PREVALENCE OF KNEE PAIN IN WOMEN DURING THIRD TRIMESTER OF PREGNANCY

[1]Syeda Farheen Narjis

[1]Hameed Latif Hospital, Lahore

Highlights:

- This cross-sectional study was conducted on 152 participants. Data were collected through a convenient sampling technique by using the modified KNEST questionnaire.
- The study added women in the third trimester of 18-30 years with knee discomfort started after the second trimester. Meanwhile, the exclusion criteria consisted of women in their first or second trimester who had a mental disease and had a knee injury in the past.
- The prevalence of knee pain in pregnant females in the third trimester was high; 73.68%.

ABSTRACT

Background: Musculoskeletal problems are widespread in the obstetric population, with one out of every four women experiencing debilitating symptoms. Because of hormonal, anatomical, physiologic, and morphological changes during pregnancy, pregnant women frequently develop musculoskeletal disorders involving the lower extremities. Symptoms such as muscular strain, cramps, discomfort, weariness, and knee soreness are common. **Objective:** Prevalence of knee pain in women during the third trimester of pregnancy **Material & Methods:** This cross-sectional study was conducted on 152 participants. Data were collected through a convenient sampling technique by using the modified KNEST questionnaire. The study added women in the third trimester of 18-30 years with knee discomfort started after the second trimester. **Results:** The mean age of women was 23.14 ±3.43 years, with a lower limit of 18 and an upper limit of 30 years. 26.3% of women had no pain in or around the knee. About 67.1% of women consulted their GP due to knee pain, 30.9% of patients visited physiotherapists, 9.9% of patients had consulted a medical specialist, 6.6% of patients visited a chiropractor, and 3.3% of patients had taken knee injections in their third trimester.**Conclusion:** The prevalence of knee pain in pregnant females in the third trimester was high; 73.68%. Most pregnant females visit physiotherapists to manage knee pain in the third trimester, preferably than going for injections and other treatment options. **Keywords:** Knee pain, Antenatal, Pregnant females, Third trimester, KNEST

INTRODUCTION

Musculoskeletal problems are widespread in the obstetric population, with one out of every four women experiencing debilitating symptoms.[1,2] The knee is the biggest joint in the body, created by the fusion of three joints: the lateral femorotibial, medial femorotibial, and femoro patellar. Various ligaments and a fibrous capsule support the knee joint. The anterior fibrous capsule is exceedingly thin and weak. The knee is a structurally weak joint because the articular surfaces are not congruent. The tibial condyles are too tiny and shallow to support the massive, convex

femoral condyles.[3] Physiological changes during pregnancy raise the amounts of two hormones, estrogen and Relaxin, which alter fibroblast activity. Estrogen inhibits the production of type I collagen and the proliferation of fibroblasts.[4] Relaxin reduces interstitial collagen creation and secretion, promotes matrix Metalloproteinase Procollagenase articulation, and lowers tissue inhibitor of metalloproteinase production by human cutaneous and lung fibroblasts. Increased Estrogen and Relaxin levels in the antenatal period promote elasticity and collagen restoration in articulations.[5]

Musculoskeletal alterations occur during pregnancy and have an impact on the musculoskeletal system. Because of hormonal, anatomical, physiologic, and morphological changes during pregnancy, pregnant women frequently develop musculoskeletal disorders involving the lower extremities. Symptoms such as muscular strain, cramps, discomfort, weariness, and knee soreness are common.[6] Altered joint biomechanics due to long-term changes in joint laxity may place an incomparable amount of stress on musculoskeletal tissues. Furthermore, more significant joint laxity may result in higher cartilage stresses or stresses with a different distribution. Relaxin is a hormone generated by the body during pregnancy that can harm the joint if exposed to abnormal contact stresses. Increased joint laxity during pregnancy may predict knee issues such as chondromalacia patella.[7] During the third trimester of pregnancy, there is a decrease in knee extension and an increase in knee adduction moment. As the weight accumulates, substantial strain is imposed on the knee joints, causing them to abduct in the third trimester gradually. Postural alterations during pregnancy may lead to an anterior swing in the balance point, causing knee joints to hyperextend to preserve a well-adjusted straight posture.[8] Changes in mass distribution during pregnancy might cause changes in gait.[9] Knee hyperextension strains the anterior cruciate ligament as it imposes on the femoral notch, which may lead it to adapt and stretch throughout pregnancy.[10]

Women in their late 30s seeking to conceive will have severe and long-lasting knee discomfort in their third trimester as the space between their knee joints narrows, causing the breadth of their patellar region to contract, resulting in a reduction of the knee joint area.[11] Because of the enormous tension imposed on the thigh bone and tibia during pregnancy, the junction between the thigh bone and the tibia begins to shorten. Increased body weight may amplify the impact of reproductive and hormone variables on knee discomfort and induce an increase in body weight during pregnancy, putting additional stress on the knee joint. As a result, the pressures transferred across the knee joint become greater.[12] This study aimed to evaluate the prevalence of knee pain in women in their third trimester, as well as how different pregnancy characteristics are linked to knee pain in women.

METHODOLOGY

It was an observational study which gathered 152 participants from Sir Ganga Ram, University of Lahore Teaching hospital, and Hameed Latif Lahore through a non-probability convenient sampling technique. The study was ended within four months after the approval of the synopsis from March 2022 to June 2022. The sample size of 152 was calculated with a 95% confidence level using the single proportion method on Epitool software.

Where p=0.261

d= 0.07

$\alpha = 0.95$
Therefore, $n = 152$
Authors screened out the subjects for the eligibility criteria before entering them into the study and granted ethical approval from the Institutional Review Board, Riphah International University, Lahore. Inclusion criteria comprised all women between 18 and 30 who were pregnant in their third trimester with knee discomfort. Meanwhile, the exclusion criteria consisted of women in their first or second trimester who had a mental disease and had a knee injury in the past. The outcome measure was the self-administered and modified KNEST questionnaire to collect data. Before completing the surveys, participants had signed the written agreements and consent forms. SPSS version 21.0 was used to analyze data. Mean ± Standard Deviation was tabulated for continuous variables. Frequencies & percentages were tabulated for categorical variables.

RESULT

The mean age of practicing pregnant females was 23.14±3.432 years. Out of 152 pregnant females, 102 (67.1%) consulted their GP in their third trimester due to knee pain. There were 42(27.6%) patients with bilateral knee pain, 35(23.0%) with right knee pain, 35(23.0%) with only left knee pain, whereas 40(26.3%) patients had no pain in the knee in the third trimester. (Table-I)

Table I: Descriptive statistics of Demographic and KNEST variables

Age	
Mean	23.1447
Std. Deviation	3.43223
Minimum	18.00
Maximum	30.00

GP (family doctor) Consultation	Frequency and Percentage
Yes	102(76.1%)
No	50(32.9%)
Laterality of Knee Pain	**Frequency and Percentage**
Bilateral Knee Pain	42 (27.6%)
Unilateral (Right) Knee pain	35(23.0%)
Unilateral (Left) Knee pain	35(23.0%)
No Pain	40(26.3%)

Out of 152 patients, 47(30.9%) patients had visited physiotherapists, 15(9.9%) patients had consulted medical specialists in nearby hospitals, 15(9.9%) had taken acupuncture sessions, 10(6.6%) patients had visited chiropractor/osteopaths, 10(6.6%) had used drugs, 10(6.6%) had done with knee surgery, and 5(3.3%) patients had taken knee injections. However, 40(26.3%) patients had no pain. (Figure 1)

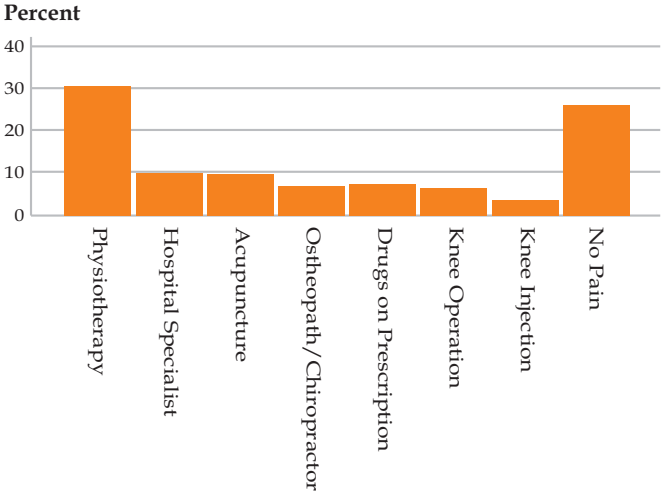

Figure 1: Treatment Services Women took for knee pain

Out of 152 pregnant females, the prevalence of knee pain in women during the third trimester was 73.7%, and only 40 (26.3%) women had no pain in that particular time duration. (Table-II)

Table II: Prevalence of knee pain in women during the third trimester of pregnancy

Pain In or Around the Knee	Frequency	Percentage
Yes	112	73.7%
No	40	26.3%

DISCUSSION

The goal of this study was to evaluate knee pain in women in their third trimester and how different pregnancy characteristics are linked to knee pain in women. The most common musculoskeletal issue during gestation was discovered to be knee pain. Musculoskeletal complaints increased in the third trimester, according to the data. Various musculoskeletal problems might cause significant discomfort during gestation. In the last trimester of pregnancy, 112 (73.68 percent) of 152 patients complained of knee pain. According to Thomas LM et al. knee is the most affected part of the gestational period due to ergonomically and hormonal changes in the body. These changes induce knee discomfort, and this present study reports that 73.68% of knee pain patients are third-trimester pregnant women.[13]

The circulatory, hormonal, and urinary systems, as well as the musculoskeletal system, are all affected by gestation.[14] There cab damage to musculature during the whole period of gestation, but the last trimester is more prior to getting the alterations. The tenderness and related deviations are more evident in the last trimester than in the initial two.[2] This increase in discomfort, tenderness, and alterations in the posture can be due to the ergonomic and endocrinal divergences along with fluid retention and carrying weight in the uterus. To better understand the etiology of musculo-skeletal disorders during pregnancy, more research is needed. It would allow the doctor to make quick diagnoses and treatments.[15,16]

Knee pain is a typical source of discomfort during maternity, and it can range in severity from mild to severe to tiring. There are a handful of reasons for knee pain in the third trimester, including hormonal fluctuations (due to the hormone Relaxin) [17], vein strain resulting in varicose veins, obesity, excessive walking or standing, age, calcium deficiency, and a changed point of gravity due to (the postural shift to facilitate the foetus). Estrogen inhibits the formation of type I collagen and the activation of fibroblasts.[18]

The lower-extremity joints must adapt to the changes in mechanics during gestation by tolerating increased force. Spasms are frequent symptoms in the body region from hip to toes in the antenatal period in which the hip region is predominantly involved. Vullo et al. worded that [19] hip pain is common among pregnant women in the second and third trimesters. It could be due to increased mechanical pressure on the hip joints as the gestation progresses.[8,9] Authors should also assess several particular ailments.[16] Hip pain is common among pregnant women in the second and third trimesters. It could be due to increased mechanical pressure on the hip joints as the pregnancy progresses. Some specific disorders, however, should be evaluated as well.[20,21] Fracture of sacrum bone, labral lesions of acetabulum, symphysis pubis diastasis or impairment, cauda equina syndrome, and sacroiliac joint infection are also peculiar reasons for hip discomfort during gestation.[22,23] The study did not evaluate the postural changes in the third trimester. A cohort study should be conducted to determine knee pain in the post-natal period on a relatively larger sample size when the hormonal changes come to normality. How the physiological changes cause, knee pain should also be studied in the future.

CONCLUSION

The prevalence of knee pain in pregnant females in the third trimester was high; 73.68% because of hormonal and musculoskeletal changes. Most pregnant females visit physiotherapists to manage knee pain in the third trimester, preferably than going for injections and other treatment options.

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