



**PELVIC ROCKING EXERCISE AS AN ALTERNATIVE EXERCISE THERAPY TO REDUCE BACK PAIN IN PREGNANT WOMEN**

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**ABSTRACT**

Back pain in pregnant women, particularly in the second and third trimesters, is often due to hormonal changes, the centre of gravity and increased body weight. Pelvic rocking is a safe and effective non-pharmacological therapeutic alternative to reduce this pain, with benefits such as reducing muscle tension, improving posture and increasing circulation. Objective: The aim of this study was to identify and summarise the scientific evidence on the effect of pelvic rocking on reducing back pain during pregnancy. Method: This research uses the systematic literature review (SLR) method published between 2020-2025, which is a structured approach to identifying, appraising and synthesising research relevant to a particular question. This research uses several available database sources in e-resources : Pubmed, ScinceDirect and Google Scholar. Results: The results showed that pelvic rocking is an effective alternative therapeutic exercise to reduce back pain in pregnant women. Conclusions: The conclusion of this study is pelvic rocking exercise techniques provides the same results in reducing back pain in pregnant women.

Keywords: back pain; pelvic rocking exercise; pregnant

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**INTRODUCTION**

Pregnancy is a physiological process that women go through, but it is often accompanied by various physical changes that can affect their wellbeing. One of the most common complaints experienced by pregnant women is back pain, especially in the second and third trimesters (Dewi et al., 2024). This pain is caused by hormonal changes that soften the ligaments, a shift in the centre of gravity due to fetal growth, and increased body weight that puts pressure on the spine and surrounding muscles. If left untreated, this condition can affect the daily activities of pregnant women, including sleeping, walking and posture (Mariana & Norhapifah, 2023). Various interventions have been introduced to treat back pain in pregnant women, using both pharmacological and non-pharmacological approaches. However, the use of medication is often restricted to avoid adverse effects on the foetus (Yuni Fitriana, Era Revika, 2023). Therefore, non-pharmacological therapy is a safer and more desirable option, including physical exercise such as prenatal exercises, prenatal yoga and stretching techniques (Handayani et al., 2021). One effective and easy-to-do exercise is pelvic rocking, a simple movement that focuses on strengthening and stretching the pelvic and back muscles (Anna, 2023; Reffita et al., 2021).

Pelvic rocking has been clinically shown to reduce muscle tension and back pain in pregnant women. This exercise works by increasing pelvic flexibility, improving posture and increasing blood flow to the affected area (Anggrayani, 2023). In addition, this technique can help prepare pregnant women's bodies for labour by building pelvic muscle strength. Several studies have also shown that this exercise is safe to do at different stages of pregnancy, as

long as it is supervised by health professionals or done according to guidelines (Eva Santi Hutaosoit et al., 2022). It is therefore important to introduce pelvic rocking as a practical and effective alternative exercise therapy to reduce back pain in pregnant women. This approach is not only beneficial for improving comfort during pregnancy, but also has the potential to improve the quality of life of pregnant women by reducing physical discomfort and helping to prepare for a more optimal delivery. Previous research by Ekasari et al. (2022) explained that pelvic rocking exercises play an important role in the management of low back pain during pregnancy, as they can help reduce the risk of disability and improve the quality of life of pregnant women. Regular pelvic rocking has been shown to be effective in reducing the intensity of back pain in pregnant women (Intan Navelia et al., 2022). The novelty of this research lies in the comprehensive evaluation of the effectiveness of pelvic rocking as an alternative therapeutic exercise to reduce low back pain in pregnant women using the systematic literature review (SLR) method. This method allows researchers to systematically analyse and synthesise different relevant studies, providing stronger and more up-to-date scientific evidence about the benefits of this exercise. The aim of this review was to identify and summarise the scientific evidence on the effect of pelvic rocking on reducing low back pain in pregnancy.

## **METHOD**

This research uses the literature review method, which is a comprehensive summary of multiple research studies organised around a specific topic. The literature review was carried out from December 2024 to January 2025. The data used in this study is secondary data, which is data that is not obtained through direct observation, but comes from the results of research conducted by previous researchers. The secondary data sources used are reputable journal articles, both national and international, that are relevant to the issues identified. Based on the results of the literature review search in the Google Scholar, PubMed and ScienceDirect databases. The researchers searched for literature using the keywords: Back pain, Pelvic rocking exercise. This literature review meets several requirements based on the criteria set by the researcher. The inclusion criteria in this study are as follows: 1) research on pelvic rocking exercise intervention 2) research on back pain in pregnant women 3) articles from 2020-2024 4) literature using pre-experimental or quasi-experimental methods 5) full text articles (Indonesian or English) that fit the topic. The exclusion criteria in this study are as follows: 1) the article is not full text 2) the article uses meta-analysis or literature review 3) the content of the research is not relevant. After collecting the articles, the selection was made according to the research topic. The collected articles were analysed descriptively to present the problem to be studied. The five steps undertaken for this review are as follows: 1) identification of research questions, 2) identification of relevant articles, 3) selection of relevant articles, 4) selection of literature related to the articles and data mining, and 5) collation, synthesis and reporting of findings.

The article search strategy in this study used the PICOS framework, which includes Population is the population analysed based on the theme identified in the literature review and in this study of pregnant women. Intervention is the action or approach used in the management of individual and community cases, as well as an explanation of the study management method according to the theme in the literature review and in this study in the form of pelvic rocking exercises. The comparison is another intervention or management method used as a comparison. If not available, a control group may be used in the selected study. Outcome is the result or outcome obtained from previous research in accordance with the themes set out in the literature review and in this review in the form of reduced back pain in pregnant women. Study design is the research design used in the article to be reviewed. The research question is "How can pelvic rocking exercise reduce back pain in pregnant women?"

The literature search was carried out by searching the Googlr Scholar, Pubmed and ScienceDirect databases using the Boolean operator 'AND'. The following keywords were used in the search 'pregnant women' AND 'back pain' AND 'pelvic rocking exercise'.

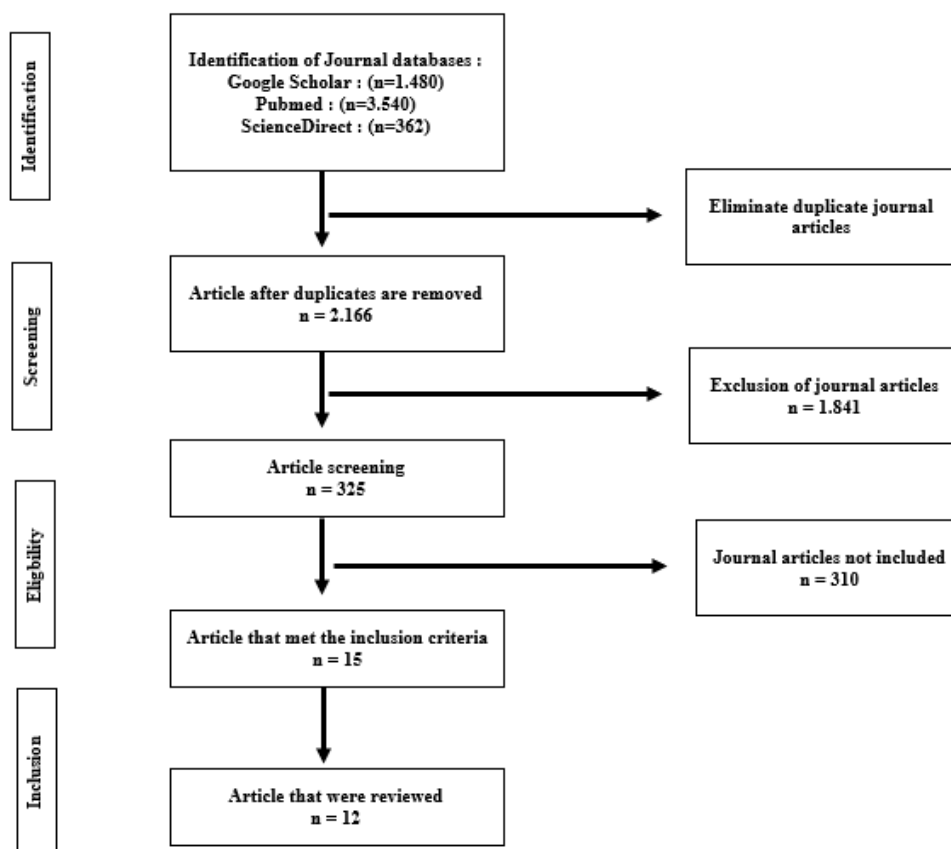


Figure 1. Article screening process

Using the PRISMA guideline and the feasibility test with the JBI Appraisal Analytical Quasi-Experiment, the following number of articles was obtained: Google Scholar: (n=1,480) articles. PubMed: (n=3,540) articles. ScienceDirect: (n=362) articles. In the screening phase, a duplication check was performed to identify similar articles, resulting in (n=3,216) articles. After excluding duplicate articles, the remaining number was (n=2,166) articles. An elimination process was then carried out, leaving (n=325) articles, with (n=1,841) articles eliminated. The remaining articles were then screened for eligibility until 15 articles met the inclusion criteria and were eliminated (n=310), leaving 12 articles for further analysis.

## RESULT

As a result of article screening, 12 articles were identified (Table 1). In addition, the researchers screened the articles by reading the titles and abstracts based on the inclusion criteria. The final stage of 12 articles selected for analysis (Table 1), are as follows:

Table 1. Article search results

No.	Title; Author; Year	Methods (Design, Sample, Variables, Instrument, Analysis)	Research result
1.	Pelvic tilt exercise againt lower back pain for third trimester pregnant women in rejang lebong regency;	Quasi Experimental; 30 responden; variabel independen pelvice tilt variabel dependen lower back pain; visual analog scale; wilcoxon test	Back pain in pregnant women in their third trimester is reduced after pelvic tilt

No.	Title; Author; Year	Methods (Design, Sample, Variables, Instrument, Analysis)	Research result
	(Akbar et al., 2023)		training, and there is a significant difference before and after the intervention..
2.	Effect of pelvic rocking on the relief of pelvic pain in pregnant women; (Akbar et al., 2023)	Quasi eksperimental with pre-posttest with control; 13 responden; variabel independen pelvic rocking variabel dependen relief of pelvic pain; visual analog scale; paired t-test.	Decreased back pain after performing pelvic rocking four times for ten minutes. This technique is a practical and economical alternative to back pain relief.
3.	Pengaruh teknik pelvic rocking terhadap pengurangan nyeri punggung bawah pada ibu hamil multigravida didesa jeruk manis wilayah kerja puskesmas kotaraja; (Akbar et al., 2023)	Pra-experiment with one group pretest-posttest without control; 14 responden; visual analog scale; paired t-test	There is an effect of the pelvic rocking technique on reducing low back pain in multigravida pregnant women.
4.	Effect of pelvic rocking technique on the relief of low back pain among multigravida pregnant women; (Akbar et al., 2023)	Pra-experiment with pre-test and post-test; 30 responden; variabel independen pelvic rocking; visual analog scale; wilcoxon test	After the pelvic rocking technique, the average back pain and this technique are effective in reducing low back pain.
5.	Pengaruh pelvic rocking terhadap penurunan intensitas nyeri trimester III; Eva Santi Hutaosoit, Yessi Azwar, Deby Yanthina, Novi Yanti; 2022	Pra-experiment with one group pretest-posttest; 20 responden, variabel independen pelvic rocking variabel dependen penurunan intensitas nyeri; numeric rating scale; wilcoxon test.	There is an effect of pelvic rocking on pain intensity in third trimester pregnant women
6.	The effect of pelvic rocking on back pain intensity in third trimester pregnant women; (Akbar et al., 2023)	Quasy-experiment with one group pretest-posttest design; 21 responden; variabel independen pelvic rocking variabel dependen back pain intensity; observation sheet research instrument; wilcoxon test	Pelvic rocking reduces the intensity of back pain in pregnant women in their third trimester. This therapy can be a non-pharmacological alternative to reduce pain during pregnancy.
7.	Optimizing Pelvic Rocking with Gym Ball to Reduce Low Back Pain in Pregnancy; (Akbar et al., 2023)	Quasi eksperimen with pre-test, post-test design, dan nonequivalent control group; 30 responden; variabel independen pelvic rocking, variabel dependen low back pain; visual analog scale (VAS); paired t-test	The use of gym balls in pelvic rocking exercises has a significant effect on the back pain scale in pregnant women with a p-value = 0.000 (p < 0.05).
8.	Pelvic rocking and back rub can reduce back pain in tirhd trimester pregnant women; (Akbar et al., 2023)	Quasy-experiment; 52 responden; variabel independen pelvic rocking variabel dependen reduce back pain in tirhd trimester; visual analog scale; mann-whitney.	Pelvic rocking and back rubbing techniques are effective in reducing low back pain, with significant differences in the back pain scale in third trimester pregnant women.

No.	Title; Author; Year	Methods (Design, Sample, Variables, Instrument, Analysis)	Research result
9.	Effectiveness of pelvic rocking exercise with birth ball on the duration of third stage of labor; (Akbar et al., 2023)	Quasi Eksperimental dengan two group comparison; 64 responden; variabel independen pelvic rocking exercise, variabel dependen duration of third stage of labor; digital watch; mann-whitney	Pelvic rocking with a birthing ball combined with acupressure is an effective method of reducing the length of labour and has been shown to be a safe option for pregnant women.
10.	Pengaruh pelvic rocking terhadap penurunan nyeri punggung pada ibu hamil trimester III dipuskesmas sochah bangkalan; (Akbar et al., 2023)	Experiment with Pretest-Posttest with Control Group Design; 30 responden; variabel independen pelvic rocking variabel dependen decreased back pain; observation sheet instrument; Wilcoxon test.	There is an effect of pelvic rocking on reducing back pain in women in the third trimester of pregnancy.
11.	Pelvic rocking exercise dengan media gymball untuk mengurangi nyeri punggung pada ibu hamil trimester III; (Akbar et al., 2023)	Quasy-experiment design one group posttest; 10 respondents; independent variable pelvic rocking exercise dependent variable back pain in third trimester pregnant women; pain instrument using Visual Analogue Scale (VAS); independent t-test.	There is a decrease in the intensity of back pain by using pelvic rocking exercises through Gym Ball media in third trimester pregnant women.
12.	Pelvic rocking exercise untuk penurunan nyeri punggung bawah pada ibu hamil trimester III; (Akbar et al., 2023)	Pre-experimental with One Group Pretest-Posttest Design; 20 respondents; independent variable pelvic rocking exercise dependent variable lower back pain reduction; visual analogue scale; wilcoxon test	There is a difference in low back pain in pregnant women before and after Pelvic Rocking intervention.

## DISCUSSION

Back pain in pregnancy is a form of back pain that occurs during pregnancy without the patient having a previous history of back pain (Liu et al., 2021). Research shows that there is a significant difference between men and women in the prevalence of low back pain (LBP). Women are reported to have a higher incidence rate than men. In addition, the impact of LBP on disability rates and the number of co-morbidities is greater in women. Several studies on the management of LBP have shown that women tend to be more flexible and creative in dealing with pain. In contrast, men often use less adaptive strategies, such as catastrophic responses (Bento et al., 2020). Pregnancy back pain is one of the most common forms of musculoskeletal pain experienced by women during pregnancy. This condition often appears for the first time during pregnancy and can cause a range of significant physical problems and disability for pregnant women (Salari et al., 2023). Back pain is also a common complaint among pregnant women. It increases in intensity as the pregnancy progresses. Back pain in pregnant women is caused by a shift in the centre of gravity and hormonal changes (Rohmawati et al., 2023). Pregnancy itself is a condition in which a woman carries a growing foetus inside her body, usually in the uterus. This process lasts about 40 weeks, or about 9 months, calculated from the first day of the last menstrual period until the birth (Agustin et al., 2023; Ekasari et al., 2022).

Back pain is a common problem faced by pregnant women, especially in the third trimester (Karningsih et al., 2024; Purnamasari, 2012). At this stage, physical changes and additional strain on the spine are the main factors that exacerbate the pain. Research shows that up to 75% of pregnant women worldwide report experiencing back and lumbar pain during their pregnancy. This pain tends to get worse with increasing gestational age, especially in the last

few months before delivery (Karwati et al., 2024; Nesi Novita, Mursyida, 2018). Low back pain (LBP) is caused by physiological changes that occur in the body of pregnant women. This condition can have a significant impact on the mother's quality of life, including decreased physical performance, disrupted sleep patterns, and increased psychological distress due to constant discomfort (Ermasari & Winarno, 2024). During pregnancy, the body undergoes many changes, including changes in posture, weight gain and stretching of ligaments. These factors trigger muscle pain and other musculoskeletal disorders. Changes in physical condition also reduce the body's ability to support weight, making back pain a common complaint. On average, pregnant women gain 11-12 kg during pregnancy. This weight gain, together with hormonal and biomechanical changes, makes the body more susceptible to pain and discomfort (Salari et al., 2023). Low back pain during pregnancy can be treated with exercise therapy. Exercise therapy is a series of body movements, postures or physical activities performed in a systematic and planned way with the aim of reducing symptoms and improving health-related physical function. It is often recommended to help pregnant women manage the discomfort they experience (Jannah et al., 2022)

One form of exercise that is widely recommended for back pain in pregnancy is pelvic rocking (Suwanti et al., 2023). This exercise involves a simple movement of rocking the pelvis back and forth. Pelvic rocking has the benefit of stretching the muscles in the lower back, increasing pelvic flexibility and helping to improve posture. In addition, this exercise can also be performed using a gym ball, where the pelvic movement is achieved by rocking the pelvis from side to side, front to back, or in a circular motion (Ermasari & Winarno, 2024). Pelvic rocking has several benefits for pregnant women, particularly in reducing the lower back pain that is common during pregnancy. This movement is effective because it can stretch tight muscles while improving circulation in the pelvic area and lower back. This exercise also uses a gym ball as a tool, where the regular rocking motion of the pelvis helps to stretch the pelvic muscles for greater comfort and flexibility. In addition, pelvic rocking can stimulate the release of the hormone beta-endorphin, which acts as a natural painkiller in the body (Ermasari & Winarno, 2024). Pelvic rocking has several other important benefits that can One of these can strengthen the abdominal, pelvic and back muscles to improve posture in pregnant women due to weight gain and hormonal changes that affect muscle structure (Kurniyati & Bakara, 2021). This exercise is easy to do anywhere, which is a great advantage for pregnant women who are looking for ways to reduce physical strain during pregnancy. This exercise also serves to prepare the pregnant woman's body for labour by increasing pelvic flexibility. In addition to increasing pelvic flexibility, pelvic rocking also strengthens the abdominal and waist muscles, which is very beneficial for reducing pressure on the waist, uterine blood vessels and bladder (Ekasari et al., 2022).

Pelvic rocking is also effective strengthening the waist and abdominal muscles, as it temporarily reduces pressure on the waist by moving the foetus forward. It can also reduce pressure in the abdominal cavity, which can reduce back pain (Nesi Novita, Mursyida, 2018). Pelvic rocking can also create a sense of relaxation in the muscles, improve posture, increase blood circulation and stimulate endorphin hormones, which create a sense of wellbeing (Lestari, 2023). The endorphin hormone can be stimulated by breathing exercises and mindfulness to distract and calm the mind (Eva Santi Hutaosoit et al., 2022). The side-to-side and circular movements relax the back, reduce movement restrictions during pregnancy and improve body function and activity. To help pregnant women have fun and enjoy their pregnancy, which promotes a better quality of life (Suwanti et al., 2023). Pelvic rocking can also be used to stretch the pelvic muscles and joints. Crawling and standing movements reduce the intensity of pain in pregnant women by reducing the pressure of the fetal head on the hip joint (Eva Santi Hutaosoit et al., 2022). Pelvic rocking also helps to relax the pelvic

ligaments through the action of the hormone relaxin. This increases the diameter of the pelvis, making labour easier. Pelvic rocking can maintain the strength of the pelvic muscle tone and increase the resistance of the postural muscle fibres in the pelvic floor, helping the birth process (Rohmawati et al., 2023). Previous studies have provided evidence that pelvic rocking is effective in reducing low back pain in pregnant women. A study by Suwanti et al (2023) found that after teaching pelvic rocking to pregnant women, the level of back pain decreased by an average of 1.47 points. Analysis using the Wilcoxon test showed a p-value of 0.000, indicating that the change was significant. Then the results of another study showed that the pelvic rocking technique had a positive effect on reducing low back pain in multigravida pregnant women, especially in Jeruk Manis village, Kotaraja Health Centre working area (Lestari, 2023).

In addition, other studies confirm that pelvic rocking exercises performed four times for ten minutes can reduce back pain in pregnant women. This suggests that pelvic rocking is a practical and effective technique for relieving back pain during pregnancy. Supported by its affordable cost and ease of implementation, this technique may be a useful alternative for pregnant women in overcoming back pain problems (Rohmawati et al., 2023). Studies conducted specifically in third trimester pregnant women show that pelvic rocking using a gym ball can be an effective alternative non-pharmacological intervention to reduce back pain during this trimester of (Kurniyati & Bakara, 2021; Rahmadania & Elly, 2024; Rohmawati et al., 2023). The statistical test results from the study showed a p-value of 0.000 (p-value 0.05), indicating that pelvic rocking exercises with a gym ball had a significant effect on reducing low back pain (LBP) in pregnancy (Ermasari & Winarno, 2024). In addition, a case study conducted by (Jasa & Listiana (2024) showed similar results, where mothers who presented to the midwife's office with complaints of back pain were taught pelvic rocking techniques and given education on correct posture. After undergoing this exercise, the mother reported a reduction in back pain, with less intensity. The results of this case study can strengthen the argument that pelvic rocking exercises can have significant benefits in reducing back pain in pregnant women when performed with correct technique and adequate support.

Based on previous studies, it can be concluded that pelvic rocking is a simple but effective alternative exercise to reduce back pain in pregnant women. This exercise involves movements that can be performed easily and anywhere, without the need for special equipment, thus providing flexibility for pregnant women. It has also been shown to be safe to do during pregnancy, as long as it is done correctly and according to your body's condition. However, despite the many benefits of pelvic rocking, it is very important for pregnant women to always consult a doctor or health professional before starting any new exercise programme to ensure that the exercises performed are suitable for their health condition and do not pose a risk to the mother or foetus.

## **CONCLUSION**

Pelvic rocking is a simple exercise that is effective in reducing back pain in pregnant women, especially in the third trimester. This exercise involves a pelvic rocking motion that can be easily performed using a gym ball or without any equipment. The main benefits of this exercise are that it reduces muscle tension in the lower back, increases pelvic flexibility, improves posture and increases blood flow, all of which help to reduce back pain. In addition, pelvic rocking can help relax the body and reduce stress by stimulating the release of natural pain-relieving hormones. The results of a systematic review of the literature support the effectiveness of this exercise in reducing back pain in pregnant women, making it a safe and easy to use non-pharmacological alternative. However, it is strongly recommended that pregnant women consult a health professional before starting this exercise to ensure its safety

for both mother and foetus.

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