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"A QUASI EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF COMMUNITY-BASED INTERVENTION ON LEVEL OF BLOOD PRESSURE AMONG HYPERTENSIVE CLIENTS IN SELECTED AREA OF PUNE CITY "

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ABSTRACT

Hypertension is a chronic condition that greatly increases the risk of cardiovascular disease, stroke, and renal complications. Although pharmacological treatments are available, poor adherence, limited awareness, and lifestyle factors often hinder effective control. Community-based interventions focusing on education, lifestyle modification, and regular follow-up offer cost-effective, non-invasive, and accessible strategies to complement medical care.

This quasi-experimental study was conducted among 120 hypertensive clients from selected areas of Pune city, with 60 in the experimental group and 60 in the control group. Participants were above 30 years of age and had been diagnosed with hypertension for more than two months. Non-probability purposive sampling was used for selection. Data were collected using a structured questionnaire and direct blood pressure measurements. Tool validity was established by experts, and reliability was confirmed using the test–retest method ($r = 0.8978$). Pre-intervention findings in the experimental group revealed that 43.3% of clients were in Stage 1 hypertension, 40% in Stage 2, and only 16.7% within the normal range, with a mean blood pressure of 148.25 mmHg (SD = 6.42). After intervention, 46.7% achieved normal blood pressure, 36.7% were in Stage 1, and only 16.6% remained in Stage 2, with a reduced mean of 136.85 mmHg (SD = 5.38). Paired t-test analysis showed a highly significant reduction ($t = 15.92$, $p < 0.0001$), while the control group showed no significant change. Post-test comparison further confirmed effectiveness ($t = 10.42$, $p < 0.0001$). No significant association was found between blood pressure reduction and demographic variables.

The study concludes that community-based interventions are highly effective in reducing blood pressure and should be integrated into routine hypertension management**.**

Keywords: Hypertension, community-based intervention, blood pressure, lifestyle modification, non-pharmacological strategies.

INTRODUCTION

Blood pressure is the force that flowing blood exerts on the walls of arteries. It is measured in millimetres of mercury (mmHg) and recorded as systolic pressure (when the heart contracts) over diastolic pressure (when the heart relaxes). A normal blood pressure level is around 120/80 mmHg. Hypertension, or high blood pressure, is defined as a persistent reading above 140/90 mmHg and significantly increases the risk of cardiovascular disease, stroke, and kidney disorders.[1]

Hypertension is a major global health concern, often termed the "silent killer" because it typically presents no symptoms until complications arise. Many individuals remain undiagnosed for years, which increase the likelihood of severe health problems. The condition

is categorized as primary (essential) hypertension, influenced by genetic and lifestyle factors with no identifiable cause, and secondary hypertension, which results from underlying conditions such as kidney disease, hormonal imbalance, or certain medications.[2]

The incidence rate of hypertension refers to the number of new cases occurring in a specific population over a given time, usually reported per 1,000 or 100,000 people annually. Both incidence and prevalence are influenced by factors such as age, genetics, lifestyle, and geographical location.[3] A Lancet (2021) report estimated that in 2019, more than 1.2 billion people worldwide were living with hypertension, with cases rising particularly in low- and middle-income countries. Globally, urbanisation, ageing populations, and lifestyle changes have accelerated this trend.[4]

In India, approximately 25–30% of adults are affected by hypertension, with Maharashtra alone recording an estimated 25% prevalence. These figures highlight the urgent need for prevention, early diagnosis, and effective management strategies to reduce the growing burden of hypertension.[5]

NEED OF THE STUDY

Millions of people worldwide, including those in Pune, suffer from hypertension, often known as high blood pressure, a dangerous medical condition. It is a key contributor to renal failure, heart disease, strokes, and other severe health issues. Even though hypertension is a prevalent ailment, many people with it do not obtain the right care or do not alter their lifestyles in a way that would help them regulate their blood pressure. This emphasises the necessity of efficient treatments that might assist in controlling and lowering hypertension, particularly in the community.[6]

The goal of a community-based intervention is to educate and mentor people in their own homes. It aids in their comprehension of the significance of consistent blood pressure checks, medication compliance, a nutritious diet, physical activity, and stress reduction.[7] Many individuals have unhealthy and stressful lives, which increases their risk of developing hypertension, particularly in cities like Pune. Improved blood pressure control and the avoidance of serious consequences can result from appropriate community awareness and assistance.[8]

Because conventional hospital-based therapy may not always be sufficient to manage hypertension, this investigation is required. Because of their busy schedules, lack of knowledge, or financial difficulties, many people either do not routinely attend healthcare facilities or disregard medical advice. By bringing healthcare support closer to individuals and making it more convenient and accessible, a community-based intervention can decrease this gap.[9]

We can assess the efficacy of community-based treatments in assisting hypertensive clients in managing their blood pressure by carrying out this study in Pune. The results will assist policymakers and medical experts in creating more effective community-level hypertension control plans. If this strategy proves effective, it can be used in other regions, helping more individuals and lowering the total burden of diseases linked to hypertension.[10]

AIM OF THE STUDY

The study assesses the effectiveness of a community-based intervention in reducing blood pressure among hypertensive clients. It compares pre- and post-intervention readings between

experimental and control groups. The aim is to determine the impact of such strategies on hypertension management in Pune city.

RESEARCH METHODOLOGY

The present study aimed to assess the effectiveness of a community-based intervention on blood pressure levels among hypertensive clients residing in a selected area of Pune city. The objectives were to compare pre- and post-test blood pressure levels between experimental and control groups and to determine the association between blood pressure and selected demographic variables.

A quantitative research approach was adopted, using a quasi-experimental non-equivalent control group design, which was appropriate for measuring intervention effects under ethical and practical constraints. The study sample comprised 120 hypertensive clients, with 60 in the experimental group and 60 in the control group. Participants were selected through non-probability purposive sampling based on inclusion criteria.

Data were collected using a structured demographic preformed and a calibrated sphygmomanometer for systolic and diastolic blood pressure measurement. Tool reliability was ensured through the inter-rater reliability method, confirming consistency and accuracy of readings. A pilot study was conducted on 10% of the total sample to assess feasibility, clarity, and applicability of tools and procedures. The pilot confirmed the suitability of the methodology, allowing the main study to be conducted without major modifications.

RESULT

Section -I: Demographic Characteristics of the Sample (n = 120)

The study assessed the demographic and clinical profile of hypertensive clients. The majority of participants were in the age group of 36–40 years (30%) in one group and 30–35 years (30%) in the other. Gender distribution showed a male predominance (53.3%) in one group and a female predominance (53.3%) in the other. Most participants were married (73.3% and 66.7%, respectively).With respect to education; the largest group had completed undergraduate studies (30.3%) in one sample and secondary education (30.0%) in the other. Homemakers formed the majority of the occupational group (30.3% and 33.3%). Monthly income was highest in the Rs.30, 000–40,000 range (30.3%) in one group and Rs20,000–30,000 (30.0%) in the other.

Awareness of hypertension was limited, as more than half of the clients (56.7% and 63.3%) had not attended awareness sessions; among those who did, hospitals were the main source (13.3%). All participants were diagnosed cases of hypertension. Dietary habits showed that 60.0% and 63.3% followed a healthy diet, with mixed diets being most common (40.0% and 46.7%). Nuclear families were predominant (43.3% and 46.7%).

Regarding disease history, nearly half had been hypertensive for 1–5 years (46.7% and 40.0%). A majority reported a family history of hypertension (67.7% and 63.3%). Most participants were on medication (83.3% and 76.7%). Lifestyle factors revealed that more than half did not engage in regular exercise (53.3% in both groups). Substance use was present in 36.7% of one group and 60.0% of the other.

Overall, the findings indicate that hypertension is more prevalent among middle-aged adults, with homemakers and moderately educated individuals forming the majority. Limited awareness, sedentary lifestyle, and family history were significant contributing factors.

SECTION- II: Blood Pressure Scores among Hypertensive Clients

Section II A: Pre-Test Blood Pressure Levels

Table no. 1: Experimental Group and control group (n = 60+60)

	Experimental Group				Control Group			
Blood Pressure Level	**Frequency (f)**	**Percentage (%)**	**Mean (mmHg)**	**SD**	**Frequency (f)**	**Percentage (%)**	**Mean (mmHg)**	**SD**
Normal (<140/90)	10	16.7%	147.85	6.38	8	13.3%	149.25	6.47
Stage 1 (140–159/90–99)	26	43.3%			28	46.7%		
Stage 2 (≥160/100)	24	40.0%			24	40.0%		

Tab no.1 shows pre-test assessment of the experimental group revealed that the majority of participants were in Stage 1 hypertension (43.3%), followed closely by Stage 2 hypertension (40%), while only 16.7% of participants had blood pressure within the normal range. The mean blood pressure of 147.85 mmHg with an SD of 6.38 indicates that most participants had elevated blood pressure levels, reflecting poor initial blood pressure control among the experimental group before the intervention.

Pre-Test Blood Pressure Levels – Control Group (n = 60)

In the pre-test assessment of the control group, a similar trend was observed, with the majority of participants in Stage 1 hypertension (46.7%), followed by Stage 2 hypertension (40%), and only 13.3% in the normal range. The mean blood pressure of 149.25 mmHg with an SD of 6.47 indicates that the control group also had predominantly elevated blood pressure levels prior to any intervention, suggesting comparable baseline characteristics between the two groups.

Section II B: Post-Test Blood Pressure Levels.

Table no. 2: Post-Test Blood Pressure Levels – Experimental Group and control group

	Experimental Group				Control Group			
Blood Pressure Level	**Frequency (f)**	**Percentage (%)**	**Mean (mmHg)**	**SD**	**Frequency (f)**	**Percentage (%)**	**Mean (mmHg)**	**SD**
Normal (<140/90)	28	46.7%	138.75	5.84	10	16.7%	148.90	6.33
Stage 1 (140–159/90–99)	22	36.7%			26	43.3%		

Stage 2 (≥160/100)	10	16.6%			24	40.0%		

(n = 60+60)

Tab.2 shows post-test evaluation of the experimental group demonstrated a marked improvement in blood pressure levels following the community-based intervention. Nearly 46.7% of participants achieved normal blood pressure, while 36.7% remained in Stage 1 hypertension and only 16.6% in Stage 2 hypertension. The mean blood pressure reduced to 138.75 mmHg with an SD of 5.84, indicating the effectiveness of the intervention in lowering blood pressure among hypertensive clients.

Post-Test Blood Pressure Levels – Control Group (n = 60)

In the control group, the post-test assessment revealed minimal changes in blood pressure levels compared to the pre-test. Only 16.7% of participants were in the normal range, while 43.3% remained in Stage 1 and 40% in Stage 2 hypertension. The mean blood pressure of 148.90 mmHg with an SD of 6.33 reflects that, without any intervention, most participants continued to experience elevated blood pressure.

SECTION III: Effectiveness of Community-Based Intervention

Comparison of Pre- and Post-Test Blood Pressure

Table no.3: Paired t-Test for Experimental Group **(n = 60)**

Test	Mean (mmHg)	SD	DF	t-value	p-value	Result
Pre-Test	148.25	6.42	59	15.92	0.0001	Significant
Post-Test	136.85	5.38				

Tab. 3 shows aired t-test for the experimental group showed a significant reduction in mean blood pressure after the community-based intervention. The pre-test mean was 148.25 mmHg (SD = 6.42), which decreased to 136.85 mmHg (SD = 5.38) post-test. The calculated t-value (15.92) with a p-value of 0.0001 confirmed the reduction was highly significant ($p < 0.05$). These findings indicate that the intervention effectively lowered blood pressure, shifting clients from Stage 1/2 hypertension toward the normal range through health education, lifestyle modification, and regular follow-up.

Table no. 4: Paired t-Test for Control Group **(n = 60)**

Test	Mean (mmHg)	SD	DF	t-value	p-value	Result
Pre-Test	149.25	6.47	59	0.85	0.398	Not Significant
Post-Test	148.90	6.33				

Tab. 4 shows that paired t-test analysis for the control group demonstrated minimal change in blood pressure over the same period. The pre-test mean blood pressure was 149.25 mmHg (SD = 6.47), which showed a slight decrease to 148.90 mmHg (SD = 6.33) in the post-test. The calculated t-value was 0.85, with a p-value of 0.398, which is statistically not significant at

$p < 0.05$. This indicates that, in the absence of any structured community-based intervention, blood pressure levels remained largely unchanged among hypertensive clients in the control group. This contrast with the experimental group highlights the effectiveness of the intervention program in achieving meaningful blood pressure reduction.

Table no.5: Post-Test Blood Pressure Comparison Between Experimental and Control Groups (n = 60 each)

Group	Mean (mmHg)	SD	DF	t-value	p-value	Result
Experimental Group	136.85	5.38	59	10.42	0.0001	Significant
Control Group	148.90	6.33				

Tab. 5 shows the combined post-test analysis showed that the experimental group had a significantly lower mean blood pressure (136.85 mmHg) compared to the control group (148.90 mmHg). The t-value of 10.42 with a p-value of 0.0001 indicates a highly significant difference between the groups at $p < 0.05$. This clearly demonstrates that the community-based intervention was effective in reducing blood pressure among hypertensive clients in the experimental group, while the control group exhibited minimal improvement.

SECTION IV: Association between Blood Pressure and Demographic Variables

Chi-Square Association of Demographic Variables with Blood Pressure Levels – Experimental Group (n = 60)

The chi-square test for the experimental group revealed that there was no statistically significant association between pre-test blood pressure levels and any of the 17 demographic variables ($p > 0.05$). Variables such as age, gender, marital status, educational level, occupation, family income, previous hypertension sessions, source of information, diet pattern, family type, and duration of hypertension, family history, medication use, physical activity, and smoking/alcohol history did not influence the distribution of blood pressure categories. This suggests that prior to the intervention; participants' blood pressure status was independent of their demographic characteristics.

Chi-Square Association of Demographic Variables with Blood Pressure Levels – Control Group (n = 60)

The shows In the control group, chi-square analysis also showed no significant association between pre-test blood pressure levels and the 17 demographic variables ($p > 0.05$). Demographic factors like age, gender, marital status, education, occupation, family income, prior exposure to hypertension education, dietary pattern, family type, duration of hypertension, medication status, family history, physical activity, and smoking/alcohol habits did not show a relationship with the blood pressure categories. This indicates that, similar to the experimental group, the distribution of blood pressure levels in the control group was independent of demographic characteristics at baseline.

DISCUSSION

This study assessed the effectiveness of community-based interventions in reducing blood pressure among hypertensive clients. A total of 120 participants were enrolled, with 60 in the experimental group and 60 in the control group, covering 17 demographic variables. Most

participants were aged 41–45 years, slightly more were male, and the majority were married, with undergraduate education. Many were homemakers, had a monthly income of ₹20,000–40,000, followed a mixed diet, lived in nuclear families, and had hypertension for 1–5 years, often with a positive family history. While most were on medication, nearly half engaged in regular physical activity, and about one-third reported smoking or alcohol use. Chi-square analysis showed no significant association between demographic factors and baseline blood pressure, indicating hypertension's multifactorial origins.

Pre-intervention assessment revealed poor blood pressure control, with over 80% in Stage 1 or Stage 2 hypertension. The experimental group recorded a mean pre-test blood pressure of 148.25 mmHg (SD = 6.42), and the control group 149.25 mmHg (SD = 6.47). After the intervention, the experimental group demonstrated a significant reduction to 136.85 mmHg (SD = 5.38), while the control group remained nearly unchanged at 148.90 mmHg (SD = 6.33). Paired t-test analysis confirmed a highly significant reduction in the experimental group ($t = 15.92$, $p < 0.0001$), with no meaningful change in controls.

The intervention's effectiveness was evident through a mean reduction of 11.4 mmHg in the experimental group. Post-test comparison further revealed a significant difference between groups ($t = 10.42$, $p < 0.0001$). These findings align with Bansal et al. (2020), highlighting that structured lifestyle interventions—including health education, dietary modification, and physical activity promotion—are effective for hypertension control. Notably, demographic variables did not influence outcomes, emphasizing the intervention itself as the key factor in lowering blood pressure.

CONCLUSION

The present study was conducted to evaluate the effectiveness of a community-based intervention on blood pressure among hypertensive clients. Hypertension continues to be a major public health problem, contributing significantly to cardiovascular morbidity and mortality. The findings of this study revealed that participants in the experimental group who received the intervention showed a significant reduction in both systolic and diastolic blood pressure levels when compared with the control group. This indicates that non-pharmacological, community-oriented approaches, when applied consistently, can complement medical management and improve outcomes.

The study further highlighted that lifestyle modifications such as dietary guidance, physical activity, stress reduction techniques, and health education are practical, feasible, and cost-effective strategies to empower individuals in managing their own health. These measures not only reduced blood pressure but also promoted awareness, self-care, and adherence to healthy practices.

In conclusion, the community-based intervention proved to be effective in lowering blood pressure among hypertensive clients. Incorporating such non-pharmacological strategies within routine healthcare delivery can reduce dependency on drugs, prevent complications, and enhance quality of life. The study emphasizes the importance of health professionals in promoting preventive and community-oriented care to address the growing burden of hypertension.

Conflict of interest

We hereby declare that we do not have any personal conflict of interest that may arise from our application and submission of our research proposal.

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