



THE IMPACT OF BACK PAIN ON PREGNANT MOTHERS IN THE THIRD TRIMESTER: A SCOPING REVIEW

Elin Puspitasari*, Meira Erawati, Anggorowati, Luky Dwiantoro

Department of Nursing, Faculty of Medicine, Universitas Diponegoro, Jl. Prof. Soedarto No.13, Tembalang, Semarang, Central Java 50275, Indonesia

*elinpuspitasari2000@gmail.com

ABSTRACT

Back pain in third-trimester pregnant women is a common complaint affecting physical and psychological conditions. It often causes activity limitations, sleep disturbances, fatigue, anxiety, and decreased quality of life. This study aimed to map the impact of back pain in third-trimester pregnant women based on recent studies. A scoping review was conducted by searching the EBSCO, Scopus, PubMed, and ProQuest databases for literature on pregnancy, back pain, and quality of life using keywords. The review showed that back pain significantly affects daily activities, mobility, sleep quality, and psychological conditions in pregnant women. Common impacts included limited mobility, sleep disturbances, fatigue, increased anxiety, and decreased quality of life, which tended to worsen with increasing gestational age. Back pain in the third trimester has multidimensional impacts; therefore, appropriate prevention, education, and management are needed to improve maternal well-being and quality of life during pregnancy.

Keywords: back pain; pregnant women; quality of life; scoping review; third trimester

How to cite (in APA style)

Puspitasari, E., Erawati, M., Anggorowati, A., & Dwiantoro, L. (2026). The Impact of Back Pain on Pregnant Mothers in the Third Trimester: A Scoping Review. *Indonesian Journal of Global Health Research*, 8(5), 1135–1146. <https://doi.org/10.37287/ijghr.v8i5.2470>.

INTRODUCTION

Pregnancy is the process of fetal growth and development within the uterus, from conception through childbirth. A normal pregnancy lasts 280 days, after which changes occur in the mother's body as a form of adaptation (Zaliyanti et al., 2024). Pregnancy is divided into three trimesters: the first trimester begins at conception and lasts for 3 months (weeks 0–12), the second trimester lasts from the fourth to the sixth month (weeks 13–28), and the third trimester lasts from the seventh to the ninth month (weeks 29–42) (Alvionita et al., 2025). During pregnancy, both the mother and the fetus undergo significant physiological, hormonal, and psychological changes that affect their health and well-being (Heriyanti et al., 2024). Changes in pregnant women include discomforts experienced in the third trimester, such as back pain, urinary tract issues, vaginal discharge, varicose veins, and hemorrhoids; however, the most common discomfort experienced by pregnant women is back pain (Dian et al., 2022).

Back pain is a very common discomfort in the bones and muscles of the lower back, often caused by an enlarged uterus that alters the curvature of the spine, leading to hyperlordosis (Sabirah & Rismayanti, 2025). Lower back pain can also be caused by the growing fetus and the mother's weight gain, which increase the load on the spine and pelvis (Rani et al., 2020). Back pain in pregnant women in the third trimester is the most common complaint due to physiological and biomechanical changes during pregnancy (Kurniyati & Bakara, 2020). This condition arises from the fetus's weight gain, a shift in the center of gravity, and the relaxation of the pelvic ligaments due to increased relaxin levels. These changes increase pressure on the spine and lower back muscles, leading to pain and discomfort (Shanshan et al., 2024).

Other factors contributing to back pain include a history of back pain during a previous pregnancy or a history of back pain before pregnancy, the mother's young age, multiple births, stress, physical strain at work, and a history of trauma to the back or pelvis (Salari et al., 2023). Back pain is often felt in the lumbosacral region; the pain may increase as pregnancy progresses due to a shift in the center of gravity and changes in body posture (Arummega et al., 2022). About 70% of pregnant women reportedly experience back pain during pregnancy, with a higher prevalence in the third trimester (Hernandez-Lucas et al., 2023).

If left untreated, back pain during the third trimester can have negative physical, psychological, and functional effects. Physically, persistent pain hinders a mother's daily activities, such as walking, standing for long periods, sleeping, and even resting (Nurjanah & Organisation, 2025). The reason for conducting this scoping review is that most previous literature reviews have addressed back pain in pregnant women in general, without distinguishing the specific effects experienced during the third trimester, even though back pain tends to be more severe during this trimester due to increased mechanical stress, changes in body posture, hormone-induced ligament relaxation, and pressure on the lumbar region. In addition, previous reviews have focused primarily on risk factors and interventions, while the effects of back pain on women in their third trimester, such as limitations in physical activity, sleep disturbances, reduced quality of life, psychological issues (stress, anxiety, and depression), and potential postpartum complications, have not yet been systematically documented.

This scoping review aims to map the existing empirical evidence regarding the impact of back pain on pregnant women in the third trimester. Specifically, this review seeks to identify the factors associated with back pain during the third trimester of pregnancy, describe the measurement instruments used to assess back pain and its related factors, examine the methodological and analytical approaches employed in relevant studies, and synthesize the existing evidence to provide a more comprehensive understanding of how back pain affects the physical condition, psychological well-being, daily activities, and quality of life of pregnant women in the third trimester (Chang et al., 2014).

METHOD

This review employs a scoping review method, which aims to map the literature, gather information on research activities related to the topic under study, and identify problems or gaps in the research area. A scoping review involves identifying research questions; identifying relevant studies using a systematic literature review based on the formulated research questions; collecting research findings; tabulating the results; compiling, analyzing, and interpreting the findings; and reporting the results. This review is guided by the main question: "What is the impact of back pain on women in their third trimester of pregnancy?"

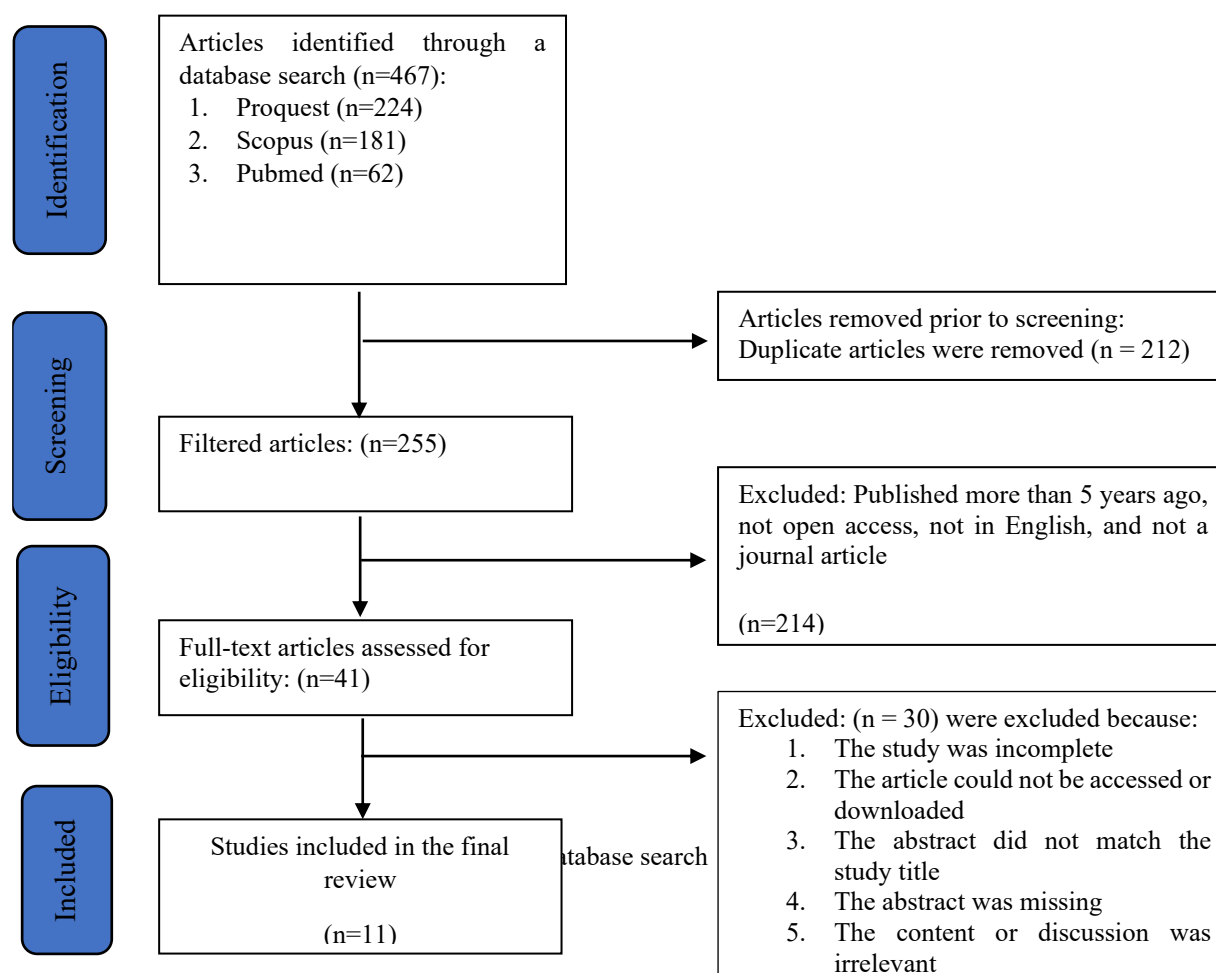
This review uses four databases: the literature search was conducted across EBSCO, Scopus, PubMed, and ProQuest. The search terms included a combination of keywords and Boolean operators: ("pregnant women" OR "pregnancy" OR "antenatal" OR "maternal health" OR "third trimester") AND ("low back pain" OR "back pain" OR "waist pain" OR "pelvic pain" OR "lumbopelvic pain") AND ("impact" OR "effect" OR "consequence" OR "quality of life" OR "daily activities" OR "functional limitation" OR "sleep disturbance" OR "psychological well-being"). The search is limited to articles that have undergone peer review and were published in English between 2020 and 2025.

After all records were retrieved, duplicate articles were removed. The remaining studies were screened based on their titles and abstracts according to the predefined eligibility criteria. Full-text articles that met the inclusion criteria were then assessed for eligibility. Relevant data from the included studies were extracted using a standardized data extraction form, including author, publication year, country, study design, sample characteristics, assessment instruments, and key

findings. Finally, the extracted data were synthesized descriptively to identify common themes and summarize the evidence regarding the impact of back pain on pregnant women in the third trimester.

PRISMA Flowchart

The process of identifying, screening, and selecting articles for this scoping review followed the PRISMA-ScR guidelines, as shown in Figure 1.



Inclusion and Exclusion Criteria

Articles were included if (1) they were quantitative studies, (2) they discussed the impact of back pain in third-trimester pregnant women, and (3) they were published in peer-reviewed journals between 2020 and 2025. Articles were excluded if they were published before 2020, were not available in full text, lacked an abstract, or were not written in English.

Data Collection

After conducting a database search, all identified records were exported to reference management software, and duplicates were removed. Titles and abstracts were screened independently by two reviewers to assess eligibility. Full-text screening was also conducted independently by both reviewers to determine final inclusion. Any disagreements were resolved through discussion, and if consensus could not be reached, a third reviewer was consulted.

Data from eligible studies were extracted using a standardized form, including study characteristics, sample demographics, back pain in third-trimester pregnant women, and its impact on third-trimester pregnant women. Key findings refer to the primary outcomes reported in each study that demonstrated the impact of back pain on third-trimester pregnant women. The initial search yielded 467 articles. After removing duplicates and irrelevant titles/abstracts, 41 articles were assessed for

eligibility. Following full-text screening and application of the inclusion/exclusion criteria, 11 articles were included in the final analysis. The screening process followed the PRISMA-ScR guidelines.

Data Extraction and Graph Creation Information

The guidelines used in selecting articles PRISMA-Scr are shown in Figure 1. The authors developed a database search strategy and completed the screening process. The authors also reviewed the search strategy and assessed the eligibility of the included articles at each screening stage. The articles selected for this review met the established inclusion and exclusion criteria. The included articles were analyzed using descriptive analysis. Key information, including author names, year of publication, study location, study title, research methods, study participants (pregnant women in the third trimester), back pain issues in pregnant women in the third trimester, and the duration of back pain in pregnant women, was summarized in a summary table (Table 1).

Table 1.
Review Article

No	Author, Year, Country (source/database)	Title	Objective	Sample	Method	Impact	Results
A1	Ceprnja D., Chipchase L., Fahey P., Liamputtong P., Gupta A., 2021 — Australia (Spine / PubMed). (Ceprnja et al., 2021)	Prevalence and Factors Associated with Pelvic Girdle Pain During Pregnancy in Australian Women: A Cross-Sectional Study	Determining the prevalence of PPGP and associated factors in pregnant women in Australia	National sample of pregnant women (cross-sectional study)	Cross-sectional; questionnaire & risk factor analysis	Significant disruption of daily activities during the trimester	The prevalence of pelvic girdle pain (PPGP) among pregnant women in Australia was 44%, with risk increasing with gestational age, parity, and duration of standing, and most strongly influenced by a history of previous
A2	M., Moges et al., 2022 — Ethiopia (Ann Med Surg / PubMed Central). (PMC) (Gashaw et al., 2022)	Level of activity limitation and predictors in women with pregnancy-related pelvic girdle pain: Prospective cross-sectional study	Assessing the level of activity restrictions and predictive factors for PGP	Pregnant women at healthcare facilities (large sample))	Prospective cross-sectional study; questionnaire and multivariate analysis	Causes limitations in daily activities	Most pregnant women with pelvic girdle pain experience activity limitations, with 57.1% experiencing moderate limitations, 29.6% mild limitations, and 13.3% severe limitations; factors that independently influence activity limitations include whether the woman has had previous children, her occupation, and alcohol consumption.

No	Author, Year, Country (source/database)	Title	Objective	Sample	Method	Impact	Results
A3	Amayri A., dkk., 2023 — Suriah (PMC / PubMed). (PMC) (Abusafia et al., 2024)	Low back pain in a sample of Syrian pregnant women: A cross-sectional study	Determining the prevalence of LBP and associated factors in the local population A sample of pregnant women at an antenatal clinic	A sample of pregnant women receiving antenatal care	Cross-sectional; questionnaire survey	Interfering with daily activities and sleep in the third trimester.	Of the 551 pregnant women, 62% experienced lower back pain, which was significantly associated with obesity, weekly walking duration, a history of pain in previous pregnancies, and type of work.
A4	Ozdilek R., dkk., 2024 — Turki (Journal / PubMed). (PubMed) (Ozdilek et al., 2025)	The Frequency of Back Pain, Lumbar Pain, And Pelvic Girdle Pain During Pregnancy	Measuring the frequency of pain locations and related factors in the second and third trimesters	Pregnant women at the antenatal clinic	Cross-sectional; survey and association analysis	Back pain hinders mobility in pregnant women	During pregnancy, pelvic girdle pain is the most common complaint (59%), followed by lower back pain (22.3%), while upper back pain is rare (2.7%). Pain frequency tends to increase in the second half of pregnancy.
A5	Arigo dkk., 2022 (multicentred/prospective; PubMed). (PubMed) (Fruscalzo et al., 2022)	Low Back Pain during Pregnancy and Delivery Outcomes	Assessing the association between LBP in the third trimester and labor outcomes and function	Pregnant women at ≥37 weeks who are admitted for labor	Prospective cross-sectional study at the onset of labor; questionnaire & delivery outcomes	Interferes with the daily activities of pregnant women	Of the 229 pregnant women, 55.9% experienced lower back pain that increased in frequency, intensity, and functional impairment through the third trimester, and was associated with a higher risk of cesarean delivery, while other delivery outcomes did not differ significantly.

No	Author, Year, Country (source/database)	Title	Objective	Sample	Method	Impact	Results
A6	García-Lucas, C. dk., 2025, Spanyol / Internasional (BMC Pregnancy & Childbirth) (BioMed Central) (Fancisa B et al., 2024)	Association between lumbopelvic pain in pregnancy and fear of childbirth: a multicenter cross-sectional case-control study	Assessing whether lumbopelvic pain is associated with anxiety, pain catastrophizing, and fear of childbirth	Pregnant women (cohort)	Observational study/correlation analysis	It was found that lumbopelvic pain is strongly associated with anxiety and pain catastrophizing.	Pregnant women with lumbopelvic pain have a greater fear of childbirth than those without such pain, and this fear is positively correlated with anxiety, depression, kinesiophobia, and catastrophizing.
A7	Sánchez-Polán, M., dk., 2023, (Open / PubMed Central) (PMC) (Gutierrez-Rojas et al., 2025)	The Influence of Physical Activity during Pregnancy on Maternal Pain and Discomfort: A Meta-Analysis	Assessing the impact of physical activity during pregnancy on musculoskeletal discomfort (such as back pain) and psychological aspects such as quality of life	Pregnant women (cohort sample)	Observational cohort study; questionnaires on physical activity, physical discomfort, and psychological quality of life	Back pain affects the psychological quality of life	Pregnant women who engage in physical activity experience lower pain intensity, reduced disability, and overall lower pain than those who do not; therefore, physical activity during pregnancy is effective in reducing pain and its functional impact.
A8	Zhou L dk 2023 — (China / PMC). (PMC) (Oyana & Sol, 2021)	The correlation between pregnancy-related low back pain and physical fitness evaluated by an index system of maternal physical fitness test	Determining the relationship between pain intensity and quality of life, sleep, and psychological symptoms	Pregnant women with varying degrees of pain	Analytical cross-sectional study; standardized questionnaire	Sleep disturbances and symptoms of anxiety or depression, especially during the third trimester.	As many as 75% of pregnant women experience pregnancy-related lower back pain, with physical condition deteriorating in the later stages of pregnancy—including reduced strength in the back and core muscles, decreased flexibility, and impaired balance—and lower back pain

No	Author, Year, Country (source/database)	Title	Objective	Sample	Method	Impact	Results
							showing a negative correlation with back and lower extremity muscle strength, indicating a high prevalence and significant functional impact of pain throughout pregnancy.
A9	Caputo EL., 2021, Brazil (<i>BMC Musculoskeletal Disorders</i> / PubMed) (Caputo et al., 2021)	Are leisure-time and work-related activities associated with low back pain during pregnancy?	Assessing the relationship between work and recreational activities and the incidence of LBP	380 pregnant women	Cross-sectional, questionnaire + LBP	Interference with daily activities and sleep disturbances	Leisure-time physical activity before and during pregnancy is not associated with lower back pain; however, working more than 8 hours per day and the habit of lifting heavy loads at work increase the risk and intensity of lower back pain in pregnant women.
A10	Manyozo SD., 2019, Malawi (<i>PLOS ONE</i> / PubMed Central)(Manyozo et al., 2019) Link Artikel	Low back pain during pregnancy : Prevalence, risk factors and association with daily activities among pregnant women in urban Blantyre, Malawi	Understanding the Prevalence of LBP and Its Relationship to Daily Activities	404 pregnant women	Cross-sectional, structured interviews	Daily activities (walking, housework) are most disrupted	Of 404 pregnant women, 62% experienced lower back pain; for most, the pain first appeared during their current pregnancy and was significantly associated with gestational age, sleep disturbances, mobility, lifting techniques, and sexual activity, although 34% of those affected did not seek treatment.
A11	Pisoh DW., dkk., 2025 — (studi lapangan tentang LBP kehamilan; PubMed Central). (Pisoh et al.,	Low back pain during pregnancy : prevalenc	Measuring the prevalence of LBP, its sublocations, and risk factors in a	410 participants (regional sample)	Cross-sectional; questionnaire & multivariate	Affects sleep and daily activities	Among 410 pregnant women, 53.9% experienced lower back pain, with a

No	Author, Year, Country (source/database)	Title	Objective	Sample	Method	Impact	Results
	2025) (PMC)	e, risk factors and clinical profile in the Bamenda Regional Hospital	local pregnant population		analysis		prevalence of lumbar pain at 34.9% and pelvic girdle pain at 26.1%; the risk of pain was higher among women with a history of pain in a previous pregnancy, obesity, and the use of soft mattresses, while exercise during pregnancy had a protective effect against back pain.

RESULT

The Results and Discussion section presents findings and characteristics of low back pain in pregnant women during the study and in the third trimester. Low back pain (LBP) in pregnant women is a common and frequently occurring musculoskeletal complaint, particularly in the third trimester. LBP can affect various aspects of a pregnant woman's life, ranging from mobility to sleep quality. Based on various studies, the following are the more specific characteristics of LBP in pregnant women:

Prevalence

Studies (Caputo et al., 2021; Cefrnja et al., 2021; Gashaw et al., 2022) show that approximately 53% to 62% of pregnant women experience low back pain, with most symptoms appearing in the third trimester; approximately 62% of pregnant women report low back pain, whereas in the study (Rabiei Vaziri et al., 2025) a similar prevalence of 62% was also found. As pregnancy progresses into the third trimester, pressure on the lower back increases due to rapid fetal growth and changes in the mother's posture, leading to an increase in complaints of low back pain.

Risk factors associated with low back pain

Pregnant women with a history of back pain are at higher risk of developing low back pain (LBP) (Cefrnja et al., 2021). Obesity and a history of back pain in previous pregnancies were identified as major risk factors contributing to the onset of low back pain (Amayri et al., 2023; Pisoh et al., 2025). In addition, parity also plays an important role, with pregnant women who have had more than one child (multiparous women) experiencing low back pain more frequently than primiparous women (those pregnant for the first time) (Gashaw et al., 2022). Prolonged standing and engagement in strenuous physical activities, such as heavy lifting, were also found to increase the risk of LBP in pregnant women (Caputo et al., 2021; Rabiei Vaziri et al., 2025). Conversely, light physical activity can help reduce the intensity of lower back pain (Sánchez-Polán et al., 2024). Obesity, as a major risk factor, increases pressure on the spine and lower back, exacerbating low back pain in pregnant women (Davenport et al., 2019).

Sympton

Dull and sharp pain: Low back pain in pregnant women is often characterized by a dull or sharp sensation in the lower back. This pain typically worsens with prolonged standing, walking long

distances, or heavy lifting (Davenport et al., 2019). Some pregnant women also experience pain radiating to the pelvic area, buttocks, or thighs, especially when pelvic girdle pain is associated with low back pain (Amayri et al., 2023). Sleep disturbances associated with low back pain can make it difficult for pregnant women to find a comfortable sleeping position, as lying down is uncomfortable (Gashaw et al., 2022; Ozdilek et al., 2025).

The Effects of Back Pain in Pregnant Women

1) Activity

The results of a scoping review of 11 articles indicate that back pain and lumbopelvic pain during pregnancy have a significant impact on the daily activities of pregnant women, particularly in the third trimester. Disruptions to daily activities were consistently reported in studies conducted in Australia, Ethiopia, Syria, Turkey, Malawi, and a recent regional study. Pelvic girdle pain significantly disrupts daily activities, and more than half of pregnant women experience limitations in walking, standing for long periods, and performing household chores due to back pain (Cepnija et al., 2021; Gashaw et al., 2022; Manyozo et al., 2019). Moderate-to-severe back pain directly reduces mobility and functional ability in pregnant women during the third trimester. This study confirms that the impact of back pain on daily activities is not merely a minor complaint but has affected mothers' ability to perform self-care and basic daily activities, such as walking, standing, bending, and even sleeping. The inability to perform these daily activities not only causes discomfort but can also worsen the physical and psychological condition of pregnant women, potentially increasing dependence and physical fatigue leading up to childbirth (Abusafia et al., 2024; Fruscalzo et al., 2022; Ozdilek et al., 2025; Pisoh et al., 2025).

2) Sleep patterns

In addition to physical activity, the review findings indicate that back pain during pregnancy is closely associated with sleep disturbances, particularly in the third trimester. Pregnant women with back pain often have difficulty falling asleep, experience restless sleep, and wake up repeatedly due to pain (Abusafia et al., 2024; Oyana & Sol, 2021). This finding is further supported by evidence that back pain contributes to sleep disturbances in nearly half to two-thirds of the pregnant women studied (Caputo et al., 2021; Pisoh et al., 2025). Sleep disturbances caused by back pain increase as pregnancy progresses and pain intensity rises. Research (Amayri et al., 2023; Bannister et al., 2025) indicates that pregnant women experiencing back pain, particularly in the third trimester, often have difficulty falling asleep or wake up at night due to disruptive pain. This lack of sleep quality not only leads to physical fatigue but can also exacerbate the pregnant woman's perception of pain. Disrupted sleep deprives the body of sufficient time to recover, increasing muscle tension and intensifying back pain. This sleep disturbance can reduce a pregnant woman's physical readiness for labor (Fruscalzo et al., 2022; Oyana & Sol, 2021).

3) Psychologist

The results of the scoping review also identified that back pain during pregnancy has a significant impact on the psychological well-being of pregnant women. There is a strong association between lumbopelvic pain and anxiety. Pregnant women with back pain experience a decline in psychological quality of life, particularly among those with low levels of physical activity (Fancisa B et al., 2024; Gutierrez-Rojas et al., 2025). Back pain in the third trimester of pregnancy not only affects the mother's physical condition but also increases anxiety and psychological stress. Pregnant women experiencing back pain often worry about the impact of their pain, particularly on the upcoming labor process; this worsens their emotional well-being, leading to anxiety disorders, depression, and stress, which in turn disrupts sleep quality and emotional balance (Abusafia et al., 2024; Oyana & Sol, 2021). These psychological impacts underscore the need for a comprehensive approach to managing back pain in pregnant women. In addition to managing physical pain through therapy and medication, it is also important to provide education, psychosocial support, and enhance self-care skills through relaxation exercises and coping techniques. This approach helps

pregnant women manage pain and stress and better prepares them for childbirth (Bannister et al., 2025).

DISCUSSION

Back pain in pregnant women during the third trimester significantly impacts sleep quality due to biomechanical changes, such as increased lumbar lordosis and a shift in the center of gravity (Resmaniasih et al., 2018). These conditions increase pressure on the muscles and lower spine, leading to more intense pain, particularly at night and when the mother changes sleeping positions (Salari et al., 2021). As a result, pregnant women often wake up frequently, experience reduced sleep quality, shorter sleep duration, and difficulty reaching the deep sleep phase—which is essential for physical recovery (Maryati, 2024). Persistent sleep disturbances can increase pain sensitivity, fatigue, difficulty concentrating, anxiety, and a reduced quality of life for pregnant women (Silva-perez et al., 2019).

In addition to affecting sleep, back pain in the third trimester also impacts daily activities. Several studies indicate that pregnant women experience limitations in movement, difficulty standing for long periods, difficulty bending over, and difficulty performing household chores (Asniah, 2020; Lestari et al., 2025). These conditions lead to decreased comfort, physical flexibility, and independence in performing daily activities (Weis et al., 2024). The impact of back pain is not only physical but also affects the psychological well-being of pregnant women. High pain intensity is associated with increased anxiety, stress, and mild depression, especially when the pain interferes with sleep and daily activities (Amayri et al., 2023; Zhou et al., 2023). These conditions can worsen the pregnancy experience and potentially affect fetal well-being due to increased levels of stress hormones in the body (Komatsu et al., 2020).

The results of various primary studies indicate that back pain in the third trimester is a multifactorial condition influenced by a history of previous pain, multiparity, obesity, physically demanding work, and poor sleep quality (Ozdilek et al., 2025; Pisoh et al., 2025; Amayri et al., 2023). The most commonly observed impacts include limited mobility, sleep disturbances, reduced activity levels, and psychological distress (Cepnja et al., 2021; Gashaw et al., 2022; Pisoh et al., 2025; Zhou et al., 2023). Therefore, the management of back pain in third-trimester pregnant women requires a holistic approach through posture education, physical exercise, antenatal physical therapy, and psychosocial support to help reduce pain and improve the quality of life of pregnant women. Published scientific articles serve as an important source for developing evidence-based practice, particularly in clinical research and in nursing and midwifery interventions (White, 2022; Marar et al., 2023). The findings of this scoping review are expected to serve as a foundation for the development of more effective interventions to reduce the impact of back pain in third-trimester pregnant women.

CONCLUSION

Back pain in pregnant women during the third trimester affects their daily activities, sleep patterns, and psychological well-being. The most common effects include limited mobility, sleep disturbances, anxiety, fatigue, and a reduced quality of life; therefore, comprehensive.

REFERENCES

- Zaliyanti V, Herlambang PM, Fatmawati W. 2024. Factors Affecting The Incidence of Anemia in Third-Trimester Pregnant Women at Purwoharjo Primary Health Center, Pemalang District. *J Public Heal Trop Coast Reg*, 7(1) : 71-82. tanggal akses : 12 September 2025.
- Alvionita V, Erviany N, Palin N, Sri Hastuti Handayani Usman A. 2025. Faktor Penyebab Nyeri Punggung Bawah pada Ibu Hamil Trimister II dan III di Puskesmas Sumarorong Kabupaten Mamasa Tahun 2024. *J Kesehatan dan Kedokt*, 2(1) : 117-126. tanggal akses : 14 September 2025.

- Heriyanti SW, Adnani QES, Rohmah S, Fatimah S. 2024. Effect of Prenatal Yoga On Back Pain and Sleep Quality in Pregnant Women: A Scoping Review. *J Bidan Cerdas*, 6(2) : 66-81. tanggal akses : 16 September 2025.
- Dian Soekmawaty Riezqy Ariendha, Irni Setyawati, Kusniyati Utami, Hardaniyati. 2022. The Effect of Pregnancy Exercises on Low Back Pain in Pregnant Women. *J Qual Public Heal*, 5(2) : 607-612. tanggal akses : 18 September 2025.
- Sabirah A, Rismayanti T. 2025. The Effect of Prenatal Massage on Reducing Back Pain in Pregnant Women in the Third Trimester at the Pebayuran Community Health Center in 2023. *Kesehat Masy*, 13(4) : 872-879. tanggal akses : 20 September 2025.
- Rani RH, Harmayetty H, Kusumaningrum T. 2020. The Combination of Benson Relaxation and Pelvic Tilting on the Scale of Low Back Pain in Pregnant Women. *Pedimaternat Nurs J*, 6(2) : 100-107. tanggal akses : 22 September 2025.
- Kurniyati, Bakara DM. 2020. Pijat Endorfin Terhadap Nyeri Punggung Bawah dan Kecemasan Endorphin Massage Against Lower Back Pain and Anxiety in Third Trimester Pregnant Women in Rejang Lebong Regency. *JIK (Jurnal Ilmu Kesehatan)*, 5(2) : 375-381. tanggal akses : 24 September 2025.
- Shanshan H, Liying C, Huihong Z, et al. 2024. Prevalence of Lumbopelvic Pain During Pregnancy: A Systematic Review and Meta-Analysis of Cross-Sectional Studies. *AOGS*, : 225-240. tanggal akses : 26 September 2025.
- Salari N, Mohammadi A, Hemmati M, et al. 2023. The Global Prevalence of Low Back Pain in Pregnancy: A Comprehensive Systematic Review and Meta-Analysis. *BMC Pregnancy Childbirth*, 23(1) : 1-13. tanggal akses : 28 September 2025.
- Arummega MN, Rahmawati A, Meiranny A. 2022. Faktor-Faktor yang Mempengaruhi Nyeri Punggung Ibu Hamil Trimester III: Literatur Review. *Oksitosin J Ilm Kebidanan*, 9(1) : 14-30. tanggal akses : 30 September 2025.
- Hernandez-Lucas P, Leirós-Rodríguez R, Mota J, García-Soidán JL. 2023. Effects of a Back School-Based Intervention on Non-Specific Low Back Pain in Adults: A Randomized Controlled Trial. *BMC Complement Med Ther*, 23(1) : 1-9. tanggal akses : 2 Oktober 2025.
- Nurjanah FW, Organisation P. 2025. Terapi Non Farmakologi Ibu Hamil Dengan Nyeri Punggung: Literatur Review. *Jurnal Sains dan Teknologi Kesehatan*, 6(1) : 21-28. tanggal akses : 4 Oktober 2025.
- Yoseph ET, Taiwo R, Kiapour A, et al. 2025. Pregnancy-Related Spinal Biomechanics: A Review of Low Back Pain and Degenerative Spine Disease. : 1-16. tanggal akses : 6 Oktober 2025.
- Chang HY, Lai YH, Jensen MP, et al. 2014. Factors Associated with Low Back Pain Changes During the Third Trimester of Pregnancy. *J Adv Nurs*, 70(5) : 1054-1064. tanggal akses : 8 Oktober 2025.
- Cepnija D, Chipchase L, Fahey P, Liamputtong P, Gupta A. 2021. Prevalence and Factors Associated with Pelvic Girdle Pain During Pregnancy in Australian Women: A Cross-Sectional Study. *Spine*, 46(14) : 944-949. tanggal akses : 10 Oktober 2025.
- Gashaw M, Yitayal MM, Zemed A, et al. 2022. Level of Activity Limitations and Predictors in Women with Pregnancy-Related Pelvic Girdle Pain: Prospective Cross-Sectional Study. *Ann Med Surg*, 78 : 103754. tanggal akses : 12 Oktober 2025.
- Abusafia AH, Khraisat AMS, Tableb OK, Al-Mugheed K, Alabdullah AA, Abdelaliem SMF. 2024. The Impact of a Nursing Spiritual Care Module on Nursing Competence: An Experimental Design. *BMC Palliat Care*, 23(1) : 1-9. tanggal akses : 14 Oktober 2025.
- Ozdilek R, Yıldırım M, Aksoy SD, Gul DK. 2025. The Frequency of Back Pain, Lumbar Pain, And Pelvic Girdle Pain During Pregnancy. *Pain Manag Nurs*, 26(4) : 470-477. tanggal akses : 16 Oktober 2025.
- Fruscalzo A, Cocco P, Londero AP, Gantert M. 2022. Low Back Pain During Pregnancy and Delivery Outcomes. *Z Geburtshilfe Neonatol*, 226(2) : 104-111. tanggal akses : 18 Oktober 2025.

- Fancisa B Y, Lubis NA, Wahyu S, Sianipar YG, Palijama A, Anatasya GD. 2024. The Effect of Pregnancy Gymnastics on the Reduction of Low Back Pain. 4th Mitra Husada Heal Int Conf, 4 : 296-303. tanggal akses : 20 Oktober 2025.
- Gutierrez-Rojas A, Manco-Herrera C, Nuñez-Escarcena X, et al. 2025. The Influence of Spirituality on Psychological Resilience in Cancer Patients Undergoing Oncological Treatment: A Cross-Sectional Study. BMC Palliat Care, 24(1). tanggal akses : 22 Oktober 2025.
- Oyana TJ, Sol HG. 2021. Barriers to eHealth Adoption in Routine Antenatal Care Practices: Perspectives of Expectant Mothers in Uganda. tanggal akses : 24 Oktober 2025.
- Caputo EL, Domingues MR, Bertoldi AD, et al. 2021. Are Leisure-Time and Work-Related Activities Associated with Low Back Pain During Pregnancy? BMC Musculoskelet Disord, 22(1) : 1-8. tanggal akses : 26 Oktober 2025.
- Manyozo SD, Nesto T, Bonongwe P, Muula AS. 2019. Low Back Pain During Pregnancy: Prevalence, Risk Factors and Association with Daily Activities Among Pregnant Women in Urban Blantyre, Malawi. Malawi Med J, 31(1) : 71-76. tanggal akses : 28 Oktober 2025.
- Pisoh DW, Karelle NTJ, Nchufor RN, et al. 2025. Low Back Pain During Pregnancy: Prevalence, Risk Factors and Clinical Profile in the Bamenda Regional Hospital. BMC Pregnancy Childbirth, 25(1). tanggal akses : 30 Oktober 2025.
- Amayri A, Khalayli N, Haj Ali D, Kudsi M. 2023. Low Back Pain in a Sample of Syrian Pregnant Women: A Cross-Sectional Study. Heal Sci Reports, 6(7). tanggal akses : 1 November 2025.
- Rabiei Vaziri M, Jaramillo J, Almagharbeh WT, Khajehhasani T, Dehghan M. 2025. Spiritual Care Competency and Spiritual Sensitivity Among Nursing Students: A Cross-Sectional Study. BMC Nurs, 24(1). tanggal akses : 3 November 2025.
- Sánchez-Polán M, Nagpal TS, Zhang D, Silva-Jose C, Montejo R, Barakat R. 2024. The Influence of Physical Activity During Pregnancy on Maternal Pain and Discomfort: A Meta-Analysis. J Pers Med, 14(1). tanggal akses : 5 November 2025.
- Davenport MH, Marchand AA, Mottola MF, et al. 2019. Exercise for the Prevention and Treatment of Low Back, Pelvic Girdle and Lumbopelvic Pain During Pregnancy: A Systematic Review and Meta-Analysis. Br J Sports Med, 53(2) : 90-98. tanggal akses : 7 November 2025.
- Bannister K, Patel R, Hughes S. 2025. The Descending Modulation of Pain. 166(11). tanggal akses : 9 November 2025.
- Resmaniasih K, Kemenkes P, Raya P, Williams M. 2018. Pengaruh Pijat Hamil terhadap Perubahan Kualitas. 2 : 93-99. tanggal akses : 11 November 2025.
- Salari N, Darvishi N, Khaledi-paveh B, Vaisi-raygani A, Jalali R. 2021. A Systematic Review and Meta-Analysis of Prevalence of Insomnia in the Third Trimester of Pregnancy. : 1-8. tanggal akses : 13 November 2025.
- Maryati S. 2024. Syncope Review: Efforts to Overcome Complaints of Back Pain in Women in the Trimester III of Pregnancy Using Non Pharmacological. 2(1) : 28-38. tanggal akses : 15 November 2025.
- Silva-perez LJ, Gonzalez-cardenas N, Surani S, Sosso FAE. 2019. Socioeconomic Status in Pregnant Women and Sleep Quality During Pregnancy. 11(11). tanggal akses : 17 November 2025.
- Asniah. 2020. Exercise Influence In Reducing Back Pain In Pregnant Women Trimester III. J Kesehat Ilm, 13(1) : 26-36. tanggal akses : 19 November 2025.
- Lestari R, Masitoh S, Tinggi S, Kesehatan I. 2025. Hubungan Kecemasan dan Aktivitas Fisik terhadap Kualitas Tidur Ibu Hamil Trimester III. : 1-9. tanggal akses : 21 November 2025.
- Zhou L, Feng X, Zheng R, Wang Y, Sun M, Liu Y. 2023. The Correlation Between Pregnancy-Related Low Back Pain and Physical Fitness Evaluated by an Index System of Maternal Physical Fitness Test. PLoS One, 18(12) : 1-13. tanggal akses : 23 November 2025.
- Persson M, Winkvist A, Dahlgren L, Mogren I. 2013. Struggling with Daily Life and Enduring Pain: A Qualitative Study of the Experiences of Pregnant Women Living with Pelvic Girdle Pain. tanggal akses : 25 November 2025.
- Komatsu R, Ando K, Flood PD. 2020. Factors Associated with Persistent Pain After Childbirth: A Narrative Review. Br J Anaesth, 124(3) : e117-e130. tanggal akses : 27 November 2025.

- White M. 2022. Sample Size in Quantitative Instrument Validation Studies: A Systematic Review of Articles Published in Scopus, 2021. *Heliyon*, 8(12) : e12223. tanggal akses : 29 November 2025.
- Marar S, Hamza MA, Ayyash M, Abu-Shaheen A. 2023. Development and Validation of an Instrument to Assess the Knowledge and Perceptions of Predatory Journals. *Heliyon*, 9(11) : e22270. tanggal akses : 30 November 2025.