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Research article

Effectiveness of Pregnancy Exercises in Reducing Lower Back Pain Among Third Trimester Pregnant Women

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Abstract

Lower back pain is one of the most common complaints experienced by pregnant women, particularly in the third trimester. Pregnancy exercise is an effective intervention to alleviate this discomfort. This study aimed to evaluate the differences in lower back pain levels before and after pregnancy exercise in third-trimester pregnant women at UPTD Klungkung I Community Health Center. A quasi-experimental design with a one-group pretest-posttest approach was utilized, involving 21 third-trimester pregnant women selected through purposive sampling. Data were collected using the Numerical Rating Scale (NRS) and analyzed with the Wilcoxon test following the Shapiro-Wilk normality test. The results showed a mean lower back pain score of 7.14 (SD = 0.793) before the intervention, with a significant reduction after pregnancy exercises ($p < 0.001$). These findings indicate a substantial improvement in lower back pain among participants after pregnancy exercises. It is recommended that pregnant women actively engage in pregnancy exercise programs to enhance comfort during pregnancy and alleviate back pain complaints.

INTRODUCTION

The first, second, and third trimesters of pregnancy are the distinct phases of the pregnancy. The fetus grows inside the mother's womb, causing the lumbar to curve more and the shoulders to pull back in order to compensate for the increased size of the fetus. Back discomfort may result from these more flexible spinal joints [1]. Lower back discomfort affects between 46 and 58% of pregnant women during the second trimester and 43.23% during the third [2]. Pregnant women in Indonesia typically experience between 60% and 80% of back pain [3].

Pregnant women's centers of gravity go forward due to uterine expansion. The mother will need to modify her standing posture as a result of this change. Such alterations in the body might result in compensatory curvatures of the thoracic spine (kyphosis) and lumbar curvature (lordosis). This type of mechanism starts in the fourth or ninth month of pregnancy and continues for a full twelve weeks following birth [4]. The woman will go through both physical and psychological changes during pregnancy. The mother may experience physical changes that are uncomfortable at times, such as lower back ache. Because the relaxant hormone causes muscles to relax

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and become limp, lower back discomfort in pregnant women usually manifests in the second and third trimesters of pregnancy and is linked to increased weight from uterine growth and straining of the supporting muscles [5].

A type of exercise called prenatal gymnastics helps to preserve and develop the flexibility of the pelvic floor muscles, ligaments, and abdominal wall muscles that are involved in labor. Because prenatal gymnastics involves activities that strengthen the abdominal muscles, it can help pregnant women who complain of back pain [6]. According to research by Arkha (2022), back pain in the third trimester of pregnancy can be effectively reduced by practicing yoga poses like the cat and cow [7]. Pregnant women's back pain significantly decreased, according to research at the Metro City Work Area Health Center on the impact of pregnancy exercise on back pain [8]. A study involving 869 expectant mothers from the US, UK, Norway, and Sweden revealed that between 70 and 86% of them experienced lower back pain [9]. 60–80% of pregnant women in different parts of Indonesia reported having lower back pain during their pregnancy, according to research findings [10].

Interviewing the midwife who oversaw the UPTD Klungkung I Health Center work area on September 12, 2023, the researcher conducted a preliminary investigation. According to them, counseling and pregnancy fitness activities are part of a regular Saturday pregnancy class program. The number of pregnant women in the third trimester in the UPTD Klungkung I Health Center's work area is known from the results of the initial survey to be 65 people. Interviews conducted with sixteen pregnant women revealed that eleven of them had lower back pain and five did not.

From the background description above and based on a preliminary study conducted in the Working Area of UPTD. Klungkung I Health Center, there were 25 pregnant women who were enthusiastic about participating in pregnancy exercises. Interviews with 16 pregnant women in TW III found that 11 of them said they still felt lower back pain and 5 of them did not experience lower back pain. Of the 11 pregnant women who still felt lower back pain, they said that when doing sitting activities, mothers used sitting pillows, mothers also often compressed their backs if they were in pain. This caused researchers to be interested in conducting a study entitled "Differences in Lower Back Pain Before and After Pregnancy Exercises in Pregnant Women in Trimester III in the Working Area of UPTD. Klungkung I Health Center".

METHODS

"Is there a Difference in Lower Back Pain Before and After Pregnancy Exercises in Pregnant Women in the Third Trimester in the Working Area of UPTD. Klungkung I Health Center?" is the research question that this study attempts to answer using a quasi-experimental research design. The present study used a single group pre-posttest design, in which a single group is subjected to pre- and post-testing to examine the effects of pregnant workouts [11]. Without a comparison group (control), this design consists of two observations (pretest and posttest) that enable researchers to assess the effects of the intervention—that is, counseling—after it is implemented.

All third-trimester pregnant women who visited during pregnancy exercises and were registered in the ANC visit register in the UPTD Work Area comprised the study population. In 2023, Klungkung I Health Center accommodated 65 expectant mothers in total. The sample collection method made use of the non-probability sampling approach, which is sampling based on inclusion criteria and purposive sampling, in which samples are selected based on predefined criteria and possess

specific features [11]. The study's sample consisted of UPTD Klungkung I Health Center Work Area pregnant women in their third trimester with a gestational age of ≥24 weeks. 21 participants fulfilled the inclusion and exclusion criteria. The paired numerical analytical approach was used to calculate the sample size [12].

Primary data were those gathered directly from the subjects. The main source of data utilized was the Numeric Rating Scale (NRS), which asked the patient to describe their pain using a number (1–10) both before and after therapy. This allowed researchers to calculate the pain score semi-quantitatively. An observation sheet in the form of a data collection instrument sheet was employed in this study's methodology. Pregnancy exercise utilizing the Leaflet and SOP pregnancy exercise technique is the instrument utilized in this study for the independent variable, while the Numerical Rating Score pain intensity observation sheet is used by the researcher to quantify back pain for the dependent variable. In this instance, the researcher opts for structured observation, which entails witnessing and documenting what is observed to be lower back pain that pregnant women suffer throughout the third trimester.

The data collection stage begins with the delivery of research objectives, explanation of procedures and provision of informed consent stating that respondents are willing to participate in the research. Data processing is carried out through the stages of editing, coding, entry, processing, and cleaning. Further data analysis is carried out using univariate and bivariate analysis. Univariate analysis shows the distribution and percentage of the characteristics of research subjects. Meanwhile, bivariate analysis is conducted to see whether there is a relationship or influence between the independent variable and the dependent variable. A normality test is conducted to determine whether the data comes from a normally distributed population or not. The normality test in this study uses the Shapiro-Wilk test with the help of SPSS 26. The use of the Shapiro-Wilk test compares a series of data in the sample against the normal distribution of a series of values with the same mean and standard deviation. If the data is normally distributed, the data analysis used is the Paired t-test and if the data is not normally distributed, the data analysis used is the Wilcoxon test with a significance level: $\alpha = 0.05$.

RESULTS

The results of table 1 above, from 21 respondents it was found that all were aged 20-35 years (100%). Based on the parity of the 21 respondents, it was found that most were primipara (52.4%). Based on education, it can be seen from 21 respondents that most were educated in secondary education (66.7%).

Table 1.
Frequency Distribution of Characteristics of Pregnant Women Based on Age, Parity, Education of Pregnant Women in the Third Trimester

Indicators	f	%
Age		
20-35 years	21	100
Pharity		
Primipara	11	52,4
Multipara	10	47,6
Education		
Intermediate	14	66,7
High	7	33,3
Total	21	100

Based on the results of the interpretation of table 2 above, the normality test of lower back pain before being given pregnancy exercises obtained a p value of 0.001, while the normality test of lower back pain after being given pregnancy exercises obtained a p value of 0.008. Because the p value before and after <0.05, this means that it is not normally distributed. Data that is not normally distributed, data analysis uses the Wilcoxon test.

Table 2.
Normality Test with Shapiro Wilk test

Low back pain	Shapiro-Wilk f	p	Median
Pain score *Pre-Test*	21	0,001	0,803
Pain score *Post Test*	21	0,008	0,867

The results of table 3 show the average value of lower back pain before being given prenatal exercise, which is 7.14 with a maximum value of 8 and a minimum value of 6 and a standard deviation value of 0.793, while the average value of lower back pain in pregnant women after being given prenatal exercise is 2.10 with a maximum value of 3 and a minimum of 1 and a standard deviation value of 0.889.

Based on table 3, it shows that the average number of pregnant women with lower back pain before being given prenatal exercise was 7.14 and there was a decrease in the average number of lower back pain in pregnant women after being given prenatal exercise to 2.10. The magnitude of the decrease in the average number of lower back pain before and after being given prenatal exercise was 5.04. Based on the statistical test with Wilcoxon, a p value of 0.000 was obtained, which means that there is a difference in lower back pain before and after prenatal exercise in pregnant women in Trimester III.

Table 3.
Differences in Lower Back Pain Before and After Pregnancy Exercises in Pregnant Women in the Third Trimester

Low back pain	Mean	Max	Min	SD	p
Pain score *Pre-Test*	7,14	8	6	0,793	
					0,000
Pain score *Post Test*	2,10	3	1	0,889	

DISCUSSION

The maternal age in this study was 100 percent between 20 and 35 years old. A woman can get pregnant and give birth safely when she is between 20 and 35 years old. According to reports, women under 20 years old have a 2–5 times higher risk of maternal death than women between 20 and 29 years old. When a mother is over 35 years old and pregnant, she may worry about her reproductive organs being too old for her and about how she will give birth safely [13].

Maternal parity obtained the results of primiparous parity 11 respondents (52.4%) more than multiparous mothers 10 respondents (47.7%), this shows that on average pregnant women in UPTD. Klungkung Health Center I primipara experience lower back pain. Pregnant women with high parity are more likely to experience pregnancy and delivery problems. Additionally, O2 transfer from the mother to the fetus may be hampered by high parity [14].

Education is divided into three, namely primary, secondary and higher education. Primary education if the mother is a graduate of elementary school-junior high school, secondary education if the mother's education is high school or vocational school while higher education if the mother's last education is college. Most of the mothers' education is secondary 14 respondents (66.7%) while those with higher education are 7 respondents (33.3%). Lichayati and Kartikasari (2013) state that one factor influencing back pain during pregnancy is education [15]. The secondary education level of high school enables students to develop their critical thinking skills and search for and apply knowledge, particularly when it comes to back discomfort during pregnancy. A better educated individual will view the world more broadly and be open to new concepts and lifestyle choices, using this information to preserve their health [16].

The results of the study showed that all pregnant women experienced back pain before doing pregnancy exercises with a maximum value of 8 and a minimum value of 6 with a standard deviation value of 0.793. Then there was a decrease in lower back pain after pregnancy exercises in

pregnant women in Trimester III with a maximum value of 3 and a minimum value of 1 with a standard deviation value of 0.889. Because prenatal exercise involves motions that strengthen the abdominal muscles, it can help pregnant women who complain of back pain. Controlling the pelvis when gazing upward is one of the main roles played by the abdominal muscles. The muscles take on a secondary role in preventing undue strain on the pelvic ligaments when the ligaments surrounding the pelvis tighten and are unable to offer robust support to the joints. It is important to keep in mind that back pain is mostly caused by weakening of the abdominal muscles and excessive strain on the pelvis. This exercise is required to maintain excellent muscle tone in the abdomen area [17]. Additionally, the body will release more endorphins during prenatal activity. Endorphins are recognized as chemicals with a mechanism of action similar to morphine, which helps to induce calm, manage stress during pregnancy, and lessen pain, including back pain [18].

Based on the results of the study, it shows that the average pain before pregnancy exercise in pregnant women in Trimester III at UPTD. Klungkung I Health Center is 7.14 and there is a decrease in the average lower back pain in pregnant women after being given pregnancy exercise to 2.10. The magnitude of the decrease in the average lower back pain before and after being given pregnancy exercise is 5.04. Based on the Wilcoxon test, a p value of 0.000 was obtained, which means there is a difference in Lower Back Pain Before and After Pregnancy Exercise in Pregnant Women in Trimester III in the Working Area of UPTD. Klungkung I Health Center.

This is also consistent with Fitriani's (2021) study at Kendangsari Hospital, Surabaya, which examined the association between prenatal exercise and back pain in expectant mothers. The study's p value of 0.000 indicates that Ho is rejected, indicating a significant relationship between prenatal exercise and back pain in expectant mothers [19]. Pregnant women's back pain can be reduced to a greater extent the more consistently they practice pregnancy exercises. According to Arkha (2022), there is a 0.000 p-value correlation between the efficacy of cat and cow yoga poses and back discomfort in third-trimester pregnant women. Regular prenatal exercise can help pregnant women feel better physically and ease their lower back discomfort [7].

CONCLUSSION

According to the study's findings, all of the pregnant women in the UPTD. Klungkung I Health Center's operating area were between the ages of 20 and 35, the majority of them were primiparous, and the majority had completed secondary school. With a p-value of 0.000, it can be concluded that there is a difference in lower back pain in pregnant women in Trimester III in the working area of UPTD. Klungkung I Health Center before and after pregnancy exercise. The level of lower back pain in these women was 7.14 and had a standard deviation of 0.793 before exercise, and 2.10 and a standard deviation of 0.889 after exercise.

Pregnant women experiencing lower back discomfort in the third trimester have found relief with antenatal exercise. Health professionals are expected to gain more understanding and enlighten the public about new information and sources regarding the efficacy of prenatal exercise movements in lowering complaints of back pain during pregnancy. It is anticipated that childbearing couples will engage in greater prenatal exercise to ensure that expectant mothers have a comfortable pregnancy.

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