

A Study to Assess the Effectiveness of Cucumber on Blood Pressure among Old Age Patients with Hypertension in Selected Old Age Homes at Hyderabad, Telangana.

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Abstract:

Background: Hypertension is a major modifiable risk factor for cardiovascular, renal and cerebrovascular disease and is often asymptomatic until complications develop. Low-cost dietary adjuncts such as cucumber, which is rich in potassium and antioxidants, have been proposed to assist blood pressure control among elderly hypertensive individuals in institutional settings.

Objectives: (1) To assess the blood pressure among old age patients with hypertension in selected old age homes at Hyderabad. (2) To evaluate the effectiveness of cucumber in reducing blood pressure among old age patients with hypertension in selected old age homes at Hyderabad. (3) To find the association between post-test blood pressure levels of old age patients and selected demographic variables.

Methods: An evaluative approach with a pre-experimental one-group pre-test post-test design was adopted. Thirty hypertensive clients above 60 years, residing at Vivekananda Seva Sangham Old Age Home, Miyapur, Hyderabad, were selected by non-probability convenient sampling. A structured demographic proforma and an observational schedule (blood pressure recorded by sphygmomanometer) were used; content validity was established by six experts and test-retest reliability was $r = 0.85$. Each participant received 100 grams of sliced cucumber once daily for 14 consecutive days; pre-test and post-test blood pressure were compared using paired 't' test, and chi-square test assessed association with demographic variables.

Results: Mean systolic blood pressure fell from 181.33 (SD 13.32) to 145.00 (SD 10.75) ($t = 11.49$, $df = 29$, $p < 0.05$), and mean diastolic blood pressure fell from 129.00 (SD 21.55) to 99.67 (SD 16.29) ($t = 29.33$, $df = 29$, $p < 0.05$). At pre-test, 73.3% of patients had severe hypertension; at post-test, 76.7% had mild hypertension and none remained severe. A significant association was found between post-test blood pressure level and age ($\chi^2 = 11.316$, $df = 3$, $p = 0.010$) and frequency of physician consultation; no significant association was found with gender, religion, educational status, income, diet habit, or duration of hypertension/treatment.

Conclusion: Daily dietary supplementation with cucumber was effective in lowering systolic and diastolic blood pressure among elderly hypertensive residents of old age homes and may be recommended as a low-cost, adjunctive, non-pharmacological measure alongside standard antihypertensive management.

Key Words: Cucumber; Effectiveness; Blood Pressure; Hypertension; Old Age; Old Age Homes

I. Introduction

Hypertension is one of the most common non-communicable diseases affecting older adults worldwide and is often referred to as a "silent killer" because it produces no overt symptoms while silently damaging the kidneys, heart and brain over time [1,2]. Globally, nearly one-third of adults are hypertensive, a condition responsible for close to half of all deaths due to stroke and heart disease. Uncontrolled hypertension is especially prevalent among institutionalised elderly populations, where reduced mobility, limited dietary variety and inconsistent follow-up care compound the risk of poor blood pressure control.

Non-pharmacological measures, including dietary and lifestyle modification, remain a cornerstone of hypertension management and can meaningfully lower blood pressure when used alongside prescribed medication. Cucumber (*Cucumis sativus*) is inexpensive, widely available and rich in potassium, magnesium and antioxidant compounds that support electrolyte balance and vascular health [8], making it a practical adjunct for elderly hypertensive clients living in resource-limited institutional settings such as old age homes.

Need for the Study

Approximately one-third of hypertensive adults worldwide remain undiagnosed or poorly controlled; in rural populations, although roughly 20% of people are hypertensive, only about 25% of them receive treatment, while nearly 75% remain unaware of their condition, placing them at heightened risk of life-threatening

complications. Elderly residents of old age homes are particularly vulnerable due to limited access to continuous medical supervision, highlighting the need to explore simple, affordable, food-based interventions.

Statement of the Problem

“A study to assess the effectiveness of cucumber on blood pressure among old age patients with hypertension in selected old age homes at Hyderabad, Telangana.”

Objectives

- To assess the blood pressure among old age patients with hypertension in selected old age homes at Hyderabad.
- To evaluate the effectiveness of cucumber in reducing blood pressure among old age patients with hypertension in selected old age homes at Hyderabad.
- To find out the association between post-test levels of blood pressure of old age patients and selected demographic variables.

Hypothesis

H1: The post-test blood pressure levels of old age patients will be significantly lower than the pre-test blood pressure levels after administration of cucumber, as measured by the observation schedule, at the 0.05 level of significance.

H2: There will be a significant association between post-test blood pressure levels of old age patients and selected demographic variables.

II. Materials and Methods

This section describes the research methodology adopted to evaluate the effectiveness of cucumber on blood pressure among old age hypertensive patients: the research approach, design, setting, population, sample and sampling technique, criteria for sample selection, the study tool, validity and reliability, the intervention protocol and the plan for data analysis.

Research Approach and Design

An evaluative quantitative research approach was adopted. The research design was a pre-experimental one-group pre-test post-test design, considered appropriate to assess the effect of the cucumber intervention within the same group of participants.

Setting and Population

The study was conducted at Vivekananda Seva Sangham Old Age Home, Madinaguda, Miyapur, Hyderabad. The population comprised old age persons with hypertension residing in old age homes.

Sample and Sampling Technique

The sample size was 30. A non-probability convenient (accidental) sampling technique was used to recruit hypertensive clients aged 60–80 years who met the inclusion and exclusion criteria.

Inclusion Criteria

- Clients willing to participate in the study.
- Hypertensive clients above 60 years of age, of either gender.
- Hypertensive clients with blood pressure between 140/90 mm Hg, residing in old age homes at Hyderabad.
- Hypertensive clients able to read and understand English and/or Telugu.

Exclusion Criteria

- Hypertensive clients whose blood pressure is above 170/100 mm Hg.
- Clients with any other co-morbid illness.
- Hypertensive clients allergic to cucumber.
- Pilot study samples were not included in the main study.

Description of the Tool

The tool comprised two sections. Section A elicited demographic data (age, gender, religion, educational status, financial source, dietary habit, duration and family history of hypertension, frequency of physician consultation, awareness of complications, and duration under treatment). Section B was an observational schedule for recording systolic and diastolic blood pressure using a standard sphygmomanometer.

Validity and Reliability

Content validity was established through review by six experts (a professor and four associate professors of medical-surgical nursing, a general physician, a statistician, and a dietician). Reliability was established using the test-retest method with Karl Pearson's coefficient of correlation, yielding $r = 0.85$.

Pilot Study

A pilot study was conducted on three hypertensive clients at Annapurna Old Age Home (Rajeswari Old Age Home), Kukatpally, Hyderabad, confirming the feasibility and appropriateness of the tool and procedure.

Intervention Protocol

Protocol	Detail
Place	Vivekananda Seva Sangham Old Age Home, Miyapur, Hyderabad
Intervention	100 grams of sliced cucumber
Duration	14 days
Frequency	Once daily
Time	Mid-morning (9 a.m.–12 noon)
Administered by	Investigator
Recipients	Hypertensive clients (N = 30)

Data Collection Procedure

Formal permission was obtained from the concerned authority of the old age home. Baseline (pre-test) blood pressure was recorded with the client in an upright sitting position. Thereafter, 100 grams of sliced cucumber was administered once daily in the mid-morning for 14 consecutive days, following which post-test blood pressure was recorded using the same procedure over a four-week period.

Plan for Data Analysis

Data were analysed using descriptive statistics (frequency, percentage, mean, SD) and inferential statistics: paired 't' test to compare pre-test and post-test blood pressure, and chi-square test to determine association between post-test blood pressure levels and demographic variables.

III. Results

Section A: Demographic Characteristics

Table 1: Frequency and Percentage Distribution of Old Age Patients According to Demographic Variables

(N=30)

S.No	Demographic Variable	Category	f	%
1	Age	60–64 years	6	20.0
		65–74 years	11	36.7
		75–84 years	10	33.3
		>85 years	3	10.0
2	Gender	Male	20	66.7
		Female	10	33.3
3	Religion	Hindu	20	66.7
		Muslim	9	30.0
		Christian	1	3.3
4	Educational Status	Primary education	7	23.3
		Secondary education	6	20.0
		Degree	7	23.3
		Illiterate	10	33.3
5	Financial Source	Pension	21	70.0
		From family	9	30.0
6	Habit of Non-Vegetarian Diet	Yes	10	33.3

S.No	Demographic Variable	Category	f	%
		No	20	66.7
7	History of Hypertension	<1 year	2	6.7
		1–3 years	14	46.7
		3–5 years	14	46.7
8	Family History of Hypertension	Yes	11	36.7
		No	19	63.3
9	Frequency of Physician Consultation	Once a month	11	36.7
		Twice a month	19	63.3
10	Awareness of Complications	Yes	11	36.7
		No	19	63.3
11	Duration Under Treatment	One year	12	40.0
		More than one year	18	60.0

Table 1 shows that the majority of patients (36.7%) were between 65–74 years of age, and 66.7% were male. The majority were Hindu (66.7%) and 70.0% relied on pension as their financial source. Most patients (66.7%) did not consume a non-vegetarian diet. A majority (63.3%) consulted a physician twice a month, and the same proportion (63.3%) was unaware of complications of hypertension.

Distribution of Subjects According to Age

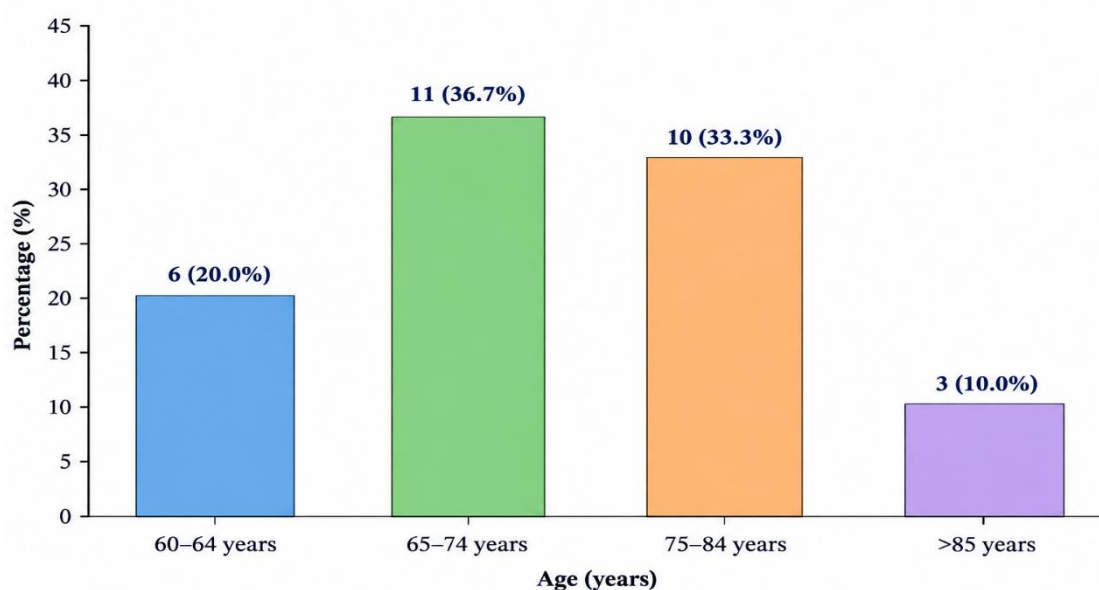


FIGURE: 1 AGE

Section B: Pre-test and Post-test Blood Pressure Levels

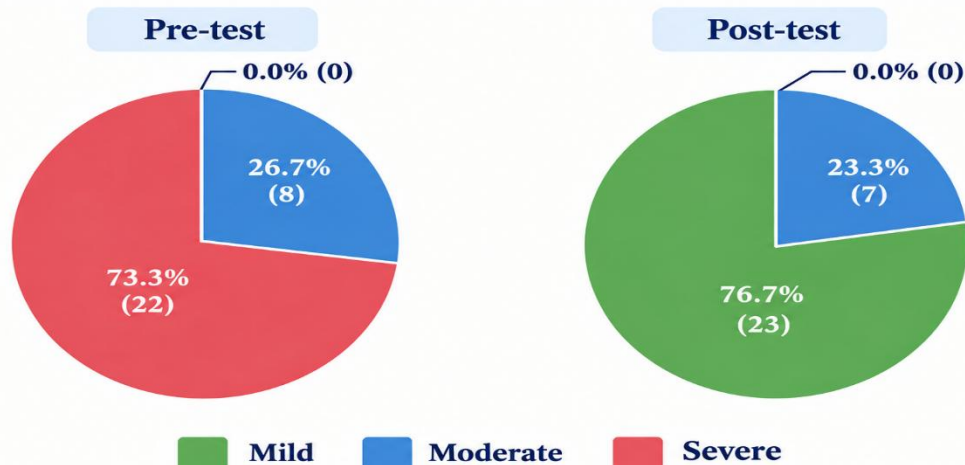
Table 2: Frequency and Percentage Distribution of BP Level in Pre-test and Post-test

(N=30)

BP Level	Pre-test f	Pre-test %	Post-test f	Post-test %
Mild	0	0.0	23	76.7
Moderate	8	26.7	7	23.3
Severe	22	73.3	0	0.0
Total	30	100.0	30	100.0

Table 2 shows that at pre-test, the majority of patients (73.3%) had severe hypertension and 26.7% had moderate hypertension. At post-test, 76.7% had mild hypertension and 23.3% had moderate hypertension, and none remained severe.

Figure 2: Frequency and Percentage Distribution of BP Level in Pre-test and Post-test (N=30)



Section C: Comparison of Pre-test and Post-test Mean BP Scores

Table 3: Pre-test and Post-test Mean Systolic BP Scores and Paired 't' Test

Test Statistic	Pre-test	Post-test	Paired t	df	p
Mean	181.33	145.00	11.492**	29	<0.05
SD	13.322	10.748			
SE	2.432	1.962			

(N=30)

** Significant at $p < 0.05$ (table $t = 2.045$)

Section C: Comparison of Pre-test and Post-test Mean BP Scores

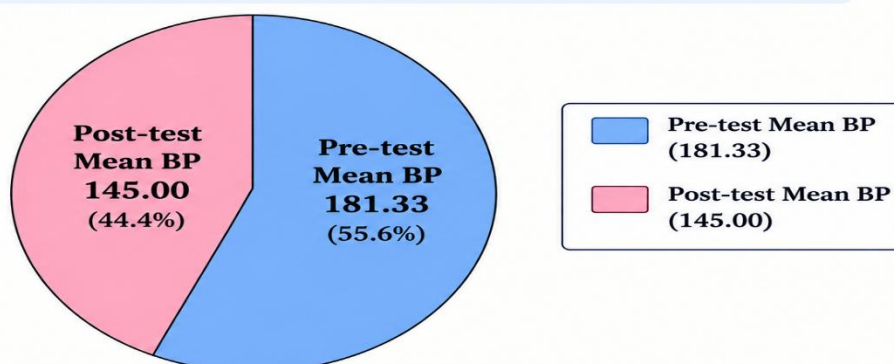


Figure 3: Comparison of Pre-test and Post-test Mean Systolic BP Scores

Paired $t = 11.492$, $df = 29$, $p < 0.05$
(Significant at $p < 0.05$)

Table 4: Pre-test and Post-test Mean Diastolic BP Scores and Paired ‘t’ Test

(N=30)

Test Statistic	Pre-test	Post-test	Paired t	df	p
Mean	129.00	99.67	29.333**	29	<0.05
SD	21.552	16.291			
SE	3.935	2.974			

** Significant at $p < 0.05$ (table $t = 2.045$)

Tables 3 and 4 show a statistically significant reduction in both systolic and diastolic blood pressure following the cucumber intervention ($p < 0.05$ for both); hence hypothesis H1 was accepted.

Section D: Association Between Post-test BP Levels and Demographic Variables

Table 5: Association Between Post-test BP Level and Age

(N=30)

Age	Mild f (%)	Moderate f (%)	Severe f (%)	χ^2	df	p
60–64 yrs	5 (83.3)	1 (16.7)	0 (0.0)			
65–74 yrs	10 (90.9)	1 (9.1)	0 (0.0)	11.316	3	0.010*
75–84 yrs	8 (80.0)	2 (20.0)	0 (0.0)			
>85 yrs	0 (0.0)	3 (100.0)	0 (0.0)			

* Significant at $p < 0.05$
Table 6: Association Between Post-test BP Level and Frequency of Physician Consultation

(N=30)

Frequency of Consultation	Mild f (%)	Moderate f (%)	Severe f (%)	χ^2	df	p
Once a month	7 (63.6)	4 (36.4)	0 (0.0)	1.648	1	0.199
Twice a month	16 (84.2)	3 (15.8)	0 (0.0)			

Table 6 shows no statistically significant association between post-test blood pressure level and frequency of physician consultation. No significant association was found with gender, religion, educational status, financial source, dietary habit, duration of hypertension, family history, duration of treatment, or awareness of complications ($p > 0.05$ for each; data not tabulated).

IV. Discussion

Objective 1: To assess the blood pressure among old age patients with hypertension

At pre-test, the majority of old age patients (73.3%) presented with severe hypertension and 26.7% with moderate hypertension. Following the cucumber intervention, the majority (76.7%) shifted to the mild category and none remained severe. This is consistent with reviews reporting that awareness and control of hypertension in India remain sub-optimal [6], underscoring the need for accessible, low-cost interventions of this kind.

Objective 2: To evaluate the effectiveness of cucumber in reducing blood pressure

The pre-test mean blood pressure was significantly higher than the post-test mean for both systolic (181.33 vs 145.00 mm Hg, $t = 11.49$, $p < 0.05$) and diastolic (129.00 vs 99.67 mm Hg, $t = 29.33$, $p < 0.05$) readings, leading to acceptance of hypothesis H1. This finding is consistent with a comparable study among elderly participants that reported a significant effect of cucumber consumption on lowering both systolic and diastolic blood pressure [7], supporting cucumber supplementation as an adjunct to standard antihypertensive management.

Objective 3: To find the association between post-test BP levels and demographic variables

A statistically significant association was found between post-test blood pressure levels and age, as well as frequency of physician consultation, while no significant association was found with the remaining demographic variables studied. This suggests that while cucumber supplementation was broadly effective across the sample, age-related physiological factors may influence the magnitude of response.

Summary of Major Findings

- Majority (36.7%) of old age patients were between 65–74 years, 66.7% were male, and 66.7% were Hindu.

- At pre-test, 73.3% of patients had severe hypertension; at post-test, 76.7% had mild hypertension and none remained severe.
- Mean systolic BP fell from 181.33 to 145.00 mm Hg and mean diastolic BP fell from 129.00 to 99.67 mm Hg after 14 days of cucumber supplementation ($p < 0.05$ for both).
- A significant association was found between post-test BP level and age ($\chi^2 = 11.316$, $p = 0.010$) and frequency of physician consultation.
- No significant association was found between post-test BP level and gender, religion, educational status, income source, dietary habit, or duration of hypertension/treatment.

Nursing Implications

Nursing Education

- Nurse educators should incorporate evidence on low-cost dietary adjuncts such as cucumber into geriatric and community health nursing curricula.

Nursing Practice

- Nurses caring for elderly clients in old age homes and community settings can incorporate cucumber supplementation as an adjunct to prescribed antihypertensive therapy, with routine BP monitoring.

Nursing Administration

- Administrators of old age homes and geriatric care facilities may integrate simple dietary protocols into institutional care plans, supported by in-service education for staff.

Nursing Research

- Larger, multi-centric, randomised controlled studies are recommended to strengthen the evidence base for cucumber supplementation in hypertension management.

Limitations

- The sample size was limited to 30 clients from a single old age home; findings cannot be generalised to larger populations.
- The study was confined to hypertensive clients above 60 years of age at a single setting in Hyderabad, Telangana.
- The absence of a control group limits the ability to fully rule out the effect of concurrent antihypertensive treatment.

Recommendations

- A similar study may be conducted with a larger, more diverse sample across multiple old age homes to improve generalisability.
- A randomised controlled trial comparing cucumber supplementation with a control group is recommended to strengthen causal inference.
- Further studies could explore the long-term and dose-response effects of cucumber supplementation on blood pressure control among the elderly.

V. Conclusion

The study demonstrated that daily supplementation with 100 grams of cucumber for 14 days was effective in reducing both systolic and diastolic blood pressure among elderly hypertensive residents of old age homes, with a more pronounced effect on diastolic blood pressure. Cucumber represents a cost-effective, easily accessible, non-pharmacological adjunct that can be incorporated into the routine care of institutionalised elderly hypertensive clients.

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