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**Original Article**

# A Study to Determine the Occurrence and Risk Factors of Hypertension Among Nursing Personnel in Selected Hospital, West Bengal

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## ABSTRACT

This research study aimed to investigate the occurrence and risk factors of hypertension among nursing personnel in a selected hospital in West Bengal. Drawing from Irwing Rossen Stock's Health Belief Model, the study employed a descriptive survey approach. A non-probability consecutive sampling technique was used to select 230 nursing personnel from various departments of Burdwan Medical College and Hospital, Purba Bardhaman. Data were collected through demographic and personal characteristic assessments, semi-structured questionnaires for risk factor evaluation, and physical measurements. The findings revealed a hypertension occurrence rate of 25.21% among nursing personnel. Most participants were staff nurses (87%), possessed a General Nursing and Midwifery (GNM) qualification (76.1%), and were assigned to non-emergency units (63.4%). Significant associations were found between hypertension and various demographic variables including designation, professional qualification, unit of posting, working experience, religion, marital status, and number of living children. Major risk factors among hypertensive nursing personnel included age (50-60 years), family history of hypertension, lack of exercise and walking habits, stress perception, and workplace stress occurrence. This study has implications for nursing practice, education, administration, and research, providing insights into addressing hypertension risks among nursing professionals. The study's recommendations encompass broader generalization through larger sample sizes, extending the assessment to different professional groups, and evaluating hypertension occurrence across various settings.

**KEYWORDS**: Hypertension; Health; Nursing; Child; Oestrogen

## INTRODUCTION

Hypertension stands as a significant public health challenge, transcending borders between economically developing and developed nations. It is a prevailing chronic condition in adults, identified as a leading contributor to premature mortality, disability, and overall disease burden. With its potential to trigger severe outcomes like myocardial infarction, heart failure, stroke, and chronic kidney disease, it is a pressing concern demanding appropriate management. In the realm of healthcare, nursing personnel face unique pressures. They often operate under time constraints, with limited decision-making power and an imbalanced workload. This situation can foster feelings of inadequacy and increased stress, potentially leading to elevated blood pressure. The intense daily workload, coupled with emergency management responsibilities, compounds stress levels, which in turn, can contribute to hypertension. Hypertension is a silent threat, often remaining undetected until a critical health crisis emerges. Globally, its prevalence has surged, with an estimated 800 million adults affected currently and projected to reach 1.5 billion by 2025. Sub-Saharan African countries, notably Nigeria, bear a substantial burden, accounting for over 80% of global cardiovascular disease deaths.[1]

Hypertension's rise in prevalence has been linked to factors like urbanization, obesity, physical inactivity, and unhealthy dietary habits. Hypertension is often termed the "silent killer" due to its asymptomatic nature in early stages. It is a leading modifiable risk factor for cardiovascular disease, irrespective of socio-economic status. While the prevalence varies worldwide, developing nations are witnessing a surge. Factors such as sedentary lifestyles and poor dietary habits fuelled by technological advancement contribute to its rise. The World Health Organization underscores the critical role of hypertension awareness and education in prevention. Hypertension, marked by elevated blood pressure in arteries, strains the heart and increases cardiovascular risk. The risk of adverse outcomes like heart attack, stroke, heart failure, and kidney disease escalate with higher blood pressure levels. Age, gender, genetics, lifestyle, and environmental factors contribute to its development. The role of hypertension in global health is substantial, with direct links to coronary heart disease and stroke. The nursing profession witnesses a higher prevalence of risk factors for hypertension due to the demands of their job. Irregular dietary habits, stress, and physically and mentally demanding work schedules contribute to their vulnerability. Studies indicate a disproportionate incidence of hypertension among nursing personnel. Given their crucial role in healthcare, it becomes imperative to address this concern.

## METHODS AND ANALYSIS

### Overview

It provides an overview of hypertension, a significant global public health challenge, emphasizing its prevalence and the associated risks of heart disease, stroke, and kidney disease. The chapter also highlights the unique stress and decision-making challenges faced by nursing personnel in managing their health. The background section underscores the silent nature of hypertension, its alarming global rise, especially in regions like Sub-Saharan Africa and Nigeria, and the role of urbanization and lifestyle changes. The need for the study is driven by the imperative to understand risk factors, increase awareness, and promote lifestyle modifications for hypertension prevention as shown in **Fig.1.** The problem statement outlines the study's goal to determine the occurrence and risk factors of hypertension among nursing personnel in a specific hospital in West Bengal. The objectives are to identify the occurrence, risk factors, and demographic associations with hypertension. Operational definitions clarify the measurement criteria for hypertension and its risk factors. The conceptual framework is based on the Health Belief Model, emphasizing factors like body weight, disease history, dietary habits, stress, and physical activity's influence on preventive actions. Delimitations specify the study's focus on a particular hospital and reliance on questionnaire responses from willing participants. Non-participating subjects are not included.

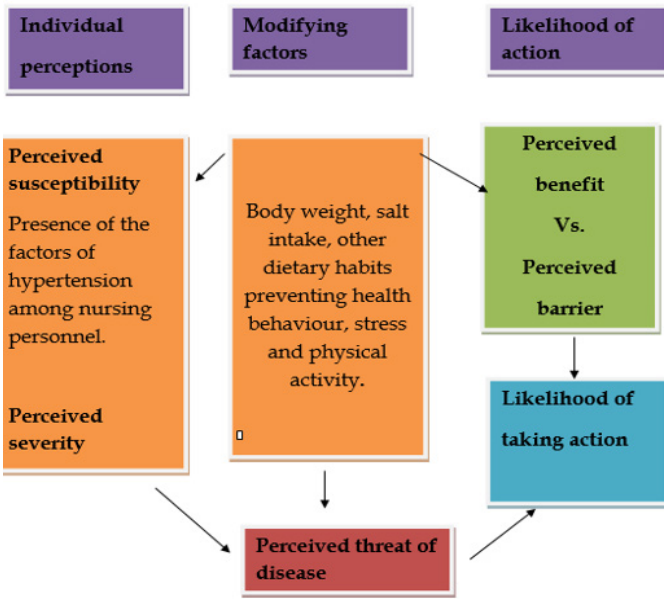


**FIGURE. 1.** Shows the conceptual frameworkbased on Rossen stock's Health Belief Model.

### Literature Review

The literature review in this chapter provides a comprehensive analysis of research on hypertension, categorizing the information into four sections: prevalence of hypertension, risk factors affecting high blood pressure, hypertension in nursing personnel, and risk factors of hypertension among nurses. Studies by Erem C, Maroof et al., highlight the high prevalence of hypertension in adult populations, affecting various demographics. Risk factors, such as sodium levels, antioxidants, and alcohol consumption, are explored.[2] The review also addresses the occurrence, diagnosis, and treatment patterns of hypertension in this group. Risk factors of hypertension among nurses are discussed in Adrlano Marcal Pimenta and Ada Avida Assuncao's study, attributing some risk to job strain. This comprehensive exploration of existing knowledge forms the foundation for the present study. The study outlines the research methodology, encompassing the research approach, design, setting, population, sample, sampling technique, data collection tools, and analysis plan. The survey research approach is chosen, with a descriptive survey design. Variables include hypertension occurrence, risk factors, and socio-demographic factors. The study is conducted at Anamoy Super speciality Hospital for a pilot and Burdwan Medical College and Hospital for the final study. The entire nursing personnel in West Bengal hospitals comprise the population, and non-probability consecutive sampling is used. Data collection tools include a semi-structured questionnaire and physical assessment instruments, developed with expert validation and reliability testing. The pilot study involved 20 nursing personnel and included biophysical measurements and questionnaire responses. Data collection spanned specific periods.[3]

## RESEARCH METHODOLOGY

The research methodology for this investigation is structured to ensure a systematic and reliable approach to collecting data on hypertension occurrence among nursing personnel, identifying risk factors, and assessing their association with demographic variables. It follows a survey research approach, which is ideal for gathering information. The research design is described as a descriptive survey, offering a framework for data collection and intervention implementation. The variables under investigation encompass hypertension occurrence, risk factors, and socio-demographic variables such as designation, qualification, and marital status.

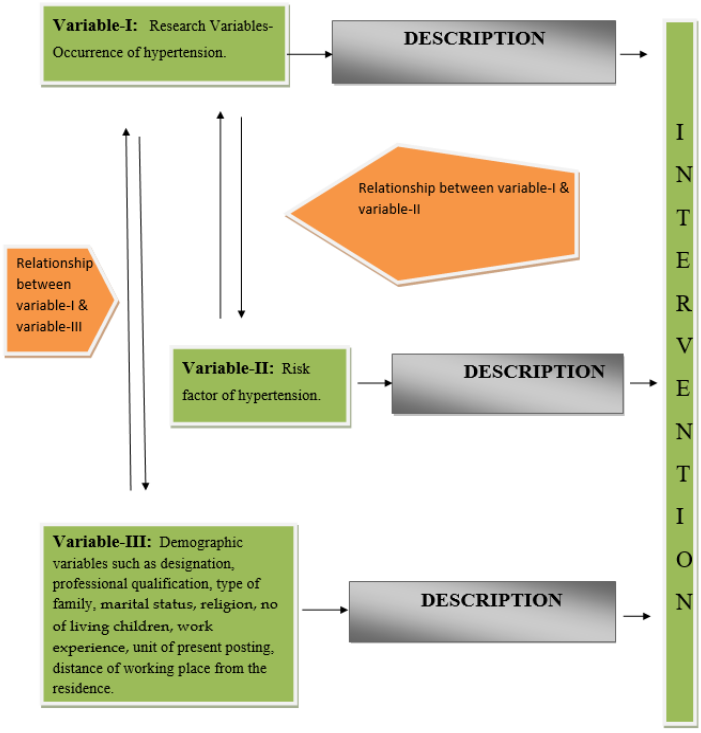


**FIGURE.2.** Schematic presentation of descriptive survey design.

The research is carried out in two healthcare facilities, Anamoy Superspeciality Hospital for the pilot study and Burdwan Medical College and Hospital for the final study. The choice of settings is based on subject availability, familiarity, feasibility, accessibility, and cooperation. The target population includes all nursing personnel in West Bengal hospitals. Non-probability consecutive sampling is employed, enlisting subjects who meet inclusion criteria and are willing and available for participation.

The data collection tools consist of a semi-structured questionnaire for demographic information, a risk factor assessment questionnaire, and physical assessment instruments such as measuring tape, weighing machine, and sphygmomanometer. These tools were developed through a comprehensive process that involved literature review, expert consultation, peer discussions, drafting, content validity assessment, pretesting, and reliability testing. The pretesting and pilot study were essential steps to ensure that the tools were clear, relevant, and reliable. Feedback from the pretest indicated that the risk factor assessment questionnaire was easily comprehensible and took approximately 20 minutes to complete. In the pilot study, data collection encompassed biophysical measurements, demographic questionnaires, and risk factor assessments and was conducted at Anamoy Super specialty Hospital with 20 nursing personnel selected through non-probability purposive sampling.

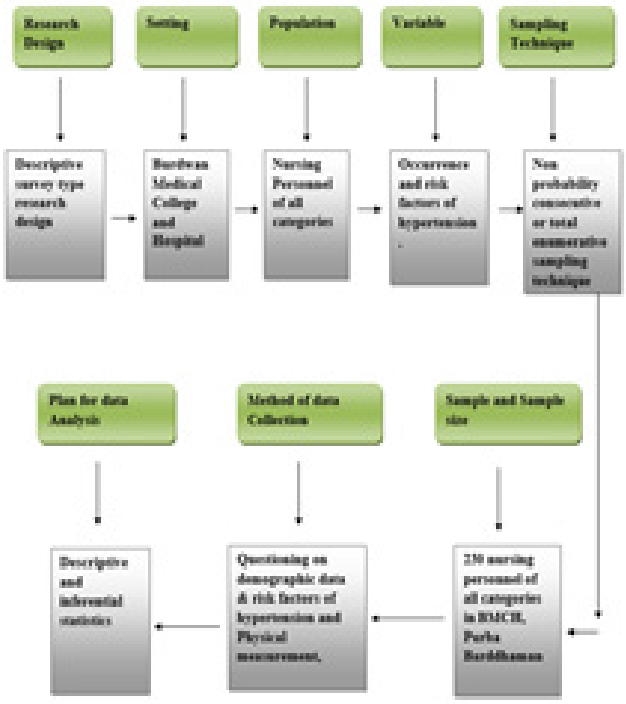

**FIGURE.3.** Schematic presentation of survey research design

This research methodology lays a strong foundation for gathering accurate data on hypertension and its associated factors among nursing personnel, ensuring the credibility and validity of the study's findings. It demonstrates a careful and well-structured approach to address the research objectives effectively. As shown in Table. 1.

Data Analysis Plan: Descriptive and inferential statistics will be employed for analysis:

- Percentage and frequency distribution of sample characteristics
- Frequency distribution of hypertension cases (old and new)
- Calculation of hypertension occurrence
- Frequency distribution of risk factors
- Chi-square test to assess hypertension-demographic variable association

## Summarization

The research methodology chapter encompasses the research approach, design, variables, setting, population, sample, sampling technique, tool development, validity, reliability, pretesting, pilot study, data collection, and analysis plan.

The study investigated the connection between hypertension and demographic traits among nursing personnel. A non-parametric Chi square test was used, assessing the relationship between hypertension and variables like age, marital status, religion, etc. Chi square tests determine the independence or association of variables, usable for nominal or ordinal data.

Results from the Chi square tests for demographic variables showed significant associations for various factors. Designation had a significant link to hypertension (Chi2 = 16.503). Professional qualification displayed no significant association (Chi2 = 3.728). Unit of posting exhibited a significant connection (Chi2 = 6.397). Working experience also showed a significant association (Chi2 = 61.757).

Further analysis with additional demographic variables indicated that religion (Chi2 = 6.424) and marital status (Chi2 = 9.578) had significant links with hypertension. Conversely, the type of family, distance from residence to workplace, and time taken for the commute did not significantly correlate with hypertension.

The number of living children showed a noteworthy relationship with hypertension (Chi2 = 8.616). Generally, hypertension was found to be prevalent among nursing personnel aged 50-60, with family histories of hypertension, no exercise habits, and work-related stress.

**Table 1. Frequency and percentage distribution of nursing personnel in terms of designation and professional qualification, unit of posting presently and working experience. N=230**

| Personal variable | Frequency | Percentage |
|---|---|---|
| Designation | | |
| NS | 1 | 0.4 |
| DNS | 3 | 1.3 |
| Sister In charge | 26 | 11 |
| PHN | 1 | 0.4 |
| Staff nurse | 199 | 87 |
| Professional qualification | | |
| GNM | 175 | 76 |
| B.Sc. Nursing | 53 | 23 |
| M. Sc. Nursing | 2 | 0.9 |
| Unit of posting presently | | |
| Emergency unit | 78 | 34 |
| Non-emergency unit | 146 | 63 |
| Administrative unit | 6 | 2.6 |
| Working experience | | |
| <10 years | 142 | 62 |
| >10-20 years | 23 | 10 |
| >20-30 years | 44 | 19 |
| >30 years | 21 | 9.1 |

**Table 2.** Frequency and percentage distribution of nursing personnel in terms of religion, marital status, type of family, distance from residence to work place and Time taken from residence to work place. N=230

| Personal variable | Frequency | Percentage |
|---|---|---|
| Religion | | |
| Hindu | 204 | 89 |
| Muslim | 23 | 10 |
| Christian | 3 | 1.3 |
| Marital status | 53 | 23 |
| Married | 138 | 60 |
| Unmarried | 87 | 38 |
| Widow | 5 | 2.2 |
| Type of family | | |
| Joint family | 56 | 24 |
| Nuclear family | 174 | 76 |
| Distance from residence to work place | 142 | 62 |
| <5 km | 155 | 67 |
| 5-25 km | 28 | 12 |
| >25-50 km | 22 | 9.6 |
| >50 km | 25 | 11 |

**Table 3.** Frequency distribution of previously detected old case of hypertension and new case of hypertension.

| Variables | Frequency |
|---|---|
| Previously known case ( old case) | 40 |
| New case | 18 |
| Total occurrence | 58 |

$$\text{Occurrence rate of hypertension} = \frac{\text{Total no of old cases + total no of new cases}}{\text{Total population}} \times 100$$

$$= \frac{40 + 18}{230} \times 100 = 25$$

**Table 4.** Frequency and percentage distribution of risk factors of hypertension among nursing personnel in terms of Age, family history, alcohol consumption, smoking and BMI.

| Risk factor | Hypertension | | No hypertension | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Age in years | N=58 | | | N=172 |
| **<30** | 8 | 13.79 | 110 | 63.95 |
| 31-40 | 8 | 13.79 | 31 | 18.02 |
| 41-50 | 13 | 22.41 | 13 | 7.56 |
| 51-60 | 25 | 43.1 | 15 | 8.72 |
| >60 | 4 | 6.9 | 3 | 1.74 |
| **Family history of hypertension** | | | | |
| Yes | 40 | 68.97 | 79 | 45.93 |
| No | 18 | 31.03 | 93 | 54.07 |
| **Alcohol consumption** | | | | |
| Yes | 0 | 0 | 0 | 0 |
| No | 58 | 100 | 172 | 100 |
| **Tobacco consumption** | | | | |
| Yes | 0 | 0 | 0 | 0 |
| No-[- | 58 | 100 | 172 | 100 |
| **BMI** | | | | |
| Underweight (<18) | 3 | 5.17 | 15 | 8.72 |
| Normal weight (18.5-24.9)31 | 31 | 53.45 | 104 | 60.47 |
| Overweight (25-29.9) | 17 | 29.31 | 40 | 23.26 |

**Table 5.** Frequency and percentage distribution of risk factors of hypertension among nursing personnel in terms of diabetes, kidney problem, hyperlipidaemia and practice of exercise.

| **Riskfactor** | **Hypertension** | | **No Hypertension** | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| Diabetes | | N=58 | N=172 | |
| Notknown | 0 | 0 | 4 | 2.33 |
| Present | 12 | 20.69 | 7 | 4.07 |
| Absent | 46 | 79.31 | 161 | 93 |
| Kidney problem | 199 | 87 | | |
| Present | 1 | 1.72 | 0 | 0 |
| Absent | 57 | 98.28 | 172 | 100 |
| Hyperlipidemia | 53 | 23 | | |
| Present | 3 | 5.17 | 0 | 0 |
| Absent | 55 | 94.83 | 172 | 100 |
| Practice of exercise | 78 | 34 | | |
| Regular | 16 | 27.57 | 38 | 22.09 |
| Sometimes | 17 | 29.31 | 35 | 20.35 |
| Never | 57.56 | 43.1 | 99 | 57.56 |

**Table 6.** Frequency and percentage distribution of risk factors of hypertension among nursing personnel in terms of walking habit, dietary habit, salt intake, sleeping habit and taking estrogen containing contraception.

| **Risk factor** | **Hypertension** | | **Non hypertension** | |
|---|---|---|---|---|
| Walking habit | N=58 | | N=172 | |
| Yes | 14 | 24.14 | 35 | 20.35 |
| No | 44 | 75.86 | 137 | 79.65 |
| **Dietary habit** | 3 | 1.3 | | |
| Vegetarian | 4 | 6.9 | 2 | 1.16 |
| Non vegetarian | 54 | 93.1 | 170 | 98.84 |
| **Salt intake** | | | | |
| Only required salt | 56 | 96.55 | 161 | 93.6 |
| Add extra salt | 2 | 3.45 | 11 | 6.4 |
| Sleeping habit | 56 | 24 | | |
| <6 hours | 27 | 46.55 | 46 | 26.74 |
| 6-8 hours | 31 | 53.45 | 120 | 69.77 |
| >8 hours | 0 | 0 | 6 | 3.49 |
| Taking oestrogen containing contraception regularly | | | | |
| Yes | 0 | 0 | 1 | 0.58 |
| No | 58 | 100 | 171 | 99.42 |

**Table 7.** Frequency and percentage distribution of risk factors of hypertension among nursing personnel in terms of job satisfaction, family problem related to job, major health problem in family member, earning member of the family and act as a guardian in the family.

| Risk factor | Hypertension | | Non hypertension | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| **Job satisfaction** | N=58 | | N=172 | |
| Satisfactory | 44 | 75.86 | 114 | 66.28 |
| Dissatisfactory | 14 | 24.14 | 58 | 33.72 |
| **Family problem related to job** | 13 | 22.41 | 13 | 7.56 |
| Yes | 2 | 3.45 | 2 | 1.16 |
| No | 56 | 96.55 | 170 | 98.84 |
| **Major health problem in family member** | | | | |
| Yes | 5 | 8.62 | 13 | 7.56 |
| No | 53 | 91.38 | 159 | 92.44 |
| **Earning member of the family** | | | | |
| Only earning member | 9 | 15.52 | 162 | 94.19 |
| Any other earning member | 49 | 84.48 | 10 | 5.81 |
| **Act as a guardian in the family** | | | | |
| Yes | 5 | 8.62 | 2 | 1.16 |
| No | 53 | 91.38 | 170 | 98.84 |

**Table 8**. Frequency and percentage distribution of risk factors of hypertension among nursing personnel.

| Risk factor | Hypertension | | Non hypertension | |
|---|---|---|---|---|
| | Frequency | Percentage | Frequency | Percentage |
| **Problem of infertility** | | N=46 | | N=92 |
| Yes | 2 | 4.35 | 6 | 6.52 |
| No | 44 | 95.65 | 86 | 93.48 |
| **History of abortion** | N=58 | | N=172 | |
| Yes | 7 | 12.07 | 20 | 11.63 |
| No | 51 | 87.93 | 152 | 88.37 |
| **Care giver for the child** | | N=43 | N=71 | |
| Yes | 5 | 11.63 | 24 | 33.8 |
| No | 38 | 88.37 | 47 | 66.2 |
| **Feeling of stress** | | N=58 | N=172 | |
| Yes | 40 | 68.97 | 114 | 66.28 |
| No | 18 | 31.03 | 58 | 33.72 |
| **Place of occurrence of feeling stress** | | N=40 | N=114 | |
| Work place | 19 | 47.5 | 72 | 63.16 |
| Home | 6 | 15 | 15 | 13.16 |
| Everywhere | 15 | 37.5 | 27 | 23.68 |

**Table 9.** Chi square value showing association between presence of hypertension and selected demographic variables such as designation, professional qualification and unit of posting presently. N=230

| Variable | Hypertension | | Chi2 | df |
|---|---|---|---|---|
| | Present | Absent | | |
| NS | 1 | 0 | 16.503 | 4 |
| DNS | 2 | 1 | | |
| Sister In charge | 13 | 13 | | |
| PHN | 0 | 1 | | |
| Staff nurse | 42 | 157 | | |
| **Professional qualification*** | | | | |
| GNM | 48 | 127 | 03.728 | 2 |
| B.Sc. Nursing | 10 | 43 | | |
| M. Sc. Nursing | 0 | 2 | | |
| **Unit of posting presently*** | | | | |
| Emergency unit | 15 | 63 | 6.397 | 2 |
| Non emergency unit | 39 | 107 | | |
| Administrative unit | 4 | 2 | | |
| **Working experience** | | | | |
| <10 years | 14 | 128 | 61.757 | 3 |
| >10-20 years | 5 | 18 | | |
| >20-30 years | 24 | 20 | | |
| >30 years | 15 | 6 | | |

## DISCUSSION

This research delves into the demographic and personal characteristics of nursing personnel. Findings indicate that most nursing personnel surveyed were Staff Nurses (87%), possessed a GNM qualification (76%), and were primarily stationed in non-emergency units (63%). Most respondents had less than a decade of working experience (62%), adhered to the Hindu religion (89%), and were married (60%). Notably, a substantial percentage resided in nuclear families (76%), lived within a 5-kilometer radius of their workplace (67%), had a daily commute of under an hour (79%), and had one living child (63%).

### Risk Factors for Hypertension

The study examined risk factors associated with hypertension among nursing personnel. It revealed that a significant proportion (43.10%) of those affected were aged between 50-60 years. A majority reported a family history of hypertension (68.97%), lacked regular exercise (43.10%), did not cultivate a walking habit (75.86%), and experienced varying degrees of stress (68.97%), with a significant percentage (47.50%) attributing workplace stress as a contributing factor.

### Association Between Hypertension and Demographic Variables

The study explored the association between hypertension and selected demographic variables. Statistical analysis indicated a significant link between hypertension and nursing personnel's designation, unit of posting, work experience, religion, marital status, and number of living children. Nonparametric statistical analysis demonstrated these associations at the 0.05 level of significance.

### Methodological Considerations

While the study did not encounter issues during data collection, analysis, or interpretation, it should be noted that it was confined to a specific hospital setting and primarily focused on the occurrence and potential risk factors of hypertension among nursing personnel. The non-probability consecutive sampling technique employed may limit the generalizability of the findings. Furthermore, data collection was carried out within a relatively brief timeframe.

### Implications for Nursing Practice, Administration, and Education

The implications of the study findings are profound and extend to various domains:

### Nursing Practice

The research underscores the need for a holistic approach in patient care, emphasizing early diagnosis and prevention of hypertension complications. Nursing personnel should receive comprehensive information on risk factors and prevention strategies to enhance patient care.

### Nursing Administration:

Administrators should proactively promote holistic health among nursing personnel and offer suitable work placements based on their physical well-being. Regular health check-ups for nursing personnel are deemed vital, and administrators should be equipped with advanced knowledge of hypertension management to guide their subordinates effectively.

### Nursing Education

The study highlights the importance of integrating both physical and social aspects of health into nursing education. Nursing students should receive a thorough education on hypertension risk factors and its prevalence among nursing personnel, emphasizing comprehensive care practices to prepare them for their future roles.

## CONCLUSION

The research has identified significant risk factors contributing to hypertension in nursing personnel, including age (particularly in the 50-60 age group), family history of hypertension, lack of exercise, stress perception, and workplace stress. This underscores the need for comprehensive health and wellness programs in healthcare settings, especially for nurses, to address these risks and promote a healthier lifestyle. Hypertension's global prevalence and hidden nature make it a pressing public health concern, emphasizing the importance of raising awareness and education about it not only among nursing personnel but also in the broader healthcare context, given the high-stress nursing environment. The study recommends larger sample sizes, expanding assessments to different professional groups, and evaluating hypertension in various settings for a more comprehensive understanding of the issue, providing a strong foundation for future research and interventions in addressing hypertension risks among nursing professionals. In conclusion, this study provides valuable insights for nursing practice, education, administration, and research, highlighting the importance of recognizing the unique challenges faced by healthcare professionals and taking proactive steps to promote their health and well-being.

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