coinciding the occipital edge was noted with the help of standard non-stretchable measuring tape.

Weight

Weight was recorded in kilograms (with minimal clothing and removal of foot wear) using a weighing machine with beam balance (sensitivity of scales was up to 500 grams).

BMI

Body Mass Index was calculated by using the formula (weight in Kg/ height in $m^{2)}$) and classified according to the WHO defined BMI categories for Asian populations.[12]

Waist circumference (WC)

It was measured at the midpoint between lower border of the rib cage and highest point of iliac crest with the subject standing, at the end of normal expiration.[13]

Hip circumference (HC)

It was measured at the level of the greater trochanters with the subject wearing minimum clothes. The mean of two readings was taken in for calculating the waist-hip ratio (WHR).

Waist to hip ratio (WHR)

It was calculated by dividing the waist circumference (cm) by the hip circumference (cm)[13] and classified as follows:

Central obesity

WHR ≥0.80 in women, WHR ≥0.90 in men.[12]

Normal WHR

WHR <0.80 in women, WHR <0.90 in men.[12]

Measurement of blood pressure

Blood pressure was measured and classified as per the JNC-7 guideline.[2] Auscultatory method of BP measurement was used. Participants were seated quietly for at least 5 minutes in a chair with feet on the floor, and right arm was bared and supported at heart level. They were requested to avoid Caffeine, exercise, and smoking for at least 30 minutes prior to measurement. A standard sphygmomanometer and a standard stethoscope were used to ensure accuracy. Two measurements were taken 1 minute apart using right arm consistently and the average recorded. For manual determinations, palpated radial pulse obliteration pressure was used to estimate systolic blood pressure (SBP)—the cuff was then be inflated 20–30 mmHg above this level for the auscultatory determinations; the cuff deflation rate for auscultatory readings was 2 mmHg per second. SBP was recorded at the point at which the first of two or more Korotkoff sounds was heard (onset of phase 1), and the disappearance of Korotkoff sound (onset of phase 5) was used to define Diastolic Blood Pressure (DBP). The equipment was regularly inspected and validated. All subjects currently on anti-hypertensive medications were classified as "hypertensive", irrespective of their current blood pressure reading.

The same measuring tape, weighing machine and sphygmomanometer were used by a single person throughout the study.

RESULTS

Total of 340 participants were included in the study, of which little over 2/5th were in the age group of 56-60 years (41.7%), 1/4th of them were in 51-55 years of age group(27.6%) followed by46-50 years12.1%, 41-45 years (7.4%), 26-30 years (7.4%), 31-35 years (2.3%)& 36-40 years (1.5%). The range of age varies from minimum 26 years to maximum 59 years. The mean age of the study population was 51.3 (±9.01) years. Majority of them were males (73.5%), Hindus (89.1%), married (92.1%), graduated (78.8%), coming from nuclear family (74.4%), belonging to upper socio-economic class(94.1%) according to Modified BG Prasad's classification (May 2014), working in urban branches 234 (68.8%) & residing in urban area (82.1%). 42.6% of them were managers (40 branch managers & 105 other (Zonal managers), 42.1% were clerks and 15.3% were cash handlers (Table 1).

Out of 340 subjects, only 13(3.8%) have not completed five years of service while 15(4.4%), 8(2.4%), 13(3.85%), 30(8.8%), 57(16.8%), 111(32.7%) and 93(27.4%) have completed service between 6-10 years, 11-15 years, 16-20 years, 21-25 years, 26-30 years, 31-35 years and 36-40 years respectively.

Of the total 340 participants, 135(39.7%) were hypertensives, 142(41.8%) were pre-hypertensive and only 63(18.5%) were normotensives. Out of 135 hypertensives, 111(82.2%) were on anti-hypertensive treatment (known hypertensives) while 24(17.8%) were newly diagnosed at the time of data collection using JNC 7 criteria (Figure 1).[2]

When z-test was applied to compare the prevalence of hypertension in this study (39.7%) with national prevalence of India (29.8%),[5] the observed difference was found to be significant (z=3.73, P <0.05). Similarly, prevalence of hypertension for urban and rural region (40.1% in urban area and 37.7% in rural area.) were also compared with that of urban and rural in India (33.8% in urban area and 27.6% in rural area) by applying z-test.[5] The observed differences were found to be significant (z=2.46, P<0.05 for urban and z=4.17, P<0.05 for rural difference).

In present study prevalence of hypertension showed binomial presentation in the age group of 31-35 years and 56-60 years. After 4th decade prevalence has increased with increasing age which is found statistically significant. Prevalence of hypertension was more in males(44.0%), Muslims(100.0%), post graduates(43.1%), married (43.1%), class I SES(40.9%), three generation family(100.0%), urban branches(41.0%), urban residents(40.1%) and cash handlers(44.2%) (Table 2).

Maximum prevalence of hypertension i.e. 60.3% was found in those using public transport followed by 37.7%, 33.3%, 29.4%, 28.1% in those using two wheeler, no vehicle, shared car and own car respectively (Figure 2).

Table 1: Socio-demographic characteristics of the study subjects.

| Sr. No.	Variables	Categories of the variables	Frequency (N =340)	%
1	Age (Years)	26-30	25	7.4
		31-35	8	2.3
		36-40	5	1.5
		41-45	25	7.4
		46-50	41	12.1
		51-55	94	27.6
		56-60	142	41.7
2	Sex	Male	250	73.5
		Female	90	26.5
3	Religion	Hindu	303	89.1
		Buddhist	25	7.4
		Jain	8	2.3
		Muslim	4	1.2
4	Marital status	Married	313	92.1
		Unmarried	19	5.6
		Widow/Widower	8	2.3
5	Education	Graduate	268	78.8
		Post Graduate	72	21.2
6	Type of family	Nuclear	253	74.4
		Joint	83	24.4
		Three generation	4	1.2
7	Socioeconomic Class	Class I	320	94.1
		Class II	20	5.9
8	Cadre of Bank employee	Manager	145	42.6
		Clerk	143	42.1
		Cash handler	52	15.3
9	Work Place	Urban Branch	234	68.8
		Semi-urban Branch	73	21.5
		Rural Branch	33	9.7
10	Place of Residence	Urban	279	82.1
		Rural	61	17.9
Total			**340**	**100**
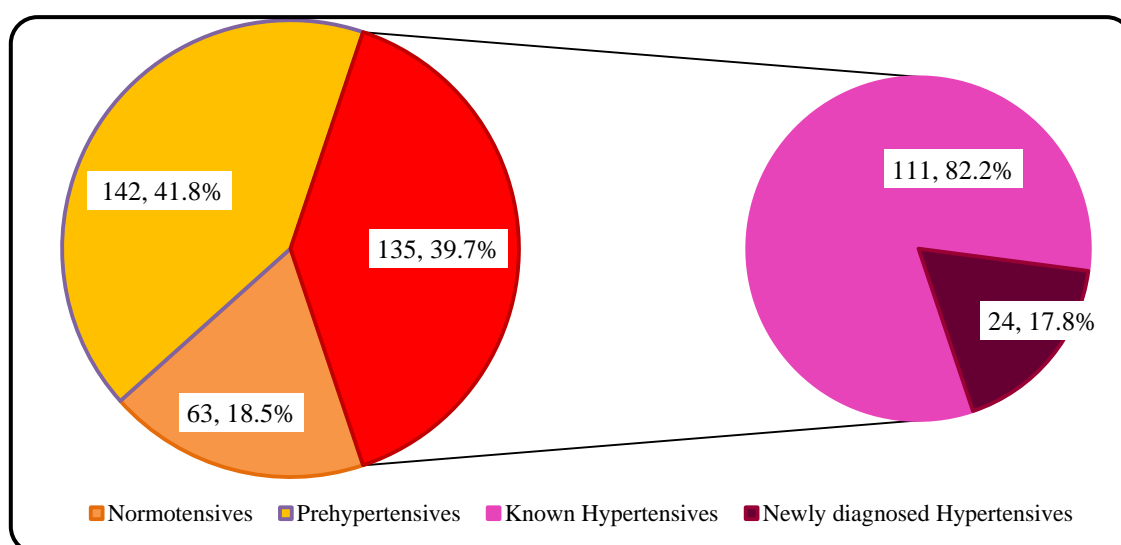
Figure 1: Distribution of study subjects according to the prevalence of hypertension.

Table 2: Prevalence of hypertension is according to the socio-demographic variables.

| S.N.	Variable	Categories	Normo-tensive		Pre-Hyper-tensive		Hyper-tensive		Total N=340 (100%)
			No.	%	No.	%	No.	%	
1	Age	26-30	17	68.0	8	32.0	0	0.0	25
		31-35	0	0.0	4	50.0	4	50.0	8
		36-40	5	100.0	0	0.0	0	0.0	5
		41-45	12	48.0	13	52.0	0	0.0	25
		46-50	13	31.7	20	48.8	8	19.5	41
		51-55	4	4.3	60	63.8	30	31.9	94
		56-60	12	8.5	37	26.1	93	65.5	142
2	Sex	Male	24	9.6	116	46.4	110	44.0	250
		Female	39	43.3	26	28.9	25	27.8	90
3	Religion	Hindu	50	16.5	130	42.9	123	40.6	303
		Buddhist	9	36.0	8	32.0	8	32.0	25
		Jain	4	50.0	4	50.0	0	0.0	8
		Muslim	0	0.0	0	0.0	4	100.0	4
4	Education	Graduate	50	18.7	114	42.5	104	38.8	268
		Post Graduate	13	18.1	28	38.9	31	43.1	72
5	Marital status	Married	41	13.1	137	43.8	135	43.1	313
		Unmarried	14	73.7	5	26.3	0	0.0	19
		Widow/ Widower	8	100.0	0	0.0	0	0.0	8
6	Socio-economic Status	Class I	55	17.2	134	41.9	131	40.9	320
		Class II	8	40.0	8	40.0	4	20.0	20
7	Type of family	Nuclear	51	20.0	100	39.5	102	40.3	253
		Joint	12	14.5	42	50.6	29	34.9	83
		Three generation	0	0.0	0	0.0	4	100.0	4
8	Work place	Urban branch	44	18.8	94	40.2	96	41.0	234
		Semi-urban br.	14	19.2	30	41.1	29	39.7	73
		Rural branch	5	15.2	18	54.5	10	30.3	33
9	Residence	Urban	53	19.0	114	40.9	112	40.1	279
		Rural	10	16.4	28	45.9	23	37.7	61
10	Cadre	Managers	22	15.2	69	47.6	54	37.2	145
		Clerks	32	22.4	53	37.1	58	40.6	143
		Cash handlers	9	17.3	20	38.5	23	44.2	52
Total			63	18.5	142	41.8	135	39.7	340
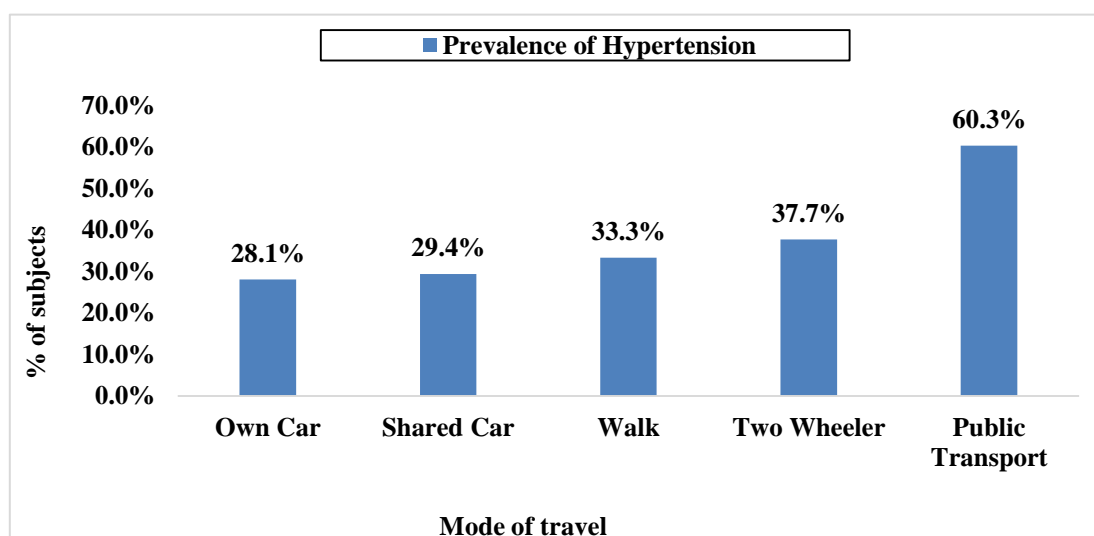
Figure 2: Prevalence of the hypertension according to the Mode of travel to workplace.

Table 3: Multivariate analysis of the risk factors for hypertension.

S.N.	Factors	Categories	No.	Hypertensives	O.R.	C.I.	P-value
1	Age in years	< 45	63	4(6.349%)	1	-	-
		> 45	277	131(47.292%)	24.085	6.347-91.397	0.000*
2	Sex	Female	90	25(27.777%)	1	-	-
		Male	250	110(44.000%)	7.837	2.867 - 21.423	0.000*
3	Family history of hypertension	Absent	238	74 (31.092%)	1	-	-
		Present	102	61 (59.803%)	7.468	3.450 - 16.166	0.000*
4	Socio-economic status	Class II	20	4 (20.000%)	1	-	-
		Class I	320	131 (40.937%)	0.311	.081 - 1.195	0.089
5	Residence	Rural	61	23 (37.704%)	1	-	-
		Urban	279	112 (40.143%)	1.051	.393 - 2.812	0.921
6	Cadre	Manager	145	54 (37.241%)	1		
		Clerk	143	58 (40.559%)	1.484	.788 - 2.795	0.221
		Cash handler	52	23 (44.230%)	2.384	.974 - 5.836	0.057
7	Type of Diet	Vegetarian	144	52 (36.111%)	1	-	-
		Mixed	196	83 (42.346%)	0.844	0.409- 1.741	0.646
8	Addition of extra salt	No	251	102 (40.637%)	1	-	-
		Yes	89	33 (37.079%)	2.223	0.890 – 5.553	0.087
9	Eating foods with high salt content	No	215	82 (38.139%)	1	-	-
		Yes	125	53 (42.400%)	1.218	0.592 – 2.504	0.593
10	Eating fruits & green leafy veg. daily	Yes	83	38 (45.783%)	1	-	-
		No	257	97 (37.743%)	0.251	0.114 – 0.550	0.001*
11	Use of beverages	None	54	17 (31.481%)	1	-	-
		Tea	269	105 (39.033%)	1.293	0.503 – 3.322	0.594
		Coffee	17	13 (76.471%)	122.24	15.468 –966.020	0.000*
12	Overweight acc. To BMI ≥ 23 Kg/m2	Absent	60	16 (26.667%)	1	-	-
		Present	280	119 (42.500%)	1	0.407 – 2.457	0.999
13	Central obesity acc. WHR	Absent	84	26 (30.952%)	1	-	-
		Present	256	109 (42.578%)	2.167	0.979 – 4.798	0.056
14	Physical activity	HEPA active	51	27 (52.941%)	1	-	-
		Non HEPA	289	108 (37.370)	0.596	0.257 – 1.381	0.228
14	Smoking	Absent	323	126 (39.009%)	1	-	-
		Present	17	9 (52.941%)	16.506	3.223 – 84.535	0.001*
15	Tobacco chewing	Absent	315	123 (39.047%)	1	-	-
		Present	25	12 (48.000%)	2.606	0.796 – 8.532	0.113
16	Alcohol intake	Absent	280	106(37.857%)	1	-	-
		Present	60	29 (48.333%)	0.974	0.403 – 2.353	0.954
17	Mental Stress level	Low	59	29 (49.152%)	1	-	-
		Moderate	251	93 (37.051%)	0.142	0.050 – 0.390	0.000*
		High	30	13 (43.333%)	0.229	0.057 – 0.923	0.038*
18	Type of family	Extended	87	33 (37.931%)	1	-	1
		Nuclear	253	102 (40.316%)	0.787	0.363 – 1.704	0.543
19	Mode of travel	Car	74	21 (28.378%)	1	-	-
		Others	266	114 (42.857%)	5.506	1.759 – 17.232	0.003*
20	Working place	Rural	33	10 (30.303%)	1	-	-
		Semi-urban	73	29 (39.726%)	1.223	0.384 – 3.889	0.733
		Urban	234	96 (41.025%)	1.679	0.555 – 5.075	0.359

In 24 newly diagnosed hypertensives, about 80% were working in urban branches, 2/3rd (66.7%) were inactive and 1/3rd were minimally active however no one was HEPA active, 100% were smokers, 16.7% were tobacco chewers, 16.7% were drinking alcohol, 2/3rd (66.7%) were centrally obese, 2/3 (66.7%) were eating foods with high salt content, 50% were taking extra salt in a meal, 2/3rd (66.7%) used to eat mixed type of diet, 2/3rd (66.7%)

had moderate level of stress, 100% were beverage drinkers. So majority of the newly diagnosed subjects had known risk factors.

In this study, factors assessed were age, gender, religion, marital status, education, type of family, socioeconomic status, cadre, work place, place of residence, years of service, family history of hypertension, life style factors like smoking, tobacco chewing, alcohol intake, physical activity, dietary factors like type of diet, addition of extra salt to food, eating foods with high salt content, not eating fruits and vegetables daily, drinking tea or coffee, overweight (BMI >23),central obesity, mental stress, and mode of travel. Out of all these factors, age, gender, family history of hypertension, years of experience, physical activity, overweight according to BMI, drinking coffee were found to have statistically significant association with hypertension in univariate analysis considering P<0.05 as significant.

Since the hypertension is a multifactorial disease and many of the factors are interrelated, multivariate analysis was also used to assess their independent effect. While applying multivariate logistic regression analysis, the variable "years of experience" was not included as it was also dependent on age of the person, similarly some other factors having less number of individuals in the group were not included. The findings were as given in table

no.3. Out of all considered factors, age >45 years (O.R.:24.1, C.I.:6.4-91.4), males (O.R.:7.8, C.I.:2.9-21.4), family history of hypertension (O.R.:7.5, C.I.:3.5-16.2), not eating fruits & green leafy vegetables daily (O.R.:0.3, C.I.:0.1–0.6), coffee intake (O.R.:122.2, C.I.:15.5–966.0), smoking (O.R.:16.5, C.I.:3.2–84.5), moderate level mental stress (O.R.:0.1, C.I.:0.1-0.4), high level mental stress (O.R.:0.2, C.I.:0.1-0.9) and mode of travel other than car (two wheeler, public transport) (O.R.:5.5, C.I.:1.8-17.2), were found to have an independent association with hypertension which is statistically significant.

DISCUSSION

Present study is carried out to find out the prevalence of hypertension and its risk factors present among the bank employees of Western Maharashtra in which a little over 80% of the participants were in the age group of 46-60 years. Majority of the participants were males, Hindus, married &from nuclear family. The study group was homogenous as almost all were educated at least up to graduation and belonging to class I (94.1%) and class II (5.9%) of modified B.G Prasad's socio-economic classification because support staff from the banks was not included in the present study. Majority of them were working in urban branches and were from urban residence.

Table 4: Prevalence of hypertension in bank employees from various regions.

S.N.	Place	Author	Year	Prevalence
1	Brazil	Chor D[29]	1998	18.0%
2	Nigeria	Ofili&Omuemu[26]	2005	17.7%
3	Nigeria	Sulaudeen et al[30]	2014	34.4%
4	Petersburg (Russia)	Konradi et al[27]	2011	35.2%
5	Puducherry, India	Ganesh Kumar et al[20]	2014	44.3%
6	Meerat (U.P.)	Maroof et al [21]	2007	69.5%
7	Meerut (U.P.)	Parashar et al[22]	2009	69.5%
8	Surat (Gujrat)	M H et al[24]	2009	30.4%
9	Surat (Gujrat)	Undhad et al[23]	2011	69.5%
10	Surat (Gujrat)	Momin et al[7]	2012	30.4%
11	Surat (Gujrat)	Mohmmedirfan et al[19]	2013	30.4%
12	Belgaum (Karnataka)	Shivaramakrishna et al[18]	2010	31.0%
13	Hubli(Karnataka)	Lokare et al[14]	2012	38.0%
14	Sullia (Karnataka)	Ismail et al[15]	2013	39.3%
15	Gulbarga (Karnataka)	Prashanth et al[16]	2013	35.7%
16	Mangalore (Karnataka)	Ganesh Kumar et al[17]	2013	31.3%
17	Bellary(Karnataka)	Nagammanavar et al[25]	2015	48.5%
18	**Present study**	-	-	**39.7%**

The prevalence of hypertension among the study population of bank employees is significantly higher as compared to that of general population of India. It is seen

from the Table 4 that hypertension prevalence in bank employees varies from region to region. The finding in present study was in accordance with the studies by

Lokare et al, Ismail et al, Prashanth et al.[14-16] It is higher as compared to the studies by Ganesh Kumar et al, Shivaramakrishna et al, Mohmmedirfan et al and lower as compared to the studies by Ganesh Kumar et al, Maroof et al, Parashar et al and Undhad et al.[17-23] This special variation could be because of the fact that hypertension is a life style disease and the prevalence is more when there is risk behaviour.

Prehypertension is not a disease category. Rather, it is a designation chosen to identify individuals at high risk of developing hypertension, so that both patients and clinicians are alerted to this risk and encouraged to intervene and prevent or delay the disease from developing.[2] Given the population distribution of BP, most ischemic strokes occur in individuals with prehypertension or stage 1 hypertension.[2] In the present study prevalence of prehypertension was 41.8% which was higher than that found in the study by Momin et al (34.5%) and similar to that found in the study by Ganesh Kumar et al (41.1%).[7,20] Prevalence of pre-hypertension was higher in the age group of 51-55 years, in males, in Jains, graduates & in class I SES. Prehypertensives were more in married, joint type of family, in managers compared to other groups which is in contrary in the study by Momin et al.[7] In total only 18.5% were normotensives which is lower as compared to that found in the study by Momin et al (35.0%) and higher than that found in the study of bank employees by Ganesh Kumar et al.[7,20]

Age: There is a strong positive correlation between increasing age and increase in blood pressure.[2] Present study has shown binomial presentation of hypertension prevalence. Such presentation might be there due to less number of individuals in the age group of 31-40 years. This should be studied further with larger sample size. After 4th decade prevalence has increased with increasing age which is found statistically significant. The similar findings were revealed by other studies conducted in the bank employees.[15,19,20,24,25] Significant association has been found between years of experience and hypertension in a present study and a study by Prashanth et al.[16] This may be due the fact that age also increases with years of experience.

Gender: Males had significantly higher prevalence of hypertension than females. Similar findings were revealed in other studies in bank employees.[7,19, 20,25-27] However it was similar among males and females in the study by Ismail et al.[15]

Religion: The prevalence of hypertension was found highest in Muslims and lowest in Jain participants. This may be due to habit of eating predominantly non vegetarian diet in Muslims and pure vegetarian diet in Jain. After extensive research studies on religion and hypertension were not found. So such studies can be conducted to find the pattern of hypertension in various religions.

Education: The prevalence of hypertension was more among post graduated participants than those with only graduation. But the observed difference in these 2 groups was not statistically significant (z=0.526, p=0.5).

Marital status: Prevalence of hypertension was found more in married individuals as compared to other groups which is similar to that found by Nagammawar et al.[25] On the contrary, it was more in widow/widower than married individuals in the study by Momin et al.[7] Present study had lesser study subjects in the groups other than married, hence the findings need to be confirmed from larger studies.

Socio-economic status: Prevalence of hypertension was found higher in higher socioeconomic status like other studies in bank employees.[17,24] However it was not statistically significant.

Type of family: Prevalence of hypertension was found higher in the participants having 3 generation family than those having joint family or nuclear family. However it was more among nuclear type of family than joint type of family. Similar findings were found in the study by Momin et al.[7] This could be due to fewer participants from 3 generation family in the current study.

Workplace: There was an increasing trend of hypertension prevalence from rural to urban branches. The employees usually reside near the work place, hence it might also be reflecting the urban-rural differences in hypertension.[5]

Place of residence: Prevalence of hypertension was higher in the urban area than that in the rural area. This is in accordance with the Meta-analytic study on prevalence of hypertension in India.[5] But the prevalence of pre-hypertension in rural area was found to be higher than that of urban study subjects. Similarly prevalence of normotensives was lesser in the study subjects from rural area as compared to study subjects from urban area. This clearly indicates that in rural area, people in 'at risk group' for hypertension are more in number and screening will help to identify such people to take protective measures.

Cadre: In the present study, higher prevalence of hypertension was found in cash handlers which was contrary to the findings from other studies in bank employees showing higher prevalence in the managers.[7,16] Higher prevalence in Cash handlers could be due to the additional stress in them of handling the cash and keeping it safe.

Life style factors: No significant association has been found between smoking, tobacco chewing or alcohol and hypertension. Other studies on bank employees revealed significant association of smoking with hypertension.[15,24] Alcohol was also found significantly associated with hypertension in some of the studies in bank

employees.[20,24,25] However it was not found significantly associated with hypertension in present study and the study by Ismail et al.[15] Tobacco chewing was found significantly associated with the hypertension in the study by MH et al and Nagammawar et al. [24,25] Present study participants contained occasional smokers and irregular tobacco chewers. Also those taking alcohol were occasional drinkers. This might be the reason for not getting the significant association between these habits and hypertension in the study. That would probably need an in-depth quantification of their usage. In present study as the number of hypertensives with these habits was very small, it was not possible to study the effect of quantity of tobacco and alcohol usage on hypertension.

Physical activity: Nagammanawar et al had shown that, physically inactive subjects had higher odds of suffering from hypertension compared to other groups and this association was found to be statistically significant.[25] But in the present study non HEPA group (inactive and minimally active) were found to have lower odds of developing hypertension than the HEPA active group. This could be due to the fact that hypertensive group might have become more active after the diagnosis of their hypertension as discussed for univariate analysis.

Dietary factors: Similar to current study, the factors like type of diet, eating foods with high salt content, not eating fruits and vegetables daily were not found significantly associated with the hypertension in a study by Ganesh Kumar et al.[20] Addition of extra salt while eating food was found significantly associated with hypertension in the study by Ganesh kumar et al and Mohmedirfan et al which is in contrary to the findings in this study and a study by Ismail et al.[15,19,20] Mixed diet was found significantly associated with the hypertension in a study by M.H. et al whereas it was not found significantly associated with hypertension in a study by Ismail et al.[24,15] Just like Physical activity, dietary changes are also important part of "Non-pharmacological treatment" of hypertension.[2] Hence many participants might have modified their dietary habits as per the doctor's advice. When the dietary factors in newly diagnosed hypertensives were analyzed, it was found that $2/3^{rd}$ of them were from mixed diet group, were eating high salt containing food items and half of them were taking additional salt while eating.

Significant association was found between beverage intake (either tea or coffee) and hypertension. Grosso et al have found that tea or coffee consumption was found to be negatively associated with hypertension.[28] This was more remarked for the coffee than tea. In contrast to this, present study had found positive and independent association of both tea and coffee with hypertension which was more marked for coffee and found to be highly significant. However association of tea with hypertension was not found significant statistically. In present study the coffee drinkers were very few in

number. Hence further studies are warranted to confirm the finding.

Family history: Familial resemblance of blood pressure levels among the first degree relatives has been found to be statistically significant in a large number of studies[1]. As per the report of WHO expert group[1] a family history of elevated blood pressure is one of the strongest risk factor for future development of hypertension in individuals. In the study by Nagammawar et al, family history of hypertension was found to have higher odds (OR=1.4) as compared to others with no family history.[25] However it was not found to be statistically significant. But present study (OR=7.468) and other studies in bank employees revealed a statistically significant association between family history of hypertension and hypertension in the individuals.[15,16,19,25]

Overweight and central obesity: Significant association has been found between overweight and hypertension but not between central obesity and hypertension in the present study. Also central obesity had higher odds than others and independent association with hypertension though not significant. Other studies on bank employees have found significant association of overweight and central obesity with hypertension.[15,21,23-25] However BMI was not associated with hypertension in the study by Ganesh Kumar et al.[20] Many studies have demonstrated the correlation between excess body weight and blood pressure. In the present study we could not find the independent association of overweight with hypertension. We have followed the WHO classification of BMI for Asians which have lower cut off level for overweight of ≥ 23 Kg/m^2. So some non-obese participants are shifted to the overweight category. So further studies should be conducted and assessed using multivariate analysis to find out the independent association of overweight / obesity with hypertension.

Mental stress level: No significant association has been found between stress level and hypertension similar to study by Ganesh Kumar et al.[20] Whereas, many other studies in bank employees.[14,26,25] have found significant association of stress with hypertension.

Mode of travel: A significant association was found between mode of travel and hypertension. It is seen from the Figure 2, that prevalence of hypertension has increased from Own car, Shared car, walking, Two wheeler to public transport. More stressful the mode of transport was, more was the prevalence of hypertension. In univariate analysis we had found the significant association of this factor with hypertension. It has also shown an independent association which was again significant with higher odds in the employees using mode of travelling other than car as compared to those using car. So further studies should consider this factor for analysis.

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