

A QUASI-EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF BEETROOT JUICE ON BLOOD PRESSURE AMONG PATIENTS WITH HYPERTENSION IN A SELECTED HOSPITAL, BHOPAL, M.P.

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ABSTRACT

A Quasi-Experimental study was conducted to examine the effect of Beetroot Juice on BP among patients with HTN. For this study, one group Pre and Post-test design was used. By using Purposive sampling technique, 30 subjects were selected. The main objective of the study was to evaluate the BP before and after providing intervention (Beetroot juice) among Hypertensive patients and the results were interesting the comparison of Mean of Pre-test and Post-test score of Systolic and Diastolic Blood Pressure among Hypertensive patients conveyed that the Pre-test SBP mean value was 140.86 and the Post-test SBP mean value was 135.23 and Pre-test DBP mean value was 89.06 Post-test DBP mean value was 85.83 This indicates that there is a significant difference in Systolic and Diastolic Blood Pressure after the administration of Beetroot juice.

Key words: BP (Blood Pressure), Hypertension, Hypertensive patients, SBP (Systolic Blood Pressure) and DBP (Diastolic Blood Pressure)

I- INTRODUCTION

Nowadays many are suffering from Hypertension, the medical term for High Blood Pressure. It has become a villain in every third person's life residing on Earth. And the fact is heart wracking that this villain is not getting defeated like in most 'Hindi cinema' does. It is an alarming state, a state to which we should act up fast. Beetroot helps to reduce high Blood Pressure effectively because it contains the high level of nitrates which get biologically transformed into nitrite (NO₂) and nitric oxide (NO) by the human body, this transformation helps to de-stress and widen blood vessels ultimately soothing high Blood Pressure of a Hypertensive patient. Because of the ill effects of High Blood Pressure on people, a simple dietary mediation that could be beneficial should research profoundly.

I.1 OBJECTIVE

- To evaluate the Blood Pressure before and after providing intervention among Hypertensive patients.
- To determine the association between pre-test scores of Blood Pressure and the selected socio-demographic variables among Hypertensive patients.

I.2 CONCEPTUAL FRAMEWORK OF THE STUDY

The conceptual framework provides a foundation for suggestions and relationship among variables. It is developed to explain which concepts contribute to the partial cause and outcome. The presentation of the framework provides a certain frame of reference for clinical practice, research and education.

I.2.1 GENERAL SYSTEM MODEL

The conceptual framework for this study was prepared using the general system model which consists of input, throughput and output.

I.2.2 MODIFIED GENERAL SYSTEM MODEL EXPLAINS:

- **Input** - The input, defined as any form of information and material that enters into the system through a boundary. In this study, it refers to the pre-test score of Blood Pressure
- **Throughput** - The throughput is the use of input, i.e., material and information for the maintenance of homeostasis of the system. Through dynamic interaction with the environment, the system changes information in different forms. In

this study, the throughput is to assess the effectiveness of Beetroot juice on Blood Pressure among patients with Hypertension in a selected hospital, Bhopal, M.P.

- **Output** - The output is any information or material that transferred to the environment. Here in this study, output refers to the assessment of the level of Blood Pressure after the intake of Beetroot juice which will be measured by the post-test scores.

CONCEPTUAL FRAMEWORK BASED ON GENERAL SYSTEM THEORY

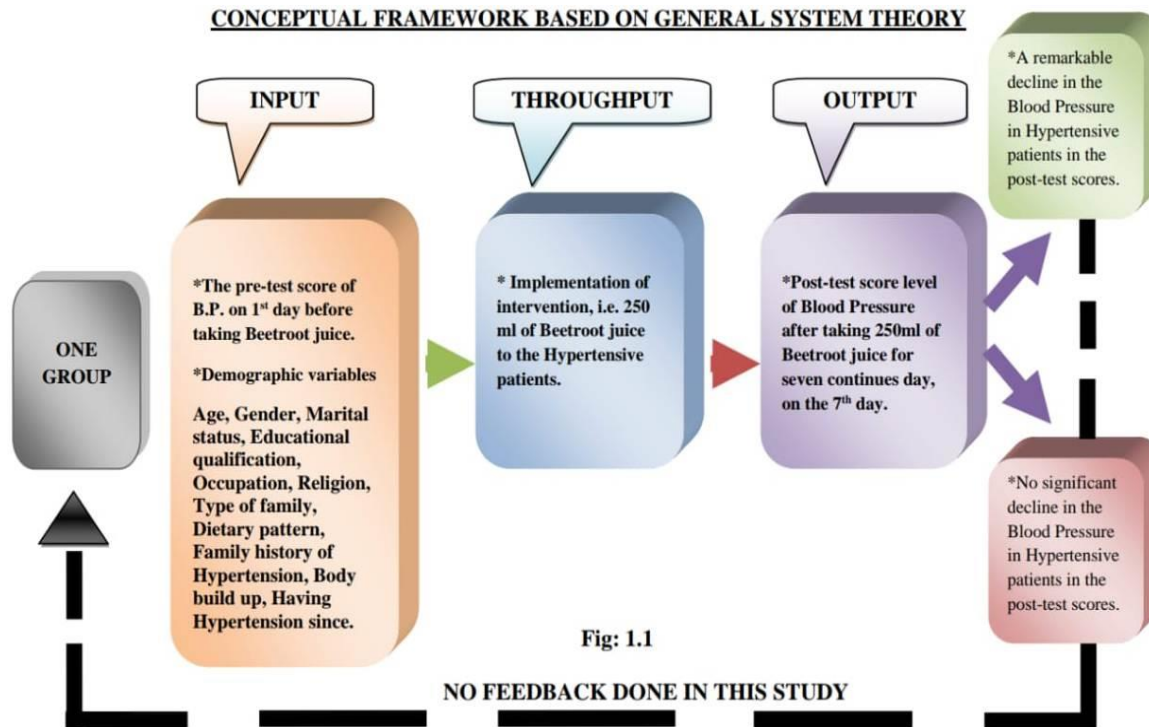


Fig: 1.1

In this study, no feedback was taken as it was not indicated.

II-METHOD

II.1 RESEARCH DESIGN

For the present study Quasi-experimental One group Pre and Post-test design was used.

ONE GROUP PRE AND POST-TEST DESIGN

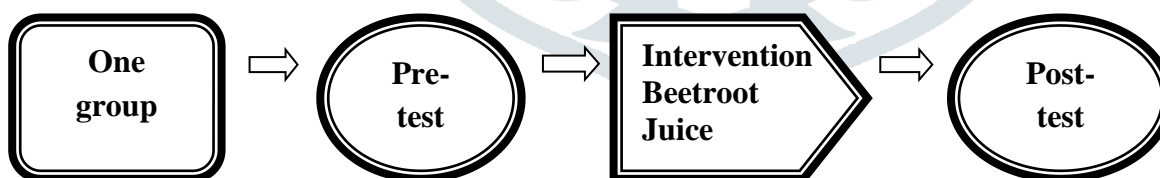


Diagram of Research design

Fig: 2.1

II.2 VARIABLES

- **Dependent Variables** : Blood Pressure (systolic and diastolic)
- **Independent Variables** : Beetroot juice, Sphygmomanometer
- **Attributed Variables** : Age, Gender, Marital status, Educational qualification, Occupation, Income per month, Religion, Type of family, Dietary pattern, Family history of Hypertension, Body build up, having Hypertension since.

II.3 SETTING OF THE STUDY

The setting of this study was a selected hospital in Bhopal i.e. People’s Hospital, Bhopal, M.P.

II.4 POPULATION OF THE STUDY

The population of the study comprised of the Hypertensive patients those who are taking treatment both in IPD and OPD in a selected hospital, Bhopal, M.P.

II.5 SAMPLE AND SAMPLE SIZE

In this study the sample size is 30 Prehypertensive and Stage 1 Hypertensive patients.

II.6 SAMPLING TECHNIQUE

Non-Probability Purposive sampling technique was followed in this study.

II.7 SAMPLING CRITERIA

II.7.1 Inclusion criteria includes

- Patients who are conscious and stable.
- Patients who are willing to participate in the study.
- Patients who come under the age group of 25-65 years.
- Both adult female and male Hypertensive patients.
- Patients who were taking antihypertensive treatment.
- Prehypertensive and Stage 1 Hypertensive patients.
- Patients, who can read, write or understand either English or Hindi.

II.7.2 Exclusion criteria includes

- Patients who don't fulfill the inclusion criteria given in this study.
- Patients who were not present at the time of providing intervention.
- Patients with diabetes mellitus.
- Patients on dialysis.
- Patients those who are allergic to beetroot.
- Patients having difficulty in swallowing.
- Pregnant women.

II.8 Description of the tool

The tool for data collection consists of the following parts.

II.8.1 Section I- A set of questionnaire dealing with socio-demographic variables such as age, gender, marital status, educational qualification, occupation, religion, type of family, dietary pattern, family history of Hypertension, body build up, having Hypertension since.

II.8.1 Section II- Instrument to assess Blood Pressure i.e. Sphygmomanometer.

II.9 DATA COLLECTION PROCESS

First, formal permission was obtained from the Medical Superintendent and the HOD Medicine Department at People's Hospital, Bhanpur, Bhopal, M.P. A total number of 30 samples under 25 to 65 years age group by inclusion criteria were selected. Established rapport and informed consent were taken from the participants after the researcher explained the study. Data such as baseline information, contributing factors and other information related to Hypertension was collected through socio-demographic questionnaire. The investigator conducted a pretest by checking Blood Pressure with the sphygmomanometer on the 1st day before providing intervention to the subjects. Immediately after the pre-assessment of Blood Pressure, 250ml of Beetroot juice was given for 7 days continuously. Then, on 7th day post-test was conducted by checking Blood Pressure with the same sphygmomanometer by the investigator.

II.9.1 STEPS OF THE PROCEDURE

- A moderate sized beetroot was taken; skin of beetroot was peeled off and chopped into small pieces.
- After that 100 g of chopped pieces of beetroot were put into a mixer-grinder machine and 50 ml of water was added to it. It was grinded for one minute. Grinded beetroot was mixed with 150 ml of water to get 250 ml of beetroot juice.
- After that Beetroot juice was transferred from the mixer-grinder machine, to fill the small bottle having the capacity of 250 ml.
- The investigator conducted a pretest by checking Blood Pressure with the sphygmomanometer on the 1st day before providing intervention to the subjects. Simultaneously after the pre-assessment of Blood Pressure, 250ml of Beetroot juice was given to take orally.
- For 7 days continuously, 250 ml of beetroot juice was provided to the subjects (once in a day) around 10 o'clock in the morning.
- On 7th day post-test was conducted after 2 hours of beetroot juice intake by the subject. Investigator assessed the Blood Pressure with the same sphygmomanometer which was used during pre-test.

III- RESULT AND DISCUSSION

III.1 The findings of the study discussed under the following headings:

III.1.1 Section A

Distribution of Hypertensive patients according to the socio-demographic variables.

III.1.2 Section B

Analysis of the difference between pre-test and post-test scores of Blood Pressure of the Hypertensive patients.

III.1.3 Section C

Associations between pre-test scores of Blood Pressure and the selected socio-demographic variables among Hypertensive patients.

III.1.1 SECTION A

DISTRIBUTION OF HYPERTENSIVE PATIENTS ACCORDING TO THE SOCIO-DEMOGRAPHIC VARIABLES

The socio-demographic data has been presented in terms of Frequency and Percentage distribution.

The findings of the study are as follows:

- The frequency and percentage distribution according to Age of the participants, represented that **5 (16.7%)** were in the age group of 25-35 Yrs, **13 (43.3%)** were in the age group of 36-45 Yrs, **8 (26.7%)**, were in the age group of 46-55 and **4 (13.3%)** were in the age group of 56-65 Yrs.
- The frequency and percentage distribution according to Gender of the participants, revealed that majority **20 (66.7%)** were male, and rest **10 (33.3%)** were female.
- The frequency and percentage distribution according to Marital Status of the participants, showed that majority **18 (60%)** were married, **6 (20%)** were unmarried, **5 (16.7%)** were widow and **1 (3.3%)** was divorced.
- The frequency and percentage distribution according to Educational Qualification of the participants, represented that majority **11 (36.7%)** were graduates and above, **10 (33.3%)** had secondary education, **6 (20%)** had primary education, and **3 (10%)** were illiterate.
- The frequency and percentage distribution according to Occupation of the participants, showcased that majority **20 (66.7%)** were employed, **4 (13.3%)** four were homemaker, **3 (10%)** were unemployed, and **3 (10%)** were retired.
- The frequency and percentage distribution according to Religion of the participants, conveyed that majority **20 (66.7%)** were Hindu, **8 (26.7%)** were Muslim, and **2 (6.6%)** were Christian.
- The frequency and percentage distribution according to Type of Family of the participants, showed that majority **17 (56.7%)** were having a nuclear family and rest **13 (43.3%)** were having a joint family.
- The frequency and percentage distribution according to Dietary Pattern of the participants, represented that **15 (50%)** were vegetarian, and **15 (50%)** were non-vegetarian.
- The frequency and percentage distribution according to the Type of Body Build-Up of the participants, showed that majority **12 (40%)** were overweight, **9 (30%)** had normal weight, **5 (16.7%)** were obese, and **4 (13.3%)** were underweight.
- The frequency and percentage distribution according to the History of Hypertension of the participants, conveyed that majority **19 (63.3%)** were in the group of 0-5 Yrs, **9 (30%)** were in the group of 6-10 Yrs, and **2 (6.7%)** were in the group of 11-15 Yrs.
- The frequency and percentage distribution according to the Family History of Hypertension of the participants, represented that majority **16 (53.3%)** were having the family history of Hypertension and **14 (46.7%)** were not having a family history of Hypertension.

III.1.2 SECTION B

ANALYSIS OF THE DIFFERENCE BETWEEN PRE-TEST AND POST-TEST SCORES OF BLOOD PRESSURE OF THE HYPERTENSIVE PATIENTS.

Comparison of Mean and Standard Deviation of Pre-test and Post-test score of Systolic Blood Pressure among Hypertensive patients through Un-paired t-test.

N=30

Systolic Blood Pressure	Mean	SD	t-test value	df	Level of Significance
Pre-Test	140.86	9.82	10.13	29	.000* P<0.05
Post-Test	135.23	10.02			

Table: 3.1

Description: The data in the above Table: 3.1, represents that the **Pre-test SBP** (Systolic Blood Pressure) **Mean** value was **140.86** with **SD** (Standard deviation) **9.82** and the **Post-test SBP Mean** value was **135.23** with **SD 10.02** . The **t-test** value **10.13** was greater than the **Table value 2.04** at the **Significance level P<0.05**, this indicates that there is a significance difference in Systolic Blood Pressure after the administration of Beetroot juice.

Comparison of Mean and Standard Deviation of Pre-test and Post-test score of Diastolic Blood Pressure among Hypertensive patients through Un-paired t-test.

N=30

Diastolic Blood Pressure	Mean	SD	t-value	df	Level of Significance
Pre- Test	89.06	6.36	6.52	29	.000* P<0.05
Post- Test	85.83	7.31			

Table: 3.2

Description: The data in the Table:3.2, represents that the **Pre-test DBP** (Diastolic Blood Pressure) **Mean** value was **89.06** with **SD** (Standard deviation) **6.36** and the **Post-test DBP Mean** value was **85.83** with **SD 7.31** . The **t-test** value **6.52** was greater than the **Table value 2.04** at the **Significance level P<0.05**, this indicates that there is a significance difference in Diastolic Blood Pressure after the administration of Beetroot juice.

Distribution of Pre-test and Post-test scores of Blood Pressure among Hypertensive patients.

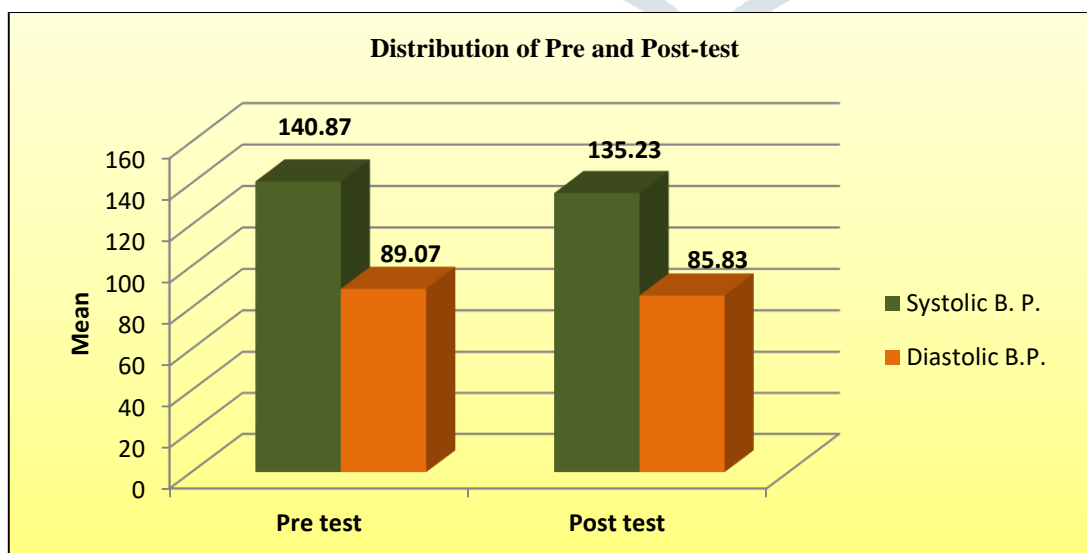


Fig: 3.1

The Figure 3.1 represents the comparison of mean of the Pre-test and Post-test scores among the Hypertensive patients. **Pre-test Mean for SBP is 140.87** and **Post-test Mean for SBP is 135.23**, **Pre-test Mean for DBP is 89.07** and **Post-test Mean for DBP is 85.83**.

III.1.3 SECTION-C

ASSOCIATIONS BETWEEN PRE-TEST SCORES OF BLOOD PRESSURE AND THE SELECTED SOCIO-DEMOGRAPHIC VARIABLES AMONG HYPERTENSIVE PATIENTS

Associations between pre-test scores of Blood Pressure and the selected socio-demographic variables among Hypertensive patients.

The finding depicts that out of 11 (Eleven) selected socio-demographical variables, 2 (Two) variables were found, that had a significant association with the pre-test scores of Blood Pressure among Hypertensive patients are as follows:

- One was the demographical variable 'Age in years.'
- Another one was the demographical variable 'Having Hypertension since.'

CONCLUSION

The study highlights the capableness of beetroot juice which is the best dietary nitrate source for the individuals who suffer from High Blood Pressure.

Modern medical science tackles High Blood Pressure with too pricey medications and routine medical checkups which seems to be challenging for many people. Thus, a better tribute to this health problem is Beetroot juice. Corresponding therapies like dietary therapy are salutary in the treatment of Hypertension along with antihypertensive medications, which in turn resists Hypertension as one of the significant burdens of disease in developing and developed countries.

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