# A cross sectional study on prevalence of hypertension and its associated risk factors among bank employees in a city of Maharashtra 

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#### Abstract

Background: Hypertension is one of the diseases of occupational origin and it stands fifth among the top ten most important categories of occupational illness. Hypertension 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. In India, the prevalence of hypertension is $23 \%$ (male $23.1 \%$, female $22.6 \%$ ) as per WHO Statistics. Bank employees become an important high risk group for hypertension due to their sedentary lifestyle and stress associated with job. Hence the study was conducted to provide data on the prevalence of hypertension among bank employees and study its associated risk factors. Objectives: The purpose of the study to assess the prevalence of hypertension among bank employees and to study various risk factors associated with hypertension. Methods: A cross sectional study was conducted among bank employees o in a city of Maharashtra. All Employees of all banks in a city who were present on the days of the interview were enrolled in the study as per following inclusion and exclusion criteria. Thus out of 260 bank employees working in various banks of a city, 236 bank employees were enrolled in the study. 24 bank employees were either absent on the fixed day of the interview or not given consent for the study. After all ethical permission, data were collected and analysed._Results: Prevalence of hypertension was $33.1 \%$ in study subjects ( $35.4 \%$ in male and $21.1 \%$ female). Hypertension had significant association with socioeconomic factors like age, marital status, higher education, nuclear family higher post in bank, obesity, physical inactivity and diabetes. Conclusion: Hypertension was found to be more prevalent in bank employees as compared to general population in India.


Key words: Prevalence, Hypertension, Risk factors, Bank employees.

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## INTRODUCTION

Hypertension is one of the diseases of occupational origin and it stands fifth among the top ten most important
categories of occupational illness. According to the report of National Institute of Occupational Safety and Health USA, the percentage of individuals having hypertension increases more when occupational groups are selected for screening. ${ }^{1}$ According JNC 7, Hypertension 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. ${ }^{2}$ In India, the prevalence of hypertension is $23 \%$ (male $23.1 \%$, female $22.6 \%$ ) as per WHO Statistics. ${ }^{3}$ It is estimated that in urban India by the year 2025, the prevalence of hypertension increases up to $29-45 \%$ and $25-38 \%$ in men and women respectively. In India, $42 \%$ coronary heart diseases deaths and $57 \%$ of all stroke deaths are due to hypertension. ${ }^{4}$ Hypertension has
modifiable as well as non- modifiable factors. Among the modifiable factors, most factors are preventable such as alcohol use, unhealthy diet, tobacco use, physical inactivity, stress, overweight and obesity. ${ }^{5}$ Bank employees become an important high risk group for hypertension due to their sedentary lifestyle and stress associated with job. With reference to above context, this study was conducted to provide data on the prevalence of hypertension among bank employees and study its associated risk factors.

## MATERIALS AND METHODS

A Cross-sectional study was carried out among bank employees in Ambajogai city of Maharashtra state during January 2017 to December 2018. Ethical committee approval was obtained from the Institutional ethical committee prior to the start of the study.
Study population
All Employees of all banks in a city who were present on the days of the interview were enrolled in the study as per following inclusion and exclusion criteria
Inclusion Criteria: All bank employees willing to participate in the study. All bank employees in the age group of 21-60 years were included.
Exclusion criteria: Bank employees absent on the days of the interview. Employees not willing to participate in the study. Pregnant employees. Bank employees working for duration less than one year.
Sample size: All the employees of all the banks in a city of Maharashtra according to inclusion and exclusion criteria were included in this study. Thus out of 260 bank employees working in various banks of a city, 236 bank employees were enrolled in the study. 24 bank employees were either absent on the fixed day of the interview or not given consent for the study.
Sampling Technique: Data Collection: Due permission was obtained from bank managers. The purpose of the study was explained to participants and written informed consent was taken from them. Data was collected using pre-designed and pre-tested proforma. Socio-economic status was determined by Modified Kuppuswamy classification of the family ${ }^{6}$
Height and Weight: The standard criteria were used for measuring the height and weight. Height was measured by using a non-stretchable measuring tape, with an accuracy
of 0.1 cm , standing against a wall bare foot. The weight was measured by using an electronic weighing scale with an error of $\pm 0.1 \mathrm{~kg}$.
Body Mass Index (BMI): Body Mass Index was calculated by using the formula
BMI $=$ Weight $(\mathrm{kg}) / \operatorname{Height}(\mathrm{m})^{2}$
Waist and Hip circumference:
Waist Circumference (WC) was measured at the midpoint between the lower margin of the least palpable rib and the top of the iliac crest in the mid-axillary line, using a stretch resistant tape.
Hip circumference (HC) was measured around the widest portion of the buttocks, with the tape parallel to the floor. For both measurements, the subject was asked to stand with feet close together, arms at the side and body weight evenly distributed, and wear little clothing. The measurement was taken at the end of a normal expiration in a relaxed mood.
Waist to Hip ratio (WHR): WHR was calculated as WHR= Waist circumference (cm) / Hip circumference (cm)

Obesity measurement:
For measurement of obesity in bank employees, BMI classification for the Asian population was used. ${ }^{7-9}$

## MEASUREMENT OF BLOOD PRESSURE:

Blood pressure was measured using a mercury sphygmomanometer of appropriate cuff size, after 5 min of rest with the participant in sitting position, feet relaxed on the floor and arm supported at chest level. ${ }^{10}$ The subject was asked to avoid caffeine, smoking or exercise for at least 30 min prior to measurement. Joint National Committee (JNC) VII criteria was used to classify the measured blood pressure values and subjects were classified as "normal," "Pre-Hypertension" or "Hypertension". ${ }^{2}$
Physical Activity: The level of physical activity was assessed by using WHO Global Physical Activity Questionnaire (GPAQ-2) ${ }^{11}$
Statistical Analysis: Data was compiled and analyzed using Microsoft Excel, Epi Info version-6 software and SPSS-21. Frequency distributions were calculated for almost all independent variables. Odds ratio and its $95 \%$ confidence intervals were calculated. Chi-square test was used to determine statistical significance and $\mathrm{p}<0.05$ was considered to be as statistically significant.

## RESULTS

Table 1: Distribution of study participants according to Socio-demographic

|  | Characteristics |  | Frequency |
| :---: | :---: | :---: | :---: |
| Age groups | $21-30$ | 106 | Percentage |
|  | $31-40$ | 59 | 44.9 |
|  | $41-50$ | 39 | 16.0 |


| Sex | 51-60 | 32 | 13.6 |
| :---: | :---: | :---: | :---: |
|  | Total | 236 | 100 |
|  | Male | 198 | 83.9 |
|  | Female | 38 | 16.1 |
|  | Total | 236 | 100 |
|  | Government Banks | 80 | 33.9 |
| Bank sector | Private Banks | 37 | 15.7 |
|  | Cooperative Banks | 119 | 50.4 |
|  | Total | 236 | 100 |
|  | Hindu | 190 | 80.5 |
|  | Muslim | 14 | 5.9 |
| Religion | Buddhist | 32 | 13.6 |
|  | Total | 236 | 100 |
|  | Primary/Middle School | 05 | 2.1 |
|  | High School | 20 | 8.5 |
| Education | Intermediate or post high school | 05 | 2.1 |
|  | Diploma |  |  |
|  | Graduate or post graduate | 205 | 86.9 |
|  | Professional or Honours | 01 | 0.4 |
|  | Total | 236 | 100 |
|  | Managers | 42 | 17.8 |
| Post of bank employees | Officers | 35 | 14.8 |
|  | Clerks | 123 | 52.1 |
|  | Attendants | 36 | 15.3 |
|  | Total | 236 | 100 |
| Socio- economic Status\# | Upper (I) | 175 | 74.2 |
|  | Upper Middle (II) | 39 | 16.5 |
|  | Lower Middle (III) | 22 | 9.3 |
|  | Total | 236 | 100 |

\# Modified Kuppuswamy's Socioeconomic Status Scale (2017) ${ }^{6}$
Table no 1 showed sociodemographic characteristics of study participants. Out of 236 study participants enrolled in the study, there were 198 males ( $83.9 \%$ ) and 38 females ( $16.1 \%$ ). Mean age of the study population was $36.08 \pm 10.10$. Out of 236 bank employees enrolled in this study, $106(44.9 \%), 59(25.0 \%), 39(16.5 \%), 32(13.6 \%)$ were in the age group of 21 to 30 years, 31 to 40 years, 41 to 50 years and 51 to 60 years respectively. Majority of them were Hindus ( $80.5 \%$ ), graduated ( $86.9 \%$ ), working in cooperative sector ( $50.4 \%$ ), at clerical post ( $5.1 \%$ ), belonging to upper socio-economic class( $74.2 \%$ ) as per Modified Kuppuswamy's socioeconomic status scale (2017) ${ }^{6}$


Figure 1: Distribution of bank employees according to blood pressure
Out of 236 bank employees, 63 ( $26.7 \%$ ) and (78) 33.1\% bank employees were pre-hypertensive and hypertensive respectively whereas $95(40.2 \%)$ were normal.

Table 2: Distribution of Hypertensive bank employees according to various variables


Hypertension was very significantly prevalent in the age group 51-60 years as compared to other age groups. The prevalence of hypertension was significantly high in married, graduate and above, belongs to nuclear family, working at higher level post (managers). Also Hypertension was significantly prevalent in obese bank employees, those having low level of physical activity and those having diabetes. The variables that had no significant association with prevalence of hypertension were religion, sex, socioeconomic class, type of diet and addiction history.

## DISCUSSION

A cross sectional study was conducted to find out the prevalence of Hypertension and its associated risk factors among bank employees of various banks in a city of Ambajogai, Maharashtra state. A total of 236 bank employees were participated in this study. Out of total participants, majority of them were in age group (44.9\%), (male 83.9\%), Hindu ( $80.5 \%$ ), working in cooperative banks ( $50.4 \%$ ), working at the post of clerk ( $52.1 \%$ ), belongs to upper socioeconomic status as per Modified Kuppuswamy's socioeconomic status scale. The overall prevalence of hypertension was found to be
33.1\%. As compared to present study, the higher prevalence was shown by Nagammanavar R, et al. (2015), Ganesh Kumar S, et al. (2014), Ismail IM, et al. (2013), Maroof KA, et al. and Brahmankar TR et al. whereas lower prevalence was shown by Momin MH, et al. (2012) and Ofili AN, et al.

Table 3: Different studies on prevalence of Hypertension

| Sr.No | Study | Year | Prevalence of Hypertension |
| :---: | :---: | :---: | :---: |
| 1 | Nagammanavar R, et al. ${ }^{16}$ | 2015 | $48.5 \%$ |
| 2 | Shivaramakrishna HR, e al. ${ }^{17}$ | 2010 | $31.0 \%$ |
| 3 | Momin MH, et al. ${ }^{19}$ | 2012 | $30.4 \%$ |
| 4 | Ganesh Kumar S, al..$^{15}$ | 2014 | $44.3 \%$ |
| 5 | Ismail IM, et al. ${ }^{14}$ | 2013 | $39.3 \%$ |
| 6 | Maroof KA, et ${ }^{12}$ | 2007 | $69.5 \%$ |
| 7 | Lokare et al..$^{13}$ | 2012 | $38.0 \%$ |
| 8 | Brahmankar TR, et al. ${ }^{21}$ | 2017 | $39.7 \%$ |
| 9 | Ofili AN, et al. ${ }^{20}$ | 2005 | $17.7 \%$ |
| 10 | Prashanth, et al. ${ }^{22}$ | 2013 | $35.7 \%$ |
| 11 | Present study | - | $33.1 \%$ |

Table 3 shows different studies on hypertension from various regions The prevalence of hypertension was increased with increase in age, it was $11.3 \%$ for age group of 21-30 years and increased to $78.1 \%$ for age group of 5160 years. Similar finding were observed in other studies conducted by Maroof et al. ${ }^{12}$, Lokare et al. ${ }^{13}$, Ismail et al. ${ }^{14}$, Ganesh Kumar S, et al. (2014) ${ }^{15}$ Nagammanavar R, et al. $(2015)^{16}$ and Shivaramakrishna HR, et al. (2010) ${ }^{17}$ The prevalence of hypertension was more in male ( $35.4 \%$ ) as compared to female employees (21.1\%) but no significant association was found. Similar finding were observed in Dubey M, et al. (2018) ${ }^{18}$, Nagammanavar R, et al. (2015) ${ }^{16}$, Shivaramakrishna HR, et al. (2010) ${ }^{17}$ In the present study, the prevalence of hypertension among Hindu, Muslim and Buddhist bank employees was $34.7 \%$, $7.1 \%$, and $34.4 \%$ respectively. The association between religion and hypertension in bank employees were found statistically not significant ( $p=0.104$ ). We could not found such studies showing the distribution of Hypertension as per religion in bank employees. The prevalence of hypertension among married bank employees was 37.0\% whereas among unmarried and others it was $17.0 \%$. There was found a significant association between marital status and hypertension ( $\mathrm{p}=0.009$ ). The findings of present study was similar to the findings of Nagammanavar R, et al. (2015) ${ }^{16}$ There was no significant association between hypertension and socioeconomic status ( $\mathrm{p}=0.125$ ). Similar findings were observed in Nagammanavar R, et al. $(2015)^{16}$ The high prevalence of hypertension in upper socioeconomic classes may be due to factors such as sedentary lifestyle, stress etc. In the present study the prevalence of hypertension was more in bank employee who educated to graduation and more (35.9\%) as compared to those educated less than graduation (13.4\%) and the association was statistically significant ( $\mathrm{p}=0.014$ ). The high prevalence of hypertension in educated bank
employees may attributed the various factors like responsibility of higher post in bank, stress etc. The findings of Nagammanavar R, et al. (2015) ${ }^{16}$ were similar to the present study. The prevalence of hypertension among employees with nuclear families was $39.6 \%$ whereas it was $19.5 \%$ among bank employees with a joint type of family and association was statistically significant ( $\mathrm{p}=0.002$ ). Similar findings were found in Momin MH, et al. (2012) ${ }^{19}$ The prevalence of hypertension among Managers, officers, clerk, attendant was $59.5 \%, 34.3 \%$, $25.2 \%$, and $27.8 \%$ respectively. The significant association was found between the post of bank employees held in banks and hypertension ( $\mathrm{p}=0.0006$ ). Higher prevalence in the Manager could be due to the stress of overall administration of bank. The similar findings were seen in Ganesh Kumar S, et al. (2014) ${ }^{15}$ and Momin MH, et al. (2012) ${ }^{19}$ The prevalence of Hypertension among Underweight, Normal, overweight and obese was $0 \%$, $18.0 \%, 26.5 \%$, and $51.5 \%$ respectively. The significant association was found between obesity and the prevalence of hypertension in bank employees ( $\mathrm{p}=0.0000004$ ). The similar findings were found in studies by Nagammanavar R, et al. (2015) ${ }^{16}$, Ganesh Kumar S, et al. (2014) ${ }^{15}$, Ismail IM, et al. (2013) ${ }^{14}$ and Maroof KA, et al. (2007) ${ }^{12}$ The prevalence of hypertension among bank employees with high level of physical activity, with moderate physical activity and low physical activity was $5.5 \%, 36.6 \%$, and $34.7 \%$ respectively. The significant association was found between the level of physical activity and hypertension ( $\mathrm{p}=0.034$ ). The findings of the present study were similar with Nagammanavar R, et al. (2015) ${ }^{16}$, Ganesh Kumar S, et al. (2014) ${ }^{15}$ and Shivaramakrishna HR, et al. (2010) ${ }^{17}$. The prevalence of hypertension was more in vegetarian employees ( $33.7 \%$ ) as compared to those with mixed diet (32.6\%). There was no significant association found between hypertension and type of diet $(\mathrm{p}=0.866)$. The
similar findings were found in the studies by Nagammanavar R, et al. (2015) ${ }^{16}$, and Maroof KA, et al. (2007). ${ }^{12}$ The bank employees with diabetes had more prevalence of hypertension ( $48.2 \%$ ) as compared to those without diabetes (28.3\%). The association was found statistically significant between hypertension and diabetes ( $p=0.005$ ). Ganesh Kumar S, et al. (2014) ${ }^{15}$ and Ismail IM, et al. (2013) ${ }^{14}$ found more prevalence in those with diabetes as compared to those without diabetes but association was not significant.

## CONCLUSION

The prevalence of hypertension in bank employees was $33.1 \%$. We found that higher age group (51-60 years), those having diabetes, obesity, low physical activity, higher posts in bank were significantly associated with the prevalence of hypertension. Such kind of study helps to have insight regarding magnitude of hypertension and its associated factors so that one can initiate appropriate preventive strategy accordingly.

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