

Original Research Article

A cross-sectional study on prevalence and risk factors of hypertension among residents of urban field practice area of Gulbarga Institute of Medical Sciences, Kalaburagi, Karnataka, India

Srikaviya R.*, Jaya V. Suryavanshi, Dayalakshmi T. Shedole, Meenakshi M. Dhadave

Department of Community Medicine, Gulbarga Institute of Medical Sciences, Kalaburagi, Karnataka, India

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*Correspondence:

Dr. Srikaviya R.,

E-mail: dr.fireandblood@gmail.com

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ABSTRACT

Background: Hypertension is the leading risk factor for disease burden worldwide and an important cause of preventable mortality. An estimated 57% and 24% of stroke and coronary artery disease-related deaths, respectively are due to hypertension. In order to take effective prevention measures, identification of the risk factors is an essential prerequisite. Hence, this study was conducted with the objective of estimating the prevalence of hypertension and determining its associated risk factors in the urban field practice area of GIMS, Kalaburagi.

Methods: This was a cross-sectional study conducted in urban field practice area of Gulbarga institute of medical sciences, Kalaburagi among 185 adults aged >18 years using purposive sampling method from August to October 2024. Data were collected using pretested, semi-structured questionnaire and blood pressure was measured and categorized according to International Society of Hypertension (ISH) Global Hypertension Practice Guidelines 2020.

Results: The prevalence of prehypertension and hypertension was found to be 10.8% and 11.8% respectively. Age, education, marital status, associated co-morbidities, sleep duration, fast food consumption, body mass index (BMI) were significantly associated with hypertension.

Conclusions: To prevent and control hypertension, campaigns to raise awareness should be carried out to reduce modifiable risk factors such as quitting smoking and drinking alcohol, promoting a healthy lifestyle and eating a balanced diet, as well as early detection and management.

Keywords: Hypertension, Urban, Prevalence, Risk factors

INTRODUCTION

Hypertension is also referred to as high or elevated blood pressure. It is a condition in which the blood vessels have constantly high pressure. A systolic blood pressure of 120 mmHg and a diastolic blood pressure of 80 mmHg are considered normal for adults. According to International Society of Hypertension, Global Hypertension Practice Guidelines 2020, pre-hypertension is defined as systolic blood pressure between 130 and 139 mmHg and/or diastolic between 85 and 89 mmHg and hypertension is

defined as a systolic blood pressure ≥ 140 mmHg and/or a diastolic blood pressure ≥ 90 mmHg.¹

The global prevalence of hypertension in adults aged 18 years and over was around 24.1% in men and 20.1% in women in 2015. The Global Burden of Hypertension study has highlighted that of the global burden of 212 million disability-adjusted life years (DALYs) related to hypertension, 18% occurred in India.² According to National Family Health Survey (NFHS-5) data, the prevalence of hypertension among urban men and women

is 17% and 13.6% in India, 16% and 10.3% in Kalaburagi respectively.³

Hypertension is the leading risk factor for disease burden worldwide and an important cause of preventable mortality.⁴ Hypertension is consistently related to the development of ischemic heart disease, heart failure, stroke, and chronic kidney disease. An estimated 57% and 24% of stroke and coronary artery disease-related deaths, respectively are due to hypertension.⁵ Urban people are more at risk of these diseases as compared to their rural counterparts. As per the findings of NFHS-5, Karnataka, the prevalence of hypertension, obesity, and blood glucose in urban area of was 16.3%, 39.4%, and 18%, respectively. However, the prevalence of the same phenomenon was 13.8%, 25%, and 14.1%, respectively in rural area.³

It is clear that all the parameters are having higher prevalence in urban area as compared to rural area. Rapid urbanization, a growing elderly population, mechanization, sedentary lifestyles, and changes in eating habits all contribute to a web of risk factors that entangle people and lead to a variety of chronic diseases. Identifying risk factors is a crucial step for effective preventive efforts.

Hence this study was conducted to find out the prevalence of hypertension and their associated risk factors in urban area of Kalaburagi.

Objectives

Objectives of the study were: to estimate the prevalence of hypertension among residents of urban field practice area of GIMS, Kalaburagi, and also to determine the risk factors associated with hypertension.

METHODS

Study setting

The study was conducted in urban field practice area (Manikeshwari) of GIMS, Kalaburagi.

Study population

Individuals aged 18 years and above were the study population.

Study duration

The duration of the study was from August to October 2024.

Study design

A community based cross-sectional study was carried out among residents of urban field practice area (Manikeshwari) of GIMS, Kalaburagi.

Sample size

Based on National Family Health Survey (NFHS-5)- India, the prevalence of hypertension was 13.6% among urban population.³ The sample size was calculated with 95% confidence level and 5% permissible error by using the formula z^2pq/d^2 , where $p=14\%$, $q=1-p=86$, $Z=1.96$ at 95% CI, and $d=5\%$ (permissible error).

$$n = z^2pq/d^2 = 185$$

Sampling method

Purposive sampling method was used to select the participants based on inclusion and exclusion criteria.

Inclusion criteria

Individuals who aged 18 years and above, residents of Manikeshwari for at least two years, and those who were willing to participate in the study were included.

Exclusion criteria

Individuals suffering from impaired hearing and speech difficulties and psychiatric illness, individuals with secondary hypertension, and pregnant women were excluded.

Data collection method

A door-to-door survey was conducted in urban field practice area and participants were included based on inclusion and exclusion criteria. The study was explained to them and consent was acquired. The participants were interviewed using a pre-designed, pre tested and semi-structured questionnaire. The questionnaire had 3 sections. Section one consisted of socio-demographic characters like age, gender, religion, education, occupation, marital status and socio-economic status. Section two had personal habits like diet, duration of sleep, alcohol and tobacco consumption, salty food, fast food and fruits and vegetable intake, any co-morbidity and family h/o hypertension. Section three consisted of clinical examination like height, weight and BMI and blood pressure. The height was measured using a standard measuring tape. The study participants were barefooted, keeping their arms by their side and eyes fixed at a spot on the horizon, touching their heels, back and buttock on the wall to ensure accurate measurement. The height was measured to the nearest 0.1 centimetre. Weight was measured by using an electronic weighing scale. BMI was calculated by using the formula, $BMI = \text{weight (kg)} / \text{height (m}^2\text{)}$ and classified according to the South East Asian region (WHO).⁶ Blood pressure measurement was done as per the International Society of Hypertension (ISH), Global Hypertension Practice Guidelines 2020. The participants were made to sit in quiet room with comfortable environment. Blood Pressure was measured manually by sphygmomanometer in right arm in sitting position. Three casual readings were taken at 1-2

minutes interval in selected participants. Average of last 2 readings was taken as final reading. The participants were categorized as follows based on the readings.⁷

Table 1: ISH classification of hypertension.

Category	Systolic		Diastolic
Normal BP	<130	and	<85
High normal	130-139	and/or	85-89
Grade 1 hypertension	140-159	and/or	90-99
Grade 2 hypertension	≥160	and/or	≥100

Statistical methods

Data was entered in Microsoft excel spreadsheet and analysed using Jamovi 2.4.14. Results were analysed in the form of frequency and proportion. Chi square test was used to find out association between different variables. Results were presented in the form of tables and graphs.

RESULTS

Among 185 participants' majority of them belonged to 26-35 years of age group (30%), Most of them were female (72.43%) and following Hindu religion (98.92%), illiterate (25.95%) or completed high school (24.32%) and were homemakers (48.11%). 79.46% were married and living in nuclear family (68.11%) and belonged to lower middle class according to modified B.G Prasad classification (31.35%) (Table 2).

Table 3 shows the lifestyle characteristics of the participants, which shows that majority of them were sleeping for 6-8 hours (90.27%), vegetarian (51.89%) and engaging in regular physical exercise (51.35%). 37.84% were consuming salty foods, 69.73% were consuming fast food and 95% of them adding fruits and vegetables in their diet. The prevalence of tobacco and alcohol use and obesity in this study was 9.19%, 7.57% and 47.03% respectively.

Our study revealed that out of 185 participants 11.8% were hypertensives and 10.8% were prehypertensive and 77.3% were normotensive (Figure 1).

It was observed that the prevalence of hypertension was highest among >55 years age group (57.1%) and also, we can see that there is a consistent rise in prevalence of hypertension with increasing age and it was found to be statistically significant ($p \leq 0.001$). The number of illiterate hypertensives (47.9%) outnumbered literate hypertensives. Among literate the hypertension was more prevalent in those who completed primary schooling (33.3%) followed by high school (17.8%) and middle school (17.6%) and less among graduates (8.1%). This was statistically significant ($p=0.002$).

Table 2: Socio demographic characteristics of the participants.

Variables	Frequency (n=185)	Percentage (%)
Age (years)		
18-25	18	9.73
26-35	56	30.27
36-45	45	24.32
46-55	31	16.76
>55	35	18.92
Gender		
Male	51	27.57
Female	134	72.43
Religion		
Hindu	183	98.92
Muslim	2	1.08
Education		
Illiterate	48	25.95
Primary	15	8.11
Middle school	17	9.19
High school	45	24.32
Diploma	23	12.43
Graduate and above	37	20.00
Occupation		
Government employee	10	5.41
Non-govt employee	15	8.11
Self-employee	50	27.03
Daily labourer	11	5.95
Retired	4	2.16
Student	6	3.24
Homemaker	89	48.11
Marital status		
Unmarried	21	11.35
Married	147	79.46
Widowed	17	9.19
Family type		
Nuclear	126	68.11
Joint	43	23.24
Three generation	16	8.65
SEC		
Upper class	11	5.95
Upper middle class	30	16.22
Middle class	41	22.16
Lower middle class	58	31.35
Lower class	45	24.32

The prevalence of hypertension was high among widowed (47.1%) compared to married participants (23.1%) and this association was statistically significant ($p=0.04$). Participant with co-morbidities had high prevalence of hypertension (56.2%) and the association was statistically significant ($p=0.005$).

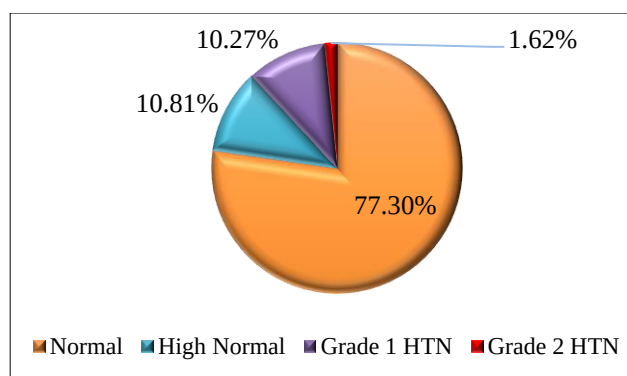


Figure 1: Proportion of hypertension among participants.

Participants who had altered sleep pattern (<6 hours or >8 hours) had more prevalence (50%) of hypertension than

who had sleep duration of 6 to 8 hours (19.8%). This association was highly significant ($p \leq 0.001$).

There was a statistically significant association ($p=0.008$) between fast food consumption and hypertension. It seemed to be more among who consumed fast food (29.5%). The prevalence of hypertension was more among underweight (41.7%) than overweight (14.3%) and obese (20.7%) and the association was highly significant ($p=0.001$). There was a higher prevalence of hypertension among female (24.6%), lower middle (27.6%) and lower socioeconomic class (28.9%) and participants with tobacco consumption habits (35.3%). In tobacco consumption who used bidi (57.1%) and betel quid (50%) had higher proportion of hypertension than who used cigarettes. However, the association was not statistically significant ($p > 0.05$).

Table 3: Lifestyle characteristics of the participants.

Variable	Frequency (n=185)	Percentage (%)
Sleep duration (hours)		
<6	14	7.57
6-8	167	90.27
>8	4	2.16
Type of diet		
Vegetarian	96	51.89
Mixed	89	48.11
Salty food consumption		
Yes	70	37.84
No	115	62.16
Fruits and vegetables consumption		
Yes	176	95.14
No	9	4.86
Fast food consumption		
Yes	129	69.73
No	56	30.27
Tobacco		
Yes	17	9.19
No	168	90.81
Type of tobacco (n=17)		
Cigarette	8	47.06
Betel quid	2	11.76
Bidi	7	41.18
Alcohol		
Yes	14	7.57
No	171	92.43
Exercise		
No	90	48.65
Yes	95	51.35
BMI		
Under weight	24	12.97
Normal	39	21.08
Overweight	35	18.92
Obese	87	47.03
Family H/o HTN		
Yes	28	15.14

Continued.

Variable	Frequency (n=185)	Percentage (%)
No	157	84.86
Co-morbidities		
Yes	16	8.65
No	169	91.35
Previous H/o hypertension		
Yes	31	16.76
No	154	83.24

Table 4: Association between participants characteristics and hypertension.

S. no.	Variables	Hypertension (%)		Total (n=185)	X ² value	P value
		Yes	No			
1	Age (years)					
	18-25	0	18 (100)	18	47.4	≤0.001
	26-35	4 (7.1)	52 (92.9)	56		
	36-45	7 (15.6)	38 (84.4)	45		
	46-55	11 (35.5)	20 (64.5)	31		
	>55	20 (57.1)	15 (42.9)	35		
2	Gender					
	Male	9 (17.6)	42 (82.4)	51	1.67	0.644
	Female	33 (24.6)	101 (75.4)	134		
3	Education					
	Illiterate	23 (47.9)	25 (52.1)	48	36.3	0.002
	Primary	5 (33.3)	10 (66.7)	15		
	Middle school	3 (17.6)	14 (82.4)	17		
	High school	8 (17.8)	37 (82.2)	45		
	Diploma	0	23 (100)	23		
	Graduate and above	3 (8.1)	34 (91.9)	37		
4	Marital status					
	Unmarried	0	21 (100)	21	12.9	0.04
	Married	34 (23.1)	113 (76.9)	147		
	Widowed	8 (47.1)	9 (52.9)	17		
5	Socio-economic status					
	Upper class	1 (9.1)	10 (90.9)	11	15.7	0.206
	Upper middle class	5 (16.7)	25 (83.3)	30		
	Middle class	7 (17.1)	34 (82.9)	41		
	Lower middle class	16 (27.6)	42 (72.4)	58		
	Lower class	13 (28.9)	32 (71.1)	45		
6	Co-morbidities					
	No	33 (19.5)	136 (80.5)	169	12.9	0.005
	Yes	9 (56.2)	7 (43.8)	16		
7	Fast food consumption					
	Yes	38 (29.5)	91 (70.5)	129	11.8	0.008
	No	4 (7.1)	52 (92.9)	56		
8	Salty food consumption					
	Yes	14 (20)	56 (80)	70	1.68	0.641
	No	28 (24.3)	87 (75.7)	115		
9	Sleep duration					
	Less than 6 hours	7 (50)	7 (50)	14	23.2	≤0.001
	6 to 8 hours	33 (19.8)	134 (80.2)	167		
	More than 8 hours	2 (50)	2 (50)	4		
10	Exercise					
	No	20 (22.2)	70 (77.8)	90	2.54	0.469
	Yes	22 (23.2)	73 (76.8)	95		

Continued.

S. no.	Variables	Hypertension (%)		Total (n=185)	X ² value	P value
		Yes	No			
11	Tobacco consumption					
	No	36 (21.4)	132 (78.6)	168	3.53	0.317
	Yes	6 (35.3)	11 (64.7)	17		
12	Type of tobacco					
	Cigarette	1 (12.5)	7 (87.5)	8	12.9	0.169
	Bidi	4 (57.1)	3 (42.9)	7		
	Betel quid	1 (50)	1 (50)	2		
13	Alcohol consumption					
	No	39 (22.8)	132 (77.2)	171	3.38	0.336
	Yes	3 (21.4)	11 (78.6)	14		
8	BMI					
	Under weight	10 (41.7)	14 (58.3)	24	27.8	0.001
	Normal	9 (23.1)	30 (76.9)	39		
	Overweight	5 (14.3)	30 (85.7)	35		
	Obese	18 (20.7)	69 (79.3)	87		

DISCUSSION

In our study we found that the prevalence of hypertension and pre-hypertension was 11.8% and 10.8% respectively. The prevalence of hypertension was almost comparable to a study conducted by Singh et al, the prevalence of hypertension in the Asian region ranges between 5% and 35%.⁸ Also it is similar to the NFHS-5 data which reported the prevalence of hypertension 13.6% in India and 10.3% in Kalaburagi respectively.³

A higher prevalence of hypertension was seen in females (24.6%) as compared to males. Similar results were observed in a study done by Radhakrishnan et al in Tamil Nadu.⁹ This could be due to a greater number of females participating in our study. In the present study, the prevalence of HTN was highest among illiterates (47.9%) which was consistent with the findings of Bhat et al and Singh et al in urban Varanasi.^{10,11} This might be attributed to their ignorance with regard to the risk factors related to the causation of disease.

Those who were widowed were having more prevalence of hypertension than who were married and this was statistically significant. These findings are similar to the study done by Ghosh et al.¹²

In this study high prevalence of hypertension among participants with tobacco consumption habits (35.3%) than those didn't use tobacco. In tobacco consumption who used Bidi (57.1%) and betel quid (50%) had higher proportion of hypertension than who used cigarettes. However, the association was not statistically significant. But there are several other studies which showed significant association between alcohol and tobacco use.^{9,11}

In our study prevalence of hypertension high among lower socioeconomic classes. SES and Hypertension were inversely proportional in our study. Which is

contradicting from study done by Kashyap et al.¹³ He observed that in rural Jharkhand the prevalence of HTN was directly proportional to the SES in that area. But Anand et al found a higher prevalence of HTN among those belonging to lower SES.^{12,14} These results suggest hypertension is no longer a disease of rich.

BMI was statically significant with hypertension in our study. Whoever underweighted (41.7%) had more prevalence of hypertension than overweighted (14.3%) and obese (20.7%). This is contradicting to other studies where obesity was associated with hypertension.^{10,15,16}

Limitations

As this was a cross-sectional study, it restricts examining causal associations. And this study was conducted at a single area, which restricts the generalizability of the study.

CONCLUSION

Based on our study findings, it can be concluded that hypertension is more prevalent in adults who were in their 5th decade of life. The modifiable risk factors like fast-food consumption, BMI, sleep duration, tobacco consumption appears to be greatly influenced the prevalence of hypertension along with non-modifiable risk factors like age and gender.

Recommendations

To prevent and control hypertension, campaigns to raise awareness should be carried out to reduce modifiable risk factors such as quitting smoking and drinking alcohol, promoting a healthy lifestyle and eating a balanced diet, as well as early detection and management. Screening of the hypertension should be conducted at early age (above 30 years) to prevent the prevalence of hypertension in the elderly people. Geriatric population should undergo

examination for NCDs which are more prevalent in these elderly populations. As many risk factors for hypertension emerge during childhood, promoting good habits in children such as avoiding processed food and encouraging playing outdoors can help prevent noncommunicable diseases in the future. To avoid the development of risk factors, primary prevention should be incorporated into school health services, with active engagement from teachers. To summarize, the hypertension epidemic is increasing rapidly among India's rural and urban populations. Disturbingly, the hypertension prevalence is now becoming more concentrated among the poor in both urban and rural areas. The increased frequency of hypertension among the least resourceful people has major social and economic consequences for the country, necessitating swift governmental intervention policies to avoid catastrophe. It is critical to have a public health program dedicated only to the prevention and control of hypertension, rather than as a component of any other national health program.^{17,18}

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REFERENCES

- Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL, et al. The seventh report of the joint national committee on prevention, detection, evaluation and treatment of high blood pressure. JAMA. 2003;289:2560-72.
- World Health Organization. WHO Fact Sheet. Cardiovascular diseases. 2015. Available at: [https://www.who.int/news-room/fact-sheets/detail/cardio-vascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardio-vascular-diseases-(cvds)). Accessed on 19 October 2024.
- International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS-5), India, 2019-20: Karnataka. Mumbai: IIPS. 2021.
- Murarkar S, Pokale A, Gothankar J, Deshmukh R, Gupta V. Prevalence of Hypertension and associated risk factors in urban slums: A community based cross sectional study in India. Indian J Public Health. 2023;67:474-6.
- Rakesh PS, Renjini BA, Mohandas S, Menon J, Numpelil M, Sreedevi A, et al. Hypertension in urban slums of southern India: Burden, awareness, health seeking, control and risk factor profile. Indian Heart J. 2023;75(4):258-62.
- World Health Organization. WHO classification of BMI. Available at: http://apps.who.int/bmi/index.jsp?introPage=intro_3. Accessed on 19 October 2024.
- Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertension. 2020;75(6):1334-57.
- Singh RB, Suh IL, Singh VP, Chaithiraphan S, Laothavorn P, Sy RG, et al. Hypertension and stroke in Asia: Prevalence, control and strategies in developing countries for prevention. J Hum Hypertens. 2000;14:749-63.
- Radhakrishnan S, Ekambaram M. Prevalence of diabetes and hypertension among a tribal population in Tamil Nadu. Arch Med Health Sci. 2015;3(1):66-71.
- Bhat KK, Yadavannavar MC, Hedge S, Sharma KK. A socio-epidemiological study of hypertension and its associated risk factors among adults (20-60 years) in rural north Karnataka. J Cardiovasc Dis Res. 2024;15(2):425-37.
- Singh S, Shankar R, Singh GP. Prevalence and associated risk factors of hypertension: A cross-sectional study in urban Varanasi. Int J Hypertens. 2017;2017:5491838.
- Ghosh S, Kumar M. Prevalence and associated risk factors of hypertension among persons aged 15-49 in India: a cross-sectional study. BMJ Open. 2019;9(12):e029714.
- Kashyap V, Kumar C, Haider S, Singh SB, Sagar V. Prevalence of Hypertension and Its Association with Selected Socio-Demographic Factors in a Rural Area of Jharkand. J Dental Med Sci. 2015;14(4):1-6.
- Anand E, Singh J. Hypertension Stages and Their Associated Risk Factors among Adult Women in India. JPSS. 2017;25(1):42-54.
- Dhungana RR, Pandey AR, Bista B, Joshi S, Devkota S. Prevalence and Associated Factors of Hypertension: A Community-Based Cross-Sectional Study in Municipalities of Kathmandu, Nepal. Int J Hypertens. 2016;2016:1656938.
- Kishore J, Gupta N, Kohli C, Kumar N. Prevalence of Hypertension and Determination of Its Risk Factors in Rural Delhi. Int J Hypertens. 2016;2016:7962595.
- Deepa M, Anjana RM, Manjula D, Narayan K, Mohan V. Convergence of prevalence rates of diabetes and cardiometabolic risk factors in middle- and low-income groups in urban India: 10-year follow-up of the Chennai urban population study. J Diabetes Sci Technol. 2011;5:918-27.
- Gowda MJ, Bhojani U, Devadasan N, Beerenahally TS. The rising burden of chronic conditions among urban poor: a three-year follow-up survey in Bengaluru, India. BMC Health Serv Res. 2015;15:330.

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