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# The Effect Of *Progressive Muscle Relaxation* (PMR on Back Pain In The Third Trimester Of Pregnant Women

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**ABSTRACT**

**Background**: Back pain is a discomfort that is often felt by mothers in the third trimester of pregnancy. During this period, the uterus gets bigger and causes the muscles in the mother's lower back to stretch, causing pain. One non-pharmacological therapy to treat back pain complaints is the relaxation technique with Progressive Muscle Relaxation (PMR). This study aims to determine the effect of Progressive Muscle Relaxation (PMR) on back pain in third trimester pregnant women at the Karangpandan Community Health Center, Karanganyar Regency. **Method**: This is a pilot study of pre-experimental with pretest-posttest design one group only. The study used 5 third trimester pregnant women who experienced back pain as samples. The research instrument used an observation sheet containing the Numeric Rating Scale (NRS) pain scale assessment. The analysis used in this research is the paired sample t-test with a confidence level of 95% (α=0.05). **Result**: There was a decrease in the average pain scale for pregnant women in the third trimester before and after being given Progressive Muscle Relaxation (PMR) therapy, namely from 4.4 down to 0.2. The results of the paired sample t-test obtained a p value (0.001) <0.05, which means that there is an average difference between the pain scale of pregnant women in the third trimester before and after being given Progressive Muscle Relaxation (PMR) therapy. **Conclusion**: There is an influence on the use of Progressive Muscle Relaxation (PMR) therapy on back pain in third trimester pregnant women.

**Keyword**: Progressive Muscle Relaxation (PMR), Pregnancy, Pain

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## INTRODUCTION

Pregnancy is a transitional stage of the life process of a woman who matures reproductively and a mother-to-be where the woman carries a fetus in her womb. Pregnancy is a unique period in life associated with hormonal and physiological changes in a pregnant woman. Data from the Ministry of Health of the Republic of Indonesia in 2020 shows that the number of pregnant women in Indonesia reached 5,221,784 people[1]. The process of pregnancy itself involves various physiological changes including physical changes, changes in the digestive system, and respiratory system, then the urinarius, musculoskeletal and circulatory tract systems. Various changes occur during pregnancy resulting in various discomforts[2].

Discomfort arises due to some changes in pregnant women. Discomfort will increase in the third trimester where the fetus develops faster. Physical changes that occur in pregnant women are the body's adaptation to pregnancy[3]. At this time, the larger the uterus of pregnant women, the mother must adjust her position and posture by relying on muscle strength because the center of gravity will move forward. Fatigue that occurs in pregnant women is the effect of the body position of pregnant women that is not right[4]. Additional stretching and fatigue usually occur in the mother's spine or lower back. This can cause back pain in pregnant women, especially in the third trimester[5.6.]

Low back pain felt in third trimester pregnant women occurs due to hormonal changes that cause changes in the supporting and connecting soft tissues resulting in decreased muscle elasticity and flexibility[7]. Back pain is an discomfort of III trimester pregnant women which has the highest percentage when compared to other discomforts, reaching 70%. Other discomforts that appear such as frequent urination 50%, vaginal discharge 15%, constipation 40%, flatulence 30%, swelling in the legs 20%, cramps in the legs 10%, headache 20%, *striae gravidarum* 50%, hemorrhoids 60%, and shortness of breath 60%[8].

Back pain that is not resolved will increase complaints after childbirth and can become chronic so that it is more difficult to cure and will result in complaints of back pain in the long term. Back pain in pregnant women can also have a negative impact that can interfere with daily physical activities, such as: standing after sitting, getting out of bed, sitting position too long, standing too long, even lifting and moving objects that involve movement from the back[9]. Unresolved back pain can escalate into *backache* or often referred to as prolonged back pain. *Backache* was found in 45% of pregnant women, an increase of 69% by week 28 of[10].

Pain can be relieved with pharmacological and nonpharmacological therapies or complementary therapies. Pharmacological pain control is more effective than nonpharmacological methods. However, pharmacology is more expensive and has potential side effects. Pharmacological methods also have an influence on pregnancy for the mother, fetus, and for the progress of labor. Management by pharmacological means will cause side effects such as gastrointestinal disorders, impaired kidney function, edema and hypertension. Efforts that can be made to reduce the risk of side effects are to use non-pharmacological or traditional treatments. One therapy that can be used as an alternative therapy without using pharmacological agents to overcome complaints of back pain without worrying about side effects is relaxation technique[11].

Relaxation therapy is a method that can reduce pain by freeing physical and psychological tension and stress so as to increase tolerance to pain and adapt to these feelings of pain[12,13]. There are various relaxations, one of which is the *Progressive Muscle Relaxation* (PMR) technique which is one of the complementary therapies that can be applied by midwives or nurses in providing care to pregnant women who experience sleep disorders, stress,

anxiety, neck muscle pain, back pain and depression[14,15]. PMR is a relaxation therapy that focuses on a muscle activity by identifying tense muscles then lowering tension by relaxing to get a relaxed feeling[16,17]. PMR is useful for reducing peripheral resistance and increasing the elasticity of blood vessels, muscles and blood circulation will be more perfect in taking and circulating oxygen and progressive muscle relaxation can be vasodilator whose effect is to widen blood vessels and can lower blood pressure directly and can reduce pain[18,19]. PMR can provide a relaxing effect by facilitating blood flow, increasing blood oxygenation and relieving muscle tension so that it is effective for reducing pain by inhibiting pain stimulation[20,21]. PMR to date is one of the cheapest relaxation techniques, requires no imagination, requires no tools, no side effects, and is easy to[do22]. Relaxation therapy with movements tightens and relaxes the muscles at one time to provide a feeling of physical relaxation, reduce stress in individuals, deep relaxation can prevent psychological and physiological manifestations caused by stress[23,24].

Relaxation therapy with PMR has many benefits and advantages in overcoming pain in the body. This therapy is expected to be a non-pharmacological treatment solution for discomfort that arises during the third trimester of pregnancy. The purpose of this study was to determine the effect of *Progressive Muscle Relaxation* (PMR) on back pain of third trimester pregnant women at the Karangpandan Health Center, Karanganyar Regency.

## METHODS

This study is a pilot pre-experimental with *a pre-posttest one group design*. The research was conducted at Public Health Center of Karangpandan, Karanganyar Regency, from August 21-September 2, 2023. The population in this study was third trimester pregnant women at Public Health Center of Karangpandan, Karanganyar Regency and the samples were five pregnant women in the third trimester who experienced back pain. The study was conducted for 7 days where respondents would be given *Progressive Muscle Relaxation* (PMR) therapy. The research instrument used an observation sheet containing an assessment of the *Numeric Rating Scale* (NRS) pain scale. Before *Progressive Muscle Relaxation* (PMR) therapy, researchers measured the nye scaleri *Numeric Rating Scale* (NRS) with measuring results of 0 for painlessness, 1-3 for mild scales, 4-6 for moderate scales, and 7-10 for severe scales. Informed consent were gained before conducting research. The analysis used was univariate and bivariate analysis. Univariate analysis to find the average pain score of pregnant women in the third trimester before and after the intervention while bivariate analysis to see the effect of intervention using paired *sample t-test* with a confidence level of 95% ($\alpha$=0.05). Data analysis was performed using the SPSS *for windows version* 26.0 program.

## RESULTS AND DISCUSSION

The results of this study have been outlined in two types of analysis, namely univariate and bivariate analysis. In univariate analysis, data are explored and elaborated separately for each of the variables studied. All women are a healthy reproductive age at 25 to 33 years old. Most of them graduated from senior high school, multiparous women, and have 28 to 36 weeks gestation.

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**Table 1. Frequency Distribution of Pain Scale for Third Trimester Pregnant Women Before and After *Progressive Muscle Relaxation* (PMR) Therapy**

| Pain score | Before | | After | |
|---|---|---|---|---|
| | f | % | f | % |
| No Pain | 0 | 0 | 4 | 80 |
| Light | 0 | 0 | 1 | 20 |
| Keep | 5 | 100 | 0 | 0 |
| Heavy | 0 | 0 | 0 | 0 |
| Sum | 5 | 100 | 5 | 100 |

Table 1 shows that before Progressive *Muscle Relaxation (PMR) therapy all respondents (100%) experienced moderate back pain, while after* Progressive Muscle Relaxation (*PMR) therapy most did not experience back pain anymore as many as 4 pregnant women (80%) and only 1 pregnant woman (20%) experienced back pain at a mild level.*

**Table 2. Average Pain Scale of Third Trimester Pregnant Women Before and After *Progressive Muscle Relaxation Therapy* (PMR)**

| Pain Score | n- Max | Mean±SD |
|---|---|---|
| Pretest | -6 | 4,4±0,894 |
| Posttest | -1 | 1±0,447 |
| P value | | 0,001* |

**Paired t test*

Table 2 shows that there was a decrease in the average pain scale of III trimester pregnant women before and after Progressive *Muscle Relaxation* (PMR) therapy, from 4.4 down to 0.2.

Bivariate analysis serves to analyze two or more variables to be explored. The purpose of bivariate analysis is to determine the effect of *Progressive Muscle Relaxation* (PMR) on back pain in III trimester pregnant women. The paired *sample t-test results and* obtained a value of p(0.001)<0.05 which means that there is an average difference between the pain scale of pregnant women in the third trimester before and after Progressive *Muscle Relaxation* (PMR) therapy. This shows that there is an influence on the use of *Progressive Muscle Relaxation* (PMR) therapy on back pain in III trimester pregnant women.

The results of this study are supported by the results of previous studies that examined the effect of progressive muscle relaxation on reducing lower back pain in third trimester pregnant women conducted at the Cibeureum Health Center, Tasikmalaya City, West Java. Based on the results of the study, it was found that there was an effect of progressive muscle relaxation on reducing the scale of lower back pain in third trimester pregnant women at Cibeureum 5 Health Center. Progressive Muscle *Relaxation* (PMR) is a relaxation technique that can be done to overcome the intensity of pain in the back by making movements to tighten and relax the muscles. *Progressive Muscle Relaxation* (PMR) is a skill that can be used to reduce tension and discomfort that can be done independently. It is further explained that tension is a condition related to muscle fibers that shrink, to eliminate this tension requires contractions in the muscles[9].

Low back pain in pregnancy is described as pain in the lumbar region above the sacrum that can radiate to the 6th leg area. Back pain in pregnant women is caused by abdominal distention, the center of gravity shifts forward, especially at the end of pregnancy, abdominal muscle tone decreases, so this requires bone adjustment (*realigment*). The normal lumbosacrum curve must be progressively curved and in the cervical region it must be curve-shaped

(excessive anterior flexion of the head such as bowing) to maintain balance[15]. Movement is increasingly difficult, ligaments, and muscles of the middle and lower spine are under heavy pressure so that this condition causes strain on the lumbar muscles. As a result, stimuli are received by pain receptors, causing the perception of pain in the back can even radiate to the hips and difficulty walking, especially in the blood part of the back of pregnant women[5].

The underlying principle of muscle relaxation in the mind-body approach is what makes muscles and the mind relax[22]. Stretching and relaxing each muscle group at once will result in progressive relaxation of the entire body, while calming the mind by stretching each muscle group for five seconds and focusing attention[20,24]. This is followed by breathing deeply and then releasing tension so that the muscles become completely weak. Physiologically, *Progressive Muscle Relaxation* (PMR ) can provide comfort to respondents because PMR can increase the production of endorphin hormones in the blood and inhibit pain nerve endings and prevent pain stimulus from entering the spinal cord, so that the cerebral cortex does not receive pain signals which results in pain intensity changing or decreasing[4].

**Summary**

The provision of non-pharmacological therapy *Progressive Muscle Relaxation* (PMR) has an effect in reducing back pain in third trimester pregnant women at the Karangpandan Health Center, Karanganyar Regency. It is recommended that *Progressive Muscle Relaxation* (PMR) might be as an alternative management of back pain in third trimester pregnant women.

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**REFERENCES**

1. Lestaluhu V. Studi Kasus: Penatalaksanaan Terapi Komplementer Pada Ibu Hamil Trimester Iii Dengan Nyeri Punggung. *J Kebidanan*. 2022;2(2):96-103. doi:10.32695/jbd.v2i2.406
2. Riadinni A. Hubungan Senam Hamil Dengan Rasa Nyaman Tidur. *J Keperawatan Widya Gantari Indones*. 2020;4(1):1-8.
3. Hidayati U. Systematic Review: Senam Hamil Untuk Masa Kehamilan Dan Persiapan Persalinan. *PLACENTUM J Ilm Kesehat dan Apl*. 2019;7(2):8. doi:10.20961/placentum.v7i2.29732
4. Rahmawati NA, Marufa SA, Rahmanto S, Handiny DLM, Lestari MAA. Pengaruh Kombinasi Breathing Exercise dan Progressive Muscle Relaxation Dalam Menurunkan Nyeri Punggung dan Sesak Napas Ibu Hamil Trimester III. *Physiother Heal Sci*. 2021;3(2):95-100. doi:10.22219/physiohs.v3i2.19449
5. Dewi PK, Patimah S, Khairiyah I. Pengaruh Relaksasi Otot Progresif Terhadap Penurunan Nyeri Punggung Bagian Bawah Ibu Hamil Trimester III. *J Bidan*. 2018;4(02):16-24.
6. Koukoulithras I, Stamouli A, Kolokotsios S, Plexousakis M, Mavrogiannopoulou C. The Effectiveness of Non-Pharmaceutical Interventions Upon Pregnancy-Related Low Back Pain: A Systematic Review and Meta-Analysis. *Cureus*. 2021;13(1):1-11. doi:10.7759/cureus.13011
7. Sari AP, Farida F. Kombinasi Teknik Effleurage Massage dan Terapi Akupresur terhadap Nyeri Punggung Ibu Hamil Trimester III. *J Bidan Cerdas*. 2021;3(4):137-145. doi:10.33860/jbc.v3i4.565
8. Sulastri M, Nurakilah H, Marlina L, Nurfikah I. Penatalaksanaan Nyeri Punggung Pada Ibu Hamil Trimester III dengan Metode Kinesio Tapping Berdasarkan Standar Profesi Bidan. *Media Inf*. 2022;18(2):145-161. doi:10.37160/bmi.v18i2.81
9. Ismawati S, Hadriani H, Sarliana S. Pijat Hamil dan Relaksasi Nafas Dalam Menurunkan Nyeri Punggung Ibu Hamil Trimester III. *Napande J Bidan*. 2022;1(1):48-56.

doi:10.33860/njb.v1i1.1049
10. Amin M, Novita N. Senam Hamil Untuk Mengurangi Nyeri Punggung Bawah Ibu Trimester III. *JKM J Keperawatan Merdeka*. 2022;2(1):66-72. doi:10.36086/jkm.v2i1.1283
11. Fira H, Apriza A, Wati NK. Pengaruh Teknik Relaksasi Otot Progresif Terhadap Penurunan Skala Nyeri Menstruasi (Dismenore) Pada Remaja Putri Di Desa Pulau Jambu. *PREPOTIF J Kesehat Masy*. 2021;5(1):400-407. doi:10.31004/prepotif.v5i1.1550
12. Raharjo R, Ayuk Naimah, Rini Setyawati. Analisis Efektivitas Tehnik Relaksasi Progresif Terhadap Nyeri Luka Episiotomi Pada Ibu Post Partum di RSUD Genteng Banyuwangi. *Prof Heal J*. 2023;4(2):287-294. doi:10.54832/phj.v4i2.390
13. Mueller SM, Grunwald M. Effects, Side Effects and Contraindications of Relaxation Massage During Pregnancy: A Systematic Review of Randomized Controlled Trials. *J Clin Med*. 2021;10(3485):1-17. doi:10.3390/jcm10163485
14. Purwati NWY, Aswitami GAP, Sumawati NMR. Efektifitas Teknik Relaksasi Otot Progresif Terhadap Kecemasan Ibu Hamil Trimester I Di UPTD Public Health Center of Kuta II. *J Med Husada*. 2023;6(2):67-72.
15. Sadeghi B, Sirati-Nir M, Hajimini Z, Ebadi A, Ali-Asgari M. Comparing the Effects of Progressive Muscle Relaxation and Physical Activity on Pregnant Women's General Health. *Iran J Nurs Midwifery Res*. 2018;23(4):298-304. doi:10.4103/ijnmr.IJNMR_54_17
16. Mulyana T, Utami S, Arneliwati. Pengaruh Relaksasi Otot Progresif Terhadap Kualitas Tidur Ibu Hamil Primigravida. *J Online Mhs Fak Kedokt*. 2018;6(1):163-172.
17. Zendehdel M, Elyasi F, Jahanfar S, Emami-Sahebi A. Effectiveness of Progressive Muscle Relaxation Technique on Anxiety Caused By Covid- 19 in Pregnant Women: A Randomized Clinical Trial. *Neuropsychopharmacol Reports*. 2022;42(2):158-165. doi:10.1002/npr2.12241
18. Marwati AW, Rokayah C, Herawati Y. Pengaruh Progressive Muscle Relaxation Terhadap Skala Nyeri pada Pasien Post Sectio Caesaria. *J Ilmu Keperawatan Jiwa*. 2020;3(1):59. doi:10.32584/jikj.v3i1.472
19. Sadeghi A, Sirati-Nir M, Ebadi A, Aliasgari M, Hajiamini Z. The Effect of Progressive Muscle Relaxation on Pregnant Women's General Health. *Iran J Nurs Midwifery Res*. 2015;20(6):655-660. doi:10.4103/1735-9066.170005
20. Muflihah E, Sari RP. Relaksasi Terapi Otot Progresif Terhadap Penurunan Skala Nyeri Low Back Pain (LBP) Pada Pengrajin Keset. *Adi Husada Nurs J*. 2022;7(2):77. doi:10.37036/ahnj.v7i2.200
21. Aalami M, Jafarnejad F, Modarresgharavi M. The Effects of Progressive Muscular Relaxation and Breathing Control Technique on Blood Pressure During Pregnancy. *Iran J Nurs Midwifery Res*. 2016;21(3):331-336. doi:10.4103/1735-9066.180382
22. Nasiri S, Akbari H, Tagharrobi L, Tabatabaee AS. The Effect of Progressive Muscle Relaxation and Guided Imagery on Stress, Anxiety, and Depression of Pregnant Women Referred to Health Centers. *J Educ Health Promot*. 2018;7(41):1-6. doi:10.4103/jehp.jehp
23. Simbung R, Ohorella F, Sikki S. Efektivitas Teknik Relaksasi Otot Progresif dengan Effleurage Massage Terhadap Nyeri Punggung pada Ibu Hamil Trimester III. *J Penelit Kesehat Suara Forikes*. 2022;volume 13:268-272. http://forikes-ejournal.com/index.php/SF
24. Gökşin İ, Ayaz-Alkaya S. The Effectiveness of Progressive Muscle Relaxation on the Postpartum Quality of Life: A Randomized Controlled Trial. *Asian Nurs Res (Korean Soc Nurs Sci)*. 2018;12(2):86-90. doi:10.1016/j.anr.2018.03.003