
THE EFFECT OF PROGRESSIVE MUSCLE RELAXATION TECHNIQUE (PMRT) ON THE QUALITY OF LIFE OF THIRD TRIMESTER PREGNANT WOMEN AT PUBLIC HEALTH CENTRE II, WEST DENPASAR DISTRICT

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ABSTRACT

Pregnancy impacts a women's physical and mental state. These modifications will have an impact on pregnant women's quality of life. Pregnant women's poor quality of life will impact the fetus and mother's health. As a result, nonpharmacological therapy, such as the use of progressive muscle relaxation techniques, is required to improve the quality of life of pregnant women (PMRT). PMRT research has so far been linked to anxiety and depression in pregnant women that it is still limited in its application to the quality of life of pregnant women in the third trimester. This study aims to see how beneficial PMRT is in improving the quality of life of pregnant women. A quasi-experimental approach with a pre-post test with Nonequivalent Control Groups is used in this investigation. With a total sample size of 46 participants, non-probability sampling was used to pick the sample. Questionnaires are used to collect data, and t-independent analysis is used to analyze it. There were p-value 0.05 variations in the quality of life of pregnant women in the control and treatment groups after receiving PMRT. The average improvement in quality of life in the control and treatment groups was significantly different (p-value 0.05). For each dimension, there was a significant difference in the quality of life between the control and intervention groups before and after the research (p-value). It is expected that health workers will provide PMRT in pregnancy health services to improve the quality of life of pregnant women.

Keywords: Pregnant women; quality of life; muscle relaxation; progressive muscle relaxation.

INTRODUCTION

Pregnancy is an extremely significant time in a woman's life. A pregnant woman undergoes various changes, including physical, psychological, and social environmental changes as she adjusts to her new position as a parent. Physical and psychological changes in pregnant women cause nausea and vomiting, an enlarged stomach due to the growth of the fetus in the womb, fatigue, back pain, and hormonal changes that cause emotional conditions in pregnant women so that it is not uncommon for pregnant women to feel anxious and even depressed during pregnancy.¹ It is reported that pregnant women who experience anxiety

during pregnancy in high-income countries reach 7-20%.² While in low and middle-income countries, it reaches more than 20%.³ Research conducted in Brazil states that anxiety occurs in 26.8% of pregnant women and is more common in the third trimester (42.9%).⁴ Pregnant women's anxiety and depression can increase pregnancy complications by approximately 40%.⁵ Reported increases in pregnancy complications caused by anxiety and depression of pregnancy are newborn mortality, low birth weight infants, postnatal depression, and susceptibility to behavioral and cognitive problems in infants.⁶ Reported other studies that support that anxiety in

pregnant women is associated with the incidence of babies with low birth weight (LBW).⁷ The results of other studies found that the anxiety of pregnant women was also associated with the high incidence of cesarean section (SC), both planned and unplanned.⁸ Pregnancy complications arising from anxiety and depression during pregnancy will have an impact on the quality of life of pregnant women.

Quality of life is a multidimensional concept that includes physical conditions, psychology, social relationships, and environment. Measurement of the quality of life of pregnant women is very important to provide information on health status so that prevention and appropriate treatment can be carried out during pregnancy.⁹ It is reported that women's vitality decreases during pregnancy, which causes a decrease in quality of life during the normal pregnancy period.¹⁰ Other studies have stated that quality of life is a health measure in pregnant women.¹¹ Nonpharmacological initiatives are required to improve the quality of life of pregnant women. One of these efforts is through relaxation. Relaxation therapy that is simple, safe for pregnant women, and has great benefits is progressive muscle relaxation therapy (PMRT).¹² PMRT is a breathing and stretching method that induces relaxation of nerves and muscles starting from the hands to the feet.¹³ PMRT has been shown to alleviate anxiety and depression in pregnant women and relieve tension and muscular spasms, exhaustion, and sleep quality.¹⁴ The research mentions relaxation can reduce complications during pregnancy and reduce the incidence of section cesarean (SC).¹⁵ Various studies show that PMRT can significantly reduce anxiety and depression in pregnant women^{12,16} Pregnant women in the intervention group who received PMRT had less back discomfort than those in the control group, according to the study. PMRT therapy was recommended in this study to relieve back pain and improve the quality of life of pregnant women¹². However, there is still limited research on the impact of PMRT on measuring the dimensions of the quality of life of pregnant

women, including physical health, psychological health, social and environmental relationships. This study aims to see how beneficial PMRT is for improving the quality of life of pregnant women and its impact on four dimensions of quality of life, which include physical health, psychological health, social relations, and the environment.

MATERIAL AND METHODS

This is a quasi-experimental study using nonequivalent control groups used in the pre-post test design. This research was conducted from March to August 2021 at Public health Centre II, West Denpasar District. The study population was pregnant women who had their pregnancy checked at the Public health Centre II, West Denpasar District. Determination of the sample size using the two-average difference test hypothesis formula:¹⁷

$$n = \frac{2\sigma^2(Z_{1-\alpha} + Z_{1-\beta})^2}{(\mu_1 - \mu_2)^2}$$

Based on calculations using the above formula, 23 respondents were obtained in each group, the control group, and the treatment group. The total number of samples was 46 pregnant women who met the research inclusion criteria. The inclusion criteria of this study were that pregnant women in the third trimester of pregnancy were not in high-risk conditions such as diabetes mellitus, hypertension, and mental disorders. After that, the research sample was divided into two groups at random: the control group and the treatment group. PMRT was given to the treatment group three times a week for four weeks. Provision of PMRT in the treatment group was carried out at the public health center together with the schedule for prenatal check-ups and at home through home visits. In providing PMRT through home visits, researchers were assisted by enumerators. The control group was not given PMRT but was given standard antenatal care.

Measurement of quality of life using the World Health Organization Quality of Life Bref (WHOQoL-BREF) questionnaire has

four dimensions: physical health dimension, the psychological dimension, the social relationship dimension, and the environmental dimension. Quality of life measurements were carried out in the control and treatment groups before the intervention and one week after the last intervention. When the data were normally distributed, the data were analyzed using paired and independent t-tests. The Health Research Ethics Commission (KEPK) of Bina Usada Bali granted ethical permission to this study with the number 136/EA/KEPK-BUB-2021.

RESULT

Table 1 below shows the quality of life of pregnant women before being given PMRT in the control group was 33.87 (6.75), which means in the bad category. The quality of life of pregnant women in the treatment group was 33.48 (7.98), which means in the bad category. Before the trial, statistical testing revealed that there was no difference in the quality of life of pregnant women in the control and treatment groups (p-value 0.858).

Table 1. Quality of life of pregnant women before the study in the control and treatment groups

Groups	Mean (SD)	p-value
Control	33,87(6,75)	0,858*
Treatment	33,48 (7,98)	

Test Description : *) T-independent Test

Table 2 below shows The quality of life of pregnant women after being given PMRT in the control group was 43.57(6.57), which means in the moderate category. The quality of life of pregnant women in the treatment group was 63.61 (9.97), which means in the good category. The statistical test results showed a significant difference in the quality of life of pregnant women in both the control and treatment groups after PMRT (p-value = 0.000).

Table 2. Quality of life of pregnant women after the study in the control and treatment groups

Groups	Mean (SD)	p-value
Control	43,57(6,57)	0,000
Treatment	63,61(9,97)	

Table 3 below shows the differences in quality of life before and after the study in both the control and treatment groups (p-value <0.05). The results also showed that the average value of the improvement in quality of life scores in the treatment group was greater than that in the control group. There was a significant difference in the average quality of life improvement in the control and treatment groups (p-value <0.05).

Table 3. The effect of PMRT on the quality of pregnant women pre-post intervention

Groups	Pre	Post	p-value
Control			
Mean(SD)	33,87(6,75)	43,67(6,57)	0,000*
Delta	9,70 (5,63)		
Treatment			
Mean (SD)	33,48(7,98)	63,61(9,97)	0,000*
Delta	30,13 (13,15)		

Test Description :

*)T-Paired Test

**)T Independent Test

For each dimension, Table 4 demonstrates the changes in quality of life between the control and intervention groups before and after the research. There was no significant difference between the two groups in domain 1, meaning the physical health domain, before the study (p-value = 0.520); however, there was a significant difference between the two groups after the study (p-value = 0.000). There was no significant difference between the two groups in domain 2, namely psychological well-being, before the study (p-value = 0.757); however, there was a significant difference between the two groups after the study (p-value = 0.000).

There was no significant difference between the two groups in domain 3, meaning the domain of social connections, before the study (p-value = 0.935), but there was a significant difference between the two groups

after the study (p -value = 0.001). There was no significant difference between the two groups in domain 4, the environmental dimension domain, before the study (p -value = 0.613); however, there was a significant difference between the two groups after the study (p -value = 0.000).

Table 4. The Differences Quality Of Life by Domain Quality of Life

Domain Quality of life	Pre-Test		Post-test	
	Mean (SD)	p-value	Mean (SD)	p-value
Domain 1				
Control	16,96 (2,49)	0,520	19,57 (2,46)	0,000
Treatment	16,48 (2,50)		24,57 (3,80)	
Domain 2				
Control	14,17 (2,49)	0,757	16,39 (2,79)	0,000
Treatment	14,39 (2,23)		20,87 (2,49)	
Domain 3				
Control	6,78 (1,99)	0,935	8,35 (2,44)	0,001
Treatment	6,83 (1,55)		10,43 (1,59)	
Domain 4				
Control	18,35 (3,12)	0,613	21,74 (3,18)	0,000
Treatment	18,83 (3,24)		29,17 (4,18)	

DISCUSSION

Quality of life of pregnant women before treatment

In this study, the quality of life of pregnant women before the study in the control group was 33.87 (6.75) and in the treatment group was 33.48 (7.98). Before the study, there was no significant difference between the two groups (p -value 0.858). Before the study, the quality of life of pregnant women showed between the range (21-40), which means in the poor category. The patient's subjective appraisal of health-

related quality of life encompasses the physical, mental, and social aspects of well-being. The subjective impression of women's health-related quality of life is an essential indicator of the success and quality of maternal and child health interventions. However, a small percentage of women (less than 20%) spoke to health professionals spontaneously about psychological health issues.¹⁸

This is consistent with Gill and Feinstein's definition of quality of life as an individual's sense of his position in life and his ideals, expectations, and perspectives, which is a multidimensional measurement that is not restricted to only physical impacts or psychological treatment. There are three concepts of quality of life: showing a multidimensional concept, which means that the information needed has a range of areas of life from the sufferer, such as physical well-being, functional ability, and emotional or social well-being, as well as assessing the gap between wants and needs. Expectations according to the ability to make changes in themselves.¹⁹

Calou et al. (2018) researched 261 pregnant women and found that respondents explained. Employment, parity, partner support, marital status, and people who live with women are all indicators that negatively affect pregnant women's quality of life. On the other hand, maternal age, gestational age, type of residence, occupation, pregnant women's stress, lack of support from partners, and gestational age are factors that negatively impact the quality of life.²⁰ In line with research, Shishehgar (2014) explains that stress during pregnancy can cause critical negative outcomes for the mother and fetus. Quality of life has been recognized as a determinant of stress among pregnant women. The final result showed a significant relationship between pregnancy stress level and quality of life (p -value <0.05; = -0.16). Pregnancy stress can create muscle tension in pregnant women and hurt pregnancy. Muscle tension is one of the signs that often occurs in stress and anxiety conditions, which is the body's preparation for potential dangerous

events. In this case, it can be said that in conditions of anxiety, individuals will need a lot of energy to restore the imbalance that occurs due to the anxiety response experienced. PMRT has been demonstrated to reduce oxygen consumption, metabolic rate, respiratory rate, muscular tension, premature ventricular contractions, systolic blood pressure, pre-ventricular contractions, and alpha waves in the brain. It also enhances beta-endorphins and increases cellular immunity function. Relaxation can be used as an active coping skill if it is used to deal with anxiety.²¹

In the researcher's opinion, the condition of the quality of life of pregnant women before the study showed that pregnant women had a poor quality of life. This quality of life will impact stressors and affect the fetus. Therefore, intervention is needed to improve the quality of life of pregnant women so that the delivery outcome is better.

Quality of life of pregnant women after treatment

In this study, the quality of life of pregnant women in the control group was 43.57 (6.57) in the moderate category. The quality of life of pregnant women in the treatment group was 63.61 (9.97), which means in the good category. The statistical test results showed a significant difference in the quality of life of pregnant women in both the control and treatment groups after PMRT (p -value=0.000). One of the nonpharmacological treatment methods to overcome physical complaints in pregnant women is relaxation techniques, namely progressive muscle relaxation techniques, which are carried out to reduce pain intensity. Progressive muscle relaxation is now one of the most affordable relaxing therapies available, as it needs no imagination, has no adverse effects, and is simple to use. Relaxation treatment involves simultaneously tightening and relaxing muscles to produce a feeling of physical relaxation.¹⁷ This is in line with the research of Nasiri et al. (2018), who conducted PMRT therapy to reduce maternal stress and anxiety. At the start of the study,

there was no significant difference in mean stress and anxiety scores between the two groups. The PMRT group had a significantly lower mean stress score at the end of week 4 of the trial and the completion of treatment, but the control group's mean stress score did not change significantly at three-time points before and after the research.

These findings show that relaxation can help pregnant women reduce stress from week 4 to week 7. As it is known, stress and anxiety will impact the quality of life of pregnant women, causing complications for the mother, child, and family, including postpartum depression²². They were supported by research by Akmese et al. (2018), which examined the calm of PMR therapy on reducing low back pain and quality of life in pregnant women. The results obtained that the control and intervention groups were comparable at the beginning of the study. After 4 and 8 weeks of intervention, there were significant changes between the two groups. After the intervention, the intervention group exhibited significant improvements in all quality of life subscales. The intervention group experienced a considerable increase in pain following the intervention, but not the control group. The intervention group had a lower perception of pain and a higher quality of life than the control group. The researcher's opinion shows that PMRT therapy can improve the quality of life of pregnant women at the end of the study. There are several reasons why this therapy may yield the results that have been reported. The firing of sympathetic and parasympathetic nerve fibers causes tension and relaxation in the autonomic nervous system. Because muscle relaxation is an important part of PMR, the parasympathetic nervous system takes over during and after it, resulting in lower heart rates, respiration rates, and blood pressure. In combination with parasympathetic dominance, deep somatic calm has been shown to alleviate anxiety. Reduced tissue oxygen, reduced levels of substances like lactic acid, and the release of endorphins are all part of the general relaxation response. Thus, a reduction in

anxiety-induced PMR, together with a decrease in pain perception, may ultimately improve QoL status in pregnant women.

Effect of quality of life before and after treatment

In this study, both groups experienced an increase in quality of life before and after the study was good (P-value <0.05). However, the average increase in quality of life scores in the treatment group was significantly greater than that in the control group (p-value <0.05). Progressive muscle relaxation (PMR), a commonly utilized approach created by Jacobson in 1938, is one of the simplest and easiest relaxation techniques to master. Deep breathing and progressive release (tension release) of key muscle groups are used in the PMR technique. This technique encourages systematic relaxation of the body's primary muscle groups to achieve physical and mental relaxation. It also minimizes stress responses, skeletal muscle contractions, and pain feelings.²³

PMR (Progressive Muscle Relaxation) is a technique for relaxing muscles that are tense all over the body. The purpose of relaxation exercises is to elicit a response that suppresses the stress response. When this aim is met, the hypothalamus adjusts and reduces sympathetic and parasympathetic nervous system activity, resulting in sensations of calm and relaxation. Progressive Muscle Relaxation is a type of relaxation therapy that involves tightening and relaxing muscles in one section of the body at a time to induce physical relaxation. This sequential tightening and relaxation of muscle groups are carried out.^{24,25}

After the initial measurements were made on each respondent, the intervention group was given treatment in the form of PMRT 3 times a week for four weeks. In the control group, antenatal care was carried out according to the guidelines of the Ministry of Health. After eight weeks of treatment, the quality of life was re-measured, which included four dimensions with each dimension using a questionnaire. According

to Akmese (2014) research, giving PMRT to pregnant women can improve the quality of life and reduce pain in the lower back. Pregnant women Deep breathing and gradual release (tension release) of key muscle groups are used in the PMRT technique. This technique encourages the systematic relaxation of the body's primary muscle groups with the goals of physical and mental relaxation, stress reduction, skeletal, muscular contraction reduction, and pain reduction.¹² This aligns with the Dikmen research (2020), which states that PMR therapy can improve the quality of life in sexual life in pregnant women. It was reported that relaxation occurred more rapidly when awareness of deep breathing was added while sending tension and releasing commands to different muscle groups for relaxation during this time. The exercise is performed starting from the legs and going up to the buttocks, stomach, back, shoulders, arms, hands, face, and finally the whole body by simultaneously contracting for 10 seconds and then relaxing for 20 seconds. Contraction and relaxation of the movement are performed three times in each muscle. The muscles you want to relax are contracted while inhaling and released on exhalation. After each muscle exercise, pregnant women were asked to breathe deeply three times. The results felt that the intervention group was more meaningful than the control group.

The control group in this study did not receive PMRT therapy but received standard antenatal care. One form of antenatal care is also taught for pregnancy exercise. This is in line with Humaera (2019), which shows that pregnancy exercise positively affects the quality of life. This is because pregnancy exercise also trains the mother's muscles during pregnancy.²⁶ In the researcher's opinion, the score of improving the quality of life of pregnant women who were given PMRT therapy was higher than that of only antenatal care. Based on the study results, muscle relaxation exercises can improve the general health status of pregnant women and are recommended during pregnancy. It can be said that progressive muscle relaxation

exercises continue to improve the quality of life in pregnant women even though the weeks of pregnancy are growing. This is an important study because it is the first and only study in Indonesia to examine progressive muscle training on quality of life in pregnant women and is considered contributing to the application of midwifery care.

The domain of quality of life before and after treatment

In this study, domain 1 is the domain of physical health; before the study, there was no significant difference in the two groups (p -value = 0.520), but after the study, there was a significant difference between the two groups (p -value = 0.000). This is in line with the research by Akmese et al. (2014), which states that PMR exercises are proven to relax the muscles of pregnant women. This affects reducing pain in the lower back and improving quality of life. The results of this study indicate a significant difference in improving the physical health of pregnant women. In the opinion of researchers, PMRT exercises can improve the physical health of pregnant women. PMR facilitates pregnant women's muscles to become stronger in carrying out daily physical activities for pregnant women. This impacts the mother's ability to complete the daily tasks of pregnant women and has a positive impact on the health of pregnant women. In this study, domain 2, namely the domain of psychological well-being before the study, there was no significant difference between the two groups (p -value = 0.757), but after the study, there was a significant difference between the two groups (p -value = 0.000). Psychological dimension, which is related to the mental state of the individual. The mental state refers to whether or not the individual can adapt to various developmental demands according to his abilities, both demands from within and from outside himself. Psychological aspects are also related to physical aspects, where individuals can perform an activity well if the individual is mentally healthy.²⁷

This is in line with Rajeswari's research (2019) which explains that PMR helps

improve the emotional condition of antenatal mothers with stress and anxiety, which are needed to maintain the fetus's health in the womb. The study showed that PMR is useful during pregnancy to reduce stress, anxiety, and post-partum complications. They are supported by Nasiri's research (2018) which states that PMR can relieve stress, anxiety, and depression in pregnant women who are referred to health facilities. This has the impact that PMR can improve the psychological health of pregnant women in dealing with any conditions during pregnancy.²² In the opinion of the researcher, PMR can improve psychological health in pregnant women. This study shows that progressive muscle relaxation exercises are useful to reduce stress and anxiety during pregnancy. In domain 3, namely the domain of social relations, before the study, there was no significant difference between the two groups (p -value = 0.935). However, after the study, there were significant differences between the two groups (p -value = 0.001). This is in line with Dikmen et al. (2020) research, which states that PMR can improve pregnant women's quality of sexual life. One of the questions in the domain of social relations is quality of life. Results SQOL-F scores, obtained in the second (p = 0.006) and third (p = 0.001) measurements, the median SQOL-F scores differed significantly between groups. Nearly half of women experience sexual problems (such as arousal problems, orgasm, sexual pain), but they don't see them as a problem. Progressive muscle exercises performed in the second and third trimesters improve the quality of sexual life of pregnant women.²⁸

In domain 4, namely the environmental dimension domain, before the study, there was no significant difference between the two groups (p -value = 0.613), but after the study, there was a significant difference between the two groups (p -value = 0.000). Currently, no research in scholarly and PubMed specifically discusses PMR exercises on quality of life, especially the environmental health dimension. However, the research study by Akmese et al. (2014) and Nasiri's research

(2020) showed that the PMR technique improved the quality of life of pregnant women as a whole, including the environmental dimension. Pregnancy can be accompanied by serious physiological and psychological changes as it is a stressful period in a woman's life.^{12,21} This is in line with the research of Sadeghi et al. (2015), which examined PMRT on improving the health of pregnant women in general health. The results showed that the total average general health score of the experimental group and the control group could be compared. Although both groups improved their general health after the intervention, the experimental group significantly differed in general health before and after the intervention ($p=0.001$). This demonstrates that PMRT can help pregnant women's health in general. According to the researcher, the study's findings demonstrate the usefulness of progressive muscle relaxation on pregnant women's overall health, indicating that prenatal clinics should include a progressive muscle relaxation training program in their usual training program.

CONCLUSION

PMRT is nonpharmacological therapy that can improve the quality of life of pregnant women. There was a significant difference in the quality of life (p -value 0.05) in the control and intervention groups before and after the PMRT intervention, including physical health, psychological well-being, social relationships, environmental dimensions, and general health. Thus, based on this study looking at the effectiveness of the method, the lack of side effects during pregnancy, the ease of cost, and the application of the method at the public health center, PMRT is recommended to be part of routine services during pregnancy to reduce anxiety and improve the quality of life of pregnant women.

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