

Research Article

A Study to Evaluate the Effectiveness of Community-Based Lifestyle Modification for Hypertension Management in Selected Rural Community at Kanpur, Uttar Pradesh

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Abstract:

Background: Hypertension is a major non-communicable disease and an important contributor to cardiovascular morbidity and mortality. Lifestyle modification is a core component of hypertension prevention and management, while community-based education may improve awareness and self-management, particularly in rural populations.

Aim: To evaluate the effectiveness of a community-based lifestyle modification programme on knowledge regarding hypertension management among adults in a selected rural community of Kanpur, Uttar Pradesh. **Methods:** A quantitative approach with a pre-experimental one-group pre-test-post-test design was used. Sixty adults aged 40-60 years diagnosed with hypertension were selected from a rural community of Ramnagar, Mandhana, Kanpur, using non-probability purposive sampling. Baseline socio-demographic

information and knowledge regarding hypertension management were assessed with a structured questionnaire.

A community-based programme addressing dietary modification, physical activity, stress management, weight control, and related health behaviours was delivered immediately after the pre-test. The same questionnaire was administered seven days later. Descriptive statistics, paired t-test, and chi-square test were used. **Results:** In the pre-test, 34 participants (56.67%) had inadequate knowledge, 26 (43.33%) had moderate knowledge, and none had adequate knowledge. In the post-test, 42 (70.00%) had adequate knowledge and 18 (30.00%) had moderate knowledge; none remained in the inadequate category.

The mean knowledge score increased from 10.42 ± 3.18 at pre-test to 22.18 ± 2.94 at post-test, with a mean difference of 11.76 and a reported paired t value of 18.54, exceeding the table value of 2.00.

Educational status ($\chi^2=8.624$, $p=0.035$) and source of health information ($\chi^2=9.248$, $p=0.026$) were reported to be significantly associated with pre-test knowledge.

Conclusion: The findings indicate that the community-based lifestyle modification programme was associated with a substantial improvement in knowledge regarding hypertension management. Community-level education delivered through accessible rural health structures may be a practical strategy for improving hypertension-related knowledge.

The results should be interpreted in light of the one-group pre-test-post-test design and the short seven-day follow-up.

Keywords: Hypertension, Community-Based Lifestyle Modification, Rural Community, Health Education, Knowledge, Lifestyle Management, Nursing Intervention.

1.INTRODUCTION:

Hypertension is a common chronic condition and a major modifiable risk factor for cardiovascular, cerebrovascular, and renal disease. The World Health Organization estimated that 1.4 billion adults aged 30-79 years were living with hypertension in 2024, with a large proportion residing in low- and middle-income countries. Many affected

individuals remain unaware of their condition, while only a minority achieve adequate control.¹ These gaps make prevention, early detection, treatment adherence, and sustained lifestyle modification important components of public health practice.

Lifestyle factors have a substantial influence on blood pressure and cardiovascular risk. Dietary patterns with lower sodium intake and greater consumption of vegetables, fruits, and other heart-healthy foods, together with regular physical activity, healthy weight management, avoidance of tobacco and excess alcohol, and stress reduction, are widely recognized elements of non-pharmacological hypertension management. Lifestyle modification can complement pharmacological treatment and may improve overall cardiovascular risk profiles.

Community-based interventions are especially relevant where access to formal healthcare services is limited. Recent evidence suggests that community-level programmes can improve hypertension-related knowledge, screening, self-management, and, in some settings, blood pressure control.⁸⁻¹¹ Educational interventions delivered by health workers or through structured counselling have also demonstrated improvements in knowledge

and hypertension-related behaviours.¹²⁻¹⁵ These findings support the need for practical, culturally appropriate interventions that can be implemented close to where people live.

The present study was conducted in a selected rural community of Kanpur, Uttar Pradesh, with the purpose of evaluating whether a community-based lifestyle modification programme could improve participants' knowledge regarding hypertension management. The programme emphasized low-cost and feasible practices involving diet, physical activity, stress management, and healthy daily behaviours.

Need for the Study:

The burden of hypertension is particularly important in low- and middle-income settings because gaps in awareness, treatment, continuity of care, and behavioural risk-factor control may coexist.^{1, 8} In rural communities, limited access to health services and health information may contribute to delayed recognition of hypertension and poor uptake of recommended lifestyle practices. Community-based strategies can reduce the distance between health information and everyday behaviour by using local health workers, simple educational materials, and culturally acceptable teaching approaches.

Evidence from community-based studies indicates that education and behavioural support can improve knowledge and self-management, although translation of knowledge into sustained clinical improvement may require longer and more intensive interventions. Therefore, evaluating the immediate educational effect of a structured community-based programme is relevant for nursing practice and rural public health planning.

Problem Statement:

“A study to evaluate the effectiveness of community-based lifestyle modification for hypertension management in selected rural community at Kanpur.”

OBJECTIVES OF THE STUDY:

The objectives of the study were to assess baseline knowledge, evaluate the effectiveness of the community-based lifestyle modification programme, and examine the association between pre-test knowledge and selected socio-demographic variables.

- To assess the pre-test level of knowledge regarding hypertension management among adults in the selected rural community.
- To evaluate the effectiveness of the community-based lifestyle modification programme by comparing pre-test and post-test knowledge scores.

- To determine the association between pre-test knowledge regarding hypertension management and selected socio-demographic variables.

Hypothesis:

The hypotheses were tested at the 0.05 level of significance.

Research Hypothesis

- H1: There is a statistically significant difference between the pre-test and post-test knowledge scores regarding hypertension management after implementation of the community-based lifestyle modification programme.
- H2: There is a statistically significant association between pre-test knowledge regarding hypertension management and selected socio-demographic variables.

Null Hypothesis

- H₀₁: There is no statistically significant difference between the pre-test and post-test knowledge scores after implementation of the community-based lifestyle modification programme.
- H₀₂: There is no statistically significant association between pre-test knowledge and selected socio-demographic variables.

2.METHODS

AND

MATERIALS:

Research Approach:

A quantitative research approach was adopted because the study aimed to measure knowledge scores numerically and compare outcomes before and after an intervention.

Research Design:

A pre-experimental one-group pre-test-post-test design was used. Participants were assessed before the intervention (O1), received the community-based lifestyle modification programme (X), and were reassessed seven days later (O2).

Research Setting:

The study was conducted in a selected rural community of Ramnagar, Mandhana, Kanpur, Uttar Pradesh.

Variables:

The independent variable was the community-based lifestyle modification programme. The principal dependent variable reported in the Results was knowledge regarding hypertension management. The dissertation also describes lifestyle practices and systolic/diastolic blood pressure as dependent variables; however, comparative numerical results for those outcomes were not presented in the final Results tables and are therefore not

reported as study outcomes in this manuscript.

Population and Sample:

The target population comprised adults diagnosed with hypertension living in rural areas. The accessible population consisted of hypertensive adults residing in the selected rural community who were available and willing to participate. The main study sample included 60 participants, while 10 participants were used for the pilot study.

Sampling Technique:

Non-probability purposive sampling was used for the main study, based on the dissertation methodology.

Sampling Criteria:

Inclusion criteria were adults diagnosed with hypertension, aged 40-60 years, residing in the selected rural community, and willing to participate. Individuals with severe hypertension-related complications, critically ill individuals, and those unavailable or unwilling during data collection were excluded.

Research Instrument:

A structured interview questionnaire was developed from relevant literature, professional advice, and a blueprint. The instrument covered general information about hypertension, dietary modification, exercise and physical activity, and stress-management practices. The questionnaire

used one correct response per item, with a pre-designed answer key. The knowledge categories used in the reported Results were inadequate, moderate, and adequate.

Intervention:

The community-based lifestyle modification programme was developed after review of relevant literature, national and international recommendations, and expert consultation. The content was presented in simple language and emphasized feasible lifestyle changes. The intervention included low-salt and balanced dietary practices, DASH-oriented food choices, fruits and vegetables, weight control, regular walking and physical activity, yoga/stretching, stress management through relaxation and deep breathing, adequate sleep, and avoidance of unhealthy behaviours. Teaching was interactive and adapted to the rural community context.

Validity and Reliability:

Content validity of the demographic proforma, knowledge questionnaire, and intervention materials was obtained through expert review by professionals from relevant fields. The tools were translated into Hindi and reviewed for conceptual and linguistic clarity. Reliability was assessed using the split-half method with Karl Pearson's coefficient of correlation, and the

dissertation reports that the instrument demonstrated high consistency. A pilot study involving 10 participants was undertaken to assess feasibility and operational procedures.

Data Collection Procedure:

After obtaining permission from the concerned authority, the investigator explained the study and obtained informed consent. During Phase I, socio-demographic data and baseline knowledge were collected; administration required approximately 30-45 minutes. During Phase II, the lifestyle modification programme was delivered immediately after the pre-test. During Phase III, the same questionnaire was administered seven days later to assess post-test knowledge.

Statistical Analysis:

Frequency and percentage were used for categorical variables. Mean and standard deviation were used to summarize knowledge scores. A paired t-test was used to compare pre-test and post-test knowledge scores. Chi-square testing was used to examine associations between pre-test knowledge and selected socio-demographic variables. Statistical significance was interpreted at $p < 0.05$. For the reported paired t value of 18.54 with $n=60$, the two-sided p value is far below 0.001; this p value is a derived calculation

from the dissertation's reported t statistic and sample size.

Ethical Considerations:

The dissertation reports prior administrative and ethical approval, written informed consent, confidentiality, privacy, voluntary participation, and the right to withdraw without penalty. No physical or psychological harm was reported during the study.

3.RESULT AND FINDINGS:

SECTION I: Socio-Demographic Characteristics of the Participants

- Age: The largest proportion of participants, 18 (30.00%), were in the 46–50 years age group.
- Gender: 32 (53.33%) participants were male, while 28 (46.67%) were female.
- Religion: The majority, 46 (76.67%), were Hindu.
- Marital status: 45 (75.00%) participants were married.
- Type of family: 36 (60.00%) participants belonged to joint families.
- Educational status: 22 (36.67%) participants had secondary education, making it the most common educational level

SECTION II: Pre-Test Knowledge Regarding Hypertension Management

Before the intervention, 34 participants (56.67%) had inadequate knowledge, while 26 (43.33%) had moderate

knowledge. No participant reached the adequate knowledge category. The finding demonstrates a substantial baseline gap in understanding of hypertension risk factors, diet, exercise, stress management, and related self-care measures.

Table 1 Distribution of participants according to pre-test knowledge level (N=60)

Knowledge level	Frequency (n)	Percentage (%)
Adequate	0	0.00
Moderate	26	43.33
Inadequate	34	56.67
Total	60	100.00

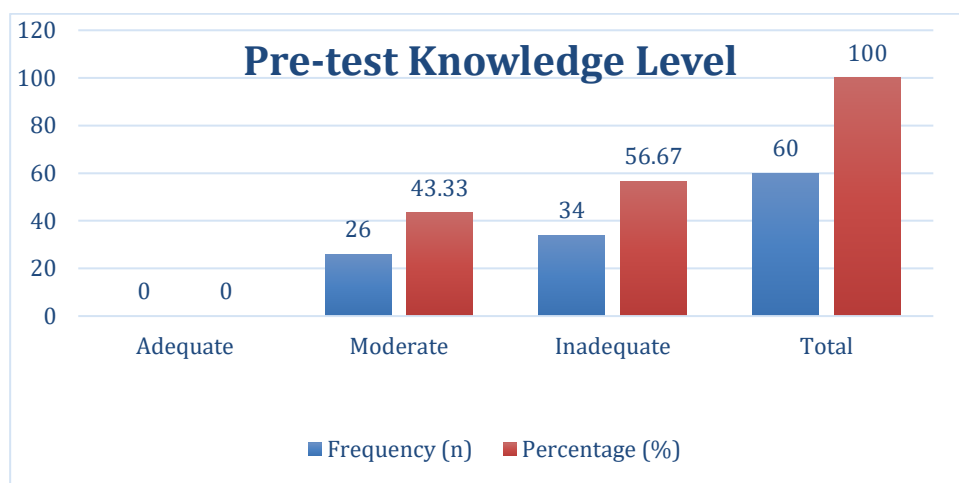


Figure 1 Percentage Distribution of Participants Based on Their Knowledge Level (N = 60)

SECTION III: Post-Test Knowledge After the Lifestyle Modification Programme

Seven days after the intervention, 42 participants (70.00%) demonstrated adequate knowledge and 18 (30.00%) demonstrated moderate knowledge. None remained in the inadequate category. The shift from predominantly inadequate knowledge at baseline to adequate knowledge after the intervention indicates a marked improvement in the observed knowledge outcome.

Table 2 Distribution of participants according to post-test knowledge level (N=60)

Knowledge level	Frequency (n)	Percentage (%)
Adequate	42	70.00
Moderate	18	30.00
Inadequate	0	0.00
Total	60	100.00

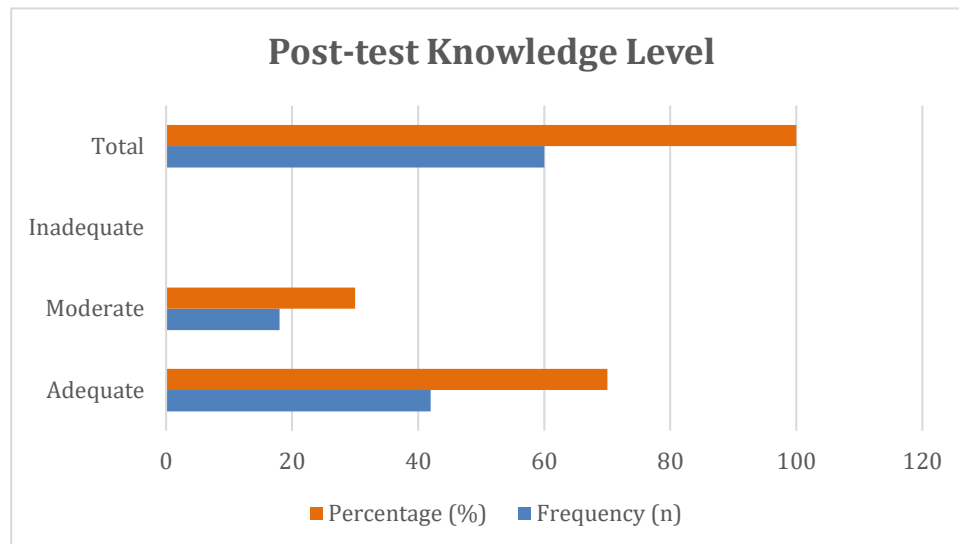


Figure 2 Distribution of Participants According to Post-Test Knowledge Level (N = 60)

SECTION IV: Comparison of Pre-Test and Post-Test Knowledge Scores

The mean pre-test knowledge score was 10.42 ± 3.18 , increasing to 22.18 ± 2.94 after the intervention. The mean improvement was 11.76 points. The reported paired t value was 18.54, compared with a table value of 2.00, and was interpreted as statistically significant. This represents a substantial within-participant improvement in the knowledge outcome.

Table 3 Comparison of participants' pre-test and post-test knowledge scores (N=60)

Assessment	Mean	SD	Mean difference	Paired t	Inference
Pre-test	10.42	3.18	11.76	18.54	Significant
Post-test	22.18	2.94			

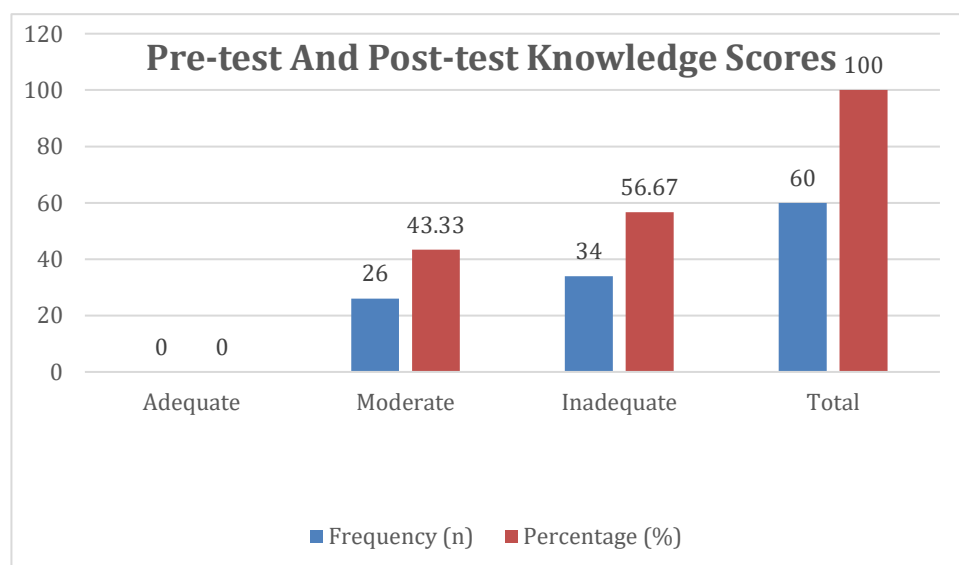


Figure 3 Comparison of Mean Pre-Test and Post-Test Knowledge Scores Among Participants (N = 60)

SECTION V: Association of Pre-Test Knowledge with Selected Socio-Demographic Variables

The dissertation reported no statistically significant association between pre-test knowledge and age, gender, religion, marital status, family type, occupation, monthly income, or dietary habit ($p > 0.05$). Educational status showed a significant association with pre-test knowledge ($\chi^2 = 8.624$, $df = 3$, $p = 0.035$). Source of health information was also reported as significantly associated with pre-test knowledge ($\chi^2 = 9.248$, $df = 3$, $p = 0.026$).

Table 4. Reported chi-square associations between pre-test knowledge and selected socio-demographic variables

Variable	χ^2	df	p value / interpretation
Age	0.512	3	0.916, NS
Gender	0.084	1	0.772, NS
Religion	0.436	2	0.804, NS
Marital status	0.288	3	0.962, NS
Family type	0.031	1	0.861, NS
Educational status	8.624	3	0.035, Significant
Occupation	1.266	3	0.737, NS
Monthly income	7.114	3	0.068, NS
Dietary habit	1.204	1	0.272, NS
Source of information	9.248	3	0.026, Significant

4.DISCUSSION:The present study evaluated a community-based lifestyle modification programme among 60 adults with hypertension living in a rural community of Kanpur. The baseline findings showed that knowledge was generally limited: 56.67% of participants had inadequate knowledge and 43.33% had moderate knowledge, while no participant demonstrated adequate knowledge. Such baseline gaps are clinically relevant because awareness of dietary, physical activity, stress-management, and self-monitoring measures can influence the ability of individuals to participate in long-term hypertension care.

Following the intervention, the proportion with adequate knowledge increased to 70.00%, while no participant remained in the inadequate category. The mean score increased from 10.42 to 22.18, with a mean difference of 11.76 and a reported paired t value of 18.54. The direction and magnitude of the change support the study hypothesis that a structured community-based educational intervention can improve immediate hypertension-related knowledge. Similar improvements after structured knowledge or educational interventions have been reported in hypertensive populations, including

studies from India and other low-resource settings.¹²⁻¹⁵

The finding is also consistent with recent evidence supporting community-based approaches. A systematic review and meta-analysis of community-based hypertension strategies in low- and middle-income countries found an overall beneficial effect on blood pressure control, while a large quasi-experimental study in Indonesia and Viet Nam demonstrated significant gains in hypertension-related knowledge among programme participants.^{9,10} Community health worker interventions may additionally improve clinical outcomes when education is reinforced over time; for example, a Kenyan randomized trial demonstrated greater reductions in systolic and diastolic blood pressure after six months of home-based community health worker intervention.¹¹

The present study found significant associations between baseline knowledge and educational status, as well as source of health information. This suggests that educational exposure and access to reliable health information may shape baseline understanding of hypertension. The absence of significant associations with most other demographic variables indicates that knowledge gaps were widespread across the sampled community

and supports the value of community-wide rather than narrowly targeted education.

However, the present study should not be interpreted as demonstrating a reduction in blood pressure. Although the dissertation identifies blood pressure and lifestyle practices as study variables, the final analytical tables supplied in the dissertation report detailed pre/post results for knowledge rather than numerical systolic or diastolic outcomes. Therefore, the evidence presented here supports improvement in knowledge, not a measured change in blood pressure.

Limitations:

- The study used a one-group pre-test-post-test design without a control group, limiting causal inference.
- The sample size was small (N=60) and participants were selected using non-probability purposive sampling; generalizability is therefore limited.
- The post-test was conducted only seven days after the intervention, so long-term retention of knowledge and sustained behavioural change could not be established.
- The final Results tables did not provide complete numerical pre/post analyses for blood pressure or lifestyle-practice outcomes described in the methodology.

5.CONCLUSION:The study indicates that the community-based lifestyle modification programme was effective in improving knowledge regarding hypertension management among adults in the selected rural community of Kanpur. The proportion of participants with adequate knowledge increased from 0% before the intervention to 70.00% after the intervention, and the mean knowledge score increased from 10.42 ± 3.18 to 22.18 ± 2.94 . The reported paired t value of 18.54 demonstrated a statistically significant pre/post difference. Educational status and source of health information were significantly associated with baseline knowledge. The findings support the integration of structured community-based health education into rural hypertension care, while recognizing the need for controlled studies with larger samples and longer follow-up to determine whether improved knowledge is sustained and translated into behavioural and blood pressure outcomes.

REFERENCES:

1. World Health Organization. Hypertension. Geneva: WHO; 2025. Available from: <https://www.who.int/news-room/fact-sheets/detail/hypertension>.
2. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension. Nat Rev

- Nephrol. 2020;16(4):223-237. doi:10.1038/s41581-019-0244-2.
3. Fuchs FD, Whelton PK. High blood pressure and cardiovascular disease. *Hypertension*. 2020;75(2):285-292. doi:10.1161/HYPERTENSIONAHA.119.14240.
 4. Gupta R, Gaur K, Ahuja S, Anjana RM. Recent studies on hypertension prevalence and control in India 2023. *Hypertens Res*. 2024;47(6):1445-1456. doi:10.1038/s41440-024-01585-y.
 5. Geremew G, Ambaw F, Bogale EK, Yigzaw ZA. Adherence to lifestyle modification practices and its associated factors among hypertensive patients in Bahir Dar City Hospitals, North West Ethiopia. *Integr Blood Press Control*. 2023;16:111-122. doi:10.2147/IBPC.S436815.
 6. Hayes P, Ferrara A, Keating A, McKnight K, O'Regan A. Physical activity and hypertension. *Rev Cardiovasc Med*. 2022;23(9):302. doi:10.31083/j.rcm2309302.
 7. Ghodeswar GK, Dube A, Khobragade D. Impact of lifestyle modifications on cardiovascular health: a narrative review. *Cureus*. 2023;15(7):e42616. doi:10.7759/cureus.42616.
 8. Azami-Aghdash S, Joudyian N, Jafari S, Karami S, Rezapour R. Assessing community-based interventions effectiveness on hypertension prevention and control: a systematic review and meta-analysis. *BMC Public Health*. 2025;25:3253. doi:10.1186/s12889-025-24283-x.
 9. Nyame S, Boateng D, Heeres P, Gyamfi J, Gafane-Mateman LF, Amoah J, et al. Community-based strategies to improve health-related outcomes in people living with hypertension in low- and middle-income countries: a systematic review and meta-analysis. *Glob Heart*. 2024;19(1):51. doi:10.5334/gh.1329.
 10. Fritz M, Grimm M, My Hanh HT, Koot JAR, Nguyen GH, Nguyen TPL, et al. Effectiveness of community-based diabetes and hypertension prevention and management programmes in Indonesia and Viet Nam: a quasi-experimental study. *BMJ Glob Health*. 2024;9(5):e015053. doi:10.1136/bmjgh-2024-015053.
 11. Mbuthia GW, Mwangi J, Magutah K, Oguta JO, Ngure K, McGarvey ST. Preliminary efficacy of a community health worker homebased intervention for the control and management of hypertension in Kiambu County, Kenya-a randomized control trial. *PLoS One*. 2024;19(8):e0293791. doi:10.1371/journal.pone.0293791.
 12. Andrew A, Hariharan M, Monteiro SR, Padhy M, Chivukula U. Enhancing adherence and management in patients with hypertension: impact of form and frequency of knowledge intervention. *Indian Heart J*. 2022;74(4):302-306. doi:10.1016/j.ihj.2022.06.002.
 13. Kurnia AD, Melizza N, Ruhyanudin F, Masruroh NL, Prasetyo YB, Setyowati CI, et al. The effect of educational program on hypertension management toward knowledge and attitude among uncontrolled hypertension patients in rural area of Indonesia. *Int Q Community Health Educ*. 2020;41(1):21-31. doi:10.1177/0272684X20972846.
 14. Oyewole OM, Olorunfemi O, Ojewole F, Olawale MO. Effect of a training programme on knowledge and practice of lifestyle modification among hypertensive patients attending out-patient clinics in Lagos. *Iran J Nurs Midwifery Res*. 2020;25(1):58-64. doi:10.4103/ijnmr.IJNMR_201_18.
 15. Khuong QL, Bui PL, Adler AJ, Shellaby JT, Aerts A, McGuire H, et al. Effect of

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- community-based intervention on self-management of blood pressure among hypertensive adults: findings from the Communities for Healthy Hearts quasi-experimental study in Vietnam. *J Glob Health Sci.* 2020;2(1):e10. doi:10.35500/jghs.2020.2.e10.
16. Turkson-Ocran RAN, Ogungbe O, Botchway M, Baptiste DL, Owusu B, Ajibewa T, et al. Hypertension management to reduce racial/ethnic disparities: clinical and community-based interventions. *Curr Cardiovasc Risk Rep.* 2024;18(12):239-258. doi:10.1007/s12170-024-00750-9.
17. Udayamathi M, Sri SD, Pramila S, Ganesh M, Dinakarkumar Y. Preventing lifestyle disorders: the diet shift in India. *Food Humanit.* 2025;4:100472. doi:10.1016/j.foohum.2024.100472.
18. Yadav R, Banerjee D. Community-based nursing strategies for optimizing public health outcomes: a systematic review and meta-analysis. *Discov Public Health.* 2025;22:799. doi:10.1186/s12982-025-01166-5.