



The Effect of *Pilates Exercise* on *Low Back Pain* in Pregnant Women in the Second and Third Trimesters at Edelweiss Day Spa

Lusinta Agustina¹, Paryono²

^{1,2} Ministry of Health Surakarta Health Polytechnic, Surakarta, Indonesia

Correspondence: Lusinta Agustina

Email: jasata.agusti@gmail.com DOI: <https://doi.org/10.56359/genmj.v3i2.327>

Address: Padan, Daleman, Tulung, Klaten, 57482, Central Java, 081298716007

Submitted: 2 February 2024 Revised: 12 August 2023 Published: 22 February 2024

This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

Abstract

Objective: This study aims to determine the effect of *Pilates Exercise* on *Low Back Pain* in pregnant women in the second and third trimesters.

Method: Type of quantitative research with a pre-experimental design with a one group pretest posttest design. Purposive sampling technique obtained a total sample of 32 respondents from pregnant women in the second and third trimesters.

Results: After doing *Pilates exercise*, there were 27 respondents with mild pain (84.4%) and 5 respondents in the no pain category (15.6%). The results of the Wilcoxon Signed Rank Test show a *p*-value of 0.000, so $p < 0.05$ so that H_a is accepted, which means there is an effect of *Pilates exercise* on the *Low Back Pain* of pregnant women in the second and third trimesters at Edelweiss Day Spa Klaten.

Conclusion: There is an effect of *Pilates exercise* on the *low back pain* of pregnant women in the second and third trimesters at Edelweiss Day Spa Klaten.

Keywords: *Pilates Exercise*, *Low Back Pain*, Pregnant Women

Introduction

Pregnancy is an event that is preceded by the meeting of the egg or ovum with sperm cells and will last for approximately 10 months or 9 calendar months or 40 weeks or 280 days calculated from the first day of the last menstrual period (*Wagiyo* and *Putrono*, 2016). The

classification of pregnancy is divided into three trimesters, namely the first trimester lasts 12 weeks, the second trimester from the 13th week to the 27th week, and the third trimester from the 28th week to the 40th week (Atiqoh, 2020). Problems in the third trimester are related to kidney pain, blood pressure and gastrointestinal changes that intensify during the last trimester (Johnson, 2014).

During pregnancy, physiological changes occur that cause discomfort in pregnant women, such as frequent urination, vaginal discharge, constipation, flatulence, swelling of the extremities, hemorrhoids, shortness of breath and back pain (Astuti et al, 2017). Changes in shape during pregnancy are an adaptation of the body to the pregnancy process. Shifting the mother's center of gravity to the back of the legs causes the body to experience progressive lordosis and it is not uncommon for there to be increased mobility of the sacroiliac and sacrococcygeal joints which can cause lower back pain. Lower back pain usually increases in intensity as pregnancy advances because this pain is a result of the movement of the pregnant woman's center of gravity and her body posture. If a woman does not pay special attention to her posture, she will walk with a backward swing due to increased lordosis. This curve will then stretch the back muscles and cause pain or tenderness (haser, 2012).

Factors that cause lower back pain in pregnant women include the gestational age that pain begins to appear at 27 weeks, this is supported by reports that the pain period is 20-28 weeks (Bryndal et al., 2020). From a biomedical perspective, the cause of lower back pain is a forward movement of the center of gravity. The gravity of the uterus over the large blood vessels reduces blood flow in the spine, causing back pain especially in late pregnancy (Carvalho, 2017).

Many pregnant women who do not do pilates exercise will have an effect on their physical and mental health. Feelings of fear can cause mental and physical tension, which can cause muscles and joints to become stiff so that walking is unnatural. From the mother's wrong posture, increased lordosis and movement of the center of gravity in late pregnant women causes the mother to experience back pain. One alternative to reduce back pain for pregnant women is Pilates Exercise. This Pilates exercise can improve imperfect body posture and can also improve problems related to spinal disorders. Because the principle of the Pilates Exercise technique is strength and relaxation, balancing muscle strength and muscle flexibility. Pilates exercise is very important for maternal fitness during pregnancy, especially to reduce the risk of back pain and can also speed up the labor process.

Pilates exercise is more effective in increasing back flexibility than prenatal yoga, this is because the movements in yoga focus more on stretching the muscles around the back, regulating breathing patterns and only a few movements to strengthen the back stabilizer muscles. Meanwhile, in Pilates exercise the focus of the movements is not only on stretching the muscles, but also more on balancing muscle strength by strengthening and activating the muscles in the back stabilizers which tend to be weak and inactive. When the muscles in the back stabilizers such as the intraspinalus and intraversalis muscles are strengthened, the stability of the back will affect the ability of the back to move, so that when the stability of the back is good, the flexibility of the back also improves (Luh Putu Ayu, 2018).

The reduction in back pain that occurs in pregnant women who are given Pilates occurs because the Pilates exercise mechanism strengthens the elasticity of the abdominal, back and pelvic muscles. In the second and third trimesters of pregnancy, the pelvic ligaments stretch to increase the ability to maintain fetal position. The result of this stretching is pain. Posterior pelvic pain is experienced as deep pain located distal and lateral to the L5/S1 vertebrae, bilateral or

unilateral in the sacroiliac joint and posterior superior iliac spine possibly spreading to the posterior thigh or knee (Lisa Namuri, 2011).

The benefit of Pilates exercise, especially for pregnant women, is being able to master breathing techniques. Breathing techniques are very helpful in getting oxygen, breathing techniques for pregnant women to prepare for childbirth, abdominal wall muscles and back muscles are strengthened, Pilates exercises are expected to reduce and eliminate back pain caused by bulges, shoulder pulls, chest enlargement and shortening of knee tendons (Martini, M. 2016).

Low back pain occurs during pregnancy, that is, back pain affects the duration of labor and the process of expelling the fetus and non-pharmacological therapy in the form of Pilates exercise. Based on the above background, this study aims to analyze the effect of Pilates Exercise on Low Back Pain in pregnant women in the second and third trimesters. .

Objective

The aim of this research was to determine the effect of *Pilates Exercise* on *Low Back Pain* in pregnant women in the second and third trimesters at Edelweiss Day Spa Klaten.

Method

experimental research which provides treatment to objects that can control variables and firmly states the existence of a cause and effect relationship (Hidayat, 2014). The design in this research is pre-experimental, namely a research design used to look for cause and effect with the involvement of research in manipulating the independent variables (Nursalam, 2015). The research design used was *a one group pre test post test design* which is an experimental study which does not use a comparison group (control) but previously the group had pre test observations so that the researcher could compare changes after the experiment was carried out (Notoadmojo, 2012). The population in this study were all second and third trimester pregnant women who would take part in Pilates Exercise at Edelweiss Day Spa Klaten and there were 42 respondents. The sampling technique in this research was to use a purposive sampling technique, namely a technique for determining samples based on certain considerations and the results obtained were 32 respondents. Data analysis in this research uses univariate analysis and bivariate analysis. Univariate analysis uses frequency distribution tables, mean, median, mode and standard deviation to determine the characteristics of respondents. In this study, the data describes the Low Back Pain scale in pregnant women in the second and third trimesters before and after doing Pilates Exercise with the characteristics of the respondents including: age, education, work. Bivariate analysis in this study used the non-parameter *Wilcoxon test*.

Results and Discussion

1. Univariate Analysis

a. Respondent Characteristics

Table 1. Distribution of characteristics of second and third trimester pregnantwomen at Edelweiss Day Spa

No.	Characteristics	Criteria	Frequency	%
1.	Age	< 20 years	0	0
		20-35 years	32	100
		>35 years	0	0
2.	Education	Elementary school	0	0
		Junior high school	0	0
		Senior high school	18	56.4
		College	14	43.8
3.	Work	Civil servant	2	6.3
		Private	14	43.8
		Self-employed	0	0
		Housewives	16	50

Source: (Primary Data, 2022)

Based on Table 1., it is known that the majority of respondents in this study were of healthy reproductive age between 20-35 years, namely 32 people (100%). And for the educational level of the respondents in this study, the majority had a secondary education level, 18 people (56.3%) and 14 people (43.8%) had a tertiary education level.

b. Low Back Pain

Table 2. Frequency Distribution of *Low Back Pain* before and after Pilates Exerciseamong pregnant women in the second and third trimesters at Edelweiss Day Spa Klaten

<i>Low Back Pain</i>	Before		After	
	F	%	F	%
No Pain	0	0	5	15.6
Mild Pain	0	0	27	84.4
Moderate Pain	7	21.9	0	0
Severe Pain	25	78.1	0	0
	32	100	32	100

Source: (Pimer Data, 2022)

Based on Table 2. above, it shows that before the Pilates exercise intervention there were 25 respondents in the severe pain category (78.1%) and 7 respondents in the moderate pain category (21.9%). Meanwhile, after the Pilates Exercise intervention, there were 27 respondents in the mild pain category (84.4%) and 5 respondents in the no pain category (15.6%).

2. Bivariate Analysis

Table 3. The effect of Pilates exercise on low back pain in pregnant women in the second and third trimesters at Edelweiss Day Spa

Variable	N	P value	Z
Pre-Test	32	0,000	-4,964
Post-Test	32		

Source: (Primary Data, 2022)

Based on Table 3, the results of the *Wilcoxon Signed Rank Test* show a p value of 0.000, $p < 0.05$, so it can be concluded that H_a is accepted, which means that there is an effect of *Pilates Exercise* on low back pain for pregnant women in the second and third trimesters at Edelweiss Day Spa.

The results of this study prove that *Pilates Exercise* carried out for 30 minutes once can reduce *Low Back Pain* in pregnant women in the second and third trimesters. The results obtained in this study are supported by Fathatul Hidayah, et al (2018) with the results of research on the intensity of back pain for pregnant women in the third trimester before it was carried out, the average was 4.76. The intensity of back pain in pregnant women in the third trimester after doing Pilates exercises is an average of 3.35. There is a significant difference in the intensity of back pain in pregnant women in the second trimester before and after carrying out Pilates exercise. The value is $0.000 < 0.05$ and t count is $6.19 > t$ table 1.73. This shows that there is a difference in pain before and after the Pilates exercise intervention is given. .

Previous research conducted by Aryunani et al (2019) stated that there was an influence on back pain in pregnant women after doing Pilates exercises with Mann-Whitney test results with $p = 0.000$, $\alpha = 0.05$. Because $p < \alpha$, then H_0 is rejected. Thus, it can be concluded that there is an influence of Pilates exercise on back pain in third trimester pregnant women. Pilates Exercise training can be developed to be an alternative for treating back pain in the third trimester of pregnancy.

The results of this study are in line with the research of Anggita Mubyar, et all (2022). The results of this study show that after doing Pilates exercises, there was a decrease in the pain scale, namely in the first study from a scale of 2 to 5 to a scale of 0 to 4 and in the second study before doing the exercises. Pilates found that 9 people (60%) experienced moderate pain and 6 people (40%) experienced severe pain and after doing Pilates exercises it was found that 6 people (40%) did not experience pain, 7 people (46.7%) experienced moderate pain and 1 person (6.7%) did not experience pain. It can be concluded in this article that the results of previous research have decreased the scale of back pain. So pilates exercise can help relieve lower back pain for pregnant women in the third trimester.

According to research by Aryuani, et all., (2019), the results of this study show that the results before treatment in the control group respondents were 6 people (40%) experienced moderate pain, 5 people had severe pain (33.3%), in the treatment group 9 people (60%) experienced moderate pain, 6 people experienced severe pain (40%). After treatment in the control group, the majority of 8 people (53.3%) experienced moderate pain and in the treatment group 6 people (40%) did not experience pain, 7 people (46.7%) experienced mild pain based on Men Whitney Test = 0, 05 $p = 0.002$. It can be concluded in this article that there is an effect of

giving Pilates exercises on back pain in pregnant women in the third trimester, and can be used as an alternative to provide comfort to mothers until the birth process.

From the results of Dewi Nopiska's research (2019), the results showed that before being given Pilates exercises, 10% of respondents experienced severe pain (3), 70% (21) moderate, and 20% (6) mild. After being given pregnancy exercises, no one experienced severe pain, moderate pain was reduced to just 1 person (3.3%), mild pain was reduced to 19 people (63.3%), and 10 people no longer felt pain (33.3%). It was found that there was a significant decrease between the intensity of pain before and after being given Pilates exercises where the p-value of 0.000 was smaller than the alpha value ($p < \alpha$ (0.05)). It can be concluded in this article based on the results of previous research that the results of pregnant women during pregnancy and before exercise Pilates, some respondents experienced moderate pain, there was a change in the degree of back pain after Pilates exercise, it was found that several respondents experienced mild pain. And pregnancy exercise was effective in reducing the intensity of back pain in pregnant women in the third trimester.

Pilates exercises are more effective in increasing back flexibility than yoga exercises, this is because the movements in yoga exercises focus more on stretching the muscles around the back, regulating breathing patterns and only a few movements to strengthen the back stabilizer muscles. Meanwhile, in *Pilates exercise*, the focus of the movements is not only on stretching the muscles, but also more on balancing muscle strength by strengthening and activating the muscles in the back stabilizers which tend to be weak and inactive. When the muscles in the back stabilizers such as the *intraspinalis* and *intraversalis muscles* are strengthened, the stability of the back will affect the ability to move the back, so that when the stability of the back is good, the flexibility of the back also improves. (Luh Putu Ayu et al., 2018)

Conclusion

Based on the results of research and discussion about *Pilates Exercise for Low Back Pain* in pregnant women in the second and third trimesters at Edelweiss Day Spa, it can be concluded that the majority of pregnant women in the second and third trimesters are of healthy reproductive age, namely 20-35 years, 32 people (100%) and have Pilates Exercise, which was initially carried out as a pre-test on a severe pain scale, then after the *Pilates Exercise* intervention was carried out, the post-test results showed that the pain scale was reduced to mild. So it can be concluded that there is an influence of *Pilates Exercise on Low Back Pain* in pregnant women in the second and third trimesters at Edelweiss Day Spa Klaten.

Thank-you note

Thank you to the Surakarta Ministry of Health Polytechnic, Edelweiss Day Spa and all pregnant women at Edelweiss as well as all colleagues who have helped with this research process.

Bibliography

1. Anggita Mubyar. Nia Risa Dewi . Sapthi Ayubbana . (2022). *Pilates exercise to painful back Mother third trimester of pregnancy* . *Journal Young Scholars Volume 2, Number 1, ISSN 2807-3649* .
2. Aryani . Festival Wiliyanarti . (2019). *Effectiveness of Pilates Exercise for Back Pain in Third Trimester Pregnant Women* . No 2. *Journal Muhammadiyah Nursing* . ISSN 2541-2396 . 4 .
3. Astuti, et al (2017). Level of knowledge of pregnant women regarding physical changes during pregnancy at the KIA Polyclinic, Kabil Health Center, Batam City. *Journal of Health Sciences*, <https://doi.org/10.37776/zonakes.v11i3.12>
4. Atiqoh, RN (2020). *Review Hyperemesis Gravidarum (Excessive Nausea and Vomiting in Pregnancy)*. DKI Jakarta : One Peach Media
5. Alimul Aziz. (2009). *Nursing Research Methods and Data Analysis Techniques*. Jakarta. Salemba Medika
6. Bryndal , A., Majchrzycki , M., Grochulska , A., Glowinski, S., & Seremak - mrozikiewicz , A. (2020). Risk factors associated with low back pain among a group of 1510 pregnant women. *Journal of Personalized Medicine*, 10(2), 1–10. <https://doi.org/10.3390/jpm10020051>
7. goddess Nopiska Lilis . (2019). The Effect of Pilates Exercise : The Pilates Method Reduces Musculoskeletal Pain in Pregnancy . *Indonesian Health Issues* , 2 . <https://doi.org/10.47134/inhis.v1i1.21>
8. Midwifery Lecturer, Indonesian Midwife. (2018). *Midwifery Theory and Care*. EGC. Jakarta
9. Febrina Yosefa , Misrawati , Yesi Hasneli . *Effectiveness of Pregnancy Exercise To Decline*
10. Fraser, Diane.M. (2012). *Myles Textbook of Midwives*. Edition 15. Jakarta. EGC
11. Johnson, J. Y. (2014). *Maternity Nursing A mandatory book for Nursing Practitioners & Students*. Translated by Kurna, dSYogyakarta : Rapha Publishing
12. Luh Putu Ayu, et al. (2018). Pilates Exercise is More Effective in Increasing Lumbar Flexibility Than Yoga Exercise in Adult Women. *Sport and Fitness Journal*. Volume 6, No.2, May 2018: 23-30 .
13. Mursid, A., 2012; Differences in the Effect of Pilates Exercise and Aerobic Exercise on Women's Trunk Flexibility; Health Polytechnic, Surakarta.
14. Nasim Yousefi Ghandali . et al. (2021). The effectiveness of a Pilates exercise program during pregnancy on childbirth outcomes: a randomized controlled clinical trial. *BMC Pregnancy and Childbirth*, 21(1), 1–11. <https://doi.org/10.1186/s12884-021-03922-2>
15. Uun Kurniasih. (2020). The Effect of Pilates Exercise on Back Pain in Pregnant Women in the Second and Third Trimesters. *Journal of Health*, 8(2), 1004–1010. <https://doi.org/10.38165/jk.v8i2.110>
16. Wagiyo and Putrono. (2016). *Antenatal, Intranatal and Newborn Nursing Care*. Yogyakarta. Andy