

Effectiveness of an Organized Teaching Programme on Knowledge Regarding Lifestyle Modification for Blood Pressure Control Among Patients with Primary Hypertension: A Pre-Experimental Study

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Abstract

Background: Primary hypertension is a widespread chronic disease that frequently goes undetected and is strongly influenced by modifiable lifestyle behaviours. Many patients possess limited knowledge of the dietary, physical activity, stress-management, and medication-adherence practices required for adequate blood pressure control, making structured patient education an important nursing intervention.

Objectives: To assess the pre-test and post-test knowledge of patients with primary hypertension regarding lifestyle modification, to evaluate the effectiveness of an organized teaching programme in improving this knowledge, and to determine the association between post-test knowledge and selected socio-demographic variables.

Methods: A quantitative, pre-experimental, one-group pre-test post-test design was used. Fifty patients with primary hypertension attending the Outpatient Department of Padmini Care Hospital, Tangi, Cuttack, Odisha, were enrolled through non-probability purposive sampling. A researcher-developed structured knowledge questionnaire (21 multiple-choice items covering the concept, risk factors, complications, and lifestyle/medical management of hypertension) was administered as a pre-test, followed by an organized teaching programme delivered through lecture-cum-discussion and PowerPoint presentation. The same tool was re-administered as a post-test after seven days. Data were analysed using descriptive statistics, the paired t-test, and the chi-square test.

Results: At baseline, 60% of participants had inadequate and 40% had moderate knowledge, with none in the adequate category. Following the teaching programme, no participant remained in the inadequate category, 30% had moderate knowledge, and 70% achieved adequate knowledge. The mean knowledge score rose from 8.16 ± 3.17 (pre-test) to 17.10 ± 3.36 (post-test), a mean gain of 8.94 marks (paired $t = 13.69$, $df = 49$, $p < 0.001$). No statistically significant association was found between post-test knowledge and any of the socio-demographic variables examined (age, gender, marital status, education, family type, occupation, residence, family history, duration of illness, or frequency of blood pressure monitoring; all $p > 0.05$).

Conclusion: The organized teaching programme produced a statistically significant and clinically meaningful improvement in patients' knowledge of lifestyle modification for blood pressure control, and this benefit was consistent across demographic subgroups. Structured, nurse-led health education should be incorporated as a routine component of hypertension care in outpatient settings.

Keywords: primary hypertension; lifestyle modification; organized teaching programme; knowledge; blood pressure control; nursing education

How to cite this article: Jeetamayee Samal. Effectiveness of an Organized Teaching Programme on Knowledge Regarding Lifestyle Modification for Blood Pressure Control Among Patients with Primary Hypertension: A Pre-Experimental Study. *Int J Drug Deliv Technol.* 2026;16(85s):1656-1663. DOI: 10.25258/ijddt.16.85s.176.

1. Introduction

Hypertension, often called the “silent killer” because it rarely produces early warning symptoms, remains

one of the leading modifiable risk factors for cardiovascular disease, stroke, and renal impairment

worldwide. The World Health Organization estimates that approximately 1.28 billion adults aged 30–79 years live with hypertension, nearly half of whom are unaware of their condition, and only about one in five have it adequately controlled. Primary (essential) hypertension, which has no single identifiable cause, accounts for 85–90% of all cases and develops gradually through the interplay of genetic predisposition with modifiable behavioural factors such as excessive dietary sodium, physical inactivity, obesity, tobacco and alcohol use, and chronic stress.

In India, hypertension prevalence continues to rise alongside urbanization and lifestyle transition, with roughly three in ten adults affected. Evidence from Odisha suggests that limited awareness, irregular blood-pressure monitoring, and poor adherence to prescribed lifestyle and medication regimens are common, and that many patients seek care only after complications have developed. Because lifestyle modification (dietary sodium restriction, regular physical activity, weight management, smoking and alcohol cessation, and stress reduction) is central to blood pressure control regardless of pharmacological treatment, patients' knowledge of these practices is a critical determinant of self-management success.

Nurses are well positioned to close this knowledge gap through structured, planned patient education. An organized teaching programme is a systematically designed educational intervention intended to improve a target population's understanding of, and attitude toward, a health condition. Prior studies in India and elsewhere have reported that such programmes produce substantial gains in hypertension-related knowledge, although the durability of these gains and their translation into behaviour change remain active areas of enquiry. The present study was undertaken to generate local evidence on this question among patients attending a hospital outpatient department in Cuttack, Odisha.

1.1 Statement of the Problem

“A study to evaluate the effectiveness of an organized teaching programme on lifestyle modification to control blood pressure among patients with primary hypertension attending the Outpatient Department of Padmini Care Hospital, Cuttack.”

1.2 Objectives

- To assess the level of knowledge regarding lifestyle modification to control blood pressure among patients with primary hypertension.
- To evaluate the effectiveness of an organized teaching programme on knowledge regarding lifestyle modification to control blood pressure among patients with primary hypertension.
- To determine the association between the level of knowledge regarding lifestyle modification

and selected socio-demographic variables among patients with primary hypertension.

1.3 Hypotheses

H1: There is a significant difference between pre-test and post-test knowledge scores regarding lifestyle modification for blood pressure control among patients with primary hypertension.

H2: There is a significant association between post-test knowledge level and selected socio-demographic variables among patients with primary hypertension.

(H2 was tested against the alternative that no such association exists; the results of this test are reported in Section 4.4.)

2. Review of Literature

A substantial body of research, drawn from both Indian and international settings, supports the use of structured teaching interventions to improve hypertension-related knowledge. Studies conducted among cohorts of 40–60 hypertensive patients have consistently reported that a majority of participants begin with inadequate or moderate baseline knowledge (roughly 58–65% classified as inadequate), and that this proportion falls to zero after a structured teaching programme, with 68–72% of participants subsequently achieving adequate knowledge. Reported pre-test mean scores in comparable studies have ranged from approximately 10 to 11 (out of a similarly scaled maximum), rising to 17–18 after intervention, with paired t-values between roughly 13 and 16 and p-values below 0.001 — a pattern closely consistent with the findings of the present study.

Several of these studies have also examined the relationship between demographic characteristics and knowledge gain, and have similarly found no statistically significant association between post-test knowledge and variables such as age, gender, education, occupation, or duration of illness, suggesting that structured teaching benefits patients fairly uniformly irrespective of background. Broader international literature on comprehensive lifestyle modification (including the landmark PREMIER and DASH-related trials) further supports the physiological benefit of dietary sodium reduction, weight management, and increased physical activity for blood pressure control, providing a rationale for why knowledge of these specific practices is clinically important rather than purely academic.

Taken together, the literature indicates that (a) baseline knowledge about lifestyle modification among hypertensive patients is frequently poor, (b) structured, nurse-led teaching programmes are an effective and low-cost means of improving this knowledge in the short term, and (c) demographic factors do not appear to moderate this effect substantially. A recurring gap noted across these studies is the absence of longer-term follow-up to determine whether improved

knowledge translates into sustained behavioural change and measurable blood pressure reduction — a gap the present study also does not resolve and which is discussed further in Section 6.

3. Materials and Methods

3.1 Research Approach and Design

A quantitative research approach was adopted, using a pre-experimental one-group pre-test post-test design, represented schematically as $O_1 - X - O_2$, where O_1 is the pre-test assessment of knowledge, X is the organized teaching programme, and O_2 is the post-test assessment conducted after the intervention.

3.2 Setting and Population

The study was conducted in the Outpatient Department of Padmini Care Hospital, Tangi, Cuttack, Odisha. The target population comprised patients diagnosed with primary hypertension; the accessible population consisted of those attending the OPD during the data-collection period who met the eligibility criteria below.

3.3 Sample and Sampling Technique

The required sample size was estimated at 49 using Cochran's formula for proportions ($Z = 1.96$, $p = q = 0.5$, allowable error $d = 0.14$) and rounded to 50. Fifty patients were enrolled using non-probability purposive sampling. Approximately 70 patients were screened, 60 eligible and willing participants were initially selected, and 10 were lost to attrition before the post-test, yielding a final analytic sample of 50.

Inclusion criteria: age 35–60 years; diagnosed with primary hypertension; blood pressure 140–180/90–110 mmHg; willing to participate.

Exclusion criteria: critically ill patients; patients with impaired sensory perception; patients who declined consent.

3.4 Study Variables

The independent variable was the organized teaching programme on lifestyle modification (covering diet, physical activity, medication adherence, stress management, and cessation of smoking/alcohol use). The dependent variable was patients' knowledge regarding lifestyle modification for blood pressure control, measured before and after the intervention.

3.5 Data Collection Tool

A structured questionnaire was developed by the researcher following a literature review and expert consultation. It comprised three sections: (A) socio-demographic variables (age, gender, marital status, education, family type, occupation, residence, family history of hypertension, duration of illness, and frequency of blood pressure monitoring); (B) a 21-item multiple-choice knowledge test covering the concept and diagnosis of hypertension, risk factors and causes, effects and complications, lifestyle modification, medication and treatment, and special conditions/follow-up, with one mark for each correct

response (maximum score 21); and (C) a scoring key classifying knowledge as poor (0–33%, score 0–7), moderate (38–77%, score 7–16), or adequate (81–100%, score 17–21).

3.6 Validity and Reliability

Content validity was established through review by five experts in medical-surgical nursing, and the tool was revised according to their recommendations. Internal consistency was evaluated using Cronbach's alpha (≥ 0.7 considered acceptable), and test–retest reliability, assessed over a seven-day interval, yielded a Pearson correlation coefficient of $r = 0.89$, indicating high stability.

3.7 Pilot Study

A pilot study was conducted among 10 patients at the same hospital to test feasibility. Knowledge improved from a mean of 10.50 ± 2.22 (pre-test) to 17.00 ± 1.67 (post-test), a statistically significant gain (paired $t = 6.90$, $df = 9$, $p < 0.001$), confirming that the tool and procedure were feasible without modification for the main study.

3.8 Procedure and Ethical Considerations

After obtaining institutional permission and informed consent, baseline demographic data and pre-test knowledge scores were collected. The organized teaching programme was then delivered through lecture-cum-discussion supported by a PowerPoint presentation covering the causes, risk factors, complications, dietary and physical-activity recommendations, stress management, medication adherence, and blood-pressure self-monitoring relevant to hypertension. A post-test using the identical questionnaire was administered seven days later. Confidentiality and voluntary participation were assured throughout, and ethical approval was obtained prior to data collection.

3.9 Statistical Analysis

Descriptive statistics (frequency, percentage, mean, standard deviation) were used to summarise demographic characteristics and knowledge scores. The paired t -test was used to compare pre-test and post-test knowledge scores, and the chi-square test was used to examine associations between post-test knowledge level and socio-demographic variables. A p -value < 0.05 was considered statistically significant.

4. Results

4.1 Socio-Demographic Characteristics

Of the 50 participants, the largest age group (40%) was 46–55 years, with the remainder evenly split between 35–45 and 56–60 years. Males comprised 60% of the sample and females 40%. Most participants were married (70%); half belonged to nuclear families (50%) and 40% to joint families. Secondary education was the most common level attained (30%). Private employment was the most frequent occupation (30%), and 60% of participants resided in urban areas. Sixty

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percent reported a positive family history of hypertension, and 80% had been living with the diagnosis for more than one year (40% for 1–5 years and 40% for over 5 years). Blood pressure monitoring frequency was fairly evenly distributed across daily, weekly, monthly, and occasional checking.

Table 1. Frequency and Percentage Distribution of Socio-Demographic Variables (n = 50)

Variable	Category	f	%
Age (years)	35–45	15	30%
	46–55	20	40%
	56–60	15	30%
Gender	Male	30	60%
	Female	20	40%
Marital status	Unmarried	5	10%
	Married	35	70%
	Widowed	5	10%
	Divorced	5	10%
Education	No formal education	5	10%
	Primary	10	20%
	Secondary	15	30%
	Higher secondary	10	20%
	Graduate	5	10%
Family type	Postgraduate	5	10%
	Nuclear	25	50%
	Joint	20	40%
	Extended	5	10%
Occupation	Private employee	15	30%
	Business	10	20%
	Government service	10	20%
	Retired	10	20%
Residence	Unemployed	5	10%
	Urban	30	60%
	Rural	20	40%
Family history of hypertension	Yes	30	60%

Variable	Category	f	%
Duration of hypertension	No	20	40%
	< 1 year	10	20%
	1–5 years	20	40%
	> 5 years	20	40%
Frequency of BP check-up	Daily	10	20%
	Weekly	15	30%
	Monthly	15	30%
	Occasionally	10	20%

f = frequency.

4.2 Pre-Test and Post-Test Knowledge Levels

Table 2 summarises the shift in overall knowledge category between the two assessment points. At the pre-test, 60% of participants had inadequate knowledge and 40% had moderate knowledge, with no participant reaching the adequate category. At the post-test, conducted seven days after the teaching programme, no participant remained in the inadequate category; 30% were classified as having moderate knowledge and 70% as having adequate knowledge.

Table 2. Pre-Test and Post-Test Level of Knowledge Regarding Lifestyle Modification (n = 50)

Level of Knowledge	Pre-test f (%)	Post-test f (%)
Inadequate (0–33%)	30 (60%)	0 (0%)
Moderate (38–77%)	20 (40%)	15 (30%)
Adequate (81–100%)	0 (0%)	35 (70%)

4.3 Effectiveness of the Organized Teaching Programme

The mean knowledge score increased from 8.16 ± 3.17 at pre-test to 17.10 ± 3.36 at post-test, a mean gain of 8.94 points on the 21-point scale. This difference was tested using the paired t-test and found to be statistically highly significant ($t = 13.69$, $df = 49$, $p < 0.001$), leading to acceptance of hypothesis H1 and rejection of the corresponding null hypothesis.

Table 3. Comparison of Pre-Test and Post-Test Knowledge Scores (n = 50)

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Test	Mean	SD	Mean Difference	Paired t (df = 49)	p-value
Pre-test	8.16	3.17	8.94	13.69	< 0.001*
Post-test	17.10	3.36			

*Significant at $p < 0.001$.

Category-wise analysis (Table 4) showed that pre-test mean percentage scores were uniformly low across all six knowledge domains (approximately 38–39%), whereas post-test scores rose to approximately 81% in every domain, indicating that the teaching programme produced a broadly consistent improvement rather than gains concentrated in a single content area. Item-level analysis of the individual questionnaire items mirrored this pattern: pre-test correct-response rates for the 21 items ranged from 30% to 50%, while post-test correct-response rates ranged from 78% to 96%, with the largest post-test gains observed on items relating to the long-term damage caused by uncontrolled hypertension and to appropriate action following pregnancy-related hypertension.

Table 4. Category-Wise Comparison of Pre-Test and Post-Test Knowledge Scores (n = 50)

Category	Max Score	Pre-test Mean (SD)	Pre-test Mean %	Post-test Mean (SD)	Post-test Mean %
Concept of hypertension	6	2.33 (0.82)	38.83 %	4.89 (0.74)	81.50 %
Diagnosis & BP values	3	1.17 (0.55)	39.00 %	2.44 (0.49)	81.33 %
Risk factors & causes	4	1.55 (0.76)	38.75 %	3.26 (0.50)	81.50 %
Effects & complications	2	0.78 (0.58)	39.00 %	1.63 (0.46)	81.50 %
Lifestyle modification	3	1.17 (0.54)	39.00 %	2.44 (0.50)	81.33 %
Medication & treatment	2	0.78 (0.44)	39.00 %	1.63 (0.46)	81.50 %

Category	Max Score	Pre-test Mean (SD)	Pre-test Mean %	Post-test Mean (SD)	Post-test Mean %
Special conditions & follow-up	1	0.39 (0.50)	39.00 %	0.81 (0.30)	81.00 %
Overall (Total score)	21	8.16 (3.17)	38.86 %	17.10 (3.36)	81.43 %

4.4 Association Between Knowledge and Socio-Demographic Variables

Chi-square analysis (Table 5) revealed no statistically significant association between either pre-test or post-test knowledge level and any of the ten socio-demographic variables examined, including age, gender, marital status, educational qualification, family type, occupation, place of residence, family history of hypertension, duration of hypertension, and frequency of blood pressure monitoring (all $p > 0.05$). Hypothesis H2 was therefore not supported by the data, indicating that the improvement in knowledge following the organized teaching programme was consistent across demographic subgroups rather than being concentrated among particular categories of patients.

Table 5. Association Between Knowledge Level and Selected Socio-Demographic Variables (n = 50)

Variable	χ^2 (pre-test)	df	Sig.	χ^2 (post-test)	df	Sig.
Age	0.32	2	NS	0.28	2	NS
Gender	0.08	1	NS	0.06	1	NS
Marital status	0.44	3	NS	0.32	3	NS
Educational qualification	1.96	5	NS	1.12	5	NS
Type of family	0.18	2	NS	0.24	2	NS
Occupation	0.52	4	NS	0.40	4	NS
Place of residence	0.08	1	NS	0.06	1	NS
Family history of hypertension	0.08	1	NS	0.06	1	NS

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Variable	χ^2 (pre-test)	df	Sig.	χ^2 (post-test)	df	Sig.
Duration of hypertension	0.24	2	NS	0.18	2	NS
Frequency of BP check-up	0.36	3	NS	0.22	3	NS

NS = not significant at $p > 0.05$.

5. Discussion

The present findings demonstrate that patients with primary hypertension attending this outpatient department began with markedly inadequate knowledge of lifestyle modification — a pattern consistent with prior Indian studies reporting pre-test inadequate-knowledge rates of roughly 58–65% and comparable pre-test mean scores in the 10–11 range on similarly structured tools. The magnitude of improvement observed here (mean gain of 8.94 points, $t = 13.69$, $p < 0.001$) is likewise consistent with, and at the upper end of, gains reported in comparable pre-experimental studies of structured teaching interventions among hypertensive patients, where paired t-values have typically ranged from about 13 to 16 and post-test adequate-knowledge rates from 68% to 72%. This convergence across settings strengthens confidence that a single, well-structured teaching session using lecture and visual aids can reliably and substantially improve hypertension-related knowledge over a short interval.

The category-wise analysis suggests that the intervention was not narrowly effective in only one domain (for example, diet) but produced roughly uniform gains across the concept of hypertension, risk factors, complications, lifestyle modification, medication adherence, and follow-up care. This breadth is clinically relevant because effective self-management of hypertension requires competence across multiple domains simultaneously; a patient who understands dietary recommendations but not the rationale for medication adherence, for instance, remains at elevated risk.

The absence of a significant association between post-test knowledge and socio-demographic variables is an encouraging finding from a health-equity perspective: it suggests that a single standardized teaching programme can be applied across a heterogeneous outpatient population — spanning different ages, education levels, occupations, and residence types — without requiring separate tailored versions for each subgroup. This mirrors the pattern reported in similar studies, where chi-square analyses have likewise failed to detect demographic moderation of knowledge

gain, reinforcing the generalizability of structured teaching as a nursing intervention.

Nonetheless, several limitations temper these conclusions. The one-group pre-test post-test design lacks a control or comparison group, so gains cannot be unambiguously attributed to the teaching programme alone rather than to test–retest familiarity with the questionnaire (a Hawthorne-type or testing effect) or to other concurrent influences. The seven-day interval between pre-test and post-test captures only short-term knowledge retention and provides no information on whether gains persist over weeks or months, nor whether improved knowledge translates into actual dietary, activity, or medication-adherence behaviour change or measurable reductions in blood pressure — a gap noted consistently in this literature. The purposive sampling strategy and single-site, moderate sample size ($n = 50$) also limit statistical power for the demographic sub-analyses and the generalizability of findings beyond similar outpatient settings in Odisha.

6. Conclusion

This study demonstrates that an organized, nurse-led teaching programme produced a statistically highly significant improvement in knowledge regarding lifestyle modification for blood pressure control among patients with primary hypertension, with the proportion of patients classified as having adequate knowledge rising from 0% to 70% within one week of the intervention. The benefit was consistent across all socio-demographic subgroups examined, supporting the routine, unmodified use of such programmes across diverse outpatient populations. These findings reinforce the role of nurses as primary health educators in chronic disease management and support the integration of structured teaching sessions — covering the concept, risk factors, complications, and lifestyle and pharmacological management of hypertension — into standard outpatient care pathways.

6.1 Implications

- Nursing practice: Organized teaching sessions should be incorporated as a routine component of outpatient care for patients with primary hypertension, delivered using accessible lecture and visual-aid formats.
- Nursing education: Curricula should strengthen training in the planning, delivery, and evaluation of structured patient-education programmes for chronic, lifestyle-related conditions.
- Nursing administration: Institutions should allocate time, teaching materials, and in-service training to support nurse-led health education activities.
- Nursing research: Further research employing control-group designs and longer follow-up is needed to determine whether knowledge gains

are sustained and translate into behavioural and clinical (blood-pressure) outcomes.

6.2 Recommendations for Further Study

- Conduct follow-up studies assessing long-term retention of knowledge beyond the seven-day post-test interval used here.
- Compare the relative effectiveness of alternative teaching strategies, such as digital/mobile-based modules, one-to-one counselling, and group sessions.
- Investigate whether knowledge gains translate into measurable behavioural change (dietary modification, physical activity, medication adherence) and into actual blood pressure control.
- Replicate the study with a control group and a larger, multi-site sample to strengthen causal inference and generalizability.

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