IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 3, Issue 4 Ver. II (Jul-Aug. 2014), PP 01-06
www.iosrjournals.org

Effectiveness of Progressive Muscle Relaxation Technique on Stress and Blood Pressure among Elderly with Hypertension

*Kumutha V, **Dr.Aruna S, **Poongodi R
**Student (MSN), College of Nursing, Sri Ramachandra University, Porur, Chennai, Tamil Nadu, India.*
***Reader (MSN), Faculty of Nursing, Sri Ramachandra University, Porur, Chennai, Tamil Nadu, India*
*** Asst.Professor (MSN), Faculty of Nursing, Sri Ramachandra University, Porur, Chennai, Tamil Nadu, India*

Abstract:
Context: *The old age is a crucial phase where the physiological, psychological and socio-cultural changes in elderly contribute to the development of stress. 236 elderly people per ten thousand suffer from mental illness mainly due to stress, heart disease, stroke and cancer. Practice of progressive muscle relaxation (PMR) is the simplest and effective method to decrease muscle tension, reduce the stress and to lower blood pressure.*
Aims: *This study aimed to assess the level of stress and blood pressure among elderly with hypertension, evaluate the effectiveness of progressive muscle relaxation technique on stress and blood pressure among elderly with hypertension, identify the relationship between the stress level and blood pressure level among elderly with hypertension and associate the stress and blood pressure with the demographic variables among elderly with hypertension.*
Materials and methods: *Research design adopted for the study was an experimental pretest posttest control group design. The study was conducted in selected villages of rural health and training centre of SRMC & RI at vayalanallur. Sixty elderly with hypertension in the age group of 60-70 years who are having mild and moderate level of stress and blood pressure. Background variables were collected. Stress level was assessed by perceived stress scale (PSS) and blood pressure was measured by sphygmomanometer. The study group (n=30) demonstrated the progressive muscle relaxation technique for 20 minutes for 21 days. Control group followed routine activities. The data were collected at four phases: The survey (pretest), demonstration of PMR, practice of PMR for 21 days, posttest on the 22ndday after intervention. During posttest the stress and blood pressure were measured.*
Results: *There were considerable variations in level of stress and blood pressure in the posttests as viewed with the pretest score of the study group at*
$P<0.001$. The outcome showed substantial variations in the study group which when compared with the control group at $p<0.001$ on stress, systolic blood pressure and $p<0.05$ on diastolic blood pressure.
Conclusion: *The result highlighted PMR to be an effective method to decrease the stress and blood pressure among elderly with hypertension.*
Keywords: *Progressive muscle relaxation technique, stress and blood pressure.*

I. Introduction

The population of India is 1.039 billion. Nearly 81 million constitute the elderly. According to WHO (2010) 524 million people were aged 65 years in the world's population. In India, most of the elderly people suffer from any one form of mental illness like depression and dementia. Magnitudes of health problems are high among old age patients. These health problems are caused by long-term stress in elderly, either directly or as a psychological reaction to the illness**.** According to Mayo clinic, Arizona (2010) stress can raise the blood pressure. If stressful situations extended over a time, they may have an elevated risk for high blood pressure. WHO (2012) reported that in the world 972 million people to be suffer from hypertension. Praveen Chandra (2012) stated that hypertension occurs in more than two thirds of individuals after the age of 65. The increased blood pressure was a danger condition that caused nearly 51% of death from strokes and 45% by coronary artery disease. Relaxation techniques have been reported to reduce stress and hypertension. Among the various relaxation techniques, the practice of progressive muscle relaxation (PMR) is the simplest and effective method to decrease muscle tension, reduce the level of stress, lower blood pressure.

II. Method

The study objectives was to assess the level of stress and blood pressure among elderly with hypertension, evaluate the effectiveness of Progressive Muscle Relaxation technique on stress and blood pressure among elderly with hypertension, identify the relationship with in stress and blood pressure among

elderly with hypertension and associate stress and blood pressure with the selected demographic variables among elderly with hypertension.

In order to accomplish the objective of the study; the hypotheses were formulated and tested.

H1- There was a significant difference in the stress among elderly with hypertension who practiced Progressive Muscle Relaxation technique than those who do not.

H2 There was a significant difference in the systolic blood pressure among elderly with hypertension who practiced Progressive Muscle Relaxation technique than those who do not.

H_3- There was a significant difference in the diastolic blood pressure among elderly with hypertension who practiced Progressive Muscle Relaxation technique than those who do not.

A. Design: Research design adopted for the study was an experimental pretest posttest control group design. The study had two arms a study group and a control group. The random selection was used to select two villages from nine villages of Rural Health and Training Centre of SRMC & RI at Vayalanallur. After selection of two villages the researcher prepared chit with study group or control group written upon them and requested one of the subject to pick a piece of lot that determined either assignment to study or control group. The Vayalanallur village population for the study group and Anaikattucherry village population for the control group were selected. Elderly with hypertension who satisfied the inclusion criteria become samples.

The researcher initially established rapport with the study participants and the purpose of the interview was explained to each participant. The consent was obtained from the study participants. The study participants were explained about progressive muscle relaxation in Tamil separately and privately in home setting.

A house to house survey was conducted to get the list of all elderly with hypertension and stress in the age group of 60-70 years from Vayalanallur and Anaikattucherry. Survey conducted for the study and control groups for 1st four days of data collection. During survey demographic variables, stress and blood pressure were assessed for all elderly with hypertension. There were 68 elderly in the study village and 50 elderly in the control village identified to fulfilled inclusion criteria. The investigator selected randomly a sample of 30 elderly from study village and 30 elderly from control village by lottery method. Survey score itself was considered as pretest score.

Progressive muscle relaxation technique was demonstrated to the study group participants by the investigator as a group session, each group consisted of 10 members, with small introduction about stress and hypertension, the steps, general instructions for performing PMR and the advantages of PMR were explained, Followed by that PMR was demonstrated by the investigator. Then return demonstration by all the study participants were performed under supervision of investigator. Each session of PMR lasted for 30 minutes. PMR was not given for the control group and they were requested to follow routine measures.

Progressive muscle relaxation technique was practiced by study subjects in the morning as a group session, each group consisted of 10 members under the supervision of investigator for 21 days at community hall, vayalanallur.

Post test was conducted for the study and control groups on the 22nd day after intervention. During post test stress and blood pressure were assessed. The Investigator used the same sphygmomanometer each time for all the participants, on the same hand and same time.

B. Method of data collection:

The tool consisted of three parts: part I: background variables: section A- demographic variables, section B- personal variables, part II: clinical variables and part III: perceived stress scale. The perceived stress scale was used to assess the level of stress and blood pressure was measured by sphygmomanometer. All the instruments were reviewed for content validity by nursing experts and they were pilot tested to assess the usability and ease administration. PSS is a standardized tool. The original tool has established validity. The adapted tool was translated in to Tamil and back translated into English. The Tamil version of PSS was tested using the interator reliability method. Pearson's product moment correlations was used to obtain the reliability which showed a significant correlation (r=0.82). Blood pressure was measured by sphygmomanometer. The reliability of the instrument was established by test retest method. The test retest reliability score for sphygmomanometer was r = 0.92. Since these tools were found to be reliable and valid they were used further to proceed with the data collection to the study.

C. Conceptual framework for the study;

The conceptual framework of this study is based on Imogene King's theory of goal attainment (1981). This framework based on the assumption that elderly are open to three interacting systems which include, personal system, Interpersonal systems and social system.

With regard to the personal system the investigator assess the level of stress and blood pressure before and after practice of PMR. In the interacting system the elderly with hypertension and the investigator

maintained verbal and non verbal communication to assess the demographic variables, level of stress and blood pressure to the study and control group. Goal setting in this study, the investigator and the elderly identify the goals to reduce stress and blood pressure.

In this study action is the investigator takes the action of practicing PMR to the elderly in the study group once a day for 21 days and elderly in the control group were instructed to follow their lifestyle pattern.

The reaction is the investigator evaluated the effectiveness of PMR on stress and blood pressure. There was a significant change in stress and blood pressure in the study group and there was no significant change in stress and blood pressure in the control group.

D. Manipulation:

The intervention (PMR) was demonstrated by the investigator on the 1st day and practice of progressive muscle relaxation technique once a day for 21 days as a group session, each group consisted of 10 members. The PMR was practiced under the supervision of investigator as a group session, in community hall, at Vayalanallur. PMR consisted of two processes namely tensing and relaxing of muscle groups in the body, tensing for 5 seconds and relaxation for 10 seconds. This technique starting with the forearm and upper arm of the right hand, forearm and upper arm of the left hand, forehead, eyes, cheek, mouth jaw, neck, shoulder, back, chest, stomach, buttocks, right and left upper leg, right and left lower foot.

E .Control group:

Elderly with hypertension selected for the control group instructed to follow routine activities which included taking regular medications, regular BP checking and dietary management and the assessments at the same intervals as that of the study group. The control group elderly with hypertension received same intervention after the completion of the study.

F .Data collection:

The data collection procedure was collected from 17.06.13 to 16.07.13 (four weeks). The study was conducted in 4 phases that is survey and pretest on first four days of data collection, demonstration of PMR, and practice of PMR for 21 days and posttest on 22 nd day intervention.

G. Data Analysis plan:

Descriptive statistics was used to describe and synthesize data. Inferential statistics was used to analyse the collected data.

III. Results

A. **Comparison of stress among elderly with hypertension**

Table 1 depicts the comparison of pretest seven (23%) had mild and 23 (77%) had moderate stress in the study group whereas in control group six (20%) had stress and 24 (80%) had moderate stress. During posttest 11 (37%) had mild and 19 (63%) had moderate stress in the study group and whereas in control group three (10%) had mild and 27 (90%) had moderate stress.

B. Comparison of level of systolic blood pressure among elderly with hypertension

Table 2 explicit, the comparison of pretest 25 (83%) elderly in the study and control groups had mild systolic blood pressure respectively. five (17%) elderly each in the study and control groups had moderate systolic blood pressure respectively. During posttest 12 (40%) had normal, 17 (57%) had mild and only one (3.3%) had moderate systolic blood pressure in the study group and In the control group none of them had normal, 24 (80%) had mild and 6 (20%) had moderate systolic blood pressure.

C. Comparison of level of diastolic blood pressure among elderly with hypertension

Table 3 shows the comparison of pretest 26 (87%) had mild and four (13%) had moderate diastolic blood pressure in the study group whereas in control group 25 (83%) had mild and five (17%) had moderate diastolic blood pressure. Comparison of posttest 10 (33%) had normal, 20 (67%) had mild and no one had moderate diastolic blood pressure in the study group. In the control group none of them had normal, 24 (80%) had mild and 6 (20%) had moderate diastolic blood pressure.

4. Comparison of mean difference scores of stress, systolic & diastolic Blood pressure among the elderly with hypertension

Table 4 revealed the mean difference scores of stress, systolic and diastolic blood pressure. Regarding the stress the mean difference score was 3.94 with standard deviation 1.01 in the study group and it was 0.001 with standard deviation 0.30 in the control group. With respect of systolic blood pressure to the mean difference

score was 9.00 with standard deviation 4.02 in the study group and it was 0.34 with standard deviation of 1.82 in the control group.

Regarding the diastolic blood pressure to the mean difference score was 8.00 with standard deviation 6.64 in the study group and it was 1.00 with standard deviation 3.05 in the control group. There was a high statistically significant difference between the study and the control groups at $p<0.001$ on stress and systolic blood pressure and $p<0.05$ on diastolic blood pressure.

An association was found in the study group between stress and education during the posttest at level of $p<0.05$, body mass index $p<0.01$ and duration of hypertension at $p<0.05$.

An association was found in the study group and control group between the systolic blood pressure and the gender during posttest at the level of $p<0.01$.

Table 1. Comparison of level stress among the elderly with hypertension in the study and the control group (N=60)

	Study group (n=30)		Control group (n=30)			Study group (n=30)		Control group (n=30)		
	No.	%	No.	%		No.	%	No.	%	
0-11 (Mild)	07	23	06	20	0.1	11	37	03	10	5.96
	23	77	24	80		19	63	27	90	

NS = Non significant, *p<0.05

Table 2. Comparison of level of systolic blood pressure among the elderly with Hypertension in the study group and the control group (N=60)

Level of Systolic Blood pressure	Pretest				χ^2 P value	Posttest				χ^2 p value
	Study group (n=30)		Control group (n=30)			Study group (n=30)		Control group (n=30)		
	No.	%	No.	%		No.	%	No.	%	
Systolic BP										
120-139 (Normal)	00	00	00	00	0.12	12	40	00	00	16.77
140-160 (Mild)	25	83	25	83	1.00 (NS)	17	57	24	80	0.002 **
161-180 (Moderate)	05	17	05	17		01	03	06	20	

NS = Non significant, **p<0.01

Table 3. Comparison of level of diastolic blood Pressure among the elderly with Hypertension in the study group and the control group (N=60)

Level of Diastolic Blood pressure	Pretest				χ^2 p value	Posttest				χ^2 p value
	Study group (n=30)		Control group (n=30)			Study group (n=30)		Control group (n=30)		
	No	%	No	%		No	%	No	%	

Diastolic BP										
80–89										
(Normal)		0	00	00	0.13	10	3	00	0	16.36
90-100	00	0	25	83	0.17 (NS)	20	3	24	0	0.03*

NS = Non significant, *p<0.05

Table 4. Comparison of mean difference scores of stress, systolic & diastolic Blood pressure among the elderly with hypertension between the study group and the control group (N=60)

Stress	Study group (n=30)		Control group (n=30)		Independent 't' & ' 'p' value
	MD	SD	MD	SD	
Stress	3.94	1.01	00.1	0.30	49.26 0.0001 ***
Systolic BP	9.00	4.02	0.34	1.82	14.73 0.0001***
Diastolic BP	8.00	6.64	1.00	3.05	2.32 0.026 *

* P<0.05, ***p<0.001

IV. Discussion

Characteristics of the study samples

The 60 elderly people were selected 30 study and 30 control group. Most of them (66.7%) in the study group and (60%) in the control group were females. With regard to age, 67% of them in the study group and 60% of them in the control group were in the age group of 60-65 years. The educational status revealed that 53.3% in the study group and 77% in the control group had no formal education.

With respect to marital status in the study group majority were married (60%) but in the control group nearly half of them were widowed (43%); because of this a statistical difference existed between the groups, even though the design was true experiment the researcher had no control on that the researcher recommends to control the difference by matching important confounding variables such as economic status and marital status. In the current study a difference existed in economic status also, in the study group most of them were partially independent (60%) but in the control group mostly (60%) were dependent on the family.

With regard to type of family 50% in the study group and 57% in the control group were from nuclear family. The personal variables of elderly with hypertension, the data revealed that majority of them to the mixed vegetarian; 73% in the study group and 93% in the control group.

With respect to body mass index 10% in the study group and 26.7% in control group were overweight (18.5% of them were overweight).

The study group's mean difference score on stress between pretest & posttest was 3.94±1.01 and paired 't'value was 5.59 at the level of p<0.001. Whereas in control group on stress between pretest & posttest was 00.1±0.30 and paired't' value was 0.123 at the level of p>0.05. The findings suggest the beneficial effects of progressive muscle relaxation technique on reducing stress among geriatric population.

The study group's mean difference score on systolic blood pressure between pretest and posttest was 9.00±4.02 mm Hg and paired't' value was 4.10 at the level of p<0.001. The findings suggest the beneficial effects of progressive muscle relaxation technique on reducing systolic blood pressure among geriatric population. In the control group the mean difference score on stress between pretest & posttest was 0.34±1.82 mm Hg and paired't' value was 0.15 at the level of p>0.05.

The mean difference score on diastolic blood pressure in the study group between pretest & posttest was 8.00±6.64 mm Hg and paired't' value was 6.45 at the level of p<0.05. The findings suggested that beneficial effects of progressive muscle relaxation technique on reducing diastolic blood pressure among geriatric population. In the control group pretest & posttest was 1.00±3.05 mm Hg and paired't' value was 0.71 at the level of p> 0.05, hence the difference was not statistically significant.

The study results were similar to the study conducted by Hahn.K and Kim.S (2006) on effects of Progressive Muscle Relaxation Technique (PMR) on hypertension. Underline blood pressure was measured four times for the both the groups by once in two weeks. For the study group, blood pressure was measured twice before and after each of the eight sessions of PMR training. A significant decline was noted in the systolic blood pressure by 20.6 mmHg and the diastolic blood pressure by 14.4 mmHg was observed in the study group. The findings suggested the beneficial effects of progressive muscle relaxation technique on reducing blood pressure among elderly.

The study revealed there was an association found in the study group between stress and education in the posttest at the level of $p<0.04$, between the stress and the body mass index in the posttest at the level of $p<0.004$ and duration of hypertension at $p < 0.02$.

There was an association found in the study group between systolic blood pressure and gender in posttest at the level of $p<0.002$.

V. Nursing Implications

Implementing the progressive muscle relaxation technique in regular practice is beneficial for elderly with hypertension to reduce stress and high blood pressure in the community level. Community health nurses should take initiative in introducing the practice of progressive muscle relaxation technique in reducing stress and hypertension in the community settings. Continuing nursing education programme could be conducted to enhance nurse's knowledge and skill in providing competent care for those women who experience stress due to various causes and high blood pressure in the community settings. A nurse administrator should take more responsibility to inculcate notions of health care among the patients. Evidence based practice improves quality of nursing care. Research adds value to the comprehensive and holistic care. This study could form a base for further study in the field. Nurses are motivated and encouraged by the nurse educators and administrators to conduct research and take up a project that utilizes the various therapies to overcome stress and hypertension.

VI. Recommendations

Recommendations for the future study include:

1. This study can be replicated with large size
2. A similar study can be conducted among other population so that the findings can be generalized.
3. A comparative study can be conducted on the effectiveness between progressive muscle relaxation technique and other alternative therapies on stress and blood pressure among elderly with hypertension.
4. A similar study can be conducted to find the effectiveness of progressive muscle relaxation technique on different psychological problems among elderly with hypertension.

VII. Conclusion

Nurses have an important role of creating awareness about complementary therapy, if the elderly are given proper guidance regarding complementary measure such as PMR, we can make a significant impact in their lifestyle that will be helpful in maintaining normal blood pressure. Community health nurses are in the best position to coordinate. Practice of PMR is an effective and feasible method to decrease the stress and blood pressure among elderly with hypertension.

Acknowledgements

It is my pride to be a part of the Sri Ramachandra University and I thank the Managing Trustee, for permitting me to use available resources in the University. I extend my gratitude to my esteemed teachers and eminent guides Prof. P.V. Ramachandran, M.Sc.(N)., Chairman Nursing Education, Dr. S. Aruna, M.Sc(N)., Ph.D., Reader, Dept of Community Health Nursing and Mrs. R. Poongodi, M.Sc.(N)., Asst. Prof., Dept. of Community Health Nursing Sri Ramachandra College of Nursing, Sri Ramachandra University for their never ending guidance, support for the completion of my research.

References

[1]. De Berry (2007). Evaluation of progressive muscle relaxation on stress relatedsymptoms. Journal of clinical psychology, 10(7) 342-346.
[2]. Hahn.K.,andKin.S. (2006). Effect of progressive muscle relaxation technique on hypertension. American Journal Hypertension,6(2), 335-339.
[3]. Poilt.D.F., and Hungler.B.P. (1999).Nursing Research Principles and methods. (6th ed). Lippincott, Philadelphia, 439-573.
[4]. Praveen Chandra.V. (2012). Hypertension in old age. Indian Heart Journal, 12(3), 18-21.
[5]. Richard.P. (2008). Complementary and natural treatments for high blood pressure
[6]. Journal of Complementary and alternative medicine, 54(11), 1529-1533.
[7]. Victor Emanuel.L. (2013). Progressive muscle relaxation technique on stress. Journal of Neuroscience, 33(9), 4076-4093.
[8]. WHO health statistics. (2012). The Times of India. Chandigarh Apr 2012.
[9]. World Health Organization (WHO). (2010). Study on Global ageing and adult health.(SAGE):2010 http://www.int/healthinfo/systems/sage/en/org.