INTERNATIONAL JOURNAL OF SOCIAL SCIENCES BULLETIN
ISSN: (E) 3007-1917 (P) 3007-1909
Volume 3, Issue 12, 2025

PREVALANCE OF LOW BACK PAIN IN PREGNANT FEMALES AND ITS ASSOCIATION WITH SLEEP DISTURBANCE IN TERTIARY CARE HOSPITAL IN PAKISTAN

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DOI: https://doi.org/10.5281/zenodo.18256373

Received	Accepted	Published
03 November 2025	17 December 2025	**31 December 2025**

ABSTRACT

Introduction:
Low back pain (LBP) is a common complaint during pregnancy, significantly affecting women's quality of life, particularly due to its association with sleep disturbances. Despite its high prevalence, LBP remains under-addressed in antenatal care settings in Pakistan. Understanding this relationship is essential to improve maternal health outcomes.

Study Purpose:
This study aimed to assess the prevalence and severity of low back pain among pregnant females in a tertiary care hospital in Pakistan and examine its association with sleep disturbance.

Research Methodology:
A descriptive cross-sectional study was conducted among 150 pregnant women attending antenatal services at a tertiary care hospital. Participants were selected using a non-probability convenience sampling technique. Data were collected using a structured, close-ended questionnaire covering demographics, characteristics of LBP, and sleep patterns. Statistical analysis was performed using SPSS version 27 to calculate descriptive frequencies and associations.

Results:
Among the respondents, 83.3% reported experiencing low back pain, with 53.3% rating it as moderate and 26% as severe. The majority experienced pain onset in the second trimester (42%). Sleep disturbances were prevalent in 72% of participants with LBP; 60% rated their sleep quality as poor. Occasional sleep disturbance was the most reported frequency (52%). These findings underscore a strong correlation between the intensity of LBP and the degree of sleep disturbance.

Conclusion:
The study reveals a high prevalence of low back pain and associated sleep disruption during pregnancy, especially in the second and third trimesters. These results highlight the need for improved antenatal interventions addressing musculoskeletal discomfort and sleep hygiene to enhance maternal well-being.

Keywords:
Low back pain, Sleep disturbance, Pregnancy, Maternal health, Antenatal care, Pakistan

1.INTRODUCTION

Low back pain manifests between the posterior iliac crest and the gluteal fold and is characterised by deep, stabbing pain that is unilateral or bilateral, recurring or continuous, and may radiate to the posterolateral thigh, knee, and calf but not to the foot(Katonis et al., 2011).A significant clinical, social, economic, and public health issue that affects people of all backgrounds is low back pain. There are numerous definitions for this condition, which can have a wide range of aetiologies and affect different demographic groups. As a result, the extensive body of research on low back pain is not just inconsistent but all are diverse(Manchikanti, 2000). During pregnancy, low-back pain (LBP) is a common symptom. Despite its high frequency, little is known about the problem's scope, and there are few in-depth studies on the risk factors that are associated with it. Furthermore, the difficulty to precisely identify which pregnancies are at danger hinders efforts to address the issue(Fast et al., 1987).

Pregnant women frequently complain of back pain. This is a musculoskeletal condition that is typically described as axial or para-sagittal lower lumbar discomfort. A mix of mechanical, hormonal, circulatory, and psychological variables may be to blame for this. Discomfort in this region may also be contributed to changes in the posterior pelvic region, particularly the sacroiliac joints which undergo changes during pregnancy and/or stretch direct stretch of intrapelvic structures. This can manifest itself in the lumbar region and/or radiate to the buttocks and posterior thighs. Unlike radiculopathy, posterior pelvic pain usually does not extend beyond the knees. The classic description of pain felt by most women is usually a result of symptoms of both types of low back pain, lumbar and pelvic. Such discomfort, which can vary in intensity and length, can significantly affect life throughout pregnancy. Low back pain usually goes away fast after giving birth and doesn't result in any long-term problems(Sabino and Grauer, 2008).

One of the causes of LBP and PGP in pregnant patients is thought to be joint laxity. Pregnant women who experience moderate to severe posterior pelvic discomfort show notable asymmetric sacroiliac joint laxity, in contrast to those who are asymptomatic.16 Furthermore, compared to pregnant women without symptoms, those with pregnancy-related lumbopelvic pain have been found to have increased pubic symphysis mobility during pregnancy and the puerperium.17 Increased levels of progesterone and oestradiol are linked to joint pain in many pregnant women (Casagrande et al., 2015). Exercises, regular rest, hot and cold compresses, abdominal or pelvic support belts, massage, acupuncture, chiropractic adjustments, aromatherapy, relaxation, herbs, yoga, Reiki, paracetamol, and non-steroidal anti-inflammatory medications are some of the interventions that have been employed thus far to assist control the pain (Liddle and Pennick, 2015). Beginning in the first trimester, the sleep alternation peaked in the third trimester.
(Huong et al., 2019)

Painful symptoms and poor sleep quality during pregnancy are caused by pregnant women's increased body weight, changes in centre of gravity and joint stability, and musculoskeletal alignment.(Sousa et al., 2015) Sleep quality starts to decline during the first trimester . Pregnant women typically report sleep maintenance insomnia. As pregnancy proceeds, both the number and duration of nocturnal awakenings increase. In addition, pregnant women suffer from sleep onset insomnia and too-early morning awakenings. Sleep duration has been reported to shorten during pregnancy. Moreover, pregnant women are more likely to take naps than other women and the frequency of napping increases in late pregnancy (Polo-Kantola et al., 2017). Poor sleep quality and insufficient sleep duration during pregnancy may raise the risk of unfavourable pregnancy outcomes, such as postpartum depression and foetal development restriction(Xu et al., 2017).

Women who encounter sleep problems during pregnancy are more likely to develop insomnia. According to the 2007 Women and Sleep Survey by the National Sleep Foundation, up to 78% of pregnant women reported having trouble sleeping during the third trimester. However, pregnant women's sleep patterns, length, and quality change during all weeks of pregnancy, not just in the latter stages(Bacaro et al., 2020). Sleep disruptions are specifically linked to high morbidity among pregnant mothers because pregnancy is linked to significant physiological and psychological changes that may impact sleep, as well as the possibility that these changes may worsen pre-existing disorders The National Sleep Foundation of America reports

that over 79% of expecting moms have had sleep disturbances or disorders that they did not have before becoming pregnant. Researchers have previously discovered a complicated link between sleep disorders and pregnancy over the last ten years, suggesting that there may be negative pregnancy-related consequences such as preeclampsia, caesarean delivery, gestational diabetes mellitus (GDM), premature birth, and lower birthweight(Yang et al., 2022).

Objective:
To evaluate the prevalence of low back pain and its association with sleep disturbance among pregnant females attending tertiary care hospitals in Pakistan.

Research Question:
What is the prevalence of low back pain among pregnant women in tertiary care hospitals, and how is it associated with sleep disturbance?

Problem statement:
Low back pain (LBP) is a common problem experienced by pregnant females, highly impacting their quality of life and their well-being. In Pakistan, the prevalence of LBP during pregnancy remains unaddressed, particularly in the context of its relation with sleep disturbances. With pregnancy-related hormonal, physical, and psychological alterations, many women suffer disturbed sleep patterns, which may increase the severity of LBP. Understanding the prevalence of LBP among pregnant women in a tertiary care hospital in Pakistan and its relationship with sleep disturbances is of vital importance for developing effective management strategies. This study aims to quantify the prevalence of LBP in this population and to investigate how sleep quality is affected by this condition, ultimately contributing to better clinical practices and maternal health outcomes.

Significance:
The prevalence of low back pain (LBP) among pregnant women and its association with sleep disturbance in Pakistan has never been addressed before this research has important ramifications for maternal health The study will close a significant gap in the literature by measuring the prevalence of LBP in this community and give medical practitioners important information about how frequent this ailment is. Furthermore, as both LBP and sleep disturbances can have a detrimental effect on a pregnant woman's physical and mental health, it is crucial to comprehend how they are related. A greater understanding of these relationships may result in more accurate clinical evaluations and customised pain management and sleep improvement strategies. .In the end, the results of this study could influence Pakistani healthcare policies and procedures, encouraging the creation of all-encompassing care plans that take pain management and sleep hygiene into account. This can help promote healthier pregnancies and the wellbeing of both mothers and their unborn children by improving maternal health outcomes, lowering healthcare expenditures, and improving the quality of life.

LITERATURE REVIEW

The work on this paper is focusing on Low Back Pain (LBP) and the risk factors associated with low back pain during pregnancy in 2020 and the study design was cross-sectional with specific implementations of VAS (Visual Analogue Scale) , RMDQ (Roland Morris Disability Questionnaire) and ODI (Oswestry Disability Index). Furthermore, the study included 1510 pregnant women. In addition to, the results confirmed that lying/sleeping (49.6%) and sitting positions (38.7%) as well as walking (37.2%) are the most significant factors causing LBP. It was also found that women who had not engaged in physical activity were more likely to experience LBP. The study concluded that predisposing factors for LBP in pregnancy are LBP in previous pregnancies, back pain during menstruation, a younger age and a lack of physical activity. Most women in pregnancy with LBP experienced minimal and mild disability. However, the study was conducted in 2020 in Poznan(Bryndal et al., 2020)
The focus of the research was to describe the occurrence and severity of sleep complaints in early pregnancy and to also investigated the associations between sleep complaints and pregnancy-related symptoms by Ertmann et al. (2020) . with specific implementation of electronic patient questionnaire The questionnaire was completed by 1338 out of 1508 eligible women before the end of gestation week 16. The gestational age ranged from 5 to 16 weeks (median 11 weeks) among the included women. On average, more than one third of the women reported to have at least one of the three sleep

complaints in the questionnaire. Problems "taking a long time to fall asleep" was reported by 312 women (23%), "waking up too early" was reported by 629 (47%), and 183 (14%) had been "lying awake most of the night". One sleep complaint was reported by 38%, two by 16, and 4% had all three symptoms. The majority were not at all or only mildly worried because of their sleep disturbances, but moderate or severe worries were found among 46% of those " taking a long time to fall asleep" and among 40% of those "lying awake most of the night". "Moderate or severe complaints" were reported by 277 (21%) women "Moderate or severe complaints" were associated with pregnancy-related physical symptoms, such as back pain, pelvic girdle pain and pelvic cavity pain, but only the association with pelvic cavity pain stayed significant after adjustment for depression

This study showed that sleep complaints in early pregnancy are common, and sleep complaints showed association with physical as well as mental symptoms. It may be important for pregnant patients that clinicians address depression, and mood in relation to sleep problems during pregnancy(Ertmann et al., 2020).

A study was conducted in Abakaliki, Nigeria in 2021.This study aimed to determine the prevalence and predisposing factors for LBP during pregnancy in this environment. The study design was cross-sectional carried out among pregnant women admitted into the Labour Ward of Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Nigeria over a period of 8 months. They were interviewed within 2 to 7 days postpartum with a questionnaire The results showed that 478 women were interviewed, 138 of them complained of LBP in pregnancy. The onset of pain was predominantly in the third trimester. The conclusion of the study was that low back pain during pregnancy is within worldwide range and predominantly mild to moderate in intensity. The independent risk factors identified call for high priorities accorded to women with these factors in measures aimed at addressing LBP during pregnancy(Omoke et al., 2021). A study was conducted in USA in 2015.This study sought to characterize sleep patterns and sleep problem in a large sample of women across all the months of pregnancy .

All data were collected online. The questionnaire was set as a pop up screen on BabyCenter, a popular pregnancy website. Com pletion of the questionnaire was voluntary, there were no exclusionary criteria, and the study was approved by the Institutional Review board of Saint Joseph's University

Results shows that across all months of pregnancy, women experienced poor sleep quality (76%), insufficient night- time sleep (38%), and significant daytime sleepiness (49%) All women reported frequent nighttime awakenings (100%), and most women took daytime naps (78%). Symptoms of insomnia (57%), sleep- disordered breathing 19%, and restless legs syndrome (24%) were commonly endorsed, with no difference across the month of pregnancy for insomnia, sleep-disorder breathing, daytime sleepiness, or fatigue. In addition, high rates of pregnancy-related symptoms were found to disturb sleep, especially frequent urination (33%) and difficulty finding a comfortable sleep position (79%)(Mindell, et al 2015). Moreover; there were the studies available on the prevalence of low back pian in Turkey, Nigeria, Poland, America etc with different other variables. .On the other hand there is still lack of discussion on the association of low back pain with sleep disturbance all over the world. Additionally; the prevalence of low back pain and its relationship with sleep disturbances is still underexplored in Pakistan. So, this study provides opportunity for health care workers to focus on the management of low back pain and sleep disturbance during pregnancy. However, this will be the first study to specifically examine the relationship between low back pain and sleep disturbance in pregnant females. This study will be conducted among pregnant females in Gynaecology wards of tertiary care hospitals of Pakistan.

METHODOLOGY

A Cross-Sectional Descriptive Survey Design Was Used To Obtain Data. The Research Was Conducted In The Gynecology Ward Of Jinnah Hospital, Lahore A Well-Established Tertiary Care Hospital Serving A Large And Diverse Population. The Study Was Carried Out Over Approximately Four Months Following Approval From The Research Ethical Committee (Rec). The Target Population Included Pregnant Females Admitted To The Gynecology Ward Who Were Available And Willing To Participate. A Total Of 150 Participants Were Included In The Study, And The Sample Size Was Calculated Using Cochrane's Formula, With A Z-Score Of 1.82 For A 93% Confidence Level, An Assumed Population

Proportion (P) Of 0.5 For Maximum Variability, And An Acceptable Margin Of Error (E) Of 0.07. A Non-Probability Convenience Sampling Technique Was Adopted To Select Participants Based On Ease Of Access. Inclusion Criteria Comprised Pregnant Females Aged Between 17 And 40 Years From Both Urban And Rural Areas, While Exclusion Criteria Eliminated Females Above 40 Years And Those With Spinal, Abdominal, Neurological, Or Systemic Disorders. Data Were Collected Through A Structured, Close-Ended Questionnaire After Obtaining Informed Written Consent From Participants To Ensure Confidentiality And Voluntary Participation. The Study's Independent Variables Included Age, Trimester, Educational Level, And Socioeconomic Status, While The Dependent Variables Were Levels Of Low Back Pain And Severity Of Sleep Disturbance. Statistical Analysis Was Conducted Using Spss Version 27, With Quantitative Variables Expressed As Mean And Standard Deviation And Categorical Variables Presented As Frequencies And Percentages. The Results Were Displayed In The Form Of Tables, Graphs, And Charts. Ethical Considerations Were Strictly Observed Throughout The Study: Written Informed Consent Was Obtained, Anonymity And Confidentiality Were Maintained, Approval Was Granted By The Research Ethical Committee, And Permission Was Obtained From The Medical Superintendent Of Jinnah Hospital, Lahore. Participants Were Assured That There Were No Associated Risks Or Penalties, Had The Right To Withdraw At Any Time Without Consequence, And Were Kept Fully Informed About The Purpose And Procedures Of The Research To Ensure Transparency And Ethical Integrity.

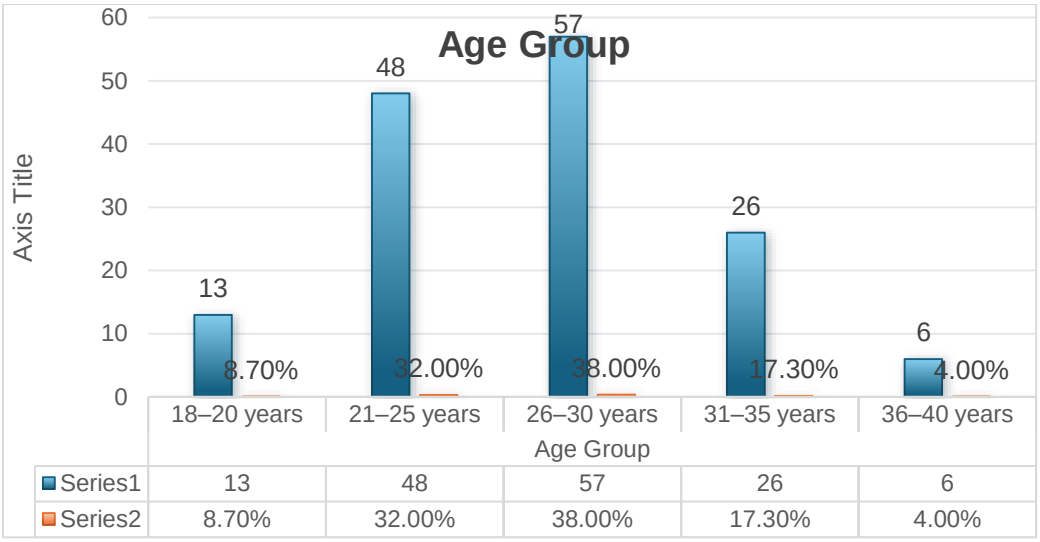
RESULTS

A. Demographic Characteristics

Out of 150 pregnant respondents, the largest proportion were aged 26-30 years (38%), followed by 21-25 years (32%) and 31-35 years (17.3%). In terms of gestational age, most participants were in their third trimester (45.3%), followed by second trimester (40%), and first trimester (14.7%). Regarding gravida status, 40% were multigravida (Gravida 2-4), and 26.7% were primigravida, while 33.3% were grand multigravida (Gravida ≥5).*(Table 01)*

Table 01: Demographic Characteristics of Respondents (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Age Group	18-20 years	13	8.7%
	21-25 years	48	32.0%
	26-30 years	57	38.0%
	31-35 years	26	17.3%
	36-40 years	6	4.0%
Gestational Age	First Trimester	22	14.7%
	Second Trimester	60	40.0%
	Third Trimester	68	45.3%
Gravida	Primigravida (G1)	40	26.7%
	Multigravida (G2-G4)	60	40.0%
	Grand Multigravida	50	33.3%



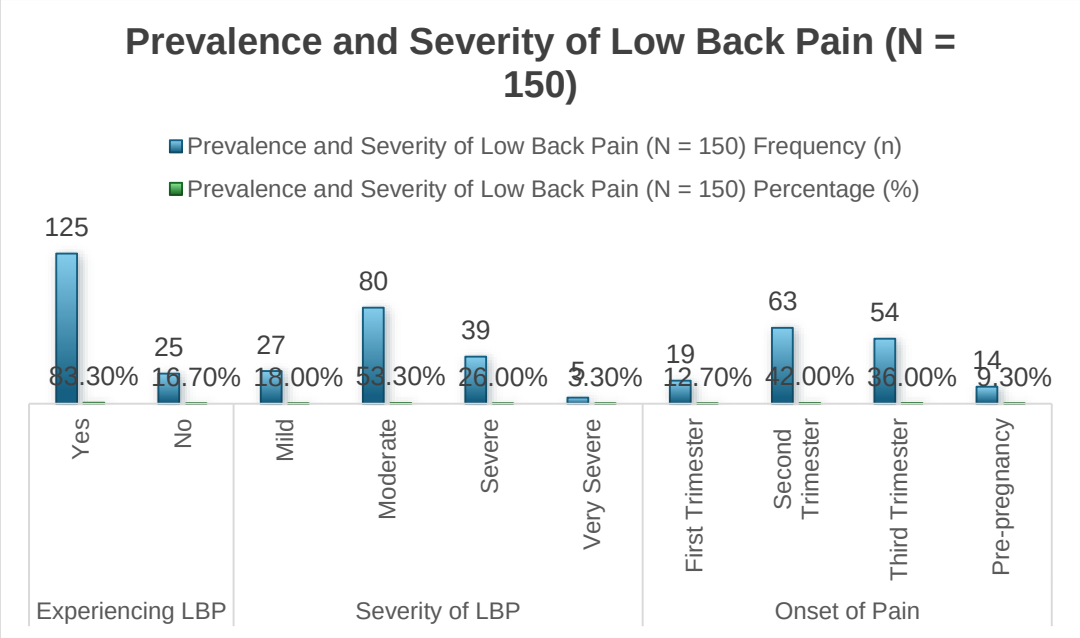
Histogram Of demographic Data (Age Group)

B. Prevalence and Characteristics of Low Back Pain

A significant proportion of the pregnant women (83.3%) reported experiencing low back pain during pregnancy. Among them, 53.3% described the pain as moderate, while 26% reported severe pain. A small group (3.3%) experienced very severe pain. Most participants reported that their pain began during the second trimester (42%), followed by the third trimester (36%).*(Table 02)*

Table 02: Prevalence and Severity of Low Back Pain (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Experiencing LBP	Yes	125	83.3%
	No	25	16.7%
Severity of LBP	Mild	27	18.0%
	Moderate	80	53.3%
	Severe	39	26.0%
	Very Severe	5	3.3%
Onset of Pain	First Trimester	19	12.7%
	Second Trimester	63	42.0%
	Third Trimester	54	36.0%
	Pre-pregnancy	14	9.3%



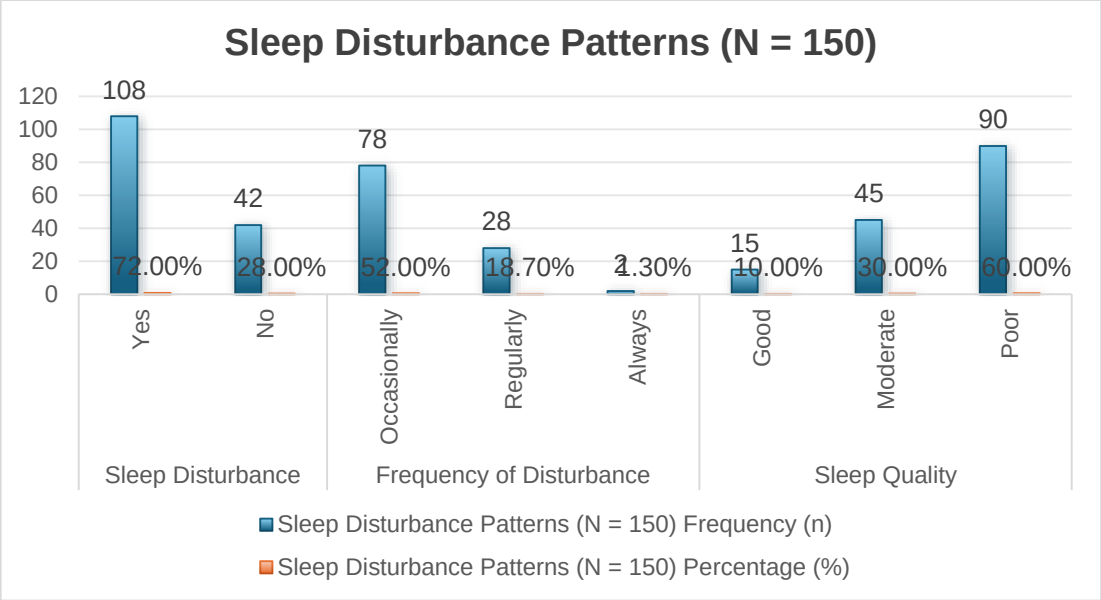
Graph Representing The Prevalence, Severity, And Onset Of Low Back Pain Among The 150 Participants.

C. Sleep Disturbance and its Association with LBP

A strong correlation between low back pain and sleep disturbance was observed. Among the respondents: 72% reported experiencing sleep disturbance due to low back pain Of these, 52% faced occasional disturbance, 18.7% experienced regular disturbance, and 1.3% suffered from constant sleep interruption. Regarding sleep quality, 60% rated their sleep as poor, and only 10% reported good sleep during pregnancy. *(Table 03)*

Table 03: Sleep Disturbance Patterns (N = 150)

Variable	Category	Frequency (n)	Percentage (%)
Sleep Disturbance	Yes	108	72.0%
	No	42	28.0%
Frequency of Disturbance	Occasionally	78	52.0%
	Regularly	28	18.7%
	Always	2	1.3%
Sleep Quality	Good	15	10.0%
	Moderate	45	30.0%
	Poor	90	60.0%



Graph Representing The Sleep Disturbance and its Association with LBP

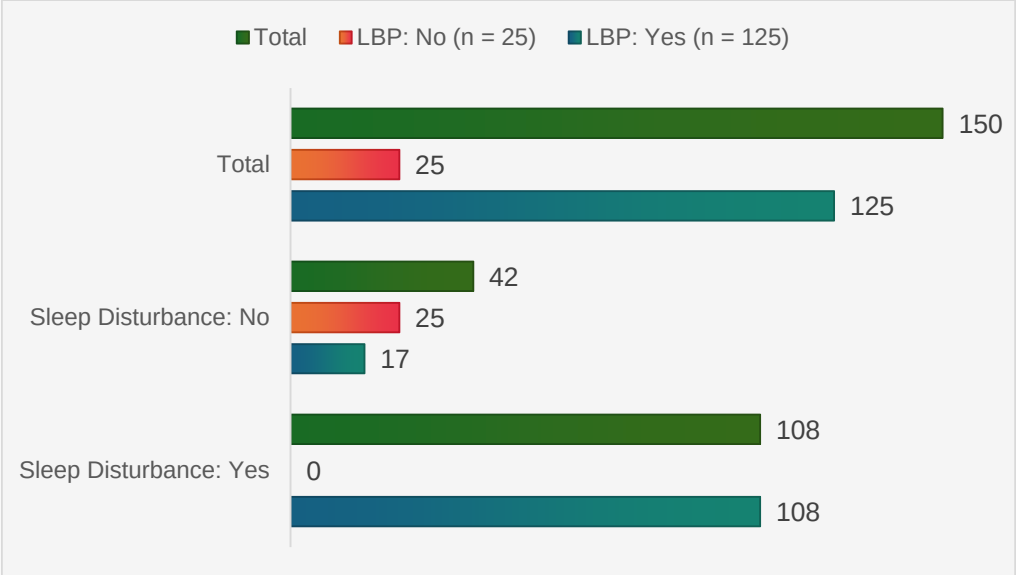
D. Chi-Square Test of Association Between LBP and Sleep Disturbance

To statistically evaluate the association between low back pain and sleep disturbance, a Chi-Square Test of Independence was conducted.

Contingency Table:

	Sleep Disturbance: Yes	Sleep Disturbance: No	Total
LBP: Yes (n = 125)	108	17	125
LBP: No (n = 25)	0	25	25
Total	108	42	150

Chi-Square Statistic (χ^2): 77.15
Degrees of Freedom (df): 1
p-value: < 0.001
Phi Coefficient (Effect Size): 0.72



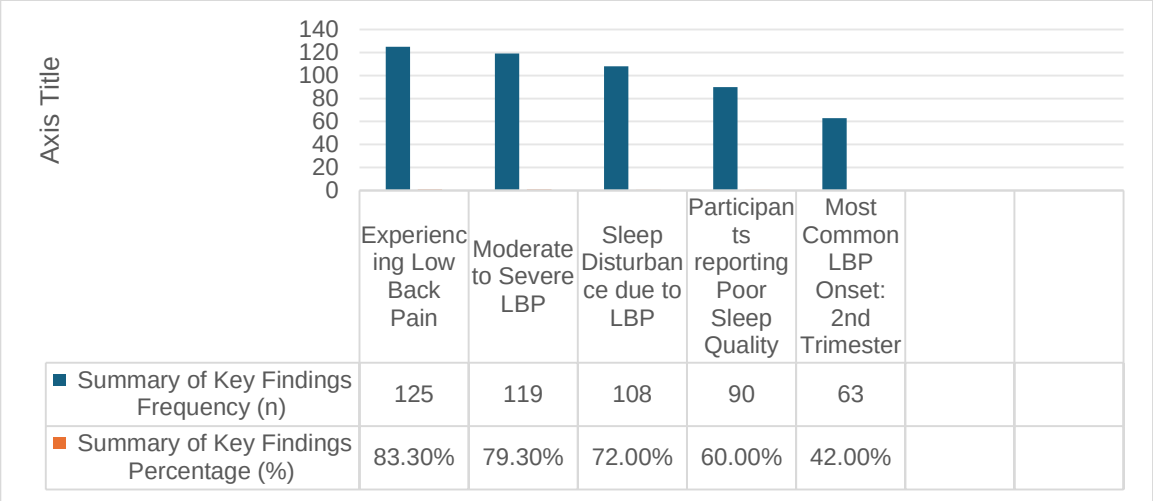
Graph **Chi-Square Test of Association Between LBP and Sleep Disturbance**

Interpretation:

The association between low back pain and sleep disturbance was found to be **statistically significant** ($\chi 2=77.15, p<0.001$)(\chi^2 = 77.15, p < 0.001)($\chi 2=77.15, p<0.001$). This indicates that pregnant women experiencing LBP were significantly more likely to suffer from sleep disturbances compared to those without LBP. The **Phi coefficient of 0.72** indicates a **strong association** between the two variables.

E. Summary of Key Findings

Variable	Frequency (n)	Percentage (%)
Experiencing Low Back Pain	125	83.3%
Moderate to Severe LBP	119	79.3%
Sleep Disturbance due to LBP	108	72.0%
Participants reporting Poor Sleep Quality	90	60.0%
Most Common LBP Onset: 2nd Trimester	63	42.0%



OVERALL INTERPRETATION

The findings demonstrate that low back pain is highly prevalent among pregnant women in the study, affecting over 80% of participants. The pain was mostly moderate to severe, with onset primarily in the second and third trimesters. Notably, a significant association was observed between LBP and sleep disturbance, as confirmed by the chi-square test. The presence of LBP markedly increased the likelihood of poor sleep quality and frequent disturbances, underscoring the need for early identification and management of LBP in antenatal care programs.

DISCUSSION:

The present study investigated the prevalence of low back pain (LBP) among pregnant women and its association with sleep disturbance in a tertiary care hospital setting in Pakistan. The findings reveal that 83.3% of participants experienced LBP during pregnancy, with a majority reporting moderate to severe pain (79.3%), and 72% noted associated sleep disturbances. These results align with international literature while also underscoring region-specific implications.

The prevalence rate of 83.3% is consistent with findings from (Wang et al., 2004), who documented a high occurrence of LBP among pregnant populations, especially during the second and third trimesters. Similar prevalence rates have been noted in studies by (Sabino and Grauer, 2008) highlighting that physiological changes like weight gain, hormonal fluctuations, and altered biomechanics in pregnancy contribute to musculoskeletal strain.

Our study observed the most frequent onset of LBP in the second trimester (42%), followed closely by the third trimester (36%), supporting the work of Casagrande et al. (2015), who found that advancing gestational age is a critical risk factor for LBP due to increasing postural stress and pelvic ligament laxity. This trend was further confirmed by (Wu et al., 2004)8} in a systematic review on pregnancy-related pelvic girdle and back pain.

A notable finding in our study was the strong association between LBP and sleep disturbance, with 72% of participants reporting sleep disruption, and 60% rating their sleep quality as poor. This is in line with (Liu et al., 2025), who found that chronic pain conditions like LBP significantly impair sleep quality due to discomfort and positional challenges. Additionally, (Abd El Hameed El Deeb et al., 2025) emphasized that poor sleep in pregnant women has multidimensional consequences, potentially affecting maternal mental health, fetal outcomes, and postpartum recovery.

Sleep disruption was most commonly reported as occasional (52%), but a substantial number (18.7%) experienced regular sleep disturbance, underscoring the chronic and impactful nature of LBP during pregnancy. (Mindell et al., 2015) support this by asserting that disturbed sleep during pregnancy often coexists with pain, mood disturbances, and fatigue, exacerbating maternal stress.

Moreover, the majority of women experiencing LBP were multigravida or grand multigravida, suggesting that cumulative physiological strain from multiple pregnancies may predispose individuals to greater musculoskeletal discomfort. This observation aligns with the findings of (Fast et al., 1987) & (Mogren and Pohjanen, 2005), who associated higher parity with increased risk of LBP.

In summary, the findings of this study reinforce the need to address low back pain and sleep quality as interlinked components of antenatal care. Given the significant prevalence and impact observed, health professionals should integrate routine screening for musculoskeletal pain and sleep disturbances into prenatal visits and offer non-pharmacological interventions such as physiotherapy, posture education, and sleep hygiene counseling.

CONCLISION

This study reveals a high prevalence of low back pain (LBP) among pregnant females, with a strong association between LBP and sleep disturbance. The majority of participants experienced moderate to severe pain, particularly during the second and third trimesters. Sleep quality was significantly impacted by the presence and intensity of pain. These findings underscore the need for early identification, management strategies, and education regarding LBP during pregnancy to improve maternal health and quality of life. The study supports the integration of physiotherapy, ergonomic counseling, and pain relief education into routine antenatal care.

Limitations

I. **Single-Center Study** - The research was limited to one tertiary care hospital, which may restrict generalizability to other healthcare settings or regions.

II. **Self-Reported Data** - Both pain intensity and sleep quality were based on self-reports, potentially introducing subjective bias.

III. **No Objective Sleep Assessment** - The study did not include clinical tools (e.g., actigraphy or polysomnography) to validate sleep disturbances.

IV. **Cross-sectional Design** - This study does not establish causality or assess changes over time.

V. Exclusion of High-Risk Pregnancies - Women with complicated pregnancies or co-morbidities were not included, which may affect applicability of results to all pregnant populations.

Recommendations

I. **Routine Screening for LBP During Antenatal Visits** - Healthcare providers should assess for back pain regularly and refer for early physiotherapy when needed.

II. **Sleep Hygiene Counseling for Pregnant Women** - Educate pregnant women about safe sleep positions and relaxation techniques to improve sleep quality.

III. **Integration of Physiotherapy Services** - Provide antenatal physical therapy sessions to manage musculoskeletal discomfort and improve posture.

IV. **Community-Based Workshops** - Conduct outreach programs in urban and rural areas to raise awareness on managing LBP during pregnancy.

V. **Further Research with Diverse Populations** - Expand studies to include rural populations, multiple healthcare centers, and longitudinal follow-ups to assess long-term outcomes.

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