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Original Article

Identifying Risk Factors Associated with Hypertension in Different Age Groups at Sindh University Employees Housing Society Phase I Jamshoro

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ABSTRACT

Background: Hypertension is recognized as the leading cause of mortality in the 21st century. It has emerged as a significant and complex health issue, necessitating well-designed treatment strategies and healthy lifestyle habits for its prevention and management.

Objective: The objective of this study was to identify the associated risk factors of hypertension in different age groups within the Sindh University Employees Housing Society Phase I, Jamshoro.

Methods: A descriptive cross-sectional study was conducted from February 2 to March 30, 2024, at Sindh University Employees Housing Society Phase I, Ward No. 04, Union Council 23, Block A, Jamshoro. The study involved 70 households in Block A. Data were collected using a well-structured questionnaire focusing on hypertension-related questions. Convenient sampling technique was used to select participants. A total of 52 individuals known to have hypertension, based on their medical history and self-reported criteria, participated in the study. Informed consent was obtained from each participant, and all relevant information was provided before the interview. The study adhered to ethical standards outlined in the Declaration of Helsinki. Data were analyzed using SPSS version 25, employing descriptive statistics to summarize the demographic and lifestyle characteristics of the participants and examining associations between hypertension and various risk factors.

Results: Out of the 52 participants, 44 (84.6%) were male and 8 (15.4%) were female. Participants were categorized into four age groups: 18-27 years (13.5%), 28-37 years (9.6%), 38-47 years (38.5%), and above 48 years (38.5%). The highest prevalence of hypertension was observed in the age groups 38-47 years and above 48 years. Smoking was prevalent among participants, with 40 (76.9%) being current smokers. Physical inactivity was reported by 48 (92.3%) participants. A significant number of participants, 48 (92.3%), had a family history of hypertension. Non-compliance with hypertension treatment was observed in 35 (67.3%) participants. Additionally, 42 (80.8%) participants did not consume fruits frequently, and 44 (84.6%) were unaware that high salt intake could cause hypertension.

Conclusion: Smoking, physical inactivity, and family history were identified as the most prominent risk factors for hypertension, particularly in males aged 38 years and above. Lack of awareness regarding dietary habits, medication adherence, and sleep patterns also contributed to the development of hypertension. Targeted interventions and comprehensive health education are needed to address these modifiable risk factors and improve hypertension management in the community.

Keywords: Hypertension, Risk Factors, Smoking, Physical Inactivity, Family History, Dietary Habits.

INTRODUCTION

Hypertension has been recognized as the leading cause of mortality in the 21st century (1). It is the primary risk factor for mortality and a significant contributor to other non-communicable diseases (2). Arterial hypertension has long been associated with severe health outcomes such as heart attacks, strokes, and kidney failure, significantly elevating the risk of premature death. Despite its severity, hypertension is a modifiable condition, and its impact can be mitigated through well-designed combination treatments and

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the implementation of appropriate healthy habits (3). Globally, hypertension remains one of the foremost risk factors for death and disability. For instance, the prevalence of hypertension in China has reached alarming levels, with 270 million affected individuals. Without timely prevention and control, hypertension poses a substantial threat to public health and imposes a significant economic burden (4). Similarly, the city of Tianjin in China, with a high prevalence rate second only to Beijing, faces a growing incidence of hypertension among its young population, underscoring the urgent need for effective prevention and control measures (4).

The rapid population growth, coupled with technological advancements, has led to reduced employment opportunities for the younger generation, contributing to stress and hypertension among young individuals (5). Hypertension exacerbates conditions such as stroke, dementia, chronic kidney disease, coronary artery disease, and heart failure. Pre-hypertensives and stage 1 hypertensives account for a significant portion of the rising prevalence of hypertension-linked events, responsible for 13 to 19% of annual global deaths. It is predicted that by 2025, 1.56 billion people will be hypertensive, driven by factors such as nutritional transitions and increasingly sedentary lifestyles, particularly in low- and middle-income countries (6). The relationship between tobacco use and hypertension has been extensively studied, with evidence suggesting that smoking causes acute increases in blood pressure and heart rate. Nicotine, an adrenergic agonist, mediates the release of catecholamines and vasopressin, contributing to hypertension (7, 8). However, some studies have shown no significant differences in blood pressure between smokers and non-smokers, highlighting the complex nature of this association (9).

Obesity is another critical public health challenge linked to adverse cardiovascular outcomes. Excess adiposity is well-established as a risk factor for hypertension, with obesity accounting for a significant proportion of primary hypertension cases (10). The relationship between hypertension and dietary sodium intake is well-documented, with high sodium consumption directly contributing to elevated blood pressure. Reducing dietary sodium intake has been associated with decreased blood pressure and reduced morbidity and mortality from cardiovascular diseases (11). Body Mass Index (BMI) and family history are significant predictors of hypertension risk, with the interaction between these factors posing a greater risk than their independent effects (12). Research indicates that the prevalence of hypertension is highest among older populations, with a significant proportion of young adults also affected (13). Gender differences also play a role, with men exhibiting higher levels of hypertension and lower levels of awareness compared to women (14). The combined effects of smoking and alcohol consumption further elevate the risk of hypertension, necessitating a dual approach in prevention strategies (15). Contrarily, some studies have found no significant differences in blood pressure between smokers and non-smokers, emphasizing the need for nuanced understanding (16). Dietary habits also significantly influence hypertension risk, with evidence suggesting that vegetarian dietary patterns are associated with lower hypertension risk (17). Recommendations by the World Health Organization to limit sodium intake further highlight the critical role of diet in managing hypertension (18, 19, 20).

Physical inactivity is another major risk factor for hypertension. Inactive individuals tend to have higher heart rates, increasing the workload on the heart and raising blood pressure (21). Family history is a prominent risk factor, with studies showing a strong correlation between hypertension and a family history of the condition (22). Non-compliance with hypertension treatment further exacerbates health outcomes, highlighting the need for improved adherence to medication regimens (23, 24). Sleep patterns also influence hypertension risk, with evidence suggesting that healthy sleep patterns can significantly reduce hypertension risk.

Overall, smoking, physical inactivity, and family history are the most prominent risk factors for hypertension, especially in males aged 38 years and above. Lack of awareness regarding dietary habits, medication adherence, and sleep patterns also contribute to the development of hypertension. As hypertension is a silent killer, early detection and monitoring systems are essential for at-risk populations, particularly older adults, smokers, and physically inactive individuals.

MATERIAL AND METHOD

A descriptive cross-sectional study was conducted from February 2 to March 30, 2024, at Sindh University Employees Housing Society Phase I, Ward No. 04, Union Council 23, Block A, Jamshoro City, Sindh. This study aimed to identify the associated risk factors of hypertension across different age groups. The target population comprised known cases of hypertension based on their medical history and self-reported criteria. The study area included 70 households in Block A, from which 52 participants were selected using a convenient sampling technique.

Data collection involved a well-structured questionnaire focused on hypertension-related questions. Informed consent was obtained from each participant, and they were provided with all relevant information before the interview to ensure ethical standards were upheld. The study adhered to the ethical principles outlined in the Declaration of Helsinki. Written permission for data collection was granted by the Union Councilor of Ward No. 04, Union Council 23. Additionally, an official letter from the Director of People's Nursing LUMHS Jamshoro was sent to the Union Council for correspondence.

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The questionnaire covered various aspects including demographic variables, lifestyle factors, and medical history. The demographic variables included age, gender, marital status, religion, education, and employment status. Lifestyle factors assessed were smoking habits, dietary patterns, physical activity levels, and sleep patterns. Medical history focused on family history of hypertension, compliance with treatment, and knowledge about obesity and its association with hypertension.

Data analysis was conducted using SPSS version 25. Descriptive statistics were applied to summarize the demographic and lifestyle characteristics of the participants. Frequencies and percentages were used to present categorical variables, while means and standard deviations were calculated for continuous variables. The association between hypertension and various risk factors was examined using appropriate statistical tests, ensuring robust and reliable findings.

The study included 52 participants, with the highest prevalence of hypertension found among males (84.6%) and those aged 38 years and above. Smoking, physical inactivity, and family history emerged as the most prominent risk factors for hypertension. Additionally, a significant lack of awareness regarding dietary habits, medication adherence, and the importance of adequate sleep was observed among the participants. These findings underscore the need for targeted interventions to address these modifiable risk factors and improve hypertension management in the community.

The study was limited by the self-reported nature of the data, which could affect reliability. The small sample size and the use of convenience sampling may limit the generalizability of the findings. Future research with larger, randomly selected samples and objective measures is recommended to validate and extend these findings.

RESULTS

A total of 52 participants were included in this study. All participants were known cases of hypertension based on their medical records and self-reported criteria. The highest prevalence of hypertension was found in males (84.6%), with only 15.4% of the participants being female. Participants were divided into four age groups, with the highest prevalence found between the age groups of 38-47 and 48 years and above.

Table 1 Demographic Variables

Characteristics	Categories	Frequency	Percentage
Age	18-27 years	7	13.5%
	28-37 years	5	9.6%
	38-47 years	20	38.5%
	>48 years	20	38.5%
Total		52	100.0%
Gender	Male	44	84.6%
	Female	8	15.4%
Total		52	100.0%
Marital Status	Single	2	3.8%
	Married	50	96.2%
Total		52	100.0%
Religion	Muslim	52	100.0%
	Non-Muslim	0	0.0%
Total		52	100.0%
Education	Middle	5	9.6%
	Secondary	26	50.0%
	Higher Secondary	18	34.6%
	Graduation	3	5.8%
Total		52	100.0%
Employment Status	Unemployed	7	13.5%
	Employed	45	86.5%
Total		52	100.0%

The majority of participants were married (96.2%), employed (86.5%), and all were Muslims. The highest educational attainment for most participants was secondary education (50.0%), followed by higher secondary education (34.6%).

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Table 2 Lifestyle-Related Factors

Items	Response	18-27 years	28-37 years	38-47 years	>48 years	Total (Percentage)
Smoking	Have you ever smoked?	Yes	4	4	11	17
		No	3	1	9	3
Currently smoke?	Yes	3	2	18	17	40 (76.9)
	No	4	3	2	3	12 (23.1)
Diet	Do you eat fruits frequently?	Yes	2	0	0	8
	No	5	5	20	12	42 (80.8)
	Do you eat vegetables frequently?	Yes	3	2	8	20
	No	4	3	12	0	19 (36.5)
	Do you know that high intake of salt can cause high blood pressure?	Yes	1	1	0	6
	No	6	4	20	14	44 (84.6)
Physical Activity	Do you perform physical activity?	Yes	1	0	1	2
	No	6	5	19	18	48 (92.3)
	Do you know that lack of physical activity can cause hypertension?	Yes	1	1	1	5
	No	6	4	19	15	44 (84.6)
Family History	Is there anyone in your family who has hypertension?	Yes	6	4	20	18
	No	1	1	0	2	4 (7.7)
Non-Compliance with Treatment	Do you take medicine for hypertension?	Yes	6	4	5	2
	No	1	1	15	18	35 (67.3)
Obesity	Do you have any knowledge about obesity?	Yes	3	5	19	3
	No	4	0	1	17	22 (42.3)
	If yes, do you think that obesity can cause hypertension?	Yes	3	5	4	7
	No	4	0	16	13	33 (63.5)
Sleep	Do you sleep more than six hours?	Yes	2	0	12	14
	No	5	5	8	6	24 (46.2)
	Do you think that inappropriate sleep causes hypertension?	Yes	0	1	0	8
	No	7	4	20	12	43 (82.7)

The study found a high prevalence of hypertension among smokers, with 76.9% of participants currently smoking. Only 19.2% of participants reported eating fruits frequently, while 63.5% reported eating vegetables frequently. However, 84.6% of participants were unaware that a high intake of salt can cause hypertension. Physical inactivity was prevalent among participants, with only 7.7% engaging in regular physical activity. Furthermore, 92.3% of participants reported a family history of hypertension. Non-compliance with hypertension treatment was observed in 67.3% of participants. Although 57.7% were aware of obesity, only 36.5% recognized it as a cause of hypertension. Sleep patterns were also assessed, with 53.8% of participants sleeping more than six hours, but 82.7% were unaware that inadequate sleep could cause hypertension.

In conclusion, smoking, physical inactivity, and family history were identified as significant risk factors for hypertension, particularly among males aged 38 years and above. Lack of awareness regarding dietary habits, medication adherence, and sleep patterns further contributed to the development of hypertension. These findings highlight the need for comprehensive health education and targeted interventions to manage and prevent hypertension in this population.

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DISCUSSION

The current study revealed that the majority of the older population, specifically those aged 38 years and above, was affected by hypertension. This finding aligns with previous research indicating that hypertension prevalence is highest in older populations, with only a minority of young adults being hypertensive (13). Additionally, a significant association between male gender and hypertension was observed, corroborating earlier studies that reported higher levels of hypertension and lower awareness among men compared to women (14).

The study identified smoking as a prevalent risk factor, with a substantial number of participants being current smokers. Previous research supports the association between smoking and increased hypertension risk, suggesting that the type of tobacco products and the interaction between tobacco and alcohol consumption significantly elevate the risk (15). However, some studies, such as one conducted in Nepal, found no significant differences in blood pressure between smokers and non-smokers, indicating the complex nature of this relationship (16).

Dietary habits were another critical factor, with a low percentage of participants frequently consuming fruits. The majority were unaware of the risks associated with high salt intake. These findings are consistent with previous studies suggesting that dietary patterns rich in vegetables, fruits, and low in sodium are associated with a reduced risk of hypertension (17, 18). The World Health Organization recommends limiting sodium intake to reduce hypertension risk, which further supports the need for dietary interventions in this population (19, 20).

Physical inactivity was highly prevalent among participants, reflecting a significant risk factor for hypertension. The lack of physical activity is known to increase heart rates and blood pressure, contributing to the development of hypertension (21). Family history also emerged as a prominent risk factor, with most participants reporting a family history of hypertension. This finding is consistent with studies that have demonstrated the strong correlation between hypertension and genetic predisposition (22).

Non-compliance with hypertension treatment was notably high, which could lead to uncontrolled hypertension and severe health complications. Previous research highlights the negative impact of non-compliance on cardiovascular outcomes, emphasizing the need for improved adherence to medication regimens (23, 24). Additionally, sleep patterns were assessed, revealing that many participants had inadequate sleep and were unaware of its potential impact on hypertension. Studies have shown that a healthy sleep pattern can significantly reduce hypertension risk, underscoring the importance of sleep hygiene in hypertension management.

The strengths of this study include its focus on a specific population within a well-defined geographical area, providing valuable insights into the local prevalence and risk factors associated with hypertension. However, the study had several limitations. The small sample size and the use of convenient sampling may limit the generalizability of the findings. Additionally, the reliance on self-reported data could affect the accuracy of the results. Future research should consider larger, randomly selected samples and objective measures to validate and extend these findings.

CONCLUSION

In conclusion, the study identified smoking, physical inactivity, and family history as significant risk factors for hypertension, particularly among males aged 38 years and above. The lack of awareness regarding dietary habits, medication adherence, and sleep patterns further contributed to hypertension risk. These findings highlight the need for comprehensive health education and targeted interventions to manage and prevent hypertension. Public health initiatives should focus on promoting healthy lifestyles, improving treatment adherence, and increasing awareness of hypertension risk factors to mitigate the burden of this condition in the community.

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