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Prehypertension, its prevalence and risk factors among young adult (25-44 years) Bank Employees of a city in coastal district of Andhra Pradesh-A cross-sectional study

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Abstract

Introduction: Hypertension is a rapidly emerging modifiable lifestyle disease and is often called as the silent killer. Owing to a steady increase in the prevalence it is of public health concern. Hypertension typically develops gradually, starting with prehypertension. By intervening in the early stages, particularly in young adults, the progression to full-blown hypertension can be significantly delayed or even completely prevented. Bank employees lead a sedentary and highly stressful life that often leads to developing NCD's such as hypertension. Diabetes mellitus etc. The study aims to assess the prevalence of prehypertension and its risk factors among them.

Objectives

1.To assess the prevalence of Prehypertension among young adult bank employees.

2.To identify risk factors for prehypertension among young adult bank employees.

Methodology: A Cross-sectional analytical Study was carried out among the bank employees of urban Kakinada, during October & November 2023 and their hypertension status was assessed. Sample size was calculated using the formula [$n=z^2pq/l^2$] with an allowable error of 15% of prevalence. Prevalence (55.3%) was taken from the study done by Sira Jam Munira et al., and sample size was 140. List of banks in the city was obtained and 32 of them were selected by simple random sampling using lottery method. Young adults(25-44years) of age from the rank of Clerk and above were included in the study. Modified WHO STEPS questionnaire was used to collect data using Kobo toolbox and the data was analyzed using MS Excel 2019 and SPSS 21. Prior approval was taken from Institutional Ethics Committee.

Results: Prevalence of Prehypertension among bank employees was 58.5% and de novo Hypertension was 12.8%. Mean age of the participants was 35.7± 4.7SD

years. Majority of them had abnormal BMI (73.6%). Significant association was found between BMI, Central obesity (high Waist hip ratio and high waist circumference) and prehypertension.

Conclusion: Young adult bank employees had high prevalence of prehypertension and there was no gender variation.

Keywords: Modified WHO STEPS Questionnaire, Prehypertension, Young Adults.

Introduction

WHO has named hypertension as the “silent killer” Because it often remains asymptomatic on the surface, hypertension inflicts substantial harm through 'Target Organ' damage (1). According to JNC 7 criteria, prehypertension is characterized by a systolic blood pressure (SBP) of 120-139 mmHg and a diastolic blood pressure (DBP) of 80-89 mmHg (2). Prehypertension increases the likelihood of progressing to full-blown hypertension and heightens the risk of CVD and mortality. Evidence indicates that individuals under 34 years with hypertension have lower awareness, slower diagnosis rates, and poorer blood pressure control compared to older adults. Individuals with prehypertension have a higher prevalence of metabolic syndrome compared to those with normal blood pressure (3). This stage signifies a doubled risk of developing hypertension compared to normal blood pressure. Social and economic changes in developing countries are affecting the rate at which hypertension and its risk factors are increasing (3). It is a significant cause of cardiovascular disease and death globally, including in India (1). The imbalance between a poor diet and insufficient physical activity results in obesity, which in turn can lead to high cholesterol levels and ultimately elevated blood pressure (4).Obesity and hypertension pose significant health risks in both sedentary lifestyles and stressful occupations. Bank employees typically have sedentary jobs that involve high levels of mental stress (5).Epidemiological studies indicate that long work hours, sedentary lifestyles, and stressful jobs are significant contributors to obesity and hypertension (6). Evidence indicates that job-related risk factors are rising among bank employees and others in similar sedentary roles, characterized by long work hours and elevated mental stress (7). A sedentary lifestyle and stress are crucial risk factors for hypertension. Consequently, the sedentary and high-stress nature of banking positions makes bank employees a potential high-risk group for developing hypertension (8). Hypertension has several risk factors, with a sedentary lifestyle and mental stress being significant contributors. Given that bank employees are exposed to elevated levels of these risk factors, they constitute a high-risk group for hypertension screening (8). Bank employees experience varying levels of mental stress as they work to minimize manual errors, making them more susceptible to chronic conditions such as hypertension (9). There is a lack of comprehensive information on the prevalence of hypertension among bank employees globally (8).The prevalence of certain chronic diseases, such as hypertension, in these populations is documented by only a few studies, both in India and globally (10). Many of these studies have not thoroughly examined the risk factors and have often reported hypertension prevalence as a secondary outcome. Conducting a study that focuses on these aspects will enhance our understanding of the issue and facilitate the development of effective interventions on a larger scale for the benefit of this vulnerable group (8). Therefore, the study was conducted to know the prevalence and risk factors of prehypertension among bank employees. Occupational factors can contribute to

high blood pressure, which in turn can disrupt one's professional life (11).

Materials & Methods

A cross-sectional analytical study was carried out among Bank employees of urban Kakinada during October & November 2023. Kakinada is a district in the coastal region of Andhra Pradesh (11). The newly established Kakinada district borders Anakapalli and Alluri Sitaramaraju districts to the north, East Godavari district to the south, Konaseema district to the west, and the Bay of Bengal to the east (13) .Urban Kakinada has a population of 5,52,000 (14) .A total of 65 different banks are present in urban Kakinada including private and Govt. of India undertaking banks (15).Out of them 32 different banks were selected by simple random sampling using lottery method. Young adults in between 25-44 years of age who worked in these banks and gave informed consent and willing to take part in the study were included. Employees in the rank of clerk and above were only included in the study. Already known hypertensives on medication and below the cadre of clerk were excluded from the study. Sample size was calculated using the formula [$n=z^2pq/l^2$] with an allowable error of 15% of prevalence. Prevalence (55.3%) was taken from the study done by Sira Jam Munira et al.,(16) and sample size was 140. A pretested modified WHO STEPS questionnaire (17) was administered to interview the study participants to collect sociodemographic data and clinical profiles. The three components of WHO STEPS questionnaire i.e. Demographic Information, Behavioral Measurements and Physical Measurements were included in the present study. Data was collected by the researcher personally by administering modified WHO STEPS Questionnaire and using Kobo toolbox. After getting permission from the branch heads of the selected banks all the employees in the bank were assessed for blood pressure as well as physical measurements but Modified WHO STEPS questionnaire was administered only to individuals satisfying the inclusion criteria. After establishing rapport with the individual employees' physical measurements were taken. Blood pressure was measured using digital sphygmomanometer Trust check BPM 2.0 after making them relax for 10 minutes and making them sit in comfortable position with feet touching the ground. Weight was measured using Trust check model no-FG266RB after proper calibration and making it to 0 each time before taking reading and asked to remove any heavy instruments like watch, cap, shoes, mobile phones. Waist circumference was measured using measuring tape by wrapping the tape between lowest rib and iliac crest, measuring tape was neither wrapped very tightly nor very loose. Hip circumference was measured by wrapping the tape around widest region of the hip. Height was measured using stadiometer by making the subject stand straight without shoes on the base of stadiometer. Waist Circumference was measured using measuring tape and noted in cm. (Normal Values: Men-≤90 cm. Women-≤80 cm.). Waist Hip Ratio-Waist and Hip were measured using measuring tape in cm and their ratio was calculated (Normal Values: Men-≤0.95. Women-≤0.80). Asia pacific classification of BMI was taken in the study. Data was collected using Kobo toolbox and the data was analyzed using MS Excel 2019 and SPSS 21. Chi-Square was applied wherever necessary. p Value of <0.05 was taken as statistically significant. The current study was approved by Institutional Ethics Committee.

Results

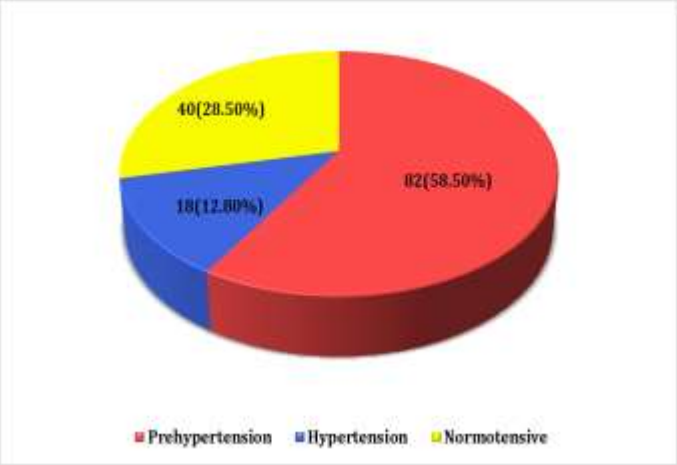

Fig 1: Distribution of bank employees based on Blood pressure levels. (n=140)

Prevalence of prehypertension among the bank employees of urban Kakinada was 58.5%. Normotensives were 28.5% and newly diagnosed hypertensives found out during the study were 12.8%.

Table 1 shows that majority of the bank employees were males 102(72.8%). Most of the participants were in between 36-44 years of age (57.1%), Mean age of the employees was 35.7±4.7 SD. Based on lottery majority of the banks included in the study were Govt. Of India undertaken nationalized banks (92.1%). Majority of the employees used Two-wheeler for commuting (74.3%), followed by Four-wheeler (20.7%), then public transport (4.3%) and least came by walk (0.7%). Most of the participants in the study were clerks (63.6%). Majority of the bank employees were married (88.6%).

Table 1: Distribution of Bank employees based on sociodemographic factors. (n=140)

Sn.	Demographic Variable	Number	%
1.	Gender		
	Male	102	72.8%
	Female	38	27.2%
2.	Age		
	25-35	60	42.9%
	36-44	80	57.1%
3.	Type Of Bank		
	Government Nationalised Bank	129	92.1%
	Private Bank	11	7.9%
4.	Mode of transport		
	Two-wheeler	104	74.3%
	Four-wheeler	29	20.7%
	Public transport	6	4.3%
	Walk	1	0.7%
5.	Designation		
	Officer	51	36.4%
	Clerk	89	63.6%
6.	Marital Status		
	Married	124	88.6%
	Unmarried	16	11.4%
7.	Education Status		
	Higher Secondary (10+2)	13	9.3%
	Bachelor degree completed	108	77.1%
	Post graduate degree	19	13.6%
8.	Type Of Family		
	Nuclear	106	75.7%
	Joint	34	24.3%
9.	Socioeconomic status		
	Upper class	125	89.3%
	Upper middle class	15	10.7%
10.	Family History Of NCD		
	Yes	120	85.7%
	No	20	14.3%
11.	Overtime Work in Bank		
	Yes	88	62.9%
	No	52	37.1%
12.	Experience in Bank		
	1-5 yrs	33	23.6%
	6-10 yrs	47	33.6%
	>10 yrs	60	42.8%

Most of the employees completed their bachelor degree (77.1%) followed by Post graduate degree holders (13.6%) and least were those who completed higher

secondary (9.3%). Majority of them belonged to nuclear family (75.7%). Most of the bank employees belonged to upper-class Socio-economic classification based on Modified BG Prasad classification 2023 (89.3%). Majority of the employees had family history of NCD (85.7%). Majority of the employees had to do overtime work in bank (62.9%). Mean years of experience is 9±4. 1SD. A little less than half of the employees had >10 years of experience (42.8%) followed by 6-10 years' experience (33.6%) and (23.6%) of the employees had 1-5 years of experience.

Table 2: Distribution of Bank employees based on behavioural Factors and anthropometric indices. (n=140)

Sn.	Behavioural Variables	Number	%
1.	Smoking		
	Yes	90	64.3%
	No	50	35.7%
2.	Frequency Of Smoking		
	Along with alcohol only	43	30.7%
	Daily	47	33.6%
	None	50	35.7%
3.	Alcohol		
	Yes	76	54.3%
	No	64	45.7%
4.	Duration Of Alcohol Consumption		
	>3 yrs	62	44.3%
	1-3yrs	14	10%
	None	64	45.7%
5.	Diet		
	Vegetarian	22	15.7%
	Mixed	118	84.3%
6.	Fruits Consumption		
	Normal	62	44.3%
	Less	78	55.7%
7.	Non-Veg Consumption		
	Normal	81	57.9%
	More	59	42.1%
8.	Oil Consumption		
	Normal	31	22.1%
	More	109	77.9%
9.	Extra Salt Addition Frequency		
	Always	13	9.2%
	Never	39	27.9%
	Often	21	15%
	Rarely	39	27.9%
	Sometimes	28	20%
10.	Daily exercise		
	Yes	49	35%
	No	91	65%

Table 2 shows the behavioral characteristics of the bank employees (64.3%) of the employees had smoking habit and among them (33.6%) smoked cigarettes daily and (30.7%) smoked along with alcohol only. (54.3%) of the employees had a habit of consuming alcohol. Among those who consumed alcohol (44.3%) of them had this habit >3 years whereas (10%) started drinking between 1-3 years. Majority of the employees consumed mixed diet (84.3%) and only (15.7%) were pure vegetarians. More than half of the employees consumed less fruits (<3 times/week) (55.7%). Those who consumed non veg ≥3 times/week was considered as more(42.1%).More than three fourth (77.9%) of the employees consumed more oil, (>15 ml/person/day). (9.2%) of the employees added salt Always-(If it is consumed daily), (15%) added salt Often-(If it is 5 days /week), (20%) added salt sometimes (3days/week) and (27.9%) added salt rarely (if it is once in a week) and remaining (27.9%) never added extra salt

in their diet. Only (35%) of the employees did daily exercise in some forms.

Table 3: Distribution of Bank employees based on anthropometric indices. (n=140)

Sn.	Anthropometric Indices	Number	%
1.	BMI Classification		
	Normal	37	26.4%
	Overweight	14	10%
	Obese	89	63.6%
2.	Waist Circumference Classification		
	Normal	56	40%
	High	84	60%
3.	Waist Hip Ratio		
	Normal	48	34.3%
	High	92	65.7%

Majority of the bank employees were obese (63.6%), followed by normal (26.4%) and (10%) were overweight. Majority of the employees had high waist circumference (60%). Majority of the employees had high waist hip ratio (65.7%).

Table 4: Comparison of Socio demographic profile with different grades of blood pressure. (n=140)

Sn.	Variable	Hypertension n (%)	Normo Tension n(%)	Prehypertension n (%)	p value
1.	Gender				0.06
	Male	17(94.4%)	26(65%)	59(72%)	
	Female	1(5.6%)	14(35%)	23(28%)	
2.	Age				0.007
	25-35	3(16.7%)	25(62.5%)	32(39%)	
	36-44	15(83.3%)	15(37.5%)	50(61%)	
3.	Designation				0.04
	Officer	6(33.3%)	21(52.5%)	24(29.3%)	
	Clerk	12(66.7%)	19(47.5%)	58(70.7%)	
4.	Marital Status				0.6
	Married	16(88.9%)	37(92.5%)	71(86.6%)	
	Unmarried	2(11.1%)	3(7.5%)	11(13.4%)	
5.	Education Status				0.007
	Higher Secondary (10+2)	0(0%)	5(12.5%)	8(9.8%)	
	Bachelor degree completed	12(66.7%)	35(87.5%)	61(74.4%)	
	Post graduate degree	6(33.3%)	0(0%)	13(15.8%)	
6.	Type Of Family				0.04
	Nuclear	12(66.7%)	36(90%)	58(70.7%)	
	Joint	6(33.3%)	4(10%)	24(29.3%)	
7.	Socioeconomic status				0.2
	Upper class	18(100%)	36(90%)	71(86.6%)	
	Upper middle class	0(0%)	4(10%)	11(13.4%)	
8.	Family History Of NCD				0.000
	Yes	18(100%)	20(50%)	82(100%)	
	No	0(0%)	20(50%)	0(0%)	

Table 5: Comparison of Behavioural Factors with different grades of blood pressure. (n=140)

Sn.	Variable	Hypertension n (%)	Normo Tension n (%)	Prehypertension n (%)	p value
1.	Overtime Work in Bank				0.01
	Yes	6(33.3%)	25(62.5%)	57(69.5%)	
	No	12(66.7%)	15(37.5%)	25(30.5%)	
2.	Experience in Bank				
	1-5 yrs	0(0%)	11(27.5%)	22(26.8%)	0.001
	6-10 yrs	5(27.8%)	21(52.5%)	21(25.6%)	
	>10 yrs	13(72.2%)	8(20%)	39(47.6%)	
3.	Smoking				0.000
	Yes	8(44.4%)	16(40%)	66(80.5%)	
	No	10(55.6%)	24(60%)	16(19.5%)	
4.	Alcohol				0.000
	Yes	12(66.7%)	9(22.5%)	55(67.1%)	
	No	6(33.3%)	31(77.5%)	27(32.9%)	

Table 6: Comparison of Dietary habits, physical activity and anthropometric indices with different grades of blood pressure. (n=140)

Sn.	Variable	Hypertension n (%)	Normo Tension n (%)	Prehypertension n (%)	p value
1.	Diet				0.3
	Vegetarian	2(11.1%)	4(10%)	16(19.5%)	
	Mixed	16(88.9%)	36(90%)	66(80.5%)	
2.	Fruits Consumption				0.000

	Normal	2(11.1%)	35(87.5%)	25(30.5%)	
	Less	16(88.9%)	5(12.5%)	57(69.5%)	
3.	Non-Veg Consumption Classification				0.1
	Normal	9(50%)	28(70%)	44(53.7%)	
	More	9(50%)	12(30%)	38(46.3%)	
4.	Extra Salt Addition Frequency				0.000
	Always	6(33.3%)	0(0%)	7(8.5%)	
	Never	0(0%)	17(42.5%)	22(26.8%)	
	Often	7(38.9%)	4(10%)	10(12.2%)	
	Rarely	0(0%)	17(42.5%)	22(26.8%)	
	Sometimes	5(27.8%)	2(5%)	21(25.7%)	
5.	Daily exercise				0.03
	Yes	7(38.9%)	20(50%)	22(26.8%)	
	No	11(61.1%)	20(50%)	60(73.2%)	
6.	BMI Classification				0.000
	Normal	1(5.6%)	24(60%)	12(14.7%)	
	Overweight	1(5.6%)	1(2.5%)	12(14.6%)	
	Obese	16(88.8%)	15(37.5%)	58(70.7%)	
7.	Waist Circumference Classification				0.000
	Normal	8(44.4%)	26(65%)	22(26.8%)	
	High	10(55.6%)	14(35%)	60(73.2%)	
8.	Waist Hip Ratio				0.01
	Normal	6(33.3%)	21(52.5%)	21(25.6%)	
	High	12(66.7%)	19(47.5%)	61(74.4%)	

In tables 4,5 and 6 Chi-Square was applied to check the association between various risk factors and prehypertension. Increasing age, clerk designation, Bachelor degree, nuclear family, family history of NCD, Overtime work, More years of work in bank, smoking, alcohol consumption, less fruits consumption extra salt addition in food, not doing daily exercise, high BMI, high waist circumference, high waist hip ratio were found to be significantly associated with prehypertension, ($p<0.05$).

Discussion

Using JNC-7 criteria our study showed a prevalence of 58.5%. In a study done by Tanuja R. Brahmankar et al.,(18) prevalence of prehypertension was 18.5% which was very less compared to our study. Similar findings were seen in a study done by Sira Jam Munira et al.,(16) where prevalence of prehypertension was 55.3%. Very few studies were done among bank employees to assess prevalence of prehypertension. Varying prevalence might be due to locality of the study being conducted.

Participants in our study were in the age group of 25-44 years and among them majority were in the age group of 36-44 57.1%, mean age being 35.7±4.7 SD. Similar findings were seen in a study done by Sira Jam Munira et al.,(16)where majority belonged to 35-44 years. In a study done by Tanuja R. Brahmankar et al.,(16)majority of the participants were in the age group of 56-60 years. In a study done by Farzaneh Montazerifar et al.,(5) majority of the study participants were in the age group of 30-50 years. Young adults were selected in our study so that early diagnosis of prehypertension might be intervened from developing to hypertension.

Majority of the participants in our study belonged to Govt banks 92.1%. Contrary to our study, in a study done by Dr Sira Jam Munira et al.,(16) private bank employees were more 51.5%.

Most of the employees in our study belonged to Clerical cadre, (63.6%). Similar findings were seen in a study done by Imaad Mohammed Ismail et al.,(19) where clerks constituted 56.4%. In a study done by S Ganesh Kumar et al.,(8) 63% of the employees were clerks. Ms.Rehana Bhanwadiya et al.,(20) in her study shows 42% of the employees belonged to clerk cadre. Majority of the posts belong to clerical cadre so more number of participants belonged to clerk cadre.

Nearly three fourth of the participants in our study used bike as their mode of transport to work (74.3%). In a study done by Sira Jam Munira et al.,(16) majority of the employees used public transport (51.2%). In a study done by Tanuja R. Brahmankar et al.,(18) majority of the employees used other mode of transport but not car (78.2%).

Most of the participants in our study were married 88.6%. Similar findings were seen in a study done by Ms.Rehana Bhanwadiya et al.,(18) where 91.3% of the employees were married. Majority of the employees were married 81.2% in a study done by Imaad Mohammed Ismail etal.,(19)

Most of the participants in our study had a bachelor degree (77.1%). In a study done by Imaad Mohammed Ismail et al.,(19) 44.4% of the employees were graduates. In a study done by Farzaneh Montazerifar et al.,(5) in Zahedan majority of the employees studied diploma and above (87.1%). In a study done by Ms.Rehana Bhanwadiya et al., majority of the participants were graduates 77.1%.

In our study residing in nuclear families was observed among (75.7%). Similar findings were seen in a study done by Tanuja R. Brahmankar et al.,(18) where 74.4% of the employees belonged to nuclear family. Nuclear families are more in our study as the study was conducted in urban area.

Family history of NCD (Diabetes, HTN, Cancer) was reported by (85.7%) in our study. In a study done by Tanuja R. Brahmankar et al.,(18) more than half of the employees had family history (59.8%). In a study done by Omobola Yetunde Ojo et al.,(21) only 37.6% had family history of NCD.In a study done by Sira Jam Munira et al.,(16) 64.3% of the employees had family history of NCD.Family history is a significant risk factor for prehypertension according to the present study.

Nearly two third (63%) of the employees did overtime work. Contrary to our findings only 47.1% of the employees had to do overtime work in a study done by Sira Jam Munira et al.,(16)

More than 10 years job experience was found among (42.9%). Mean years of experience is 9±4.1SD.Similar findings were seen in a study done by Farzaneh Montazerifar et al.,(5) where 44.4% of the employees had more than 10 years of experience in banking.

Obesity was found in a major proportion among the employees (64%).Similar findings were seen in a study done by Pavithra R et al.,(22) where 70% of the employees had abnormal BMI and 20% were obese whereas 49.7% were overweight. In a study done by Sira Jam Munira et al.,(16) 85.4% of the employees had abnormal BMI.

Waist hip ratio and waist circumference were 65.7% and 60% respectively which was also high. In a study done by Sira Jam Munira et al.,(16) 71% and 88.5% had high waist circumference and high waist hip ratio respectively. In a study done by Tanuja R. Brahmankar et al.,(18) 42.5% had high Waist hip ratio. In a study done by Idris Muhammad Yakubu et al.,(23) 60.9% of the employees had high WHR.

In our study Chi-Square was applied to check the association between various risk factors and prehypertension. Increasing age, clerk designation, Bachelor degree, nuclear family, family history of NCD,Overtime work, More years of work in bank, smoking, alcohol consumption, less fruits consumption ,extra salt addition in food, not doing daily exercise, high BMI, high waist circumference, high waist hip ratio were found to be significantly associated with prehypertension,($p<0.05$).In a study done by Imaad Mohammed Ismail et al.,(19) Increasing age,family

history of hypertension ,high BMI,High waist hip ratio had significant association with hypertension p,0.05.

In a study done by Sira Jam Munira et al.,(16) gender, educational status, overtime work, increased duration of service in bank, increased BMI,and high WHR had significant association with prehypertension and hypertension.($p<0.05$).

Conclusion

Prevalence of prehypertension and its risk factors are higher among bank employees as compared to general population. Both genders are equally affected with prehypertension. Factors like obesity, family history, smoking and alcohol habits have direct relation with prehypertension.

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