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A Study to Assess the Effectiveness of an Intervention on Dietary Habits among Prehypertensive Church Workers in Selected Community Wards of Nagercoil Town, Kanyakumari District

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Abstract: ***Prehypertension is a precursor to hypertension and is associated with an increased risk of cardiovascular diseases. Early identification and lifestyle modifications, such as relaxation exercises and healthy dietary habits, can help prevent its progression to hypertension. This study aimed to assess the effectiveness of relaxation exercise and dietary habit intervention among prehypertensive church workers in selected community wards of Nagercoil Town, Kanyakumari District. A quasi-experimental pre-test and post-test control group design was adopted. Sixty prehypertensive adults were selected using a non-probability convenient sampling technique and divided into an experimental group (n=30) and a control group (n=30). The experimental group received relaxation exercise training and dietary habit intervention, while the control group received no intervention. Blood pressure was assessed before and after the intervention. The findings revealed a significant reduction in both systolic and diastolic blood pressure among participants in the experimental group ($p < 0.001$), whereas no significant change was observed in the control group. The study concluded that relaxation exercises combined with dietary habit modification are effective, simple, cost-effective, and non-pharmacological measures for reducing blood pressure and preventing hypertension among prehypertensive adults.***

Keywords: Prehypertension, Relaxation Exercise, Dietary Habits, Blood Pressure Management, Lifestyle Modification, Effectiveness.

1. Introduction

Hypertension is a major public health problem and one of the leading causes of death and disability worldwide. Prehypertension, defined as a systolic blood pressure of 120–139 mmHg or diastolic blood pressure of 80–89 mmHg, is an early warning stage that increases the risk of developing hypertension and cardiovascular diseases. Studies across the world, India, Tamil Nadu, and Kanyakumari district have reported a high prevalence of prehypertension, with factors such as obesity, physical inactivity, excessive salt intake, smoking, alcohol consumption, and family history contributing significantly to its occurrence. Early identification and lifestyle modifications, including regular exercise, healthy diet, stress management, and relaxation techniques, can effectively prevent the progression of prehypertension to hypertension.

Hypertension affects millions of people globally and is expected to increase further in the coming years. In India, a large proportion of adults with raised blood pressure remain undiagnosed, increasing the risk of heart attack, stroke, and other cardiovascular complications. Evidence suggests that regular physical activity, healthy dietary habits, and relaxation exercises can help control blood pressure and reduce cardiovascular risk. During community postings, the investigator observed that many individuals with prehypertension were unaware of its risk factors and preventive measures. Therefore, the study was undertaken to assess and manage blood pressure among individuals with prehypertension in the Nagercoil town area through appropriate lifestyle interventions.

2. Objectives of the study

- To assess and compare the Pre and post-test score of blood pressure among experimental and control group.
- To assess and compare the Pre and post-test score of dietary habits among the experimental and control group.
- To associate the pre- test score of blood pressure with selected demographic variables.
- To associate Pre-test score of dietary habits with demographic variables.

3. Hypotheses

All the hypothesis was tested at 0.05 level of significance
H1: There is significant difference between the pre and post-test score of blood pressure among the experimental and control group.
H2: There is a significant difference in the pre and post-test score of dietary habits between the experimental and control group.
H3: There is a significant association between pre-test score of blood pressure and selected demographic variables.
H4: there is a significant association between pre-test score of dietary habits and selected demographic variables.

4. Methodology

This study adopted a quantitative research approach using a quasi-experimental pre-test and post-test control group design to assess the effectiveness of a muscle relaxation intervention on prehypertension and dietary habits among church workers.

The study was conducted in Nagercoil Town Panchayat among clients with prehypertension (BP 120–139/80–89 mmHg). A total of 60 participants were selected through non-probability convenience sampling. The independent variable was the muscle relaxation technique, while the dependent variable was dietary habits. Influencing variables included age, gender, education, occupation, religion, marital status, income, family type, and dietary pattern.

Data were collected using a structured tool consisting of:

- **Section A:** Demographic and clinical variables.
- **Section B:** Blood pressure assessment using a sphygmomanometer.
- **Section C:** Questionnaire on blood pressure management, including diet, exercise, medication, follow-up, and relaxation practices.

The intervention included health education on prehypertension, its causes, risk factors, complications, lifestyle modifications, diet, exercise, relaxation techniques, and sleep management. The tool and intervention were validated by experts in community health nursing, statistics, physiotherapy, nutrition, and counselling. Reliability was established through the inter-rater reliability method.

A pilot study was conducted to assess the feasibility and practicability of the research and confirmed that the study was feasible. Data collection was carried out from 01.06.2022 to 15.06.2022 after obtaining necessary permissions and informed consent. The experimental group received health education and relaxation exercise training for one week, while the control group received routine care. Post-tests were conducted on the 7th and 14th days.

Data were analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation. Ethical approval was obtained from the Institutional Ethical Committee, and informed consent was secured from all participants before data collection.

5. Findings

This chapter presents the analysis and interpretation of data collected from 60 pre-hypertensive adults (30 experimental and 30 control group) to assess the effectiveness of muscle relaxation techniques on blood pressure and dietary habits.

Section I: Sample Characteristics

Among the participants, the majority in both groups belonged to the 30–39 years' age group. All participants were male Christians employed in the private sector. Most had professional education, belonged to nuclear families, and received health information through internet/social media. The majority had normal BMI (18.5–24.9), no family history of hypertension, followed a non-vegetarian diet, consumed limited salt, and were moderately physically active.

Table 1: Comparison of Pre-test and Post-test Blood Pressure in Experimental and Control Groups

Blood Pressure	Group	Pre-test Mean ± SD	Post-test Mean ± SD	Mean Reduction	t-value	p-value
SBP	Experimental	129.6 ± 4.3	121.6 ± 2.9	7.9 ± 1.8	22.71	<0.001*
DBP	Experimental	81.5 ± 3.3	79.7 ± 2.8	1.8 ± 1.3	7.992	<0.001*
SBP	Control	128.2 ± 4.3	128.5 ± 4.4	0.3 ± 0.6	2.523	0.017
DBP	Control	81.5 ± 3.5	81.3 ± 3.6	0.2 ± 1.0	1.14	0.264

*Significant at $p < 0.05$

The experimental group showed a statistically significant reduction in both systolic and diastolic blood pressure after muscle relaxation intervention, whereas the control group showed no meaningful improvement.

Table 2: Comparison of Post-test Blood Pressure Between Experimental and Control Groups

Variable	Experimental Mean ± SD	Control Mean ± SD	t-value	p-value
Post-test SBP	121.6 ± 2.9	128.5 ± 4.4	6.04	<0.001*
Post-test DBP	79.9 ± 2.8	81.3 ± 3.6	2.131	0.036*

*Significant at $p < 0.05$

The post-test blood pressure scores were significantly lower in the experimental group compared with the control group, indicating the effectiveness of muscle relaxation techniques.

Table 3: Significant Association Between Blood Pressure and Selected Variables

Variable	Experimental Group	Control Group
Age	Significant	Significant
Family History of Hypertension	Significant	Significant
BMI	Significant	Significant
Salt Intake Per Day	Significant	Significant

Age, family history of hypertension, BMI, and salt intake were significantly associated with blood pressure levels in both groups.

The findings revealed that muscle relaxation techniques were effective in reducing both systolic and diastolic blood pressure among pre-hypertensive adults. Significant associations were found between blood pressure and age, family history of hypertension, BMI, and salt intake. The study supports the use of muscle relaxation techniques as a simple and effective non-pharmacological intervention for managing prehypertension.

6. Results and Discussion

This chapter presents the major findings of the study on the effectiveness of muscle relaxation techniques in reducing blood pressure among pre-hypertensive adults.

Sample Characteristics

The study included 60 pre-hypertensive adults (30 in the experimental group and 30 in the control group). Most participants were aged 30–39 years, male, Christian, professionally educated, privately employed, and belonged to

nuclear families. The majority had a monthly income between ₹15,001–25,000 and obtained health information through internet/social media.

Most participants had a normal BMI (18.5–24.9), no family history of hypertension, followed a non-vegetarian diet, consumed one teaspoon of salt per day, were moderately physically active, and reported no alcohol or tobacco use.

Assessment and Comparison of Blood Pressure
Before the intervention, both groups had similar systolic and diastolic blood pressure levels. After the intervention, the experimental group showed a marked reduction in blood pressure, whereas the control group showed minimal change.

1) Experimental Group:
   - Mean SBP reduced **from 129.6 ± 4.3 mmHg to 121.6 ± 2.9 mmHg.**
   - Mean DBP reduced **from 81.5 ± 3.3 mmHg to 79.7 ± 2.8 mmHg.**
   - The reduction was highly significant **($p < 0.001$).**
2) Control Group:
   - No significant reduction in blood pressure was observed.

These findings indicate that muscle relaxation techniques were effective in reducing blood pressure among pre-hypertensive adults.

Effectiveness of the Intervention
Comparison of post-test scores showed that the experimental group had significantly lower systolic and diastolic blood pressure than the control group.
1) Post-test SBP:
   - Experimental: **121.6 ± 2.9 mmHg**
   - Control: **128.5 ± 4.4 mmHg**
   - Significant difference (**$p < 0.001$**)
2) Post-test DBP:
   - Experimental: **79.9 ± 2.8 mmHg**
   - Control: **81.3 ± 3.6 mmHg**
   - Significant difference **($p < 0.05$)**

The findings support the research hypothesis that muscle relaxation techniques are effective in controlling blood pressure among pre-hypertensive adults.

4. Association Between Blood Pressure and Demographic Variables
A significant association was found between pre-test blood pressure scores and:
- Age
- Family history of hypertension
- Body Mass Index (BMI)
- Salt intake per day

No significant association was found with other demographic variables.

7. Nursing implications

7.1 Nursing Education

- Nursing curriculum should emphasize prevention and management of pre-hypertension.
- Students should be trained in health education and IEC (Information, Education and Communication) programmes.
- Knowledge regarding national health programmes for hypertension prevention should be updated regularly.

7.2 Nursing Practice

- Nurses should educate patients about lifestyle modifications and blood pressure control.
- Individualized counselling can improve adherence to treatment and reduce cardiovascular risks.
- Regular hypertension awareness and management programmes should be conducted in hospitals and communities.

7.3 Nursing Administration

- Nurse administrators should promote guidelines and educational programmes on pre-hypertension management.
- In-service education should be organized to update nurses' knowledge.
- Nursing staff and students should be encouraged to participate in blood pressure management programmes.

7.4 Nursing Research

- Further research can be conducted on pre-hypertension management using larger samples and different interventions.
- The findings can serve as baseline data for future studies and evidence-based nursing practice.
- Research on health education and IEC programmes related to other health issues is recommended.

8. Conclusion

The study demonstrated that muscle relaxation techniques were effective in reducing blood pressure among pre-hypertensive adults. The findings highlight the importance of lifestyle modification and non-pharmacological interventions in preventing the progression of hypertension.

9. Recommendations

- Similar studies can be conducted with larger sample sizes.
- Comparative studies can be carried out using different teaching or intervention methods.
- Further research can evaluate the effectiveness of muscle relaxation techniques in different settings and populations.

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