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Prevalence and Correlation of Lumbo-pelvic Pain with Depression, Anxiety, Stress and Mobility levels in Pregnant Women

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ABSTRACT

Pregnancy-related lumbo-pelvic pain (LPP) is a prevalent condition with physical and psychological risk factors. **Objective:** To investigate the relationship between lumbo-pelvic pain during pregnancy, psychological and physical risk factors. **Methods:** An observational cross sectional study recruited 210 pregnant women from a reputable tertiary care hospital. Duration of study was 6 months. The study was conducted in line with ethical standards set by the ethical committee of CMH Lahore Medical College and Institute of Dentistry. In accordance with the Declaration of Helsinki. Written informed consent was taken from each participant. This study interviewed the pregnant ladies in 2nd and 3rd trimesters and collected data about demographic information and included the Pregnancy Mobility Index Scale (PMI), the Disability, Anxiety, Stress Scale (DASS-21) questionnaire and Numeric Pain Rating Scale (NPRS). Authors explained each term mentioned in all questionnaires to participants in Urdu or Punjabi language so that every participant was able to understand complex terms. Spearman correlation coefficient test had been used for calculating correlation. **Results:** LPP was reported in 146 pregnant women. There was a significant correlation between pain and psychological risk factors such as: between LPP and stress there was r=0.39, p<0.05, between LPP and anxiety there was r=0.36, p<0.05, between LPP and depression there was r=0.41, p<0.05. There was a weak correlation between LPP and physiological risk factors with p-value of 0.002 and r=0.212. The mean age of participants was 27.46 years. **Conclusions:** Lumbo-pelvic pain was found in 69.5% pregnant women. Lumbo-pelvic pain was significantly correlated with mobility levels and psychological factors such as depression, stress and anxiety in 2nd and 3rd trimesters.

INTRODUCTION

When both the low back and the pelvis are affected by pain, it is referred to as lumbo-pelvic pain (LPP). LPP has been extensively examined in the general population and has a wide range of effects on a person's quality of life, employment, and productivity [1]. LPP is defined as "pain or discomfort placed between the 12th rib and the gluteal fold [2, 3]. Despite different definitions, there appears to be agreement that when low back pain (LBP) and pelvic girdle pain (PGP) are not distinguished, the term "LPP" is used [4]. Some women view pregnancy as a painful and difficult time [5]. The lumbo-pelvic area effected during pregnancy is known as pregnancy-related LPP (PRLPP) [6]. This type of pain affects women all over the world and significantly raises health care costs [7]. LPP is present in 40.6% women in 3rd trimester of the pregnancy [8]. Additionally, it has been reported in 76.2% women in last month of their pregnancy. Women who have LBP face a larger decline in their health-related quality of life during pregnancy [9]. Pregnancy-related LBP has the potential to develop into a lifelong issue. Mostly women who do not engage in exercises during pregnancy tend to develop LPP. LBP from previous pregnancies, back discomfort during menstruation, being younger, and a lack of physical exercise are risk factors for LBP during pregnancy [10]. LPP during pregnancy has been extensively studied in American Caucasian populations but largely ignored in Hispanic and

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Asian populations. It is a prevalent pregnancy related discomfort but it is a complex issue with physical, psychological, and financial effects. Research in the US has revealed that lumbopelvic discomfort during pregnancy was influenced by high pregnancy mobility index (PMI) scores, and economic unreliability [11]. Unfortunately, women are more likely than male to experience psychological distress as a result of many social, familial, occupational, and health problems that have an indirect impact on LPP [12]. According to another study, severity of pregnancy-related LPP was positively correlated with activity restrictions but not with physical activity behaviors [13]. Mostly, mobility levels denote physical risk factors during pregnancy. To measure and label a variety of mobility levels, the Pregnancy Mobility Index was introduced in 2006 specifically for pregnant women in place of pelvic girdle questionnaire that was not meant for pregnant ladies specifically and was general in nature. This questionnaire has been validated in its use and has been translated into many languages to record normal daily activities, household chores related activities and outdoor activity levels in pregnant women. For psychological factors, depression, anxiety and stress scale (DASS-21) is a short version scale of 21 items that has been validated in adults. It is a routine clinical based outcome measure [14]. Previously, it has been administered in 343 pregnant women from the time of their pregnancies to the 5-year postpartum period in an Australian study. It effectively registered comparable differences in levels of depression, anxiety and stress in pregnant women in this longitudinal study [15]. Numeric pain rating scale (NPRS) consists of 0-10 numbers, 0 means no pain and 10 means highest possible level of pain. This is a validated scale that correlates to poorly controlled pain with higher scores [16]. It has been used in pregnant women related studies for gauging pain levels [17]. Most of the studies have reported high prevalence of LPP during the third trimester mostly but have not included the 2nd trimester as well. Additionally, it has been reported that not doing exercises and financial issues leading to depression are main risk factors for LPP but it is still untaped that separately three psychological aspects i.e. depression, stress and anxiety; and overall mobility have any correlation with LPP or not. Therefore, this study intended to examine how frequently pregnant women feel lumbo-pelvic discomfort with a focus on possible correlations with psychological and physical risk factors.

This research aimed to advance knowledge of the complex interactions between physical changes, psychological health, and the occurrence of lumbo-pelvic discomfort during pregnancy.

METHODS

It was an observational cross-sectional study and the data were collected from a reputable Tertiary Care Hospital in Lahore. The duration of the study was 6 months from May 2023 to October 2023. The Ethical Review Committee CMH Lahore Medical College reviewed this study and issued an IRB letter with reference number: 706/ERC/CMH/LMC for conducting this research. The study was conducted in line with ethical standards set by the ethical committee of CMH LMC & IOD and under the Declaration of Helsinki. Written informed consent was taken from each participant. The total sample size was 210 and pregnant females in 2nd and 3rd trimester between the ages of 18 to 40 years were included. The following sample size calculator was used:

$n = z2\ p(1-p)/d2$

$z = 1.96$

$p = 0.153$

$d = 0.05$

The recruitment of participants was through the non-probability convenient sampling technique. Patients with hypertension, systemic illness, cognitive impairment, incontinence issues were excluded from the study. The researchers conducted detailed reviews of the participant's medical history and demographic data such as age, trimester, total number of children, and current number of pregnancy. Data were collected through questionnaires during interviews conducted by physiotherapists. Authors explained each term mentioned in all questionnaires to participants in Urdu or Punjabi language so that every participant was able to understand complex terms. Data were analyzed using SPSS version 25.0. Numeric Pain Rating scale (NPRS) for pain, Pregnancy Mobility Index (PMI) for mobility and physical activity levels, and Depression, Anxiety, Stress scale-21 (DASS-21) for gauging psychological factors were used. NPRS is a modified version of Visual Analogue Scale with an evenly spaced scale containing 0 to 10 numbers. 0 means no mean and 10 means worst imaginable pain [18]. At first participants were asked to identify and mark the location of pain from 12th rib to gluteal fold. Then they were asked about the intensity of pain using NPRS. For mobility levels that present physical factors PMI was used. It is 24-item scale and related to different mobility tasks at home and outdoors. Greater the score, greater is the level of mobility limitations. It records responses on a likert scale such as: 0= no difficulty, 1= slight difficulty, 2= mild difficulty, 3= severe difficulty and 4 = unable to perform the activity. Then in the end, the sum of all recorded scores is calculated that ranges from 0 to 96. Here is the interpretation of PMI:

a) 0-20: Minimal or no mobility issues
b) 21-40: Mild to moderate mobility difficulties
c) 41-60: Significant mobility difficulties
d) 61-96: Severe mobility impairment

DASS-21 was used to record psychological 3 sub factors such as depression, anxiety and stress through 21 items. It also followed likert scale 0 to 4, with 0 being not applicable at all and 4 meaning fully applicable most of the time.

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Recorded scores as per the categories such as depression, stress and anxiety were summed and then multiplied by two to get values according to each category. Its interpretation [17-18] is as follows:

Depression:
Normal: 0-9; Mild: 10-13; Moderate: 14-20; Severe: 21-27; Extremely Severe: 28+

Anxiety:
Normal: 0-7; Mild: 8-9; Moderate: 10-14; Severe: 15-19; Extremely Severe: 20+

Stress:
Normal: 0-14; Mild: 15-18; Moderate: 19-25; Severe: 26-33; Extremely Severe: 34+

The Kolmogorov-Smirnov test was run to check normality of data. As long as the p-value was below 0.05, all data were nonparametric. To find relationships between pain levels, PMI, stress, anxiety, and depression, the Spearman correlation test was utilized. Quantitative variables were expressed using percentages, means and standard deviations. P-values less than 0.05 showed significant correlations. PMI has high reliability and validity with Cronbach Alpha = 0.80 or higher during pregnancy and after pregnancy. Overall Cronbach Alpha=0.74 for DASS-21 [19]. Reliability was also reported higher in the case of NPRS for low back pain with ICC=0.99 [20].

RESULTS

Table 1 shows the clinical and descriptive stats of the study population. The mean age of participants was 27.46 ± 5.5, and the mean NPRS score was 3.74 ± 2.88. Mean scores of NPRS represent moderate levels of pain in pregnant women.

Table 1: Clinical and Descriptive Stats of Study Population

Variables	Mean ± S.D	Minimum	Maximum
Age of Participant (Years)	27.46 ± 5.05	18	40
NPRS*	3.74 ± 2.88	0	10
Stress	10.59 ± 8.21	0	38
Anxiety	11.57 ± 7.81	0	36
Depression	7.96 ± 7.76	0	36
PMI*	10.99 ± 5.24	0	61.54

*NPRS: Numeric pain rating scale for pain levels; PMI: pregnancy mobility index for physical factors

Table 2 shows the prevalence of lumbo-pelvic pain among the study population. More than the average number of pregnant women experienced LPP in the 2nd and 3rd trimester.

Table 2: Prevalence of Lumbo-Pelvic Pain (LPP) in Pregnant Ladies with 2nd and 3rd Trimesters

Variables	Response	Frequency (%)
LPP (210 Participants)	Yes	146 (69.52%)
	No	64 (30.48%)
LPP in 2nd Trimester	Yes	48 (70.60%)
	No	20 (29.40%)
LPP in 3rd Trimester	Yes	98 (69.00%)
	No	44 (31.00%)

Table 3 shows the correlation of lumbo-pelvic pain with psychological factors and mobility levels in pregnant ladies. According to the table, there were moderate correlation of pain (NPRS) with psychological factors, and no correlation was found between pain and mobility levels in 2nd trimester. On the other hand, in third trimester, LPP had weak correlations with pain and mobility levels.

Table 3: Correlation of Pain (NPRS) with Psychological Variables (DASS-21) and Mobility Levels (PMI) in 2nd and 3rd Trimester

Trimester	Variables	p-value*	r-value*
2nd	Stress	0.00	0.583
	Anxiety	0.00	0.424
	Depression	0.00	0.517
	PMI	0.44	0.096
3rd	Stress	0.00	0.310
	Anxiety	0.00	0.333
	Depression	0.00	0.365
	PMI	0.003	0.248
Total 210 Participants	Stress	0.00	0.40
	Anxiety	0.00	0.40
	Depression	0.00	0.41
	PMI	0.002	0.21

*Spearman Correlation Test was applied with r-values interpreted as: 0 to 0.3-weak correlation; 0.3-0.5-moderate correlation; 0.5-0.7-strong correlation & 0.7 onwards-very strong correlation. P value is interpreted as: p>0.05 no significant difference exists and p<0.05 significant difference exists.

Figure 1 shows that mostly pregnant women had moderately impaired levels of physical activity during both trimesters but a large number of women with 3rd trimester as compared to 2nd trimester faced mobility restrictions.

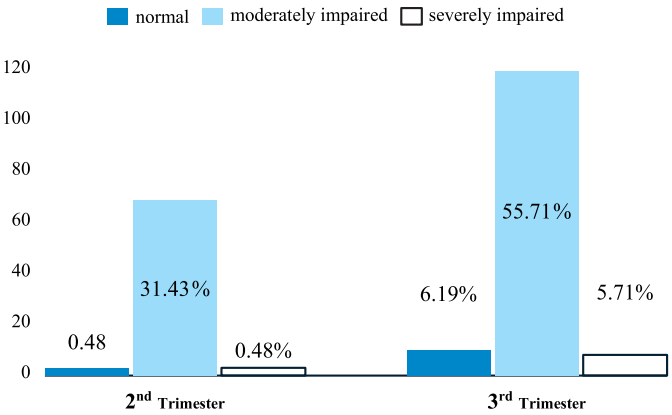

Figure 1: Gender distribution among study participants

DISCUSSION

The high prevalence of LPP in pregnant women shows that this condition is a significant public health concern. The prevalence of lumbopelvic pain varies greatly among healthcare systems. Overall, it was noticed that 55.71%

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pregnant women in the third trimester and 31.43% in the 2nd trimester faced moderately impaired mobility. On the other hand, 5% of women in the 3rd trimester reported moderate limitations in mobility levels. Our current study's results are consistent with earlier accounts of ADL challenges brought on by pain sensations related to LPP in pregnancy. According to Gashaw *et al.*, study that was conducted in Ethiopia 57% of pregnant women with lumbo-pelvic discomfort indicated that it restrained their ADLs moderately, and 49% avoided daily activities including running, stair climbing, doing hectic work, and lifting weights activities that are part of the PMI [21]. When assessed by their capacity to carry out their regular ADLs, it was discovered that more than half of the pregnant women with low back pain had a moderate level of impairment. In contrast to present study that only reported 5% women with extreme activity limitations, that Ethiopia based study showed that 43% women with pregnancy experienced extreme levels of activity limitations. In a systematic review done by Shanshan *et al.*, prevalence of LPP remained between 58% to 63% in pregnant women according to continent, BMI and age [22]. Higher BMI and old ages had an impact on increased prevalence. Additionally, gestational age did not matter for LPP. Similarly, the current study reported that occurrences of LPP remained similar in 2nd and 3rd trimesters. But as far as age is concerned, most of the data had a mean age of mid-twenties but still the prevalence was quite high. A cross-sectional study done by Eroglu *et al.*, included 160 pregnant women in Türkiye. They reported LPP in 73.4% of women. Moreover, significant correlations were reported between pain levels and disability with $p<0.001$. Same was found between pain, depression and anxiety. This study's results are validating the current study's results [23]. Uzelpasaci *et al* interviewed 107 pregnant women and tried to find relations of pain levels with musculoskeletal and physical risk factors [27]. They found mild intensities of low back ache but the current study reported moderate intensity of LPP in the reported population. Similar to current study, they reported more disability levels in 3rd trimester. They reported that presence of diastasis recti and abdominal muscle thickness were not related to low back pain intensity levels. In contrast to current study, it was established that physical inactivity was not related with LPP in 3rd and 1st trimesters, however, there was positive association between LPP and sedentary behavior in 2nd trimester.

CONCLUSIONS

A significant number of pregnant women experience moderate physical impairments during both the second and third trimesters, with a notable increase in mobility impairments during the third trimester. Additionally, lumbo-pelvic pain was prevalent in over half of the participants and showed a moderate correlation with psychological factors, while its correlation with physical factors was weak.

Authors Contribution

Conceptualization: SMAMN
Methodology: SMAMN, SZHS, MI, FC, FR
Formal analysis: SMAMN, AR
Writing-review and editing: YS, AR

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Gashaw M, Gedlu S, Janakiraman B. Burden of Pelvic Girdle Pain During Pregnancy Among Women Attending Ante-Natal Clinic, Ethiopia: A Cross-Sectional Study. BMC Pregnancy and Childbirth. 2020 Dec; 20: 1-1. doi: 10.1186/s12884-020-03184-4.

[2] Hameed F, Cesare A, Mariscal del Moral N, Barton T, Chiarello C. Is Pregnancy-Related Lumbopelvic Pain Reported to Health Care Providers?. Journal of Women's Health. 2023 Nov; 32(11): 1192-9. doi: 10.1089/jwh.2022.0459.

[3] Muhammad BO and Ahmed HM. The Association of Knowledge and Practice of Body Mechanics and Lumbopelvic Pain Among Pregnant Women: A Cross-sectional Study. Journal of Midwifery & Reproductive Health. 2023 Oct; 11(4). doi: 10.22038/JMRH.2023.70390.2071.

[4] Burani E, Marruganti S, Giglioni G, Bonetti F, Ceron D, Cozzi Lepri A. Predictive Factors for Pregnancy-Related Persistent Pelvic Girdle Pain (PPGP): A Systematic Review. Medicina. 2023 Dec; 59(12): 1-12. doi: 10.3390/medicina59122123.

[5] Leźnicka K, Pawlak M, Gasiorowska A, Jażdżewska A, Wilczyńska D, Godlewska P *et al.* Individual Characteristics and Pain Sensitivity during Pregnancy—A Cross-Sectional Study in Pregnant and Non-Pregnant Women. International Journal of Environmental Research and Public Health. 2022 Oct; 19(21): 1-13. doi: 10.3390/ijerph192114151.

[6] Buin L, Joaquim RH, Strong J, Robinson K. The Experience of Pregnancy-Related Lumbopelvic Pain: A Qualitative Evidence Synthesis. Canadian Journal of Occupational Therapy. 2024 Mar; 91(1): 29-43. doi: 10.1177/00084174231172037.

[7] Erten H, Aygün M, Esencan TY, Merih YD. Pregnancy-Related Lumbopelvic Pain and Disability: An Invisible and Neglected Problem. Journal of Nursology. 2023 Jun; 26(2): 99-106. doi: 10.5152/JANHS.2023.23314.

DOI: https://doi.org/10.54393/pbmj.v7i10.1122

[8] Shad M, Ijaz MJ, Qamar MM, Basharat A. Prevalence of Lumbo-Pelvic Pain in Pregnant Women of Third Trimester in Lahore Pakistan. Journal of Liaquat University of Medical & Health Sciences. 2019 Apr; 17(01): 52-6. doi: 10.22442/jlumhs.181710549.

[9] Goossens N, Geraerts I, Vandenplas L, Van Veldhoven Z, Asnong A, Janssens L. Body Perception Disturbances in Women with Pregnancy-Related Lumbopelvic Pain and their Role in the Persistence of Pain Postpartum. BMC Pregnancy and Childbirth. 2021 Dec; 21: 1-3. doi: 10.1186/s12884-021-03704-w.

[10] Bryndal A, Majchrzycki M, Grochulska A, Glowinski S, Seremak-Mrozikiewicz A. Risk Factors Associated with Low Back Pain Among a Group of 1510 Pregnant Women. Journal of Personalized Medicine. 2020 Jun; 10(2): 51. doi: 10.3390/jpm10020051.

[11] Hameed F, Barton T, Chiarello C. Lumbopelvic Pain in Pregnancy in a Diverse Urban Patient Population: Prevalence and Risk Factors. Journal of Women's Health. 2022 Dec; 31(12): 1736-1741. doi: 10.1089/jwh.2022.0077.

[12] Sushil P, Chawla JK, Parasher RK. Coexistence of Biopsychosocial Factors with Lumbopelvic Pain in Indian Women: A Systematic Review. Cureus. 2023 Mar; 15(3). doi: 10.7759/cureus.36937.

[13] Lardon E, St-Laurent A, Babineau V, Descarreaux M, Ruchat SM. Lumbopelvic pain, Anxiety, Physical Activity and Mode of Conception: A Prospective Cohort Study of Pregnant Women. BMJ Open. 2018 Nov; 8(11): 1-11. doi: 10.1136/bmjopen-2018-022508.

[14] Ng F, Trauer T, Dodd S, Callaly T, Campbell S, Berk M. The Validity of the 21-Item Version of the Depression Anxiety Stress Scales as A Routine Clinical Outcome Measure. Acta Neuropsychiatrica. 2007 Oct; 19(5): 304-310. doi: 10.1111/j.1601-5215.2007.00217.x.

[15] Bryson H, Perlen S, Price A, Mensah F, Gold L, Dakin P *et al.* Patterns of Maternal Depression, Anxiety, and Stress Symptoms from Pregnancy to 5 years Postpartum in an Australian Cohort Experiencing Adversity. Archives of Women's Mental Health. 2021 Dec; 24(6): 987-997. doi: 10.1007/s00737-021-01145-0.

[16] Stewart K, Hincker A, Holroyd L, Rimsza R, Veade A. Subjective Versus Objective Pain Assessment in the Postpartum Period: Improving Pain Control After Vaginal Delivery [ID: 1378006]. Obstetrics & Gynecology. 2023 May; 141(5S): 68S. doi: 10.1097/01.AOG.0000930632.45067.94.

[17] Shi Z, Yan F, Lu Y, Liu W, Wang Z, Zhang H. Pregnancy-Related Low Back/Pelvic Girdle Pain: Prevalence, Severity, and Risk Factors in Zhengzhou, China. Journal of Back and Musculoskeletal Rehabilitation. 2023 Jan; 36(4): 895-902. doi: 10.3233/BMR-220147.

[18] Waldman SD. Pain Management E-book. Elsevier Health Sciences. 2011 Jun

[19] Moya E, Larson LM, Stewart RC, Fisher J, Mwangi MN, Phiri KS. Reliability and validity of depression anxiety stress scale (DASS)-21 in screening for common mental disorders among postpartum women in Malawi. BMC psychiatry. 2022 May; 22(1): 352. doi: 10.1186/s12888-022-03994-0.

[20] Yao M, Xu BP, Li ZJ, Zhu S, Tian ZR, Li DH et al. A Comparison between the Low Back Pain Scales for Patients with Lumbar Disc Herniation: Validity, Reliability, and Responsiveness. Health and Quality of Life Outcomes. 2020 Dec; 18: 1-2. doi: 10.1186/s12955-020-01403-2.

[21] Gashaw M, Yitayal MM, Zemed A, Nigatu SG, Kasaw A, Belay DG *et al.* Level of Activity Limitations and Predictors in Women with Pregnancy-Related Pelvic Girdle Pain: Prospective Cross-Sectional Study. Annals of Medicine and Surgery. 2022 Jun; 78. doi: 10.1016%2Fj.amsu.2022.103754.

[22] Shanshan H, Liying C, Huihong Z, Yanting W, Tiantian L, Tong J *et al.* Prevalence of Lumbopelvic Pain During Pregnancy: A Systematic Review and Meta-Analysis of Cross-Sectional Studies. Acta Obstetricia et Gynecologica Scandinavica. 2024 Feb; 103(2):225-240. doi: 10.1111/aogs.14714.

[23] Eroglu S and Karatas G. The Effect of Low Back Pain on Quality of Life and Anxiety Levels in Pregnant Women. Akdeniz Tıp Dergisi. 2021 Jul; 7(2): 212-219. doi: 10.53394/akd.964025.

[24] Üzelpasaci E and Akbayrak T. AB1404 The Association of Pain Intensity and Musculoskeletal Factors, Physical Activity, and Quality of Life in Pregnant Women with Low Back Pain: A Cross-Sectional Study. 2023 May; 82: 1931-1932.