Research Article

# Exploring Stress Levels and Blood Pressure Correlation Among School Teachers: A Comparative Study Of Hypertensive and Non-Hypertensive Individuals

Shaheen Akhtar Khan[1], Pawan Parashar[2], Geeta Parwanda[3]

[1]Ph.D Scholar, Faculty of Nursing, Swami Vivekanand Subharti University, Meerut
[2]HOD, Department of Community Medicine, Faculty of Medicine, Swami Vivekanand Subharti University, Meerut
[3]Principal & Dean, Faculty of Nursing, Swami Vivekanand Subharti University, Meerut.
*Corresponding Author
Shaheen Akhtar Khan
shaheen.sbu@gmail.com

**Abstract**

**Background & Objectives**
Occupational stress among educators is a growing public health concern, frequently linked to adverse cardiovascular outcomes, including hypertension. This study aimed to assess and compare stress levels among hypertensive and non-hypertensive school teachers, investigate the direct relationship between blood pressure (BP) and stress scores, and identify key socio-demographic predictors influencing both conditions.

**Methods**
Methods: A comparative cross-sectional study was conducted among 400 school teachers from selected schools in District Basti, eastern Uttar Pradesh. Participants were selected using purposive sampling. Data were collected using a demographic questionnaire, standardized digital blood-pressure measurement, and a 30-item stress questionnaire. Descriptive statistics, independent-samples t-test, chi-square test, correlation, multiple linear regression, and binary logistic regression were used. Statistical significance was set at $p < 0.05$.

**Results**
Of the 400 teachers, 263 (65.7%) were hypertensive and 137 (34.3%) were non-hypertensive. Most participants had moderate stress (95.8%). Hypertensive teachers had significantly higher mean stress scores (72.38 ± 10.12) than non-hypertensive teachers (67.77 ± 9.87; $t = 4.43$, $p < 0.001$). Stress score had a moderate positive correlation with systolic blood pressure ($r = 0.42$, $p < 0.001$) and diastolic blood pressure ($r = 0.36$, $p < 0.001$). Ageand gender were significant predictors of stress score. Age and teaching experience were significant predictors of hypertension. However, categorized stress level was not significantly associated with hypertension status ($p = 0.854$).

**Conclusion**
Hypertensive school teachers had significantly greater stress scores, and higher stress was associated with higher systolic and diastolic blood pressure. Regular blood-pressure screening, stress-management programmes, and teacher-wellness initiatives are recommended to promote cardiovascular and psychological health among school teachers.

**Keywords:** Occupational Stress, Hypertension, School Teachers, Blood Pressure, Socio-demographic Predictors.

## INTRODUCTION

The foundation of any educational system is its teachers. Their health and well-being are frequently disregarded, despite the fact that they are crucial in forming future generations. Though teaching is one of the occupations that is most likely to experience stress and lengthy workdays, which are frequently accompanied by mental strain, little physical exercise, irregular eating habits, and a poor work-life balance. These elements may raise the risk of developing diseases linked to the lifestyle, such as high blood pressure. Even if they belong to an educated community, many teachers might not put their own health first because of work obligations or ignorance.

Nearly two-thirds of the world's 1.3 billion hypertensive individuals reside in low- and middleincome nations, according to the World Health Organization (WHO). Particularly in India, the number of instances of hypertension has sharply increased recently, affecting both urban and rural people. An increasing trend of hypertension in working-age adults was noted by the National Family Health Survey (NFHS-5), highlighting the urgent need for sustainable and successful preventive measures.

Hypertension—defined as a clinical elevation of systolic blood pressure (>140 mm Hg) and/or diastolic blood pressure (>90 mm Hg)—is often referred to as a "silent killer" due to its asymptomatic progression toward severe adverse events such as myocardial infarction, stroke, renal impairment, and premature mortality. In educational

environments, where teachers often experience unremitting psychological tension without adequate recovery periods, the potential for occupational stress to act as a primary catalyst for hypertension is particularly acute.
Despite extensive research into general workplace stress, the specific intersection between subjective stress scores, objective blood pressure measurements, and socio-demographic influences within school environments remains a critical area of investigation. Assessing whether hypertensive educators experience significantly higher stress levels than their non-hypertensive peers—and understanding the precise empirical link between stress ratings and biological pressure metrics—is essential for shaping proactive health policy in educational institutions.
Although teaching is known to carry significant occupational strain, school systems often focus on educational outputs while neglecting the health and physiological toll on educators. While some teachers adapt to job pressures, a substantial proportion develop severe psychosomatic manifestations, including clinically diagnosed hypertension.
The direct quantitative relationship between subjective perceived stress scores and objective blood pressure readings (systolic and diastolic BP) among school teachers requires deeper exploration. It remains unclear whether elevated psychological stress directly correlates with incremental increases in blood pressure, or if hypertension in educators is predominantly driven by underlying demographic vulnerabilities such as age, gender, teaching duration, or lifestyle factors. Without clear empirical data comparing hypertensive and non-hypertensive teachers across standardized stress measures and demographic variables, school administration and health policy planners lack the specific insights needed to implement targeted health interventions.
**JOCPR Research Group (2017)** evaluated occupational stress and cardiovascular health parameters among teachers compared to office workers. Their comparative study revealed that working environment stress affected teachers to a far greater extent, showing statistically significant increases in systolic blood pressure (11.88%), diastolic blood pressure (13.29%), and overall arterial pressure compared to control groups. They concluded that: "The job stress faced by teachers is multidimensional—comprising job overload, physical discomfort, unsupportive management, and student difficulties—which directly manifests in heightened cardiovascular risk factors."
**Li et al. (2023)** conducted a comprehensive cohort study on occupational stress, biological stress biomarkers, and blood pressure regulation. They observed that individuals with high occupational stress experienced a mean increase of 3.43 mmHg in systolic blood pressure (95% CI: 2.02–4.84) and 2.07 mmHg in diastolic blood pressure (95% CI : 1.17–2.97). The findings confirmed that rising occupational strain scores are a strong risk factor for hypertension (RR = 4.200, 95% CI : 1.734–10.172).
The impact of occupational stress on blood pressure is modulated by socio-demographic factors such as age, gender, years of teaching experience, and body mass index (BMI).
**Vyas et al. (2017)** highlighted that demographic traits like advancing age and longer teaching tenure significantly increase susceptibility to both chronic stress and essential hypertension. Older teachers and those with over 15–20 years of service demonstrated higher baseline blood pressure levels, driven by compounding occupational burnout and age-related vascular changes.
**Mayo Clinic Health Review (2024)** noted that while stress causes acute surges in blood pressure via hormone release, long-term exposure combined with unhealthy coping mechanisms—such as poor diet, lack of physical activity, and sleep deprivation—creates an environment that promotes sustained vascular damage and clinical hypertension.

**AIM**

This study aimed to assess and compare stress levels among hypertensive and non-hypertensive school teachers, investigate the direct relationship between blood pressure (BP) and stress scores, and identify key socio-demographic predictors influencing both conditions.

## OBJECTIVES

To measure and compare the level of stress among hypertensive and non-hypertensive school teachers.
To analyze the direct correlation between blood pressure readings (systolic and diastolic) and standardized stress scores among the study participants.
To identify key socio-demographic predictors influencing both stress levels and hypertension in school teachers.

**Research Hypotheses: (p<0.05 level of significance)**

The study tested both association and predictive hypotheses to examine the relationship and influence of demographic variables on stress score among hypertensive and non-hypertensive school teachers.

**Comparative Hypothesis:**

**$H_{o1}$ (Null Hypothesis):** There is no significant difference in the mean stress levels between hypertensive and non-hypertensive school teachers.

**$Ha_1$ (Alternative Hypothesis):** Hypertensive school teachers have a significantly higher mean stress level compared to non-hypertensive school teachers.

**Associative Hypothesis:**

**($H_{o2}$) (Null Hypothesis):** There is no significant correlation between blood pressure readings (systolic and diastolic) and standardized stress scores among school teachers.

**($H_{a2}$) (Alternative Hypothesis):** There is a significant positive correlation between blood pressure readings (systolic and diastolic) and standardized stress scores among school teachers.

**Predictive Hypothesis:**

**($H_{o3}$) (Null Hypothesis):** Socio-demographic factors (e.g., age, gender, marital status, teaching experience, monthly income) are not significant predictors of stress levels or hypertension status among school teachers.

**($H_{a3}$) (Alternative Hypothesis):** Selected socio-demographic factors significantly predict stress levels and hypertension status among school teachers.

**Assumptions:**

The study is based on the following assumptions:

Teachers will answer the stress survey honestly.

The stress questionnaire accurately measures mental stress.

Teachers can be correctly grouped as hypertensive or non-hypertensive based on medical standards.

Blood pressure readings taken during the study are accurate and follow clinical standards.

Higher psychological stress relates directly to higher physical blood pressure.

Temporary spikes in blood pressure (e.g., nervousness from testing) are minimized.

It is assumed that the participants provided accurate and truthful demographic information**.**

**Delimitaions**

The study will be limited to the school teachers from selected school of East UP.

The study includes only the school teachers available during the data collection period, excluding those absent or unwilling to participate.

The research is confined to selected demographic variables such as age, gender, marital status, residence location, educational background, years of teaching experience, prior exposure to health education programme, and participation in similar intervention.

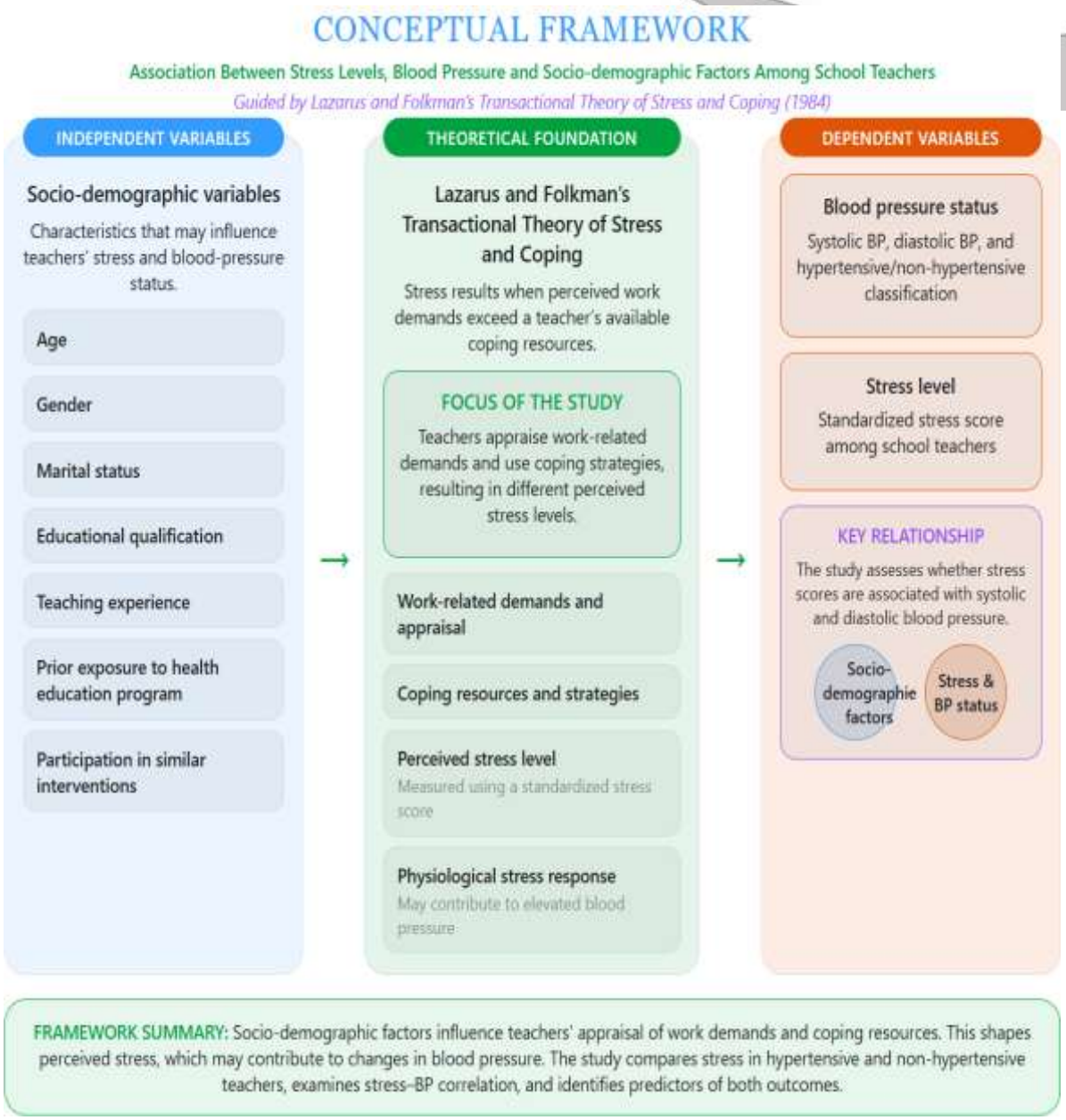
Stress is evaluated solely using a standardized self-report questionnaire (e.g., Perceived Stress Scale), and blood pressure status is determined using standard clinical BP monitors during the study period.

**Conceptual framework**

The conceptual framework of the present study is based on Lazarus and Folkman's Transactional Theory of Stress and Coping (1984). The theory explains stress as a dynamic interaction between an individual and the environment. Stress occurs when a person perceives workplace demands, such as heavy workload, time pressure, classroom management, administrative responsibilities, and role conflict, as exceeding their available coping resources.

In the present study, school teachers' socio-demographic characteristics—such as age, gender, marital status, residence location, educational background, years of teaching experience, prior exposure to health education programme, and participation in similar intervention. —may influence their appraisal of work-related demands and their ability to cope. These factors can therefore affect their stress level.

Prolonged or poorly managed stress may activate physiological stress responses, including increased heart rate and vasoconstriction, which may contribute to elevated systolic and diastolic blood pressure. Thus, teachers with hypertension may experience different or higher levels of stress than non-hypertensive teachers. The framework also proposes a direct relationship between standardized stress scores and blood-pressure readings. In this study, socio-demographic factors are considered independent or predictor variables because they may influence both teachers' stress levels and blood-pressure status. Stress level and blood pressure are the principal study variables: stress is compared across hypertensive and non-hypertensive groups, while systolic and diastolic BP readings are correlated with standardized stress scores.




## Methodology:

**Materials and Methods:**

A comparative cross-sectional study was conducted to assess and compare stress levels among hypertensive and non-hypertensive school teachers. The study also examined the relationship between blood pressure readings and stress scores and identified socio-demographic factors associated with stress and hypertension.

**Study setting and population**

The study was conducted among school teachers working in selected schools of District Basti situated in east Uttar Pradesh. Eligible participants included male and female teachers aged 21 years or above who had been employed for at least six months and provided written informed consent.

**Sample size and sampling technique**

The study's sample size was 400, calculated using the Cochran formula. There were 200 samples in the experimental group and 200 samples in the control group. A non-probability purposive sampling technique was adopted in this study.

**Sample Size determination (Cochran's Formula): $S = Z^2 \times p(1-p) / M^2$**
S: Sample size for infinite population
Z: Z-score (95% = 1.96)
p: Population proportion (assumed 50% = 0.5)
M: Margin of error (5% = 0.05)
$S = (1.96)^2 \times 0.5(1-0.5)/(0.05)^2$
$S = 3.8416 \times 0.25/0.0025 = 384.16$
Rounded up to 400 for practical implementation.

**Inclusion Criteria**
School teachers aged 21 years and above.
Teachers currently employed in the selected schools.
Teachers with at least six months of teaching experience.
Both hypertensive and non-hypertensive teachers.
Teachers who were available during data collection and willing to participate.
Teachers who provided written informed consent.

**Exclusion Criteria**
Teachers who were pregnant.
Teachers with a known severe psychiatric illness or cognitive impairment.
Teachers with acute illness at the time of data collection.
Teachers unable to complete the questionnaire or undergo blood pressure measurement.
Teachers who did not provide written informed consent.

**Variables of the Study**

**Independent variables**
Age
Gender
Marital status
Educational qualification
Teaching experience
Prior exposure to a health education program
Participation in similar interventions
**Dependent variables**
Stress level of school teachers, measured using a standardized stress score
Blood pressure status, measured through:
Systolic blood pressure
Diastolic blood pressure
Hypertensive or non-hypertensive classification

**Data Collection Tool**
Based on the research problem and objectives, the following steps were undertaken to select and develop the data collection tool.
**Development of Tool**: The tools were developed:
• After reviewing related literature.
• Based on the experience of the investigator.
• Through guidance and consultation with subject experts.
• In consultation with a statistician.
The tool is divided into three parts:
**Part 1: Demographic Variables**
This section includes key demographic variables related to the school teachers and consist of age, gender, marital status, residence location, educational background, years of teaching experience, Prior Exposure to Health Education Programs and Participation in Similar Interventions.
**Part 2: Blood Pressure Measurement Protocol**
Blood pressure (BP) was assessed using a standardized digital sphygmomanometer (e.g., Diamond BP DG 124 or similar device) following World Health Organization (WHO) guidelines to ensure accuracy and consistency.

**Scoring Interpretation**:

| Category | Systolic (mmHg) | Diastolic (mmHg) |
|---|---|---|
| Normal | < 120 | < 80 |
| Prehypertension | 120–139 | 80–89 |
| Stage 1 Hypertension | 140–159 | 90–99 |
| Stage 2 Hypertension | ≥ 160 | ≥ 100 |

**Part 3: Stress Level Questionnaire**

A structured and standardized Stress Level Questionnaire was used to assess the stress levels among school teachers. This tool was designed to capture various dimensions of stress including work-related pressures, personal life stressors, and the individual's coping mechanisms. It helped in evaluating the overall psychological well-being of the participants.

**Number of Items: 30**

Domains Covered:

**Work-related stress**: workload, deadlines, responsibilities, administrative duties, student behavior

**Personal stress**: family concerns, health issues, financial problems, work-life balance

**Coping strategies**: problem-solving, emotional regulation, support-seeking behavior, relaxation practices

| Score Range | Stress Level |
|---|---|
| 0–13 | Low Stress |
| 14–26 | Moderate Stress |
| 27–40 | High Stress |

**Ethical Consideration**

Prior to data collection, ethical clearance was obtained from the Institutional Ethics Committee of Swami Vivekanand Subharti University, Meerut, ensuring compliance with institutional and national research ethics guidelines. Formal permission was also secured from the principals of the participating schools at Basti. All participants were informed about the purpose, objectives, and procedures of the study, and written informed consent was obtained before participation.

Confidentiality and anonymity of responses were strictly maintained throughout the research process. Participation was entirely voluntary, with the right to withdraw at any time without penalty. The study adhered to the ethical principles outlined in the Indian Council of Medical Research (ICMR) 2017 guidelines and the Declaration of Helsinki (2013), ensuring respect for human dignity, privacy, and the right to informed decision-making.

**Data Collection Procedure**

After obtaining approval from the concerned institutional authority and permission from the selected schools, the investigator approached eligible school teachers and explained the purpose of the study. Written informed consent was obtained from each participant before data collection. Confidentiality and anonymity of the information were assured.

Data collection was carried out in a quiet, comfortable, and private area within the school premises. Each participant was assessed individually using the following procedure:

**Collection of demographic data:**

The investigator collected information using Part 1 of the tool, including age, gender, marital status, residence location, educational background, years of teaching experience, prior exposure to health education programs, and participation in similar interventions.

**Blood pressure measurement:**

Blood pressure was measured using a standardized digital sphygmomanometer, such as Diamond BP DG 124 or a similar validated device, following WHO guidelines. Participants were asked to rest quietly for at least five minutes before measurement. They were seated comfortably with their back supported, feet flat on the floor,

and arm supported at heart level. An appropriately sized cuff was applied to the upper arm. Systolic and diastolic blood-pressure readings were recorded. Where required, two readings were taken with an interval of 1–2 minutes, and the average reading was used for analysis. Participants were classified as hypertensive or non-hypertensive according to the predetermined study criteria.

**Assessment of stress level:**
Following BP measurement, participants completed Part 3, the 30-item structured and standardized Stress Level Questionnaire. The questionnaire assessed work-related stress, personal stress, and coping strategies. Participants were instructed to read each item carefully and select the response that best represented their experience. The investigator remained available to clarify doubts without influencing responses.

**Scoring and recording:**
Completed questionnaires were checked for completeness immediately after collection. Stress scores were calculated according to the scoring key of the standardized questionnaire. The obtained stress scores were categorized into the predetermined levels of stress. All demographic details, BP readings, hypertension status, and stress scores were recorded systematically for statistical analysis.

The collected data were coded, tabulated, and analyzed to compare stress levels between hypertensive and non-hypertensive teachers, determine the relationship between BP readings and stress scores, and identify socio-demographic predictors.

**Data Analysis and Interpretation**
Data will be coded, entered, cleaned, and analyzed using appropriate statistical software. The level of significance will be set at $p < 0.05$, with a 95% confidence interval.

**Data Organization and Preparation:**
The data obtained from the School teachers were organized, coded, and analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.0. Descriptive and inferential statistics were employed to summarize findings and test hypotheses at a 0.05 level of significance, with a 95% confidence interval. All collected data were coded manually and entered into SPSS software.

**Descriptive Statistics:**
Data were entered, cleaned, and analyzed using appropriate statistical software. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to summarize participant characteristics, blood pressure values, and stress scores.

**Inferential Statistics:**
The independent-samples t-test, or Mann–Whitney U test where appropriate, was used to compare mean stress scores between hypertensive and non-hypertensive teachers. Chi-square testing was used to assess associations between categorized stress levels, hypertension status, and socio-demographic variables.
Pearson's correlation coefficient, or Spearman's rank correlation where data were non-normally distributed, was used to assess the association between stress scores and systolic and diastolic blood pressure. Multiple linear regression was used to identify predictors of stress scores, while binary logistic regression was used to identify socio-demographic predictors of hypertension. Statistical significance was set at $p < 0.05$.

## RESULTS

**Table 1: Distribution of School Teachers According to Socio - Demographic Variables**

**N=400**

| S. No | Demographic Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|---|
| 1 | **Age** | 21–30 years | 115 | 28.8% |
| | | 31–40 years | 91 | 22.8% |
| | | 41–50 years | 97 | 24.3% |
| | | >50 years | 97 | 24.3% |
| 2 | **Gender** | Male | 184 | 46.0% |

| S. No | Demographic Variable | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|---|
| | | Female | 216 | 54.0% |
| 3 | **Marital Status** | Single | 80 | 20.0% |
| | | Married | 300 | 75.0% |
| | | Divorced | 13 | 3.3% |
| | | Widowed | 7 | 1.8% |
| 4 | **Residence Location** | Rural | 131 | 32.8% |
| | | Semi-urban | 134 | 33.5% |
| | | Urban | 135 | 33.8% |
| 5 | **Educational Background** | Diploma | 79 | 19.8% |
| | | UG | 92 | 23.0% |
| | | PG | 85 | 21.3% |
| | | M.Phil. | 76 | 19.0% |
| | | PhD | 68 | 17.0% |
| 6 | **Years of Experience** | <5 years | 98 | 24.5% |
| | | 5–10 years | 107 | 26.8% |
| | | 11–15 years | 102 | 25.5% |
| | | >15 years | 93 | 23.3% |
| 7 | **Health Education Exposure** | Health Education | 138 | 34.5% |
| | | Workshops | 135 | 33.8% |
| | | Awareness Programme | 127 | 31.8% |
| 8 | **Similar Interventions** | Research Studies | 123 | 30.8% |
| | | Educational Modules | 134 | 33.5% |
| | | Intervention Programme | 143 | 35.8% |

**Inference:** table shows the demographic characteristics of 400 school teachers. With regard to age, the highest proportion of participants, 115 (28.8%), belonged to the 21–30 years age group. This was followed by 97 (24.3%) teachers each in the 41–50 years and above 50 years groups, while 91 (22.8%) teachers were aged 31–40 years. Regarding gender, 216 (54.0%) teachers were female and 184 (46.0%) were male. Most participants were married, comprising 300 (75.0%) teachers. Single teachers accounted for 80 (20.0%), while divorced and widowed teachers constituted 13 (3.3%) and 7 (1.8%) participants, respectively.

The distribution according to residence location was almost equal: 135 (33.8%) teachers resided in urban areas, 134 (33.5%) in semi-urban areas, and 131 (32.8%) in rural areas. In relation to educational background, 92 (23.0%) teachers were graduates, followed by 85 (21.3%) postgraduates, 79 (19.8%) diploma holders, 76 (19.0%) M.Phil. holders, and 68 (17.0%) PhD holders.

With respect to years of teaching experience, 107 (26.8%) teachers had 5–10 years of experience, 102 (25.5%) had 11–15 years, 98 (24.5%) had less than 5 years, and 93 (23.3%) had more than 15 years of experience.

Regarding health education exposure, 138 (34.5%) teachers reported health education exposure, 135 (33.8%) had attended workshops, and 127 (31.8%) had participated in awareness programmes. Similarly, 143 (35.8%) teachers had participated in intervention programmes, 134 (33.5%) in educational modules, and 123 (30.8%) in research studies. Overall, the findings indicate that the participants were broadly and evenly distributed across most demographic categories.

**Table 2. Distribution of teachers according to blood pressure scores (N = 400)**

| Category | Frequency (n) | Percentage (%) |
|---|---|---|
| Normal | 137 | 34.3% |
| Prehypertension | 144 | 36.0% |

| Category | Frequency (n) | Percentage (%) |
|---|---|---|
| Stage 1 Hypertension | 82 | 20.5% |
| Stage 2 Hypertension | 37 | 9.2% |
| **Total** | **400** | **100.0%** |

**Inference:** Table 2 represents that out of 400 school teachers, while 34.3% of the participants have normal blood pressure, a significant majority (65.7%) fall into elevated categories (Prehypertension, Stage 1, or Stage 2 Hypertension). Combined, full hypertension (Stage 1 and Stage 2) affects 29.7% (119 out of 400) of the surveyed teachers.

**Table 3. Distribution of teachers according to hypertension status (N = 400)**

| Hypertension status | Frequency (n) | Percentage (%) |
|---|---|---|
| Hypertensive | 263 | 65.7% |
| Non-hypertensive | 137 | 34.3% |
| **Total** | **400** | **100.0%** |

**Inference:** The table 3 shows that, out of 400 school teachers, 263 were hypertensive and 137 were non-hypertensive. Thus, the majority of participants were hypertensive, while a smaller proportion were non-hypertensive.

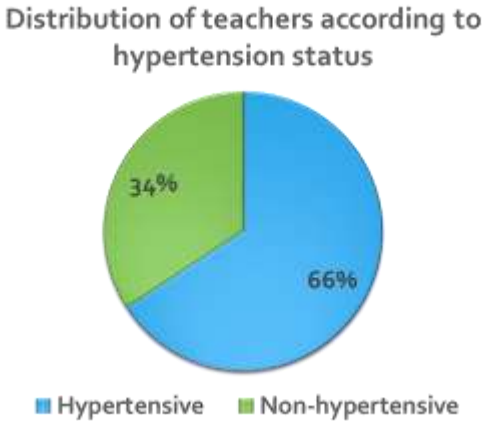



**Table 4. Distribution of teachers according to stress level (N = 400)**

| Stress level | Frequency (n) | Percentage (%) |
|---|---|---|
| Low stress | 8 | 2.0% |
| Moderate stress | 383 | 95.8% |
| High stress | 9 | 2.3% |
| **Total** | **400** | **100.0%** |

**Inference:**Table 4 shows the distribution of teachers according to their stress level. Out of 400 teachers, the vast majority, 383 (95.8%), had moderate stress. Only 8 teachers (2.0%) had low stress, while 9 teachers (2.3%) had high stress. These findings indicate that moderate stress was highly prevalent among the teachers in the study.

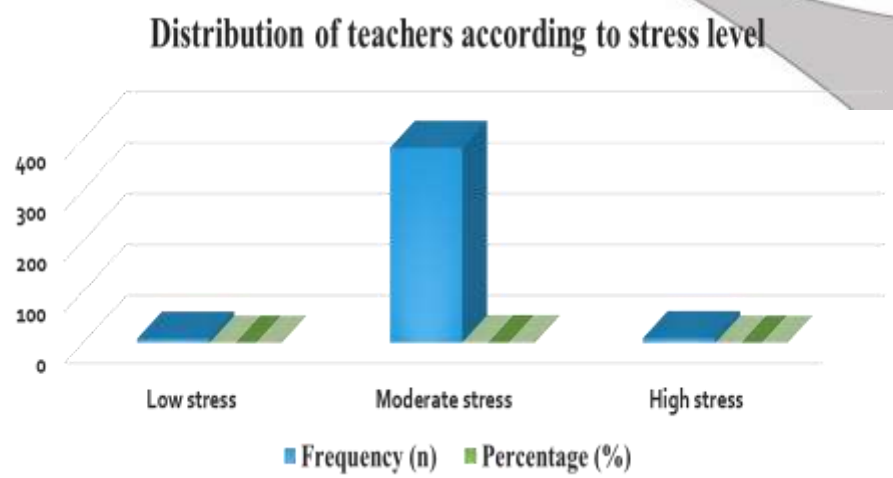



**Table 5. Distribution of stress level among hypertensive and non-hypertensive school teachers.**

| Stress level | Hypertensive teachers (n = 263) | Non-hypertensive teachers(n = 137) |
|---|---|---|
| Low stress | 4 | 4 |
| Moderate stress | 252 | 131 |
| High stress | 7 | 2 |

**Inference:** Moderate stress affects virtually all teachers (95.8% of hypertensive and 95.6% of non-hypertensive), showing high occupational stress regardless of blood pressure. Extremely low (≈2%) or high (≈2%) stress levels are uncommon across the entire sample.

**Table 6. Comparison of mean stress scores between hypertensive and non-hypertensive teachers**

| Group | n | Mean stress score | SD | Mean Difference | t-value | df | p-value | Interpretation |
|---|---|---|---|---|---|---|---|---|
| Hypertensive teachers | 263 | 72.38 | 10.12 | 4.61 | 4.43 | 398 | <0.001 | Significant |
| Non-hypertensive teachers | 137 | 67.77 | 9.87 | _ | — | — | | — |

**Inference:** The mean stress score was higher among hypertensive school teachers (72.38 ± 10.12) than among non-hypertensive school teachers (67.77 ± 9.87), with a mean difference of 4.61. The independent samples t-test yielded a t value of 4.43 with 398 degrees of freedom and a p value of <0.001. The difference was statistically significant. Therefore hypertensive school teachers had significantly higher stress scores than non-hypertensive school teachers.

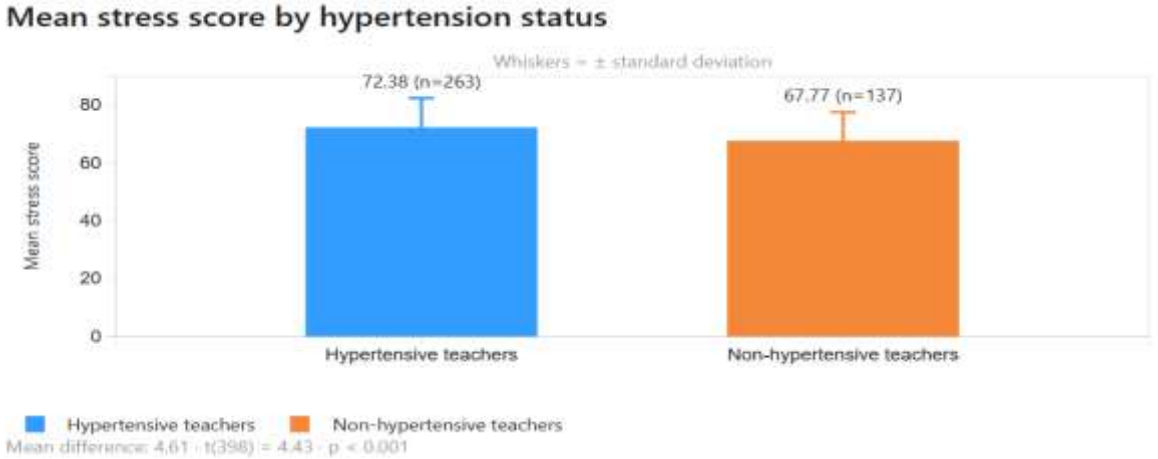


**Table 7. Distribution and Comparison of Blood Pressure Readings among Hypertensive and Non-hypertensive Teachers**

| BP reading | Hypertension status | n | Mean stress score | SD | Mean Difference | t-value | df | p-value | Interpretation |
|---|---|---|---|---|---|---|---|---|---|
| Systolic BP | Hypertensive teachers | 263 | 143.83 | 12.46 | 21.04 | 17.34 | 398 | <0.001137 | Significant |
| | Non-hypertensive teachers | 137 | 125.78 | 9.18 | | | | | — |
| Diastolic BP | Hypertensive teachers | 263 | 91.64 | 8.72 | 12.31 | 15.83 | 398 | <0.001137 | Significant |
| | Non-hypertensive teachers | 137 | 79.33 | 7.04 | | | | | |

**Inference:** The mean systolic blood pressure was higher among hypertensive school teachers (146.82 ± 12.46 mmHg) than among non-hypertensive school teachers (125.78 ± 9.18 mmHg), with a mean difference of 21.04 mmHg. The difference was statistically significant (t = 17.34, df = 398, p < 0.001).
Similarly, the mean diastolic blood pressure was higher among hypertensive teachers (91.64 ± 8.72 mmHg) compared with non-hypertensive teachers (79.33 ± 7.04 mmHg), with a mean difference of 12.31 mmHg. This difference was also statistically significant (t = 15.83, df = 398, p < 0.001).
Overall inference: Both systolic and diastolic blood pressure readings were significantly higher among hypertensive school teachers than among non-hypertensive school teachers.

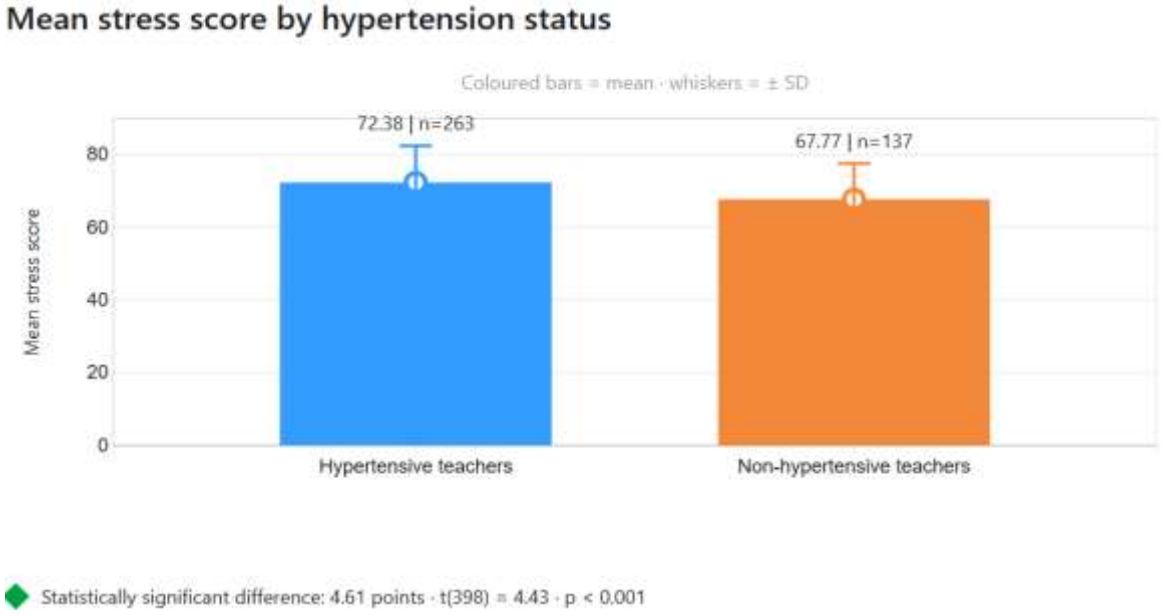



**Table 8. Correlation Between Standardized Stress Scores and Blood Pressure Readings Among School Teachers**

| Variables | Correlation coefficient (r) | p-value | Direction | Strength | Interpretation |
|---|---|---|---|---|---|
| Systolic BP and stress score | 0.42 | <0.001 | Positive | Moderate | Significant |
| Diastolic BP and stress score | 0.36 | <0.001 | Positive | Moderate | Significant |

**Inference:** Table 8 summarizes the correlation between standardized stress scores and blood pressure readings. A moderate positive correlation was observed between stress score and systolic blood pressure (r = 0.42, p < 0.001). Similarly, a moderate positive correlation was observed between stress score and diastolic blood pressure (r = 0.36, p < 0.001). Both correlations were statistically significant.

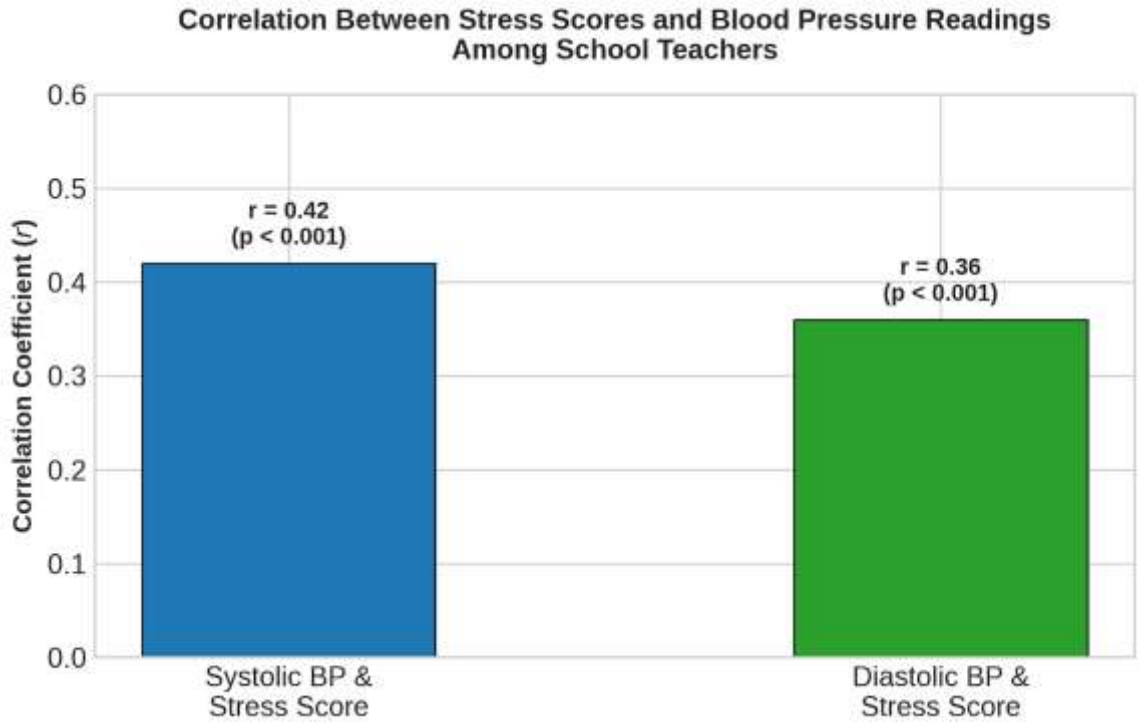



**Table 9. Association between Stress Level and Hypertension Status among School Teachers**

| Stress level | Hypertensive n (%) | Non-hypertensive n (%) | Total n (%) | $\chi^2$ value | df | p value | Inference |
|---|---|---|---|---|---|---|---|
| **Low stress** | 6 (75.0) | 2 (25.0) | 8 (100.0) | | | | |
| **Moderate stress** | 251 (65.5) | 132 (34.5) | 383 (100.0) | 0.315 | 2 | 0.854 | Not significant |
| **High stress** | 6 (66.7) | 3 (33.3) | 9 (100.0) | | | | |
| **Total** | 263 (65.7) | 137 (34.3) | 400 (100.0) | | | | |

**Inference:** Table 9 shows the association between stress level and hypertension status among school teachers. Out of the 8 teachers with low stress, 6 (75.0%) were hypertensive and 2 (25.0%) were non-hypertensive. Among the 383 teachers with moderate stress, 251 (65.5%) were hypertensive and 132 (34.5%) were non-hypertensive. Among the 9 teachers with high stress, 6 (66.7%) were hypertensive and 3 (33.3%) were non-hypertensive. The Pearson's Chi-square test yielded a $\chi^2$ value of 0.315 with 2 degrees of freedom and a p value of 0.854. Since $p > 0.05$, the association between stress level and hypertension status was not statistically significant.

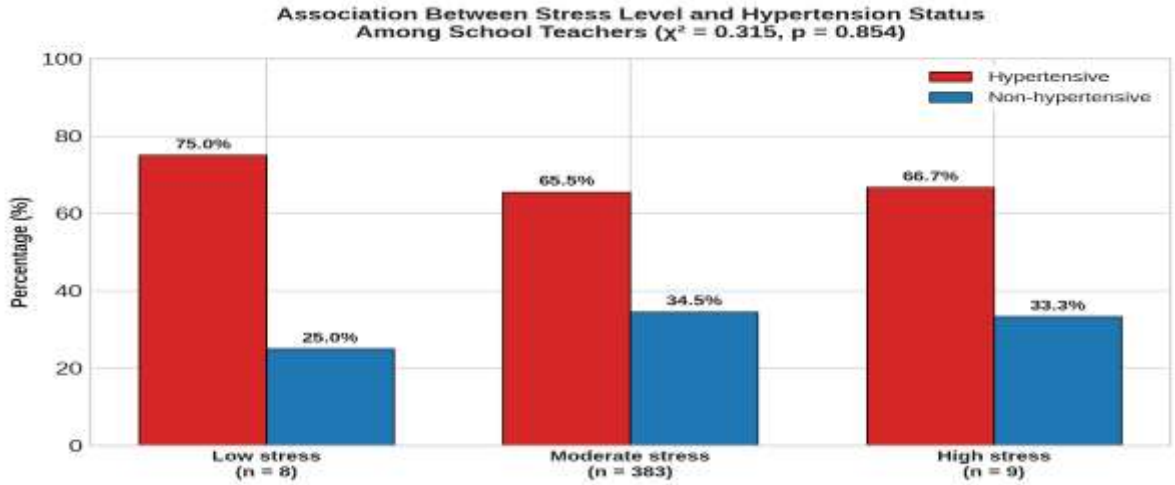


**Table 10. Multiple Linear Regression Analysis of Selected Socio-demographic Predictors of Stress Scores among School Teachers**

| Predictor variable | B | SE | β | t value | p value | 95% CI for B | Interpretation |
|---|---|---|---|---|---|---|---|
| **Age** | 0.18 | 0.08 | 0.12 | 2.25 | 0.025 | 0.02–0.34 | Significant |
| **Gender** | 2.41 | 0.91 | 0.13 | 2.65 | 0.008 | 0.62–4.20 | Significant |
| **Teaching experience** | 0.09 | 0.07 | 0.07 | 1.29 | 0.198 | −0.05–0.23 | Not significant |
| **Educational qualification** | 0.74 | 0.69 | 0.05 | 1.07 | 0.286 | −0.62–2.10 | Not significant |

Here, stress score is the dependent variable, while socio-demographic characteristics are entered as predictor variables.

**Inference**

The multiple linear regression analysis demonstrated that the selected socio-demographic variables explained approximately 18% of the variance in stress scores among school teachers. Age and gender were significant independent predictors of stress score, whereas teaching experience and educational qualification were not significant predictors.

The overall regression model was statistically significant ($F = 17.24$, $p < 0.001$), indicating that the set of selected socio-demographic variables significantly predicted stress scores.

**Table 11. Binary Logistic Regression Analysis of Selected Socio-demographic Predictors of Hypertension among School Teachers**

| Predictor variable | B | SE | Wald $\chi^2$ | OR | 95% CI for OR | p value | Interpretation |
|---|---|---|---|---|---|---|---|
| **Age** | 0.08 | 0.02 | 16.00 | 1.08 | 1.04–1.12 | <0.001 | Significant |
| **Gender** | 0.42 | 0.24 | 3.06 | 1.52 | 0.95–2.43 | 0.080 | Not significant |
| **Teaching experience** | 0.05 | 0.02 | 6.25 | 1.05 | 1.01–1.09 | 0.012 | Significant |
| **Educational qualification** | −0.18 | 0.21 | 0.73 | 0.84 | 0.56–1.27 | 0.393 | Not significant |

For this analysis:

**Dependent variable**: Hypertension status

1 = Hypertensive

0 = Non-hypertensive

**Predictors**: Selected socio-demographic variables

**Inference**

The binary logistic regression analysis identified age and teaching experience as significant socio-demographic predictors of hypertension. For every one-unit increase in age, the odds of hypertension increased by approximately 8% (OR = 1.08, 95% CI: 1.04–1.12, $p < 0.001$). Teaching experience was also significantly associated with increased odds of hypertension (OR = 1.05, 95% CI: 1.01–1.09, $p = 0.012$).

Gender and educational qualification were not statistically significant independent predictors of hypertension after adjustment for the other variables.

**Summary of the Study**

This comparative cross-sectional study examined the relationship between occupational stress and blood pressure among 400 school teachers from selected schools in District Basti, eastern Uttar Pradesh. The study compared stress scores between hypertensive and non-hypertensive teachers, assessed correlations between stress scores and systolic and diastolic blood pressure, and identified socio-demographic predictors of stress and hypertension.

Teachers aged 21 years and above with at least six months of teaching experience were selected through purposive sampling. Data were collected using a demographic questionnaire, blood-pressure measurement with a standardized digital sphygmomanometer, and a 30-item stress questionnaire. Descriptive statistics, independent-samples t-tests, chi-square tests, correlation, multiple linear regression, and binary logistic regression were used for analysis.

Most teachers experienced moderate stress (95.8%). Hypertensive teachers had significantly higher mean stress scores than non-hypertensive teachers. Stress scores were moderately and positively correlated with both systolic and diastolic blood pressure. Age and gender predicted stress scores, while age and teaching experience predicted hypertension status.

**Major Findings of the study**

Out of 400 school teachers, 263 (65.7%) were classified as hypertensive and 137 (34.3%) as non-hypertensive.
Moderate stress was highly prevalent: 383 teachers (95.8%) had moderate stress, while 8 (2.0%) had low stress and 9 (2.3%) had high stress.
Hypertensive teachers had a significantly higher mean stress score (72.38 ± 10.12) than non-hypertensive teachers (67.77 ± 9.87). The difference was statistically significant ($t = 4.43$, $p < 0.001$).
Mean systolic and diastolic blood-pressure readings were significantly higher among hypertensive teachers than non-hypertensive teachers ($p < 0.001$).
Stress score showed a moderate positive correlation with systolic blood pressure ($r = 0.42$, $p < 0.001$) and diastolic blood pressure ($r = 0.36$, $p < 0.001$).
The categorized stress level was not significantly associated with hypertension status ($\chi^2 = 0.315$, $p = 0.854$).
In multiple linear regression, age and gender were significant predictors of stress score. The model explained approximately 18% of the variation in stress scores.
In binary logistic regression, age and teaching experience were significant predictors of hypertension. Each increase in age was associated with approximately 8% higher odds of hypertension, while each increase in teaching experience was associated with approximately 5% higher odds.

**Discussion of Findings**

The present study examined the relationship between stress levels, blood-pressure readings, hypertension status, and selected socio-demographic variables among school teachers. The findings indicate that hypertensive teachers had significantly higher mean stress scores than non-hypertensive teachers. In addition, stress scores showed a moderate positive correlation with both systolic and diastolic blood pressure. These results suggest that prolonged occupational stress may be an important factor associated with adverse cardiovascular health among teachers.

The significantly higher stress score among hypertensive teachers may be explained by the demanding nature of the teaching profession. Teachers are routinely exposed to heavy workloads, time constraints, classroom-management difficulties, administrative responsibilities, examinations, and expectations from school authorities and parents. Persistent exposure to these stressors can activate physiological stress responses, including increased sympathetic nervous system activity, heart rate, and vascular resistance, which may contribute to raised blood pressure over time. This finding is consistent with Liu et al. (2017), whose systematic review and meta-analysis reported that chronic psychosocial stress was associated with an increased risk of hypertension.

The present study found a moderate positive correlation between stress score and systolic blood pressure ($r = 0.42$, $p < 0.001$), as well as between stress score and diastolic blood pressure ($r = 0.36$, $p < 0.001$). This indicates that teachers with higher perceived stress tended to have higher blood-pressure readings. The finding is supported by Landsbergis et al. (2013), who found that job strain was associated with higher systolic and diastolic ambulatory blood pressure.

The very high proportion of teachers with moderate stress in the present study indicates that stress is a common occupational concern in the teaching profession. Although only a small proportion of teachers had high stress, sustained moderate stress may still affect sleep, physical activity, dietary patterns, emotional well-being, and cardiovascular health. A recent study among school teachers in Kerala also found that moderate occupational stress was common and that stress was significantly associated with blood-pressure status, teaching experience, workload, and commuting-related factors (Bhushan et al., 2026). These findings highlight that teacher stress should be addressed before it progresses to severe psychological or physical health consequences.

In the present study, categorized stress levels were not significantly associated with hypertension status. This result may be attributed to the highly uneven distribution of stress categories, as most teachers were grouped under moderate stress and only a few were categorized as having low or high stress. This finding also suggests that hypertension is multifactorial and may be influenced by age, family history, body mass index, dietary habits, physical activity, sleep, medication adherence, and other lifestyle factors in addition to perceived stress.

Age was identified as a significant predictor of both stress score and hypertension status. The likelihood of hypertension increased with advancing age, which may be related to age-associated vascular changes, cumulative exposure to occupational demands, family responsibilities, and other cardiovascular risk factors. Teaching experience was also a significant predictor of hypertension, suggesting that long-term occupational exposure may contribute to elevated blood-pressure risk. This is consistent with Balachandran et al. (2025), who found that older university teachers had greater odds of hypertension. Their study also demonstrated that occupational stress and workplace factors should be considered in hypertension-prevention strategies for teachers.

Gender was significant predictors of stress scores in the present study. However, gender was not a significant independent predictor of hypertension after adjustment for other variables. This suggests that demographic characteristics alone may not determine hypertension; rather, the combined effects of age, work experience, lifestyle, workplace stress, and health-related behaviours are more important.
Overall, the findings emphasize the need for comprehensive teacher-health programmes. Regular blood-pressure screening, stress assessment, health education, physical-activity promotion, relaxation training, counselling, and supportive workplace policies may help reduce stress and prevent hypertension among teachers. School administrators should consider workload management, adequate staffing, supportive supervision, and accessible health services as essential components of teacher welfare and educational quality.

**Limitations of the Study**

The cross-sectional design identifies associations but cannot establish a cause-and-effect relationship between stress and hypertension.
Purposive, non-probability sampling limits the generalizability of the findings to all school teachers in Uttar Pradesh or India.
The study was limited to selected schools in District Basti; institutional, geographic, and cultural differences may affect results elsewhere.
Stress was measured using a self-report questionnaire, which may be affected by recall bias, social-desirability bias, or differences in individual interpretation of questionnaire items.
Blood pressure may vary with time of day, recent activity, anxiety during measurement, caffeine intake, medication use, and other temporary factors. Repeated measurements over several visits would provide stronger evidence.
Important confounding factors, such as body mass index, diet, physical activity, sleep quality, family history of hypertension, tobacco or alcohol use, co-morbidities, and antihypertensive medication, were not included in the reported analysis.
The small number of participants in low- and high-stress categories reduced the ability to detect an association between categorized stress level and hypertension status.

## Conclusion

The study concludes that occupational stress and hypertension are important health concerns among school teachers. Hypertensive teachers had significantly higher mean stress scores than non-hypertensive teachers, and stress was positively correlated with both systolic and diastolic blood pressure. Age and teaching experience emerged as important predictors of hypertension, while age, gender, and type of school influenced stress scores. These findings indicate that stress management and routine cardiovascular screening should be integrated into teacher-welfare programmes. Early identification of stress and elevated blood pressure can help prevent complications and promote a healthier, more productive teaching workforce.

**Implications**

**Nursing Education**

Nursing education should strengthen training on occupational health, stress assessment, hypertension prevention, health counselling, and workplace wellness. Student nurses should develop competence in measuring blood pressure accurately, identifying psychosocial risk factors, providing stress-management education, and conducting school-based health programmes. Case discussions and community-health postings can include teacher-health assessments as practical learning experiences.

**Clinical Practice**

Community health nurses and public health nurses can conduct periodic blood-pressure screening and stress assessments for teachers. Nurses can provide individual counselling on diet, physical activity, sleep, relaxation techniques, medication adherence, and regular follow-up. Teachers identified with elevated blood pressure or severe stress should be referred promptly for medical assessment and management.

**Policy and Administration**

Educational institutions should establish teacher-wellness policies that include periodic health check-ups, blood-pressure monitoring, stress-management programmes, and referral mechanisms. School administrators should consider workload distribution, adequate staffing, supportive supervision, reasonable administrative demands, protected breaks, and access to mental-health support. Collaboration between schools, primary health centres, and nursing colleges can support regular screening and health-promotion activities.

**Future Research**

Future studies should use longitudinal or cohort designs to examine whether occupational stress predicts the development of hypertension over time. Random sampling across rural, urban, government, and private schools would improve generalizability. Intervention studies are also needed to evaluate the effectiveness of nurse-led stress-management, physical-activity, yoga, mindfulness, and workplace-wellness programmes in reducing stress and blood pressure among teachers.

## References


1. Balachandran, K., Maniyara, K., Palle, E., & Kodali, P. B. (2025). Stress and hypertension among university teachers: A cross-sectional survey from northern Kerala. Indian Journal of Occupational and Environmental Medicine, 29(1), 15–20. https://doi.org/10.4103/ijoem.ijoem_62_24
2. Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24(4), 385–396. https://doi.org/10.2307/2136404
3. Cochran, W. G. (1977). Sampling techniques (3rd ed.). John Wiley & Sons.
4. Indian Council of Medical Research. (2017). National ethical guidelines for biomedical and health research involving human participants. ICMR. https://www.icmr.gov.in/icmrobject/custom_data/pdf/resource-guidelines/ICMR_Ethical_Guidelines_2017.pdf
5. Landsbergis, P. A., Dobson, M., Koutsouras, G., & Schnall, P. (2013). Job strain and ambulatory blood pressure: A meta-analysis and systematic review. American Journal of Public Health, 103(3), e61–e71. https://doi.org/10.2105/AJPH.2012.301153
6. Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. Springer Publishing Company.
7. Liu, M.-Y., Li, N., Li, W. A., & Khan, H. (2017). Association between psychosocial stress and hypertension: A systematic review and meta-analysis. Neurological Research, 39(6), 573–580.
8. https://doi.org/10.1080/01616412.2017.1317904
9. Ministry of Health and Family Welfare, Government of India. (2021). National Family Health Survey (NFHS-5), 2019–21: India report. International Institute for Population Sciences. https://www.mohfw.gov.in/sites/default/files/NFHS-5_Phase-II_0.pdf
10. Nyberg, S. T., Fransson, E. I., Heikkilä, K., Ahola, K., Alfredsson, L., Bjorner, J. B., Borritz, M., Burr, H., Dragano, N., Goldberg, M., Hamer, M., Heikkilä, K., Houtman, I. L. D., Knutsson, A., Koskenvuo, M., Koskinen, A., Kouvonen, A., Kumari, M., Madsen, I. E. H., … Kivimäki, M. (2013).
11. Job strain and cardiovascular disease risk factors: Meta-analysis of individual-participant data from 47,000 men and women. PLoS ONE, 8(6), e67323. https://doi.org/10.1371/journal.pone.0067323
12. World Health Organization. (2021). Guideline for the pharmacological treatment of hypertension in adults. World Health Organization. https://www.who.int/publications/i/item/9789240033986
13. World Health Organization. (2023). Hypertension. https://www.who.int/news-room/fact-sheets/detail/hypertension
14. World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. JAMA, 310(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053
15. Do not retain the draft's "JOCPR Research Group (2017)," "Li et al. (2023)," "Vyas et al. (2017)," or "Mayo Clinic Health Review (2024)" citations unless you have their complete, original publication details; incomplete references should not be included in a dissertation.

16. Bhushan, A., et al. (2026). Prevalence of occupational stress among school teachers working in Ernakulam, Kerala, India. [Study indexed in PubMed]. https://pubmed.ncbi.nlm.nih.gov/42529766/
17. Landsbergis, P. A., Dobson, M., Koutsouras, G., & Schnall, P. (2013). Job strain and ambulatory blood pressure: A meta-analysis and systematic review. American Journal of Public Health, 103(3), e61–e71. https://doi.org/10.2105/AJPH.2012.301153
18. Nyberg, S. T., Fransson, E. I., Heikkilä, K., Ahola, K., Alfredsson, L., Bjorner, J. B., et al. (2013). Job strain and cardiovascular disease risk factors: Meta-analysis of individual-participant data from 47,000 men and women. PLoS ONE, 8(6), e67323. https://doi.org/10.1371/journal.pone.0067323