*International Journal of Advanced Nursing Studies*, 7 (1) (2018) 39-43

International Journal of Advanced Nursing Studies

*Website: www.sciencepubco.com/index.php/IJANS*
*doi: 10.14419/ijans.v7i1.8931*
***Research paper***

# The influence of progressive muscle relaxation on stress, blood pressure, and quality of life in hypertension patients in the working area of Muliorejo Puskesmas, deli Serdang regency

**Abdul Hanif Siregar, Agustina Boru Gultom ***

[1]*Lecturer in Department of Nursing, Polytechnic of Health, Ministry of Health, Medan, North Sumatera, Indonesia*
**Corresponding author E-mail: agna01012018@gmail.com*

**Abstract**

Hypertension is most commonly found in the primary care. It is very important to be warded off since it can cause the incidence of sickness and death. The management through lifestyle is very potential to control blood pressure and even to decrease the need for pharmacological management. The objective of this research was to analyze the influence of progressive muscle relaxation on stress, blood pressure, and quality of lifein hypertension patients in the Working Area of Muliorejo Puskesmas, Deli Serdang Regency. The research used quantitative method with quasi-experimentalnon-equivalents group control design. The samples were 30 respondents for both treatment and control groups, taken by using consecutive sampling technique. The data were analyzed by using dependent t-test and independent t-test. It could be concluded that there was the influence of progressive muscle relaxation on stress, blood pressure, and quality of life in hypertension patients. It is recommended that using progressive muscle relaxation be seriously considered as nursing intervention as a complementary therapy for decreasing stress, stabilizing blood pressure, and improving quality of life in hypertension patients in the Working Area of Muliorejo Puskesmas, SunggalSubdistrict, DeliSerdang Regency.

***Keywords***: *Progressive Muscle Relaxation; Stress; Blood Pressure; Quality of Life; Hypertension.*

## 1. Introduction

Hypertensionis most commonly found in the primary care, and it is one of the most important problems, which has to be warded off since it can cause the incidence of sickness and death (James, et al., 2013). It is the main risk factors in the incidence of cardiovascular disorder. If it is not controlled properly, there will be the increase in blood pressure or hypertension, which will eventually cause stroke, myocardium infarct, heart failure, dementia, kidney failure, and blindness. All these disorders will make people suffer physically, mentally, and financially, and health care system will increase drastically (James, et al.,2013; WHO, 2014). Hypertension is responsible for at least 45% of death due to heart disease and 51% of death due to stroke (WHO, 2013).

The results of scientific studies consistently show the advantages of lowering blood pressure through the population and individuals. For example, the lowering of systolic blood pressure of 10 mmHg is related to 22% of the decrease in coronary heart disease, 41% of the decrease in stroke, and 41%-46% of the decrease in death as the result of heart metabolism (WHO, 2014).

Non-pharmacological therapy, such as lifestyle behavior and pharmacology, is needed to decrease blood pressure (WHO, 2014; Gupta & Gupta S, 2010). The management through lifestyle behavior is very potential in improving blood pressure control andeven in decreasing the need for pharmacological management (James, et al.,2013). The lifestyle behavior includes the behavior in low salt, low fat, absence from alcohol dieting, and the increase in potassium, fruit, andvegetables, the management of weight control, followedby the decrease in obesity, regular physical exercises, and stress management (Gupta R & Gupta S., 2010).

Progressive muscle relaxation is one of the forms of guided imagination; that is, intervention on mind and body to bring changes in physical, emotional, or spiritual dimensions (Snyder&Lindquist, 2010). It can decrease stress and anxiety by studying how to relax muscles which undergo strain (Varvogli&Darviri, 2011; Kumutha et. al.2014). It is effective in decreasing blood pressure (Yung et. al., 2001; Varvogli&Darviri, 2011; Kumutha et. al., 2014). It can also increase quality of life (Snyder & Lindquist, 2010).

Based on the preliminary survey done at Muliorejo Puskesmas, Deli Serdang Regency, it was found that hypertension was the 10 biggest cases of serious diseases, and hypertension patients used anti-hypertension medicines. The objective of this research was to analyze the influence of progressive muscle relaxation on stress, blood pressure, quality of life in hypertension patients in the Working Area of Muliorejo Puskesmas, Deli Serdang Regency.

## 2. Method

The research used quantitative method with quasi experiment non-equivalent group control design. The population was all hypertension outpatients at Muliorejo Puskesmas, Deli Serdang Regency, and 30 of them were used as the samples, taken by using consecutive sampling technique. The sample criteria were as follows: 1) patient who suffered from hypertension with blood pressure increased to ≥ 140/90 mmHg, 2) using the minimum of one type of hypertension medicines like Captoprill of 12.5 mg 2x1 a day or Amilodipinof 5 mg 1x1 a day, 3) having full consciousness and not undergoing place, time, and human disorientation, 4) being able to communicate by using good Indonesian, and 5) being

ready to become the respondents and participating in the research procedure until the end of the program.

The research variables include: 1) progressive muscle relaxation was the technique which combined deep breath exercise and a series of contraction and muscle relaxation art; that is, 16 muscles with the frequency of 2 times per dayand with the duration of 15-20 minutes, adopted from Jacobson (Bernstein, et al., 2000), 2) stress; that is, how farthe respondents felt that they were in the unpredictable condition, uncontrolled, and overloaded, measured with questionnaires on Perceived Stress Scale with 10 questions in 5 answering intervals 0-4, consisted of 0 = never, 1 = hardly ever, 2 = sometimes, 3 = often, 4 = very often (Cohen,1984), 3) blood pressure; that is, systolic blood pressure was measured when listening to the sound of blood vessel which suddenly swells after having collapsed, or when the sound was heard for the first time in the stethoscope, and systolic blood pressure was measured by the time the sound disappears, measured by meter tension, sphygmomanometer, Nova brand and Littman Stethoscope, and 4) quality of life in hypertension patients; that is, a welfareenjoyed by a person and comes from satisfaction or dissatisfaction in undergoing sickness and was under hypertension treatment, measured by using WHOQOLBREF with the score range of 1-5 (WHO, 2004).

The method of gathering the data was as follows:

1) Approval of the Research Ethics Commission of Polytechnic of Health, Ministry of Health, Medan, 2) After obtaining the approval from the Head of Puskesmas, searching for respondents began by checking hypertension patients' names in the medical records of Puskesmas, and together with the health care providers planned to take research samples, 3) During the gathering of data, the researcher explained the advantages of the research and motivated the aspirant respondents to participate in it, and those whowerewilling to participate were asked to sign the informed consent, 4) The respondents who were willing to participate in the research and had met the criteria should have taken the pre-teston measuring stress, using questionnaires and measuring quality of life by using questionnaires, 5) The respondents were divided into two groups with 15 respondents in each groups. Each group was asked their agreement on the place and time for carrying out progressive muscle relaxation treatment, which would be guided and monitoredby the facilitator twice a week within four weeks. In the first 3 sessions: lecture, demonstration, and re-demonstration methods for the duration of 1.5 – 2 hours, guided by the facilitator were carried out. In the 4th – 8$^{th}$sessions, demonstration atthe duration of 30 minutes – one hour, monitored by the facilitator was carried out. Prior to the guidance, the respondents' blood pressure was measured in the pre-test, using sphygmomanometer, Nova's brand and stethoscope, Littman brand. Each respondent was given notes of their activities in carrying out progressive muscle relaxation exercise at home, and 6) after the progressive musclerelaxation exercises were carried out in 4 weeks, in the next stage; they were given post-test for measuring stress, blood pressure, and quality of life by using questionnaires and the same equipment.

The aspect of measuring stress, blood pressure, and quality of life was by using ratio scale. The data were analyzed by using dependent t-test and independent t-test at the significance level of 5%; it wascalled significance when $p < 0.05$.

## 3. Result

In this research,there were 30 respondents, and the other 30 respondents were not given the treatment.The distribution frequency of the hypertension respondents' characteristics could be seen in Table 1.

**Table 1:** Distribution Frequency of the Characteristics of Hypertension Respondents with and Without Progressive Muscle Relaxation Treatment in the Working Area of Muliorejo Puskesmas, Medan, In 2017

| No. | Respondents 'Characteristics | Treatment Group | | Non-Treatment Group | |
|---|---|---|---|---|---|
| | | Total | % | Total | % |
| 1 | Sex | | | | |
| | Male | 0 | 0,0 | 9 | 30,0 |
| | Female | 30 | 100,0 | 21 | 70,0 |
| | Total | 30 | 100,0 | 30 | 100,0 |
| 2 | Age | | | | |
| | 35 – 44 | 3 | 10,0 | 1 | 3,3 |
| | 45 – 59 | 17 | 56,7 | 12 | 40,0 |
| | 60 – 74 | 8 | 26,7 | 15 | 50,0 |
| | 75 – 90 | 2 | 6,7 | 2 | 6,7 |
| | Total | 30 | 100,0 | 30 | 100,0 |
| 3 | Marital Status | | | | |
| | Single | 0 | 0,0 | 0 | 0,0 |
| | Married | 16 | 53,3 | 21 | 70,0 |
| | Widower/Widow | 14 | 46,7 | 9 | 30,0 |
| | Total | 30 | 100,0 | 30 | 100,0 |
| 4 | Income | | | | |
| | < 2.271.500 | 21 | 70,0 | 27 | 90,0 |
| | ≥2.271.500 - < .4500.000 | 9 | 30,0 | 3 | 10,0 |
| | ≥4.500.000 | 0 | 0,0 | 0 | 0,0 |
| | Total | 30 | 100,0 | 30 | 100,0 |
| 5 | Occupation | | | | |
| | Housewife | 20 | 66,7 | 18 | 60.0 |
| | Private Employee | 0 | 0,0 | 6 | 20,0 |
| | Govt. Employee/BUMN | 0 | 0,0 | 0 | 0,0 |
| | Entrepreneur | 10 | 33,3 | 4 | 13,3 |
| | Pensioners | 0 | 0,0 | 1 | 3,3 |
| | Others | 0 | 0,0 | 1 | 3,3 |
| | Total | 30 | 100,0 | 30 | 100,0 |
| 6 | Duration of Suffering from Hypertension | | | | |
| | < 1 year | 3 | 10,0 | 6 | 20,0 |
| | ≥ 1 year - < 5 year | 21 | 70,0 | 20 | 66,7 |
| | ≥ 5 year - < 10 year | 3 | 10,0 | 4 | 13,3 |
| | ≥ 10 year - < 15 year | 2 | 8,7 | 0 | 0,0 |
| | ≥ 15 year - < 20 year | 0 | 0,0 | 0 | 0,0 |
| | ≥ 20 year | 0 | 0,0 | 0 | 0,0 |
| | Total | 30 | 100,0 | 30 | 100,0 |

Dependent t-test (paired t-test) was used to find out the influence of progressive muscle relaxation in the pre and post treatment and pre and post non-treatment on stress, blood pressure, and quality of life. The result of Shapiro-Wilk test showed that the score data of stress in pre and post progressive muscle relaxation treatment, score data of stress in post non-progressive muscle relaxation treatment, the respondents' data of blood pressure and quality of lifein pre and post progressive muscle relaxation treatment and in pre and post non-progressive muscle relaxation treatment had normal distribution (p-value > 0.05) at the significance level of 95% so that it was appropriate when the dependent t-test (paired t-test) was carried out.

However, the data of stress in pre non-progressive muscle relaxation treatment had abnormal distribution (p-value < 0.05). At the significance level of 95%, and after transformation was done, the distribution was still abnormal; therefore, Wilcoxon test was carried out for the data of stressin pre-progressive muscle relaxationtreatment. Description of stress, blood pressure, and quality of life, and the result of dependent t-test (paired t-test) and the result of Wilcoxon test could be seen in Table 2.

Independent t-test wasused to find out the mean difference in the scores of stress, blood pressure, and quality of lifethe respondents in pre and post treatment and in pre and post non-progressive muscle relaxation. The prerequisite for doing this test was that the data had to be innormal distribution. The result of Shapiro-Wilk test showed that the score data of stress, blood pressure (systolic and diastolic), and quality of life the respondents in post progressive muscle relaxation treatment and in post, non-progressive muscle relaxation treatment had normal distribution (p-value>0.05) at the significance level of 95% so that it was appropriate to carry out independent t-test. The result of independent t-test could be seen in Table 3.

**Table 2:** Description of Stress, Blood Pressure, and Quality of Life of Hypertension Respondents in Pre and Post Treatment and Non-Treatment of Progressive Muscle Relaxation

| Variables | | Mean | SD | Value Min | Max | P Value |
|---|---|---|---|---|---|---|
| Stress | | | | | | |
| PMR | Pre | 20,5667 | 3,53976 | 13 | 31 | 0,000 |
| | Post | 15,5333 | 4,36074 | 7 | 26 | |
| Non-PMR | Pre | 19,8000 | 2,42636 | 16 | 23 | 0,377 |
| | Post | 19,6667 | 2,46819 | 14 | 23 | |
| Blood Pressure | | | | | | |
| Systolic, PMR | Pre | 170,4000 | 22,11350 | 140 | 220 | 0,000 |
| | Post | 154,1667 | 20,38776 | 110 | 195 | |
| Systolic, Non- PMR | Pre | 179,0667 | 11,43176 | 160 | 200 | 0,000 |
| | Post | 163,6333 | 12,24881 | 140 | 198 | |
| Diastolic, PMR | Pre | 98,4667 | 5,98120 | 90 | 110 | 0,000 |
| | Post | 86,5000 | 8,23680 | 70 | 100 | |
| Diastolic, Non- PMR | Pre | 106,2667 | 9,62373 | 90 | 120 | 0,000 |
| | Post | 99,8000 | 6,93517 | 90 | 112 | |
| Quality of Life | | | | | | |
| PMR | Pre | 80,3000 | 7,13491 | 67 | 97 | 0,000 |
| | Post | 88,1000 | 8,64770 | 73 | 112 | |
| Non- PMR | Pre | 84,9000 | 5,89769 | 71 | 97 | 0,386 |
| | Post | 85,2333 | 6,40949 | 71 | 98 | |

**Table 3:** Main Difference in the Scores of Stress, Blood Pressure, and Quality of Life in Hypertension Respondents in Pre and Post Treatment and Non-Treatment of Progressive Muscle Relaxation

| Variables | | Mean | SD | Mean Difference | P Levene's | P Value |
|---|---|---|---|---|---|---|
| Stress | | | | | | |
| PMR | Pre | 20,5667 | 3,53976 | 5,03333 | | |
| | Post | 15,5333 | 4,36074 | | 0,041 | 0,000 |
| Non-PMR | Pre | 19,8000 | 2,42636 | 0,13333 | | |
| | Post | 19,6667 | 2,46819 | | | |
| Blood Pressure | | | | | | |
| Systolic,PMR | Pre | 170,4000 | 22,11350 | 16,23333 | | |
| | Post | 154,1667 | 20,38776 | | 0,009 | 0,034 |
| Systolic,Non-PMR | Pre | 179.0667 | 11,43176 | 15,43333 | | |
| | Post | 163,6333 | 12,24881 | | | |
| Diastolic,PMR | Pre | 98,4667 | 5,98120 | 11,96667 | | |
| | Post | 86,5000 | 8,23680 | | 0,309 | 0,000 |
| Diastolic,Non-PMR | Pre | 106,2667 | 9,62373 | 6,46667 | | |
| | Post | 99,8000 | 6,93517 | | | |
| Quality of Life | | | | | | |
| PMR | Pre | 80,3000 | 7,13491 | -7,80000 | | |
| | Post | 88,1000 | 8,64770 | | 0,09 | 0,150 |
| Non- PMR | Pre | 84,9000 | 5,89769 | -0,33333 | | |
| | Post | 85,2333 | 6,40949 | | | |

## 4. Discussion

The objective of the research was to analyze the influence of progressive muscle relaxation on stress, blood pressure, andquality of life in hypertension patients in the Working Area of Muliorejo Puskesmas, Deli Serdang Regency. In this research, progressive muscle relaxation exercise was designed as a device to decrease stress, stabilize blood pressure, and improve quality of life. The result of this research showed that progressive muscle relaxation exercise could decrease stress, stabilize blood pressure, and improve quality of life. It was also found that the mean score of the respondents' stress in pre progressive muscle relaxation treatment was 20.5667 with the minimum score of 13 and the maximum score of 31, and the mean score of respondents' stress in post progressive muscle relaxation treatment was 15.53333 with the minimum score of 7 and the maximum score of 26. The mean

score of respondents' stress in pre non-progressive muscle relaxation treatmentwas 19.8000 with the minimum score of 16 and the maximum score of 23, and the mean score of the respondents' stress in post non-progressive muscle relaxation treatment was 19.6667 with the minimum score of 14 and the maximum score of 23. The result of the research also found that the mean difference in the score of stress in the treatment was 5.03333, and the result of independent t-test showed that p-value = 0.000 < 0.05. The mean difference in the score of stress in the non-treatment was 0.13333, and the result of Wilcoxon test showed that p-value = 0.377 > 0.05. The result of independent t-test showed that p-value = 0.000 < 0.05 which indicated that there was the influence of progressive muscle relaxation on stress in hypertension patients.

The result of the research done by Kumutha, et al., (2014) indicated the effect of progressive muscle relaxation on stress in the elderly (60—70 years old) with hypertension. They divided the respondents into the treatment group (30 respondents) and the control group (30 respondents); the treatment group got progressive muscle relaxation exercise 20 minutes per day in 21 days. The result of this research, using Perceived Stress Scale (PSC) and independent t-test (unpaired t-test), showed thatp-value = 0.001 < 0.05 which indicated that progressivemuscle relaxation method was effective in decreasing stress in the elderly with hypertension.

The same result of the research done by Sheila, et al.,(2003) was on the effect of progressive muscle relaxation on blood pressure and psychosocial status of essential hypertension patients with 40 outpatients in the Hypertension Clinic in Taiwan (20 respondents in the treatment group and 20 respondents in the control group). The 20respondents who got progressive muscle relaxation exercise once a week and was practiced at home every day within 4 weeks, showed that there was a significant decrease in the respondents' perception on stress.

It was also found that the mean score of the respondents' systolic blood pressure in pre progressive muscle relaxation treatment was 170.4000 mmHg with the minimum score of 140 mmHg and the maximum score of 220 mmHg. The mean score of the respondents' systolic blood pressure in post progressive muscle relaxation treatment was 154.1667 mmHg with the minimum score of 110 mmHg and the maximum score of 195 mmHg. The mean score of the respondents' systolic blood pressure in pre non-progressive muscle relaxation treatment was 179.0667 mmHg with the minimum score of 160mmHg and the maximum score of 200 mmHg, and the mean score of the respondents' systolic blood pressure in post non- progressive muscle relaxation treatment was 163.6333 mmHg with the minimum score of 140 mmHg and the maximum score of 198 mmHg. It was also found that the mean difference in the score of systolic blood pressure in the treatment was 16.23333 mmHg, and the result of dependent t-test showed that p-value = 0.000 < 0.05. The mean difference in the score of systolic blood pressure in thenon-treatment was 15.43333 mmHg, and the result of dependent t-test showed that p-value = 0.000 < 0.5. It was also found that the result of independent t-test showed that p-value = 0.034 < 0.05 which indicated that there was the influence of progressive muscle relaxation on systolic blood pressure in hypertension patients..

The result of the research showed that the mean score of the respondents' diastolic blood pressure in pre progressive muscle relaxation treatment was 98.4667 mmHg with the minimum score of 90 mmHg and the maximum score of 110 mmHg. The mean score of the respondents' diastolic blood pressure in post progressive muscle relaxation treatment was 86.5000 with the minimum score of 70 mmHg and the maximum score of 100 mmHg. The mean score of the respondents' diastolic blood pressurein pre non-progressive muscle relaxation treatment was 106.2667 mmHg with the minimum score of 90 mmHg and the maximum score of 120 mmHg, and the mean score of the respondents' diastolic blood pressure in post non- progressive muscle relaxation treatment was 99.8000 mmHg with the minimum score of 90 mmHg and the maximum score of 112 mmHg. The result of the research also showed that the mean difference in the score of diastolic blood pressure in the treatment was 11.96667 mmHg, and the result of dependent t-test showed that p-value = 0.000 < 0.05. The mean difference in the score of diastolic blood pressure in the non-treatment was 6.46667 mmHg, and the result of independent t-test showed that p-value = 0.000 < 0.05 which indicated that there was the influence of progressive muscle relaxation on diastolic blood pressure in hypertension patients.

The result from the research done by Shinde, et al.,(2013) was on the immediate effect of progressive muscle relaxation and by Jacobson in hypertension patients with 105 respondents who did progressive muscle relaxation exercise in supine position within 30 minutes. It was found that there was significant difference between pre and post progressive muscle relaxation treatment in Jacobson' research; the respondents' systolic and diastolic blood pressure was measured.

The result of the research done by Patel, et al., (2012) was on the effect of progressive muscle relaxation on maintaining systolic and diastolic blood pressure in hypertension young patients (from 20 until 45 years old) with and without using anti-hypertension medicines. It was found that there was a little difference in its result. In this research, there were 26 respondents in the treatment group; they got the treatment in progressive muscle relaxation exercise, using tape recorder containing progressive muscle relaxation exercise, which was done twice a day in 3 months. The other 24 respondents did not get any treatment; their systolic and diastolic blood pressure was measured before and after three months of exercise. The result showed that there was significant difference in the systolic blood pressure in the treatment and in the non-treatment after three months of exercise. It was also found that there was insignificant difference in the diastolic blood pressure.

In the non-progressive muscle relaxation treatment group, there was an also different result in the score of systolic and diastolic blood pressure in pre and post non-treatment. This was because there was the selection in recruiting the respondents. The respondents in this research were those who used anti-hypertension medicines. The result from the research done by Rose, et al.,(2011) on the effect of the respondents' compliance with taking anti-hypertension medicines every day in handling blood pressure showed that the blood pressure of the respondents who seriously complied with taking anti-hypertension medicines was more decreasing than that of the respondents who did not comply. However, there was the mean difference in systolic and diastolic blood pressure in pre and post treatment between the group that got progressive muscle relaxation treatment and used anti-hypertension medicines and the group that did not getthe treatment and did not use anti-hypertension medicines.

The result of the research showed that the mean score of the respondents' quality of life in pre progressive muscle relaxation treatment was 80.3000 with the minimum score of 67 and the maximum score of 97. The mean score of the respondents' quality of life in post progressive muscle relaxation treatment was 88.1000 with the minimum score of 73 and the maximum score of 112. The mean score of the respondents' quality of life in pre non-progressive muscle relaxation treatment was 85.2333 with the minimum score of 71 and the maximum score of 78. It was also found that the mean difference in the score of quality of life in the treatment was -7.80000 or increased to the score of 7.8000, and the result of dependent t-test showed that p-value = 0.000 < 0.05. The mean difference in the score of quality of lifein the non-treatmentwas -0.33333 or increased to the score of 0.33333,and the result of dependent-test showed that p-value = 0.386 > 0.05, while the result of independent t-test showed that p-value = 0.150 > 0.05 whichindicated thatthere was the influence of progressive muscle relaxation on quality of life in hypertension patients.

The result of the research done by Sheila, et. al., (2003) on the effect of progressive muscle relaxation on blood pressure and psychosocial status in essential hypertension patients in the Hypertension Clinic in Taiwan with 40 outpatients showed that there was significant increase in the perception on health so that progressive muscle relaxation could be used as an independent function in improving quality of life. Petska, et. al., in Snyder and Lindquist (2010) pointed out that relaxation was functioned to

decrease stiffness in muscles for which relaxation exercise could decrease the effect of damage and the symptom of stress which was influenced by sickness, and it could also increase a person's quality of life. Relaxation exercise gives an opportunity to patients to get more active pattern in taking care of their health.

However, independent t-test which showed that p-value = 0.150 > 0.05 indicated that there was no significant mean difference in the score of quality of life between the treatment group and the non-treatment group. It indicated that good quality of life could also be found in the non-treatment group. This was probably because other factors were involved in influencing patients' quality of life. The result of the research done by Paskulin, et al. , (2009) showed that some factors correlated with the elderlypeople's quality of life was education, perception on health, medical condition, depending on daily activities, participating in physical exercises, and age.

There were some research limitations in this research. They were related to the variants of respondents in which they were not exactly the same between the treatment group and the non-treatment group in the variables of stress and systolic blood pressure. Besides that, the research limitations were also related to data gathering in which there was the difference in time: group 1 did their activity by the fasting month, while group 2 did their activity while they were not fasting.

## 5. Conclusion

The result of this research showed that there was significant influence of progressive muscle relaxation on stress, blood pressure, and quality of life between the treatment group and the non-treatment group at p-value < 0.05.

## 6. Recommendation

It is recommended that using progressive muscle relaxation should be considered as one of nursing interventions, as a complementary therapy in decreasing stress, stabilizing blood pressure, and improving quality of life in hypertension patients in the Working Area of Muliorejo Puskesmas, Medan SunggalSubdistrict, Deli SerdangRegency.

## Acknowledgments

The research was supported by Polytechnic of Health, Ministry of Health, Medan, North Sumatera, Indonesia.We would like to thank to health officers at Muliorejo Puskesmas Medan, who were active in help a researcher to provide hypertension patients.

## References

[1] Berstein,D,A., Borkovec,T,D., Stevens,H,H., 2000. New Directions in Progressive Relaxation Training, AGuidenook for Helping Professionals, London: Praeger.

[2] Boron-Krupinska,K., Kulmatycki,L., 2014. Effectiveness of Progressive Muscle Relaxation (Pmr) In Alleviating Psychophysical Disorder-A Systematic Review (1982-2012), Poland: Global Journal for Research Analysis Volume 3 Issue 10 Oct 2014, ISSN 2277-8160.

[3] Cohen,S., 1984. Perceived Stress Scale, Newbury Park: MindGarden.

[4] Gupta,R&Guptha,S., 2010. Strategies For Initial Management of Hypertension, Indian J Med Res, 132, November 2010, pp 531-542.

[5] James, P,A., Oparil,S., Carter,B,L., Cushman,W,C., Dennison-Himmelfarb,C., Handler,J., Lackland,D,T., LeFevre,M.L., MacKenzie,T,D., Ogedegbe,O., Smith,S,C., Svetkey,L,P., Taler,S,J., Towsend,R,R., Wright,J,T., Narva,A,S., Ortiz,E., 2013. Special Communication. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JCN 8), JAMA. doi:10.1001/jama.2013.284427,Lowa City:AmericanMedical Association. http://jama.jamanetwork.com https://doi.org/10.1001/jama.2013.284427.

[6] Kumutha V, Aruna S, Poongodi R, 2014. Effectiveness of Progressive Technique on Stress and Blood Pressure among Elderly with Hypertension, 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.

[7] Larkin, K, T., 2005. Stress Hypertension. Examining the Relation between Psychological Stress, and High Blood Pressure, London: Yale: University Press.https://doi.org/10.12987/yale/9780300106442.001.0001.

[8] Patel,H,M., Kathrotia,R,G., Pathak,N,R., Thakkar,H,A., 2012. Effect of Relaxation Technique on Blood Pressure in Essential Hypertension, National Journal of Integrated Research in Medicine (2012), 3(4); 10-14.

[9] Rose,A,J., Glickman,M,E., D'Amore,M,M., Orner,M,B., Berlowitz,D., Kressin,N,R., 2011. Effect of Daily Adherence to Antihypertensive Medication on Blood Pressure Control,The Journal of Clinical Hypertension, Volume 13, No.6, June 2011;pp.416-421.https://doi.org/10.1111/j.1751-7176.2011.00427.x.

[10] Sheila,S., Barbara,I., Huey-Shyan,L., Chun-Lin,M., 2003. Effects of Progressive Muscle Relaxation on Blood Pressure and Pressure and Psychososial Status for Clients with Essential Hypertension in Taiwan, Holistic Nursing Practice (2003), Volume 17 Issue 1;pp 41 – 47.

[11] Shinde,N., Shinde,K,J., Khatri,S,M., Hande,D., 2013. Immediate Effect of Jacobson's Progressive Muscular Relaxation in Hypertension, Indian Journal Physiotherapy & Occupational Therapy-An International Journal, Volume 7,No 3 (2013);pp. 234-237.

[12] Smith, J, C., 2007. Special Issue. The New Psychology of Relaxation and Renewal, Biofeedback, Volume 35 Issue 3; pp.85-89.

[13] Snyder, M., Lindquist,R., 2010. Complementary & Alternative Therapies in Nursing, edisikeenam, New York: Springer Publishing Company, pp: 63-81.

[14] Varvogli,L., Darviri,C., 2011. Stress Management Techniques : evidence-based procedures that reduce stress and promote health, Health Science Journal,Volume 5, ISSUE 2 (2011) E-ISSN:1791-809X, Greece, pp : 74 -89.

[15] Yung,P., French,P., Leung,B., 2001. Relaxation Training As Complementary Therapy For Mild Hypertension Control And The Implications of Evidence-Based Medicine, Complementary Therapies in Nursing &Midwifery (2001) 7, Hong Kong: Harcourt Publishers Ltd, pp: 59 – 65.

[16] WHO, 2014. Global Status Report On Noncommunicable Diseases 2014. "Attaining the nine global noncommunicable diseases targets; a shared responsibility", Switzerland: WHO Press.

[17] 2013. A global Brief on Hypertension. Silent killer, global public health crisis, Switzerland : WHO Press wi

[18] 2004. The World Health Organization Quality Of Life (WHOQOL)-BREF.