

Prevalance of Lumbo-Sacral Dysfunction in Multiparous Women

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KEYWORDS

Pregnancy, lumbo-sacral joint, dysfunction, multiparous women.

ABSTRACT:

Background: In pregnancy there is progressive anatomical, physiological, psychological and biochemical changes at various trimesters. These alterations might induce low back pain or lower pelvic discomfort during pregnancy or after delivery, restricting normal movement and causing misery. **Objective:** To identify the prevalence of lumbosacral dysfunction in women who have had two or more pregnancies.

Methods: The study was an observational which includes 100 multiparous women in and around Karad and the female residing in urban and rural areas were taken and the consent form were signed by the participants were explained regarding the test and then it was undertaken. The test performed was Specific lumbar spine torsion test.

Result: On the basis of this study 58% women showed dysfunction of lumbosacral joint and 48 % have excellent joint conditions the women of both urban and rural areas were included. According to the number of gravida the women were having issues.

Conclusion: The study concluded that there is prevalence of lumbo-sacral joint dysfunction is highly significant in multiparous pregnant women.

1. Introduction

Pregnancy causes physiological and structural changes in a woman's body, affecting multiple systems including the cardiovascular, respiratory, endocrine, renal, and musculoskeletal systems. These changes are required to fulfill the mother's increased metabolic demands, support fetal development, and prepare both the mother and the fetus for birthing⁽¹⁾. Gaining 20 to 40 pounds during pregnancy causes the center of gravity to shift forward. Neuromechanical modifications occur, resulting in alterations in gait and posture. Low back pain, cramping, and hip discomfort are among the most common musculoskeletal disorders. Elevated lordosis also occurs, putting additional tension on the lower spine⁽²⁾. Muscle laxity causes intervertebral disc instability, disc bulging, and lower-back compression⁽³⁾. The capacity of the abdominal muscles to maintain good posture is compromised when they stretch to make room for the growing uterus. Consequently, the lower back area is supported by an increased pressure on the torso⁽⁴⁾. Lower back or pelvic discomfort is a common result of musculoskeletal changes that many women undergo during pregnancy or the postpartum phase. This may make it uncomfortable and limit regular mobility. One of the most prevalent problems during pregnancy is lumbosacral discomfort, which is a primary cause of the condition. Its substantial influence on the woman's quality of life and the related medical expenses has made it more relevant in recent years⁽⁵⁾. The degree of impairment and the intensity of pain are strongly correlated with absence from work. Compared to pregnant women without pelvic or low back discomfort, it doubles in those who have these conditions⁽⁶⁾. Pregnant women who experience pelvic and low back discomfort frequently have difficulty with everyday tasks including getting up, sitting for long periods of time, walking long distances, getting dressed, and lifting items. Wheelchairs or crutches could be required in more extreme situations^{(7), (8)}. The occurrence of low back discomfort, which frequently precedes more serious lumbo-sacral problems, has been found to be significantly correlated with the amount of weight acquired during pregnancy, according to several studies⁽⁹⁾. The mechanical load exerted on the spine is compounded by a relaxation of the supporting ligaments and joints due to hormonal changes, especially the in relaxin and progesterone levels during pregnancy⁽¹⁰⁾. These hormones help to relax the pelvic ligaments and the sacroiliac joints in preparation for childbirth, but they also reduce spinal stability, increasing the likelihood of lumbo-sacral dysfunction⁽¹¹⁾. Multiparity, or having multiple pregnancies, further amplifies these changes⁽¹²⁾. Studies suggest that women who have had multiple pregnancies are at high risk for chronic lumbo-sacral dysfunction compared to primiparous women⁽¹³⁾. Body mass index (BMI) is another critical factor in development of lumbosacral dysfunction in multiparous women. A higher BMI, often associated with pregnancy, places additional stress on the spine and pelvis, intensifying the biomechanical strain. Women who enter pregnancy with an elevated BMI, or who experience excessive

weight gain during pregnancy, are at a greater risk for lumbosacral pain and dysfunction ⁽¹⁴⁾. Particularly, obesity has been repeatedly associated with a higher prevalence of lumbo-sacral dysfunction and low back pain. This is due to the greater axial load placed on the lumbar vertebrae and intervertebral discs, which can accelerate degenerative changes and lead to disc herniation or facet joint arthropathy ⁽¹⁵⁾. In addition, adipose tissue can contribute to systemic inflammation, which may exacerbate pain and dysfunction in the lumbosacral region ⁽¹⁶⁾. On the other hand, while for different reasons, women with low BMI may also be susceptible to lumbosacral dysfunction. Weakness in the muscles supporting the spine, such as the paraspinal and abdominal muscles, can result from inadequate muscular mass and poor nutritional condition. This muscle weakness may reduce the spine's ability to withstand the mechanical loads imposed by pregnancy, thereby increasing the likelihood of dysfunction ⁽¹⁷⁾. Age is another important factor that influences the prevalence of lumbosacral dysfunction in multiparous women. As women age, the spine undergoes degenerative changes, including disc dehydration, loss of elasticity, and reduced height of intervertebral discs. These age-related changes can predispose women to lumbosacral dysfunction, especially when combined with the mechanical stresses of multiple pregnancies ⁽¹⁸⁾. Older women who have had several pregnancies are particularly vulnerable to conditions such as degenerative disc disease, osteoarthritis, and spondylosis, all of which can contribute to chronic lumbo-sacral dysfunction. Moreover, the cumulative effects of pregnancy-related ligament laxity and postural changes over the years can result in long-term spinal instability, further increasing the risk of dysfunction in the lumbo-sacral region ⁽¹⁹⁾. In addition to age-related structural changes in the spine, the healing capacity of musculoskeletal tissues declines with age. This means that older multiparous women may experience a slower recovery from the biomechanical stressors of pregnancy, leading to prolonged periods of lumbosacral pain and dysfunction ⁽²⁰⁾. Furthermore, as women age, the likelihood of comorbidities such as osteoporosis or osteopenia increases, this can further compromise spinal integrity and exacerbate lumbosacral dysfunction ⁽²¹⁾. These women often experience cumulative physical changes, including ligament laxity, weight gain, and postural shifts, which predispose them to chronic back pain and dysfunction. Understanding the extent and contributing factors of this condition is crucial for developing targeted preventive measures, improving postpartum recovery, and enhancing long-term spinal health. Thus there is need to study the prevalence of lumbo-sacral dysfunction in multiparous women arises from the increased mechanical and hormonal stresses that multiple pregnancies place on the spine. Additionally, this study would offer important new information about the effects of multiparity on musculoskeletal health, which is now little understood and underrepresented in clinical settings.

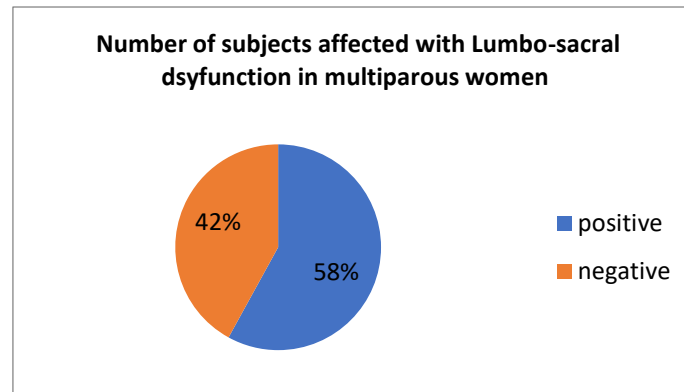
2. Methods

This was an observational study carried to find the risk factor associated to lumbo sacral joint dysfunction. Approval was given by institutional ethical committee (protocol number: 132/2023-2024). For this investigation, 100 individuals were chosen at random. All participants provided written informed permission in their native tongue. The study's methodology and goal were explained to the subjects. The 20–40 age range was chosen for this investigation. The participants had a history of low back discomfort and complained of pelvic girdle pain, and they were between the fourth and sixth months postpartum. Participants who had a history of low back pain requiring surgery or who had indications or symptoms of a significant cause of pain—such as inflammatory, infectious, traumatic, neoplastic, degenerative, or metabolic—were excluded. Comorbidities such as hypertension, thyroidism and diabetes were also excluded from the study. The test was Specific lumbar spine torsion test and Gaenslen test was performed on each participant for diagnosis of lumbo-sacral dysfunction. The patient lies on their right side with their lumbar spine extended (slight lordosis) while undergoing a specialized lumbar spine torsion test. The examiner grasps the right arm and pushes it forward and upward at a 45-degree angle until movement is detected at the L5 spinous process in order to achieve rotation and side bending. All of the vertebrae above L5 are thus "locked." The examiner then rotates the pelvis and sacrum forward while pushing the left shoulder back with the examiner's elbow to stabilize the L5 spinous process until S1 begins to move with the opposite hand. By gently pressing the shoulder back with the elbow and moving the pelvis forward with the other arm or hand, L5-S1 should be pressed with little movement and a proper stretch of the capsular tissues. The test is positive if the patient feels discomfort. The patient starts the Gaenslen test in a supine posture, with the troublesome leg lying on the edge of the table. The examiner bends the non-symptomatic hip sagittally and flexes the knee to a 90-degree angle. While the therapist stabilizes the pelvis and applies passive pressure to the leg being tested (the symptomatic side), causing it to hyperextension at the hip, the patient should hold the nontested (asymptomatic) leg with both arms. The flexed leg should then receive a flexion-based counterforce that pushes it in the cephalad direction, causing torque to the pelvis. The

test is deemed successful if the patient's typical discomfort is replicated.

3. Result

100 Individual who participated in the simple random survey, of the multiparous female population. They were examined with the help of lumbar spine torsion test and gaenlen's test. Female aged 20-40 years and with least 2 gravida.



Graph 1: Out of 100 females 67 had full term normal delivery and 23 had lower segment caesarean section.

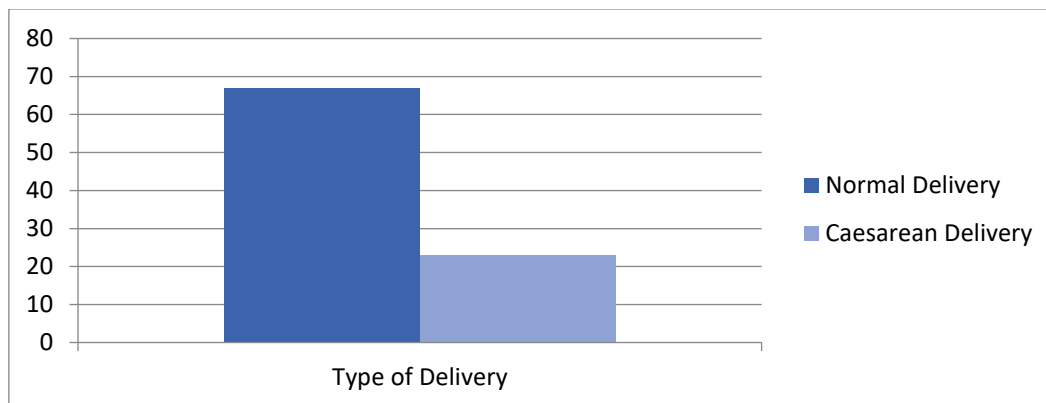


Figure 1: Type of Delivery

In the age group of 20 to 30 there were 48 female out of which were 18 were found to be tested positive for lumbo-sacral dysfunction and 30 of them were negative. In the age group of 31 to 40 there were 52 females out if which 40 female were positive and 12 females were negative for lumbo-sacral dysfunction.

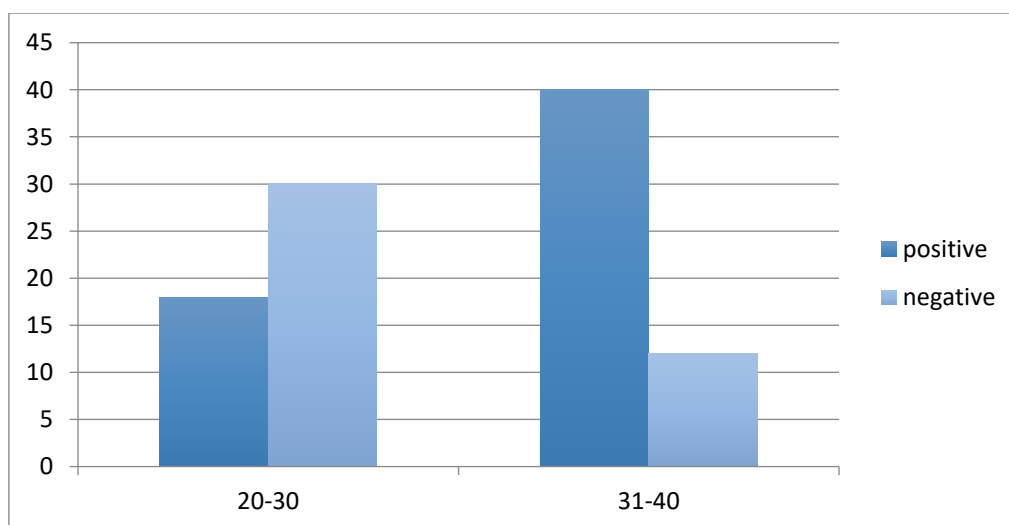


Figure 2 Prevalence among age group

In normal group of BMI there were 51 females out of which 22 were positive and 31 were negative, in overweight group of BMI there were 37 females out of which 28 were positive and 9 were negative and in the obese group of BMI there were 10 females out of which 8 were positive and 2 were negative.

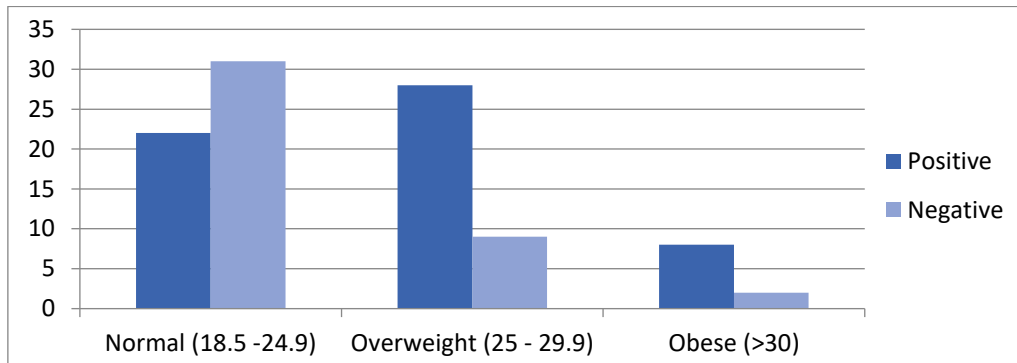


Figure 3: Body Mass Index (kg/m²)

Table-1 Number of females with gravid and prevalence of Lumbo sacral dysfunction.

Gravida	No. of females	Test Positive	Test Negative	Prevalence
Women with 2 children	63	29	34	46.03%
Women with 3 children	37	20	17	54.05%

4. Discussion

There are lot of physiological, anatomical, biochemical and hormonal changes that occurs in woman's body during the pregnancy and the postpartum period which includes weight gain, changes in the body posture. Approximately 20 to 40 pounds of weight is gained during pregnancy. Because a lady carrying several babies will gain more weight than a woman carrying only one pregnancy. Anatomical alterations are seen in addition to physiological changes. After conception, the fetus grows and develops in the safe and nutrient-rich environment provided by the uterus. At 40 weeks of gestation, it grows from a pear-shaped size when not pregnant to accommodate a full-term baby. During the first 20 weeks, the tissue that makes up the uterus continues to expand, increasing in weight by around 50–1000 grams. After this period, it extends to provide room for the developing baby, placenta, and amniotic fluid without becoming heavier. The woman's bones and muscles were under a lot of pressure due to the weight of the fetus, the expanded placenta, the amniotic fluid, and the growing curvature of her back. From a biomechanical perspective, the uterine volume increases cause the abdominal muscles to weaken and stretch, which increases the strain on the lumbar muscles. Additionally, when the breast and abdomen grow in size, the center of gravity moves forward, altering posture with greater lordosis and pelvic anteversion, which increases the strain on the ligaments and lumbar spine. Low back pain is exacerbated by the compression of the intervertebral disc caused by increased axial load, which causes the disc's height to decrease and fluid to be expelled ⁽²³⁾. Pregnant women with advanced maternal age, high body mass index (BMI), a history of low back discomfort during a prior pregnancy, and joint hypermobility are more likely to have low back pain.

Lumbosacral joint is the important weight bearing joint of the body. As in the pregnant stage the uterus enlarges as to accommodate the growing foetus and there is more amount of stress on the lumbar spine which leads to exaggeration of the lumbar spine, which alters the normal gait more likely in the non -pregnant state. There has been a rise in cesarean sections in recent years when certain medical conditions and the baby's aberrant position prevent a natural vaginal birth. Despite the fact that the procedure keeps the baby safe, many women who have a c-section with spinal anesthesia suffer from low back discomfort. When lifting, bending, and feeding the infant, good posture has helped to relieve chronic low back discomfort.

Research indicates that up to 50% of subjects experience lower back pain during pregnancy, and a significant portion continue to experience symptoms postpartum, indicating a high prevalence of lumbo-sacral dysfunction in multiparous women. A study conducted by Beales et al. found that more than half of multiparous women reported persistent low back pain after multiple pregnancies, with the severity and frequency of the pain increasing with the parity. A study by Morgen supports this, showing that multiparous women have a higher prevalence of chronic low back pain than nulliparous women due to the cumulative effect of multiple

pregnancies.

BMI is a well- documented risk factors for musculoskeletal disorders, and its role in lumbo-sacral dysfunction is significant. Because of the increased mechanical strain on the spine, people who are overweight or obese are more prone to suffer from pain in the lower back. During pregnancy, weight gain further exacerbates this load, and for women with a high BMI, this can lead to a significant strain on the lumbar and sacral regions.

A study was observed as a direct correlation between increased BMI and alterations in the lumbo-sacral angle, a crucial determinant of lumbar spine health. In obese individuals, the lumbar spine tends to compensate for the excess weight by increased by increasing lordosis, leading to further compression of spinal nerves and structures. For multiparous women, particularly those with multiple pregnancies can result in lasting changes in spinal curvature, leading to chronic lumbar dysfunction. Moreover, postpartum weight gain across pregnancies can result in lasting changes in spiral curvature, leading to chronic lumbar dysfunction ⁽²⁴⁾.

Moreover, postpartum weight retention is common, especially in women with higher parity. This retained weight can perpetuate the strain on the spine, contributing to the persistence of lumbar spine dysfunction long after childbirth.

Age is another critical factor influencing the prevalence of lumbo-sacral dysfunction I n multiparous women. As women age, their risk of developing musculoskeletal issues increases due to the natural degenerative processes affecting the spine, muscles, joints. In particular, older multiparous women (above 35 years of age) are more prone to experiencing chronic low back pain due to combined effects of aging and multiple pregnancies. A study conducted highlighted the increased risk of lumbo-sacral dysfunction in women over 35 years who have undergone multiple pregnancies. The study suggested that age-related decline in muscle strength and elasticity, coupled with the mechanical burden of pregnancy, contributes to lumbar instability and chronic pain. Furthermore, older women are likely to have developed degenerative disc disease, which can exacerbate lumbar spine problems. Additionally, multiparous women in their late 30s and 40s may have a delayed recovery from the physical stresses of pregnancy and childbirth, further increasing vulnerability to lumbo-sacral dysfunction. The wear and tear on the body from multiple pregnancies, combined with age related factors, results in a higher predominance of chronic pain in the back in this group in contrast to younger women with multiple pregnancies ⁽²⁵⁾.

The type of delivery is a crucial factor within the development of lumbo-sacral dysfunction. Vaginal delivery, particularly when associated with instrumental interventions like forceps or vaccum extraction, can cause significant trauma to the pelvic floor muscles and surrounding structures. The stretching and tearing of these muscles can lead to pelvic floor dysfunction, which is strongly linked to lumbo-sacral instability. A study found that women who had undergone multiple vaginal deliveries were at an increased chance of developing lumbo-sacral dysfunction because the repeated injury to the pelvic floor and sacroiliac joints. This study suggested that weakened pelvic floor muscles, which are unable to adequately assistance the spine, lead to increased stress on the lumbar and sacral regions. In contrast, caesarean sections may reduce the risk of pelvic trauma, but they are not without consequences for lumbar spine health. Women who have undergone multiple caesarean sections often experience weakening of the abdominal muscles, which can impair core stability and increase the likelihood of lumbar dysfunction. Furthermore, the muscles supporting the spine may recover more slowly following a caesarean delivery due to the longer recovery period ⁽²⁶⁾. Spine alterations can have direct effect of lower limbs. Foot dysfunctions are very common in them⁽²⁷⁾.

5. Conclusion

In conclusion, lumbo-sacral dysfunction is a prevalent and often debilitating condition among multiparous women. Factors such as BMI, age, and mode of delivery play significant roles in determining the risk and severity of this dysfunction. Addressing these factors through preventive measures and appropriate treatment strategies is essential for reducing the burden of lumbo-sacral dysfunction in this population.

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