



**EFFECTIVENESS OF A NURSE-LED DASH DIET AND PHYSICAL ACTIVITY
INTERVENTION ON BLOOD PRESSURE, BODY MASS INDEX, AND CARDIOVASCULAR
RISK AMONG ADULTS WITH STAGE 1 HYPERTENSION**

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ABSTRACT

Background

Hypertension is a major modifiable risk factor for cardiovascular morbidity and mortality worldwide. Individuals with Stage 1 hypertension are particularly suitable for early lifestyle-based interventions because dietary modification, regular physical activity, weight management, and other behavioural changes can contribute substantially to blood pressure control and reduction of long-term cardiovascular risk. Nurses have an important role in providing structured education, behavioural counselling, monitoring, motivation, and follow-up. The Dietary Approaches to Stop Hypertension (DASH) eating pattern combined with regular physical activity provides a practical non-pharmacological strategy for hypertension management.

Methods

A quantitative evaluative approach with a quasi-experimental one-group pre-test–post-test design was adopted. A total of 50 adults with Stage 1 hypertension were selected through purposive sampling from Shyma Hospital, Dewas. Baseline assessment included systolic blood pressure (SBP), diastolic blood pressure (DBP), body mass index (BMI), and cardiovascular risk score. Participants received a structured nurse-led intervention consisting of DASH dietary education, reduction of sodium intake, promotion of fruits, vegetables and whole grains, weight-management counselling, and a planned moderate-intensity physical activity programme. Follow-up reinforcement and monitoring were provided throughout the intervention period. Post-test measurements were obtained after 12 weeks.

Results

The mean systolic blood pressure decreased from 137.84 ± 4.92 mmHg at pre-test to 128.26 ± 5.38 mmHg at post-test, while mean diastolic blood pressure decreased from 86.48 ± 2.71 mmHg to 80.62 ± 3.34 mmHg. Mean BMI decreased from 27.86 ± 3.12 kg/m² to 26.91 ± 3.04 kg/m². The mean estimated cardiovascular risk score decreased from $10.42 \pm 3.71\%$ to $8.34 \pm 3.18\%$. The differences between pre-test and post-test measurements were statistically significant ($p < 0.001$).

Conclusion

The nurse-led DASH diet and physical activity intervention was effective in improving blood pressure, BMI, and cardiovascular risk among adults with Stage 1 hypertension. Incorporating structured nurse-led lifestyle programmes into routine hypertension care may strengthen early management and prevention of cardiovascular complications.

INTRODUCTION

Hypertension is one of the most important public health challenges affecting adults worldwide. Persistent elevation of blood pressure contributes significantly to coronary artery disease, stroke, heart failure, chronic kidney disease, and premature mortality. The burden of hypertension is particularly important in India because of demographic transition, urbanization, dietary changes, sedentary lifestyles, obesity, psychosocial stress, tobacco consumption, and inadequate preventive health practices.

Stage 1 hypertension represents an important point for preventive intervention. Early identification and timely lifestyle modification can help individuals achieve better blood pressure control and potentially prevent progression to more severe hypertension and associated cardiovascular complications.

Lifestyle-related risk factors have an important influence on the development and progression of hypertension. Diets high in sodium, saturated fat, processed foods, and refined carbohydrates, combined with inadequate intake of fruits, vegetables, whole grains, and dietary fibre, contribute to increased cardiovascular risk. Similarly, physical inactivity and excessive body weight are associated with elevated blood pressure and adverse metabolic outcomes.

The **Dietary Approaches to Stop Hypertension (DASH)** eating pattern emphasizes fruits, vegetables, whole grains, legumes, nuts, and low-fat dairy products while limiting

sodium, saturated fat, sugar-sweetened foods, and highly processed foods. When combined with regular physical activity, the DASH approach can contribute to reduction in blood pressure and improvement in overall cardiovascular health.

Nurses interact regularly with individuals attending outpatient departments and other healthcare services. This places them in an advantageous position to identify lifestyle risk factors, provide individualized education, establish achievable behavioural goals, monitor progress, and reinforce adherence. A nurse-led intervention may therefore bridge the gap between lifestyle recommendations and sustained implementation in everyday life.

The present study was undertaken to evaluate whether a structured nurse-led DASH diet and physical activity intervention could improve blood pressure, BMI, and cardiovascular risk among adults with Stage 1 hypertension attending Shyma Hospital, Dewas, Madhya Pradesh.

NEED FOR THE STUDY

Hypertension frequently remains inadequately controlled despite being preventable and manageable. Individuals with mild elevations in blood pressure may not perceive themselves to be at immediate risk because hypertension is often asymptomatic. Consequently, adherence to dietary recommendations, physical activity, weight management, and regular monitoring may remain inadequate.

Lifestyle interventions are central to hypertension management. However, simply advising patients to “eat healthy” or “exercise regularly” may not produce sustained behavioural change. Patients require structured information, practical guidance, individualized goals, continuous motivation, and follow-up.

Nurse-led programmes can provide these components in an organized manner. The DASH dietary pattern and regular physical activity are comparatively inexpensive, feasible, and adaptable to local dietary practices. A structured programme incorporating these interventions may reduce blood pressure and body weight while improving cardiovascular risk profiles.

Considering the increasing burden of hypertension and cardiovascular disease, evaluation of nurse-led preventive interventions in local healthcare settings such as

Dewas is important for developing practical nursing strategies for long-term noncommunicable disease management.

PROBLEM STATEMENT

“A Study to Evaluate the Effectiveness of a Nurse-Led DASH Diet and Physical Activity Intervention on Blood Pressure, Body Mass Index, and Cardiovascular Risk Among Adults with Stage 1 Hypertension at Shyma Hospital, Dewas, Madhya Pradesh”

OBJECTIVES

1. To assess pre-intervention blood pressure, BMI, and cardiovascular risk among adults with Stage 1 hypertension.
2. To evaluate the effectiveness of a nurse-led DASH diet and physical activity intervention on blood pressure, BMI, and cardiovascular risk.
3. To compare pre-test and post-test blood pressure, BMI, and cardiovascular risk scores among the participants.
4. To determine the association between selected demographic and clinical variables and post-intervention outcomes.

HYPOTHESES

All hypotheses were tested at the **0.05 level of significance**.

H₁: There will be a statistically significant difference between pre-test and post-test systolic and diastolic blood pressure among adults receiving the nurse-led DASH diet and physical activity intervention.

H₂: There will be a statistically significant difference between pre-test and post-test BMI following the intervention.

H₃: There will be a statistically significant difference between pre-test and post-test cardiovascular risk scores following the intervention.

H₄: Post-intervention outcomes will have a significant association with selected demographic and clinical variables.

MATERIALS AND METHODS

Research Approach

A quantitative evaluative research approach was adopted.

Research Design

A quasi-experimental one-group pre-test–post-test design was used.

Schematic Representation

$O_1 \rightarrow X \rightarrow O_2$

Where:

- O_1 = Pre-intervention assessment
- X = Nurse-led DASH diet and physical activity intervention
- O_2 = Post-intervention assessment

Setting

The study was conducted at Shyma Hospital, Dewas, Madhya Pradesh.

Population

The target population consisted of adults diagnosed with Stage 1 hypertension.

Sample

The study included 50 adults with Stage 1 hypertension attending Shyma Hospital, Dewas.

Sampling Technique

A non-probability purposive sampling technique was used.

Inclusion Criteria

Participants were included if they:

- were adults aged 30–60 years;
- were identified as having Stage 1 hypertension according to the operational criteria adopted for the study;
- were able to participate in moderate physical activity;
- were willing to follow dietary and physical activity recommendations;
- were available throughout the intervention and follow-up period; and

- provided informed consent.

Exclusion Criteria

Adults were excluded if they:

- had severe or uncontrolled hypertension requiring urgent medical management;
- had significant cardiovascular, renal, neurological, or musculoskeletal conditions limiting participation in physical activity;
- were pregnant;
- were already following a medically supervised intensive diet or exercise programme; or
- were unable to complete the intervention programme.

DATA COLLECTION TOOLS

The following tools were used:

Section A: Demographic and Clinical Profile

A structured questionnaire was used to obtain information regarding age, sex, education, occupation, family history, dietary practices, physical activity, smoking, alcohol consumption, and clinical history.

Section B: Blood Pressure Assessment

Blood pressure was assessed following standardized measurement procedures. Measurements were obtained after adequate rest, and the same standardized procedure was followed during pre-test and post-test assessments.

Section C: Body Mass Index

BMI was calculated using:

$$\text{BMI} = \text{Weight in kilograms} / \text{Height in metres}^2$$

Participants were classified according to the BMI criteria specified in the study protocol.

Section D: Cardiovascular Risk Assessment

A standardized cardiovascular risk assessment method incorporating relevant variables such as age, sex, blood pressure, smoking status, diabetes status, and lipid-related information, where available, was used to estimate cardiovascular risk.

RESULTS**Table 1. Demographic Characteristics of Participants (N=50)**

Variable	Category	Frequency	Percentage
Age	30–39 years	10	20%
	40–49 years	22	44%
	50–60 years	18	36%
Sex	Male	28	56%
	Female	22	44%
Family history of hypertension	Yes	31	62%
	No	19	38%
Baseline physical activity	Inadequate	36	72%
	Adequate	14	28%
Dietary pattern	Vegetarian	29	58%
	Mixed	21	42%

The majority (44%) of participants belonged to the 40–49-year age group. More than half (56%) were male, 62% reported a family history of hypertension, and 72% reported inadequate physical activity at baseline.

EFFECT OF THE INTERVENTION ON BLOOD PRESSURE**Table 2. Comparison of Pre-Test and Post-Test Blood Pressure (N=50)**

Parameter	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	Mean Reduction	p-value
Systolic BP (mmHg)	137.84 $\pm$ 4.92	128.26 $\pm$ 5.38	9.58	<0.001
Diastolic BP (mmHg)	86.48 $\pm$ 2.71	80.62 $\pm$ 3.34	5.86	<0.001

The mean systolic blood pressure decreased by **9.58 mmHg**, while mean diastolic blood pressure decreased by **5.86 mmHg** following the 12-week intervention. The differences were statistically significant.

Thus, **H₁ was supported.**

EFFECT ON BODY MASS INDEX

Table 3. Comparison of Pre-Test and Post-Test BMI (N=50)

Measurement	Mean	SD	Mean Reduction	p-value
Pre-test BMI	27.86	3.12		
Post-test BMI	26.91	3.04	0.95 kg/m²	<0.001

The mean BMI decreased from 27.86 ± 3.12 kg/m² before intervention to 26.91 ± 3.04 kg/m² after intervention. The observed reduction was statistically significant.

Therefore, **H₂ was supported.**

EFFECT ON CARDIOVASCULAR RISK

Table 4. Comparison of Estimated Cardiovascular Risk (N=50)

Assessment	Mean Risk (%)	SD	Mean Reduction	p-value
Pre-test	10.42	3.71		
Post-test	8.34	3.18	2.08 percentage points	<0.001

The estimated cardiovascular risk declined from $10.42 \pm 3.71\%$ at baseline to $8.34 \pm 3.18\%$ after the intervention. The difference was statistically significant.

Hence, **H₃ was supported.**

RECOMMENDATIONS

1. Conduct randomized controlled trials with larger samples.
2. Compare nurse-led intervention with routine hypertension care.
3. Extend follow-up to six months, one year, or longer.

4. Incorporate mobile applications or tele-nursing for follow-up.
5. Examine biochemical outcomes such as lipid profile, fasting glucose, and HbA1c.
6. Evaluate intervention adherence and long-term maintenance of DASH dietary practices.

REFERENCES

1. Appel LJ, Moore TJ, Obarzanek E, Vollmer WM, Svetkey LP, Sacks FM, et al. A clinical trial of the effects of dietary patterns on blood pressure. *New England Journal of Medicine*. 1997;336(16):1117–1124.
2. Sacks FM, Svetkey LP, Vollmer WM, Appel LJ, Bray GA, Harsha D, et al. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. *New England Journal of Medicine*. 2001;344(1):3–10.
3. Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, et al. 2017 ACC/AHA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults. *Hypertension*. 2018;71(6):e13–e115.
4. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension global hypertension practice guidelines. *Hypertension*. 2020;75(6):1334–1357.
5. World Health Organization. *Guideline for the Pharmacological Treatment of Hypertension in Adults*. Geneva: World Health Organization; 2021.
6. World Health Organization. *Global Report on Hypertension: The Race Against a Silent Killer*. Geneva: World Health Organization; 2023.
7. Filippou CD, Tsioufis CP, Thomopoulos CG, Mihas CC, Dimitriadis KS, Sotiropoulou LI, et al. Dietary Approaches to Stop Hypertension (DASH) diet and blood pressure reduction in adults with and without hypertension: a systematic review and meta-analysis of randomized controlled trials. *Advances in Nutrition*. 2020;11(5):1150–1160.
8. Cornelissen VA, Smart NA. Exercise training for blood pressure: a systematic review and meta-analysis. *Journal of the American Heart Association*. 2013;2(1):e004473.

9. Nerenberg KA, Zarnke KB, Leung AA, Dasgupta K, Butalia S, McBrien K, et al. Hypertension Canada's 2018 guidelines for diagnosis, risk assessment, prevention, and treatment of hypertension in adults and children. *Canadian Journal of Cardiology*. 2018;34(5):506–525.
10. Geldsetzer P, Manne-Goehler J, Theilmann M, Davies JL, Awasthi A, Vollmer S, et al. Diabetes and hypertension in India: a nationally representative study of 1.3 million adults. *JAMA Internal Medicine*. 2018;178(3):363–372.