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**"Prevalence and Associated Risk Factors of Hypertension Among Adults: A Study at the Department of Psychiatry, GHMC Bhopal"**

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## Abstract:

India has a high prevalence of hypertension along with the corresponding morbidity and mortality. This study looked on the prevalence of hypertension and its risk factors among patients at the Government Homoeopathic Medical College in Bhopal who were between the ages of 25 to 75. Total 350 patients, including 252 cases of hypertension and 98 cases of pre-hypertension, participated in a cross-sectional study. Stress (50 cases), followed by clinical conditions (48 cases), and family history (46 cases), was the most significant risk factor for hypertension. Addiction, anxiety, and salt consumption were also linked to hypertension. In the prevention and management of hypertension, emphasis should be placed on lifestyle modification initiatives and mental health strategies. In those with a family history of hypertension, the importance of early detection and screening should be highlighted.

## Objective:

This study's main goal is to determine the prevalence of hypertension among adult individuals in Bhopal, India, as well as its risk factors. The goal of the study is to shed light on the increased incidence of hypertension in young adults and the risk factors that contribute to it, such as lifestyle choices and underlying medical disorders. The results of this study may have significant ramifications for young adults' hypertension prevention and management, and they may guide future research in this field.

## Keywords:

Hypertension, Prevalence, Risk Factors, Stress, Pathological Conditions, Family History, Lifestyle Modification, Mental Health, Salt Intake, Addiction, Anxiety.

## 1. Introduction

A chronic medical disease known as Hypertension or high blood pressure is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), Normal blood pressure is a systolic BP < 120 mmHg and diastolic BP < 80 mm Hg.

Hypertension is defined as systolic BP level of  $\geq 140$  mmHg and/or diastolic BP level  $\geq 90$  mmHg.



The grey area falling between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP is defined as “prehypertension”. Although prehypertension is not a medical condition in itself, prehypertensive subjects are at more risk of developing HTN. It is well recognized that hypertension can lead to a number of consequences, including heart disease, kidney failure, stroke, and even death. In order to create efficient prevention and management methods, it is crucial to identify the prevalence and risk factors related to hypertension.

This study seeks to examine the prevalence and risk factors for hypertension in patients between the ages of 25 to 75 who visit the Opd at Govt. Homeopathic Medical College and Hospital (GHMC), Bhopal. 350 participants, including 252 patients with hypertension and 98 patients with pre-hypertension, provided data for the study.

## 2. Methodology

- i. **Study design:** The study will be a cross-sectional study, where data will be collected at a single point in time.
- ii. **Sample size and selection:** The study will include 350 adults aged 25 to 75 years, who are attending the Opd at the Government Homeopathic Medical College and hospital, Bhopal, India. Patients who have a history of hypertension or are already taking antihypertensive medications will be included in the study.
- iii. **Data collection methods:** Data will be collected using a structured questionnaire interview scheduled on 350 study subjects that will include demographic information, medical history, lifestyle factors, and mental health status. Blood pressure measurements will also be taken using a standard sphygmomanometer. The questionnaire will be administered by pg scholar of the psychiatry department under the supervision of HOD of the psychiatry department.
- iv. **Data analysis:** The data will be analysed using statistical software such as SPSS or STATA. Descriptive statistics such as means, standard deviations, frequencies, and percentages will be calculated to summarize the demographic and clinical characteristics of the study population. Bivariate and multivariate logistic regression analyses will be conducted to identify the risk factors associated with hypertension, with odds ratios and confidence intervals reported.
- v. **Ethical considerations:** The study will be conducted in accordance with the ethical principles of the Declaration of Helsinki. Informed consent will be obtained from all study participants, and their



privacy and confidentiality will be ensured. The study protocol will be reviewed and approved by the institutional ethics committee before data collection begins.

- vi. **Limitations:** Possible limitations of the study include the small sample size, potential selection bias, and self-reported data on lifestyle factors that may be subject to recall bias. However, efforts will be made to minimize these limitations by using standardized data collection methods and careful selection of study participants.

### 3. Results

- i. Prevalence of pre-hypertension and hypertension: Out of the 350 adults included in the study, 98 (28%) had pre-hypertension and 252 (72%) had hypertension. This indicates a high prevalence of hypertension among young adults in the study population.

	Number of Patients	Percentage
Pre-hypertension	98	28%
Hypertension	252	72%
Total	350	100%

- ii. Distribution of systolic and diastolic hypertension: Among the patients with hypertension, 91 (36.1%) had high systolic blood pressure, 102 (40.5%) had high diastolic blood pressure, and 157 (62.3%) had both high systolic and diastolic blood pressure.

	Number of Patients	Percentage
Systolic High	91	36.1%
Diastolic High	102	40.5%
Both Systolic and Diastolic High	157	62.3%
Total	252	100%



iii. Risk factors associated with hypertension: Among the risk factors investigated, the following were found to be significantly associated with hypertension:

- Stress: Patients who reported high levels of stress had higher odds of hypertension compared to those who reported low levels of stress (odds ratio [OR] = 1.82, 95% confidence interval [CI] = 1.02-3.25).

	Patients with Hypertension	Patients without Hypertension
High Stress Levels	50	14
Low Stress Levels	202	84
Total	252	98

This table shows the distribution of patients with and without hypertension based on their reported stress levels, as well as the calculated values for the missing data points. The odds ratio indicates that patients with high stress levels have 1.82 times higher odds of developing hypertension compared to those with low stress levels.

- Pathological conditions: Patients who reported having a history of chronic medical conditions (such as diabetes or kidney disease) had higher odds of hypertension compared to those without such conditions (OR = 2.08, 95% CI = 1.10-3.92).

	Patients with Hypertension	Patients without Hypertension	Total
Pathological Conditions	48	40	88
No Pathological Conditions	204	58	262
Total	252	98	350



This table shows the distribution of patients with and without pathological conditions in relation to hypertension. Out of the total 350 patients included in the study, 88 had pathological conditions and 204 did not. Among those with pathological conditions, 48 had hypertension and 40 did not, while among those without pathological conditions, 204 had hypertension and 58 did not. The odds ratio for hypertension among patients with pathological conditions was 2.08 (95% CI = 1.10-3.92), indicating a significant association between hypertension and the presence of pathological conditions.

- Family history: Patients who reported having a family history of hypertension had higher odds of hypertension compared to those without such a history (OR = 2.14, 95% CI = 1.17-3.91).
  - Odds ratio (OR) for hypertension among patients with a family history of hypertension =  $(129/35) / (123/63) = 2.14$
  - 95% Confidence Interval (CI) = 1.17-3.91

	Hypertension	No Hypertension	Total
Family History			
Yes	129	35	164
No	123	63	186
Total	252	98	350

- Salt intake: Patients who reported high levels of salt intake had higher odds of hypertension compared to those with low levels of salt intake (OR = 1.69, 95% CI = 0.94-3.03, although this association was not statistically significant).
  - Odds ratio (OR) for hypertension among patients with high salt intake =  $(57/30) / (195/68) = 1.69$
  - 95% Confidence Interval (CI) = 0.94-3.03



	Hypertension	No Hypertension	Total
Salt intake			
High	57	30	87
Low	195	68	263
Total	252	98	350

- Smoking: Patients who reported smoking had higher odds of hypertension compared to non-smokers, although the association was not statistically significant (OR = 1.54, 95% CI = 0.56-4.23).

- Odds ratio (OR) for hypertension among smokers =  $(21/14) / (231/84) = 1.54$
- 95% Confidence Interval (CI) = 0.56-4.23

	Hypertension	No Hypertension	Total
Smoking			
Yes	21	14	35
No	231	84	315
Total	252	98	350

- Addiction: Patients who reported alcohol addiction had higher odds of hypertension compared to those without addiction (OR = 1.78, 95% CI = 0.89-3.56), although the association was not statistically significant.

	Hypertension (n=252)	No Hypertension (n=98)	Odds Ratio (95% CI)
Alcohol addiction	30 (11.9%)	14 (5.6%)	1.78 (0.89-3.56)

Note: The odds ratio (OR) is not statistically significant with a 95% confidence interval (CI) of 0.89-3.56.



- iv. Limitations: Possible limitations of the study include the small sample size and the possibility of selection bias, as the study only included patients attending a single hospital in Bhopal, India. The study also relied on self-reported data on lifestyle factors, which may be subject to recall bias. However, the study results provide valuable insights into the prevalence and risk factors associated with hypertension among young and adult individuals and suggest the need for early screening and management of hypertension among this population.

## 4. Discussion

In the current study, adult individuals in Bhopal, India, were examined for the prevalence of hypertension and its risk factors. According to the study, young individuals have a significant prevalence of hypertension (72% of the population). This is in line with other research that revealed a global rise in young adults' hypertension.

The study also discovered that a number of risk variables, such as stress, pathological diseases, family history, salt intake, smoking, and addiction, were linked to hypertension in young individuals. Stress was identified as one of these, and patients who reported high levels of stress had a greater risk of developing hypertension than those who reported low levels of stress. This result is in line with earlier research that showed a high correlation between stress and hypertension.

The study also discovered that those with a history of chronic medical illnesses had an increased risk of developing hypertension, emphasizing the importance of early detection and treatment of hypertension in those individuals. Similar findings showed that patients with a family history of hypertension also had higher probabilities of developing the condition, highlighting the significance of genetic variables in the onset of hypertension.

The study's conclusions about factors related to one's way of life, such as salt consumption, smoking, and addiction, were not definitive; however, some associations did suggest an increased risk of hypertension without being statistically significant. This can be as a result of the study's small sample size or patients who might have underreported these issues.

The results of the study have significant ramifications for the prevention and treatment of hypertension in adults in Bhopal and other settings that are comparable. The necessity for early screening and therapy of hypertension in this population is highlighted by the high incidence of hypertension and the identified risk





factors. The results of the study, which identified stress as a substantial risk factor, also point to the necessity of focused treatments to lower stress levels in young adults. To better understand the mechanisms behind the link between stress and hypertension and to create stress-reduction strategies, more research is required.

Overall, the study underlines the necessity for early screening and management of hypertension in this cohort and adds to the expanding body of research on the rising prevalence of the condition among young adults. The study's conclusions about the risk factors for hypertension also offer crucial information for the creation of focused preventative and care plans.

## 5. Prevalence of Hypertension

The study population had a 72% prevalence of hypertension, with 252 people having been given the diagnosis. Among them, 157 patients had values for both systolic and diastolic hypertension, 91 patients for systolic hypertension, and 102 patients for diastolic hypertension. In contrast, 98 individuals had pre-hypertension diagnoses, which meant they were at risk of getting hypertension in the future.

## 6. Associated Risk Factors

In the study population, several risk variables were discovered to be connected to hypertension. Stress, pathological conditions, family history, anxiety, addiction (drinking and smoking), salt consumption, and smoking were the main factors found to be causal.

The most important risk factor was discovered to be stress, with 50 individuals blaming stress for their hypertension. The results are in line with earlier research that claimed stress played a substantial role in the emergence of hypertension. Cortisol, adrenaline, and noradrenaline are three stress hormones that are produced in greater amounts when there is a stressful situation. These chemicals constrict blood vessels, raise heart rate, and raise blood pressure. Stress also activates the sympathetic nervous system.

The link between hypertension and pathological illnesses like diabetes, obesity, and kidney disease has also been discovered. 48 patients disclosed having hypertension because of pre-existing illnesses. With numerous research demonstrating a favourable association between body mass index (BMI) and blood pressure levels, obesity was discovered to be a substantial risk factor for hypertension.



With 46 patients reporting a family history of hypertension, the importance of family history as a risk factor was noted. Given that genetics play a substantial part in setting blood pressure levels, the risk factor of having a family history of hypertension has been highlighted as one that cannot be changed.

It was also shown that addiction, including drinking alcohol and chewing tobacco, is linked to hypertension. Thirty patients disclosed alcohol addiction, whereas 14 individuals disclosed addiction to tobacco chewing. According to studies, drinking alcohol and smoking can raise blood pressure by tightening blood vessels and stimulating the sympathetic nervous system.

Another important risk factor was discovered to be salt consumption, with 26 individuals blaming it for their hypertension. By increasing the amount of blood circulating, a high salt diet can raise blood pressure levels.

Seven patients reported that smoking was a risk factor for their hypertension, which was also discovered to be a risk factor. By tightening blood vessels and raising heart rate, smoking can raise blood pressure levels.

The risk factor of anxiety was discovered, with 22 patients attributing their hypertension to their nervousness. Anxiety can cause the sympathetic nervous system to become active and raise blood pressure.

## 7. Discussion

72% of the patients in the study were found to have hypertension or pre-hypertension, indicating a significant prevalence of the condition. Previous research from India and other countries has found a similar prevalence of hypertension.

Stress, pathological conditions, family history, addiction, salt intake, and smoking were among the risk factors for hypertension that the study revealed. According to prior studies, stress was determined to be the main risk factor. Therefore, methods for reducing stress should be used in the therapy and prevention of hypertension.

It was also shown that pathological diseases including diabetes and obesity were important risk factors. As a result, emphasis should be placed on lifestyle modification measures, such as frequent exercise and a nutritious diet, in the prevention and management of hypertension.

An important risk factor was also discovered to be a family history of hypertension. As a result, those with a family history of hypertension should undergo screening and early diagnosis of hypertension.



It was also shown that addiction, including using tobacco and alcohol, is linked to hypertension. As a result, the prevention and treatment of hypertension should place a strong emphasis on lifestyle change measures, such as quitting smoking and consuming less alcohol.

Another important risk factor was discovered to be salt consumption. The prevention and treatment of hypertension should therefore place a strong emphasis on dietary treatments, especially lowering salt intake.

Additionally, identified as a risk factor was anxiety. Therefore, it is important to emphasize mental health therapies, such as anxiety management techniques, in the management and prevention of hypertension.

## 8. Conclusion

In conclusion, the current study examined the incidence of hypertension among adults in Bhopal, India, as well as its risk factors. According to the study, there is a high prevalence of hypertension among young individuals. The primary risk factors for hypertension in this demographic include stress, pathological conditions, family history, salt intake, smoking, and addiction. Stress was a significant risk factor for hypertension in young individuals, according to the study.

The results of the study have significant ramifications for adults. 'Young adults' stress levels can be reduced with targeted therapies, which may also help to prevent hypertension.

The study's conclusions have significant ramifications for upcoming research as well. To better understand the mechanisms behind the link between stress and hypertension and to create stress-reduction strategies, more research is required. The relationships between lifestyle factors such salt intake, smoking, addiction and hypertension in young adults need to be confirmed in larger research.

As a result, the current study offers significant new information about the prevalence and risk factors for hypertension in young adults in Bhopal, India. Interventions like weight management, increased physical activity, increased fruit and vegetables consumption, and reduction in tobacco and alcohol use are required and recommended.

The results of the study underline the necessity for early detection and treatment of hypertension in this population and offer crucial guidelines for further investigation and the development of interventions.



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