Section: Community Medicine

Original Research Article

STUDY TO ASSESS THE PREVALENCE OF HYPERTENSION AND ASSOCIATED FACTORS AMONG THE RURAL POPULATION IN SOUTH INDIA – A CROSS SECTIONAL STUDY

Renuka V[1], Mohamed Tanveer Ahmed[2], Satheesh B C[3], Shankar K[4], Muralidharan A R[5]

[1]*Professor, Department of Community Medicine, Sapthagiri Institute of Medical Sciences & Research Center, Bangalore, Karnataka, India*
[2]*Associate Professor, Department of Community Medicine, BGS Medical College & Hospital, Adichunchanagiri University, Bangalore, Karnataka, India.*
[3]*Professor - Department of Community Medicine, BGS Medical College & Hospital, Adichunchanagiri University, Bangalore, Karnataka, India.*
[4]*Professor - Department of Community Medicine, MAHER University, Tamil Nadu, India*
[5]*Assistant Professor - Department of Community Medicine, BGS Medical College & Hospital, Adichunchanagiri University, Bangalore, Karnataka, India.*

Received *: 26/08/2025*
Received in revised form *: 09/10/2025*
Accepted *: 29/10/2025*

Corresponding Author:
Dr.Mohamed Tanveer Ahmed,
Associate Professor, Department of Community Medicine, BGS Medical College & Hospital, Adichunchanagiri University, Nagarur, Dasanpura, Bangalore, Karnataka, India.
Email: tanuahmed15@gmail.com

DOI: 10.70034/ijmedph.2025.4.435

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 2418-2421

ABSTRACT

Background: Hypertension is one of the leading risk factor for coronary heart diseases. It is significant health concern not only in urban areas but also in rural areas. This study was undertaken in order to estimate the prevalence of hypertension and associated factors influencing hypertension in rural areas. 1. The aim is to estimate the prevalence of hypertension in the rural field practice area of MMCRI. 2. To assess the factors associated with hypertension among adults in the rural community.

Materials and Methods: A community based cross sectional study conducted in the rural community in the field practice area of MMCRI. A door to door survey was conducted and blood pressure was measured along with collection of the details related to socio demographic variables and other factors that may have an influence on the blood pressure using a self structured pre-validated questionnaire. The data thus obtained was compiled and analyzed using specific statistical tools.

Results: The overall prevalence of hypertension in this study was 20.0% among the rural population in the study area. There was a significant association between prevalence of hypertension with age and other factors like gender, occupation, education, socio economic status, family history; smoking and alcohol were not found to be associated with hypertension. The prevalence of Stage 1 & stage 2 hypertension was 15.5% & 4.5%respectively.

Conclusion: According to this study, the prevalence of hypertension among the rural population was found to be higher. Significant association was found between the age of the study participants and the prevalence of hypertension.

Keywords: Prevalence, Hypertension, Rural area, Blood pressure, associated factors.

INTRODUCTION

Hypertension is a silent killer of human beings. It is a leading cause of cardiovascular deaths across the globe.[1]In 2010, hypertension, defined as systolic blood pressure of 140 mmHg and/or diastolic blood pressure of 90 mmHg, affected 31.1% of the world's adult population, or 1.39 billion people.[2]It is one of the leading modifiable risk factor for Coronary Heart diseases. It causes 7.6 million premature deaths, 54% of strokes, 47% of ischemic heart disease, and 13% of attributable deaths globally. In 2012, cardiovascular disease was listed as the leading cause of mortality for 17.5 million people.[3] The burden of hypertension is predicted to rise further by involving 1.5 billion population during 2025.[4]

Hypertension is a significant public health concern in both economically developed and developing countries, as well as in rural and urban areas. Previously, communicable diseases were the most prevalent pathological processes affecting the inhabitants of poor countries, particularly in rural regions. With the advent of urbanization, there is an increase in sedentary lifestyles, tobacco smoking, hazardous alcohol usage which are risk factors for hypertension.[5,6]

According to community surveys, the prevalence of hypertension has increased by roughly 30 times among urban people and by roughly 10 times among rural residents over a period of three to sixty years. According to several studies, the prevalence of hypertension ranged from 1.99% in 1958 to 21.2% in 1994 for rural residents and from 1.24% in 1949 to 36.4% in 2003 for urban residents.[7] However, very few studies have documented the prevalence of hypertension in rural areas recently. Hence it was decided to take up this study in order to study the prevalence of hypertension in rural areas.

MATERIALS AND METHODS

This is a rural community based cross sectional study was undertaken in Vadamavandal village which is the rural filed practice area of Department of Community Medicine, MMCRI, Tamil Nadu between April 2024 to October 2024. This Vadamavandal village comprises of 9 villages with a total population of 11,173. The required sample size was calculated to be 600, based on the prevalence of hypertension 17% among the rural population as per the study done by Singh P S et al,[8] and an allowable error of 5% and a confidence interval of 95%. Proportionate sampling method was used in each village to reach the desired sample size based on its population.

In each village, households were selected by using systemic random sampling method. Later complete list of households was made sampling interval was calculated. Starting point was chosen randomly in each village and households were visited sequentially until the required sample size is reached through house to house survey. The study subjects who have completed 18 years of age during the study period were included in this study. Those not willing to take part in the study and with other comorbid conditions were excluded from the study.

Clearance from institutional ethics committee was obtained before the study was started. A written informed consent was obtained before including the study subjects in to the study. The study subjects were taken care to refrain from drinking any caffeinated or alcoholic beverages and from smoking for at least half an hour before recording of the blood pressure.

The blood pressure was measured after ensuring the rest of at least 5 minutes for the study subjects and in sitting position using mercury sphygmomanometer (Diamond and co.). The first blood pressure measurement was recorded after collecting the socio demographic information from all the study participants. The second blood pressure measurement was recorded after 5 minutes of rest.

The blood pressure measurement was conducted according to report of a WHO expert committee on hypertension control. Systolic blood pressure and Diastolic blood pressure recordings are obtained for two times and average of this blood pressure were calculated and recorded. Those with systolic blood pressure of >140 mm Hg and diastolic blood pressure of >90 mm Hg were considered for the study.

The data thus obtained was compiled using Microsoft excel sheet and analyzed using SPSS software. Categorical variables were presented as frequencies and percentages. Continuous variables were presented as mean and standard deviation. Chi-square test was used to find association between prevalence of hypertension and different study variables. P-value <0.05 was considered significant.

RESULTS

The overall prevalence of hypertension in this study among the rural population was 20%. The prevalence of hypertension was found to be higher in the age group of 51-60 years accounting for 28.9% followed by the age group >60 years with prevalence of 23.2% at 5% level of significance which was found to be statistically significant. Among the study participants, 63% of the males and 57% of females were hypertensive and association between gender and prevalence of hypertension was not statistically significant at 5% level of significance. In this study, the prevalence of hypertension was high among housewives accounting for 21.9% followed by 20.2% prevalence in the study participants involved in unskilled occupation. The prevalence of hypertension was 29% among the study participants with the post graduate level of education. The prevalence of hypertension was high among families belonging to Class I level of socio economic status accounting for 33.3% followed by 25.5% in families belonging to class IV socioeconomic status. In this study no significant association was found between prevalence of hypertension and personal habits like smoking and alcohol consumption among the study participants. With respect to grading of hypertension, in this study we found that 36.8% were pre-hypertensive, 15.5% had stage I hypertension and 4.5% had stage II hypertension. In this study we also found that the mean systolic and diastolic blood pressure was significantly higher among hypertensive than non-hypertensive and there was significant association between mean values and hypertension.

Table 1: Prevalence of hypertension in rural population

Hypertension	Frequency	(%)
Hypertensive	120	20.0
Non hypertensive	480	80.0
Total	600	100

Table 2: Prevalence of hypertension according to socio demographic characteristics

Demographic Characteristics		Non hypertensive n (%)	Hypertensive n (%)	P value,
Age	21 – 30 years	19 (86.4)	3 (13.6)	0.011*
	31 – 40 years	147 (87.0)	22 (13.0)	
	41 – 50 years	94 (82.5)	20 (17.5)	
	51 – 60 years	81 (71.1)	33 (28.9)	
	More than 60 years	139 (76.8)	42 (23.2)	
Sex	Male	252 (80.0)	63 (20.0)	0.992
	Female	228 (80.0)	57 (20.0)	
Occupation	Business	8 (100.0)	0	0.619
	Housewife	107 (78.1)	30 (21.9)	
	Manual laborer	123 (80.6)	29 (19.1)	
	Skilled	1 (100.0)	0	
	Unskilled	241 (79.8)	61 (20.2)	
Education	Illiterate	98 (82.4)	21 (17.6)	0.658
	Up to matriculation	207 (80.2)	51 (19.8)	
	Pre university/ Diploma	11 (73.3)	4 (26.7)	
	Graduate	142 (80.2)	35 (19.8)	
	Post graduate	22 (71.0)	9 (29.0)	
Socio economic status	Class I	4 (66.7)	2 (33.3)	0.069
	Class II	49 (83.1)	10 (16.9)	
	Class III	157 (84.0)	30 (16.0)	
	Class IV	178 (74.5)	61 (25.5)	
	Class V	92 (84.4)	17 (15.6)	
Family history	No	359 (79.2)	94 (20.8)	0.420
	Yes	121 (82.3)	26 (17.7)	
Smoking	No	419 (81.0)	98 (19.0)	0.110
	Yes	61 (73.5)	22 (26.5)	
Alcohol	No	419 (79.4)	109 (20.6)	0.286
	Yes	61 (84.7)	11 (15.3)	

*Significant @5% level

Table 3: Grading of hypertension

Grading (in mm of Hg)	Frequency	Percentage
Normal (SBP< 120 and DBP < 80)	259	43.2
Pre hypertension (SBP = 120 – 139 or DBP = 80 – 89)	221	36.8
Stage 1 hypertension (SBP = 140 – 159 or DBP = 90 – 99)	93	15.5
Stage 2 hypertension (SBP ≥ 160 or DBP ≥ 100)	27	4.5

Table 4: Mean blood pressure in hypertensive and non hypertensive

Mean ± SD	Systolic blood pressure	Diastolic lood pressure
Hypertensive	146.96 ± 11.2	96.5 ± 7.6
Non hypertensive	116.88 ± 8.25	76.0 ± 6.3
p value	0.000, Sig	0.000, Sig

DISCUSSION

This study was undertaken to study the prevalence of hypertension in rural areas. The studies have consistently shown increase in prevalence in urban and rural areas. This study had shown a prevalence of 20% in rural area of Tamilnadu. In a similar study done by Singh P S et al,[8] the prevalence of hypertension among the rural population of central India was found to be 17%. In a meta analysis done by Anchala R et al,[9] found that, the overall prevalence of hypertension in India was 29.8% followed by prevalence of 27.6% in rural areas and 33.8% in urban areas. A similar finding was reported in one more study conducted among the rural population in Patna, Bihar by Singh R et al with a prevalence of hypertension as 23.73%.[10] But in a study done by Vijna et al,[11] in Uttar Pradesh on prevalence and predictors of hypertension, the prevalence of hypertension was found to be 31.5% comparatively higher than this study.

In our study, it was found that there was significant association between prevalence of hypertension and age of study participants. A similar finding was seen in a study done Singh R et al,[10] where the prevalence of hypertension was found to higher among the older subjects. In our study there was no significant association between prevalence of hypertension and gender. Similar finding was seen in a study done by Vijna et al,[11] where there was no significant association between prevalence of hypertension and gender. In this study, the

prevalence of hypertension among males was 63% and females were 57%. A similar finding was seen in a study done by Mohammad R et al,[12] in which even though the overall prevalence of hypertension was lesser than our study but among men it was 24.1% higher than females with prevalence of 21.2%. In one more study done by Singh P S et al,[8] the prevalence was found to be higher among females with 18.3% followed by 15.8% among males. In our study, we didn't find significant association between prevalence of hypertension and personal habits like smoking and alcohol consumption. But in a study done by Ranjan A et al,[13] on prevalence and factors associated with hypertension in rural areas in Patna district, the odds of having hypertension was significantly high with tobacco chewing. In a study done by Singh J et al,[14] also found that alcohol consumption is a risk factor for hypertension among adults in rural population.

In this study, the prevalence of stage 1 and 2 hypertension was 15.5% and 4.5% respectively. Whereas, In a study by Singh P S et al,[8] the prevalence of grade I & II hypertension was 11.33% and 5.69% respectively which is comparatively lesser than our study

CONCLUSION

By this study we found that, the overall prevalence of hypertension is gradually increasing in rural areas and it is becoming in par with the urban areas. Urbanisation and its factors like smoking, alcoholism, sedentary life style, advanced technology etc has played a significant role in increasing the prevalence of hypertension in the rural population. Other factors like increased life expectancy, age and family history also are the major influencers for the higher prevalence of hypertension in the rural areas.

REFERENCES

1. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nat Rev Nephrol. 2020; 16(4):223-237. Available from: https://pubmed.ncbi.nlm.nih.gov/32024986/
2. Mills KT et al. Global Disparities of Hypertension Prevalence and Control: A Systematic Analysis of Population-Based Studies From 90 Countries. Circulation: 2016: 134, 441–450. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC4979614/
3. He J, Whelton PK. Elevated systolic blood pressure and risk of cardiovascular and renal disease: Overview of evidence from observational epidemiologic studies and randomized controlled trials. Am Heart J. 1999; 138:S211–S219. Available from: https://pubmed.ncbi.nlm.nih.gov/10467215/
4. Lawes CM, Hoorn SV, Rodgers A. Global burden of blood pressure related disease. Lancet.2008; 371(9623):1513-8. Available from: https://pubmed.ncbi.nlm.nih.gov/18456100/
5. Kearney PM, Whelton, RK, Whelton PK, He J. Worldwide prevalence of hypertension: a systematic review. J Hypertens. 2004; 22(1):11-9. Available from: https://pubmed.ncbi.nlm.nih.gov/15106785/
6. Alwan A. Global status report on noncommunicable diseases. 2010. World Health Organization; 2011:9-31. Available from: https://www3.paho.org/hq/dmdocuments/2012/WHO-Global-Status-Report-NCDs-2010-Eng.pdf
7. Das SK, Sanyal K, Basu A. Study of urban community survey in India: growing trend of high prevalence of hypertension in a developing country. Int J Med Sci. 2005;2(2):70-78. Available from: https://pubmed.ncbi.nlm.nih.gov/15968343/
8. Singh PS, Singh PK, Zafar KS, Sharma H, Yadav SK, Gautam RK, et al. Prevalence of hypertension in rural population of Central India.Int J Res Med Sci2017;5:1451-5. Available from: https://www.msjonline.org/index.php/ijrms/article/view/2166
9. Anchala R, Kannuri NK, Pant H, Khan H, Franco OH, Di Angelantonio E, et al. Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension. J Hypertens. 2014;32:1170–7. Available from: https://pubmed.ncbi.nlm.nih.gov/24621804/
10. Singh R, Sinha RK, Mani C, Singh R, Pal R. Burden and vulnerability of hypertension in a rural population of Patna, Bihar, India. South East Asia Journal of Public Health. 2011;1:53–8. Available from: https://www.banglajol.info/index.php/SEAJPH/article/view/13221
11. Vijna, Mishra CP. Prevalence and predictors of hypertension: Evidence from a study of rural India. J Family Med Prim Care. 2022;11(3):1047–54. Available from: https://pubmed.ncbi.nlm.nih.gov/35495805/
12. Mohammad, R., Bansod, D.W. Hypertension in India: a gender-based study of prevalence and associated risk factors. BMC Public Health 24, 2681 (2024). Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-20097-5#citeas
13. Ranjan A, Pandey S, Kumar Nirala S, Singh C, Bhardwaj M. Prevalence and factors associated with hypertension in rural areas of Naubatpur block of Patna District in Bihar, India: a population-based cluster cross-sectional study. BMC Public Health. 2025 May 31;25(1):2023. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23198-x
14. Singh J, Iqbal SA, Mohammed TI, Radhavan P, Rajpal S, Gajula S, Rath S. Prevalence and associated risk factors of hypertension in rural and urban areas of Punjab: A cross-sectional study. J Family Med Prim Care. 2025 Feb;14(2):757-761. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC11922354/.