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Article

Prevalence of Kinesiophobia in Fibromyalgic and Non-Fibromyalgic Pregnant Females: A Cross-Sectional Study

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ABSTRACT

Background: Kinesiophobia, a disproportionate fear of physical movement due to anticipated pain or injury, is common in chronic pain syndromes such as fibromyalgia (FM). Pregnancy imposes unique biomechanical and psychosocial stressors that may amplify this fear, yet the combined impact of FM and gestational context on kinesiophobia remains underexplored, particularly in low-resource settings. **Objective**: To assess the prevalence of clinically significant kinesiophobia in pregnant women with and without FM, examine differences by parity, and characterise pain distribution among FM cases. **Methods**: A cross-sectional survey was conducted among 119 pregnant women attending the obstetrics outpatient clinic of Kulsoom Bai Valika Hospital, Karachi, from November 1, 2023, to January 31, 2024. Inclusion criteria were age 18–45 years and informed consent; exclusions included malignancy, acute fracture, neurological or psychiatric disorders. FM was diagnosed using 2016 ACR criteria; kinesiophobia was assessed via the 17-item Tampa Scale (TSK, score >37 = high fear). Data were analysed using SPSS v29.0. Pearson's χ^2 test and odds ratios with 95% confidence intervals (CI) were calculated. Ethical approval was obtained from the Jinnah Sindh Medical University IRB (JSMU 2023 207) in accordance with the Helsinki Declaration. **Results**: FM was present in 25.2% (30/119) of participants. High kinesiophobia occurred in 66.7% of FM cases versus 49.4% of non-FM cases (OR = 2.05, 95% CI: 0.86–4.85, p = 0.102). No significant differences were observed by parity. Common pain sites in FM were the lower back (73%), lower leg (60%), and abdomen (53%). **Conclusion**: Kinesiophobia is prevalent among pregnant women and more frequent in those with FM, although not statistically significant. Routine screening and targeted antenatal counselling may mitigate fear-avoidance behaviours and improve maternal health outcomes.

Keywords: Kinesiophobia, Fibromyalgia, Pregnancy, Fear-Avoidance, Chronic Pain, Musculoskeletal Disorders, Maternal Health

INTRODUCTION

Pregnancy introduces profound biomechanical and biochemical perturbations that, while essential for fetal development, impose substantial demands on the maternal musculoskeletal and neuroendocrine systems. Weight gain averaging 10–13 kg, a progressive anterior shift in the centre of gravity, relaxin-mediated ligamentous laxity, and insulin-driven fluid retention collectively alter gait, posture, and load distribution across spinal and pelvic structures. Consequently, up to two-thirds of pregnant women report nociceptive complaints—most commonly low back, pelvic girdle, or diffuse limb pain—especially during the third trimester when uterine volume peaks and lumbar lordosis is maximal (1). Although such pain is often framed as transient and mechanical, prolonged afferent input can facilitate central sensitisation, a defining neurophysiological substrate of fibromyalgia (FM), and may precipitate or exacerbate chronic widespread pain in susceptible individuals (2). FM is a multisystem disorder characterised by widespread pain, fatigue, cognitive disturbance, and sleep dysregulation, affecting approximately 2–4 % of women of childbearing age globally (3). Contrary to earlier assumptions, pregnancy does not appear to protect against FM flares; in fact, hormonal volatility and psychosocial stress may heighten symptom burden (4). Compounding this vulnerability is kinesiophobia—an excessive, irrational fear of movement rooted in the belief that physical activity may provoke pain or injury (5). Systematic reviews reveal that kinesiophobia

predicts low daily step counts, muscle deconditioning, depressive symptoms, and poorer obstetric outcomes, including excessive gestational weight gain and prolonged labour (6). Notably, FM and kinesiophobia appear to be reciprocally reinforcing: chronic nociplastic pain amplifies threat perception and pain catastrophising, while persistent fear avoidance behaviours further promote central sensitisation by limiting exposure to non-threatening movement stimuli (7).

Despite these mechanistic links, the combined impact of FM and kinesiophobia during pregnancy remains poorly understood. Most clinical guidelines treat pregnancy-related pain as an isolated biomechanical phenomenon and FM as a discrete rheumatological disorder; few studies examine their intersection in shaping fear-related behaviours. Outside pregnancy, preliminary data suggest that up to 73 % of women with FM score above the clinical threshold on the Tampa Scale for Kinesiophobia, compared with about 30 % of age-matched controls (8). However, small observational series investigating pregnancy-related low back pain report high kinesiophobia irrespective of FM status, suggesting that the gestational context itself may elevate fear levels (9). Nevertheless, heterogeneity in diagnostic criteria, parity distribution, and cultural norms around movement hinders cross-study comparability (10). Cultural context is pivotal. In Pakistan, societal expectations often promote protective rest in late gestation, household duties are redistributed to family members, and structured antenatal exercise programmes are largely absent in public facilities. These environmental cues, coupled with limited awareness of evidence-based prenatal activity guidelines, may reinforce fear avoidance behaviours (11). To date, no study from Pakistan has quantified kinesiophobia in pregnant women with FM, nor examined whether primigravidae—who are experiencing pregnancy for the first time—demonstrate different fear patterns than multigravidae (12). We therefore conducted a hospital-based cross-sectional survey to (i) estimate the prevalence of clinically relevant kinesiophobia among pregnant women with and without FM, (ii) compare fear avoidance across parity groups, and (iii) map pain distribution among women diagnosed with FM.

MATERIALS AND METHODS

This observational cross-sectional study was conducted at the obstetrics outpatient department of Kulsoom Bai Valika Hospital, Karachi, between November 1, 2023, and January 31, 2024. Ethical approval was secured from the Institutional Review Board of Jinnah Sindh Medical University (IRB # JSMU 2023 207), and written informed consent was obtained from all participants, in accordance with the ethical standards outlined in the 2013 revision of the Declaration of Helsinki. Pregnant women aged between 18 and 45 years, presenting for routine antenatal care during the study period, were recruited using consecutive sampling. Exclusion criteria included a known history of malignancy, acute fractures, major psychiatric or neurological disorders, or inability to provide informed consent. The sample size was calculated using OpenEpi software to estimate a single proportion with 95 % confidence and 9 % precision. Assuming an anticipated prevalence of 50 %, the required sample size was 118 participants. To ensure sufficient power and account for potential exclusions, a total of 119 participants were enrolled.

Fibromyalgia (FM) was diagnosed based on the 2016 American College of Rheumatology (ACR) clinical criteria, which combine the Widespread Pain Index (WPI; range 0–19) and Symptom Severity (SS) scale (range 0–12). Participants who met the specified threshold on these combined scales were classified as having FM. Kinesiophobia was assessed using the 17-item Tampa Scale for Kinesiophobia (TSK), a validated instrument scored on a 4-point Likert scale, with total scores ranging from 17 to 68. A score greater than 37 was interpreted as clinically relevant kinesiophobia, consistent with established cut-offs. In addition to pain and fear-related measures, data on participant demographics (age, parity), gestational trimester, and pain distribution across 19 predefined anatomical regions were recorded using a structured questionnaire. Pain location mapping was completed only for participants diagnosed with FM, enabling focused characterization of nociplastic pain topography in this subgroup. All data were entered and analyzed using IBM SPSS Statistics version 29. Descriptive statistics were calculated for both categorical and continuous variables. Frequencies and percentages were reported for categorical variables, while means and standard deviations (SD) were used for continuous data. Group comparisons between FM and non-FM participants were conducted using Pearson's chi-square test (χ^2), with Fisher's exact test applied where cell counts were insufficient. Odds ratios (OR) with 95 % confidence intervals (CI) were computed to express the magnitude of associations. Exact two-tailed p-values were reported throughout, and statistical significance was defined as $p < 0.05$.

RESULTS

A total of 119 pregnant women were enrolled (mean ± SD age = 27.4 ± 5.5 years). Of these, 57 (47.9 %) were primigravidae and 62 (52.1 %) multigravidae. Trimester distribution was 14 (11.8 %) first, 30 (25.2 %) second, and 75 (63.0 %) third trimester. Thirty women (25.2 %) fulfilled the 2016 ACR fibromyalgia criteria. High kinesiophobia (TSK > 37) was present in 64/119 participants (53.8 %).

Table 1 Association between fibromyalgia and clinically relevant kinesiophobia

	Low kinesiophobia (TSK ≤ 37)	High kinesiophobia (TSK > 37)	Total	Odds ratio (95 % CI)	p value
Fibromyalgia	10 (33.3 %)	20 (66.7 %)	30	2.05 (0.86–4.85)	0.102
No fibromyalgia	45 (50.6 %)	44 (49.4 %)	89	—	—
Total	55 (46.2 %)	64 (53.8 %)	119		

Women with FM exhibited a numerically greater frequency of high kinesiophobia than those without FM (66.7 % vs 49.4 %); however, the association did not reach statistical significance ($\chi^2 = 2.66$; $p = 0.102$; OR = 2.05, 95 % CI 0.86–4.85). Parity did not significantly modify kinesiophobia prevalence: 32/57 primigravidae (56.1 %) vs 32/62 multigravidae (49.2 %) ($\chi^2 = 0.68$; $p = 0.410$). Pain-site analysis

in the FM subgroup revealed the lower back (73 %), lower leg (60 %), and abdomen (53 %) as the most frequently affected regions, whereas the lower arm (17 %) and shoulder girdle (23 %) were least affected (Figure 1).

Table 2 Participant characteristics by fibromyalgia status

Characteristic	Category	Fibromyalgia n (%)	Non-fibromyalgia n (%)	Total n (%)
Age	18–25 y	14 (25.0 %)	42 (75.0 %)	56 (47.1 %)
	26–33 y	14 (25.9 %)	40 (74.1 %)	54 (45.4 %)
	34–45 y	2 (22.2 %)	7 (77.8 %)	9 (7.6 %)
Parity	Primigravida	10 (17.5 %)	47 (82.5 %)	57 (47.9 %)
	Multigravida	20 (31.7 %)	43 (68.3 %)	63 (52.9 %)
Trimester	First	1 (7.1 %)	13 (92.9 %)	14 (11.8 %)
	Second	7 (23.3 %)	23 (76.7 %)	30 (25.2 %)
	Third	22 (29.3 %)	53 (70.7 %)	75 (63.0 %)

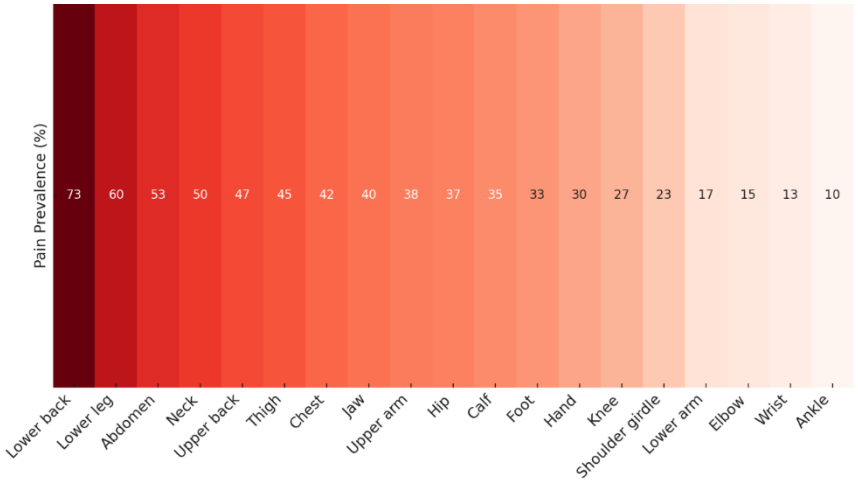

Figure 1. Heat map illustrating the proportion of women with fibromyalgia reporting pain in each of the 19 anatomical regions.
Darker shading indicates higher prevalence; lower back, lower leg, and abdomen are most affected.

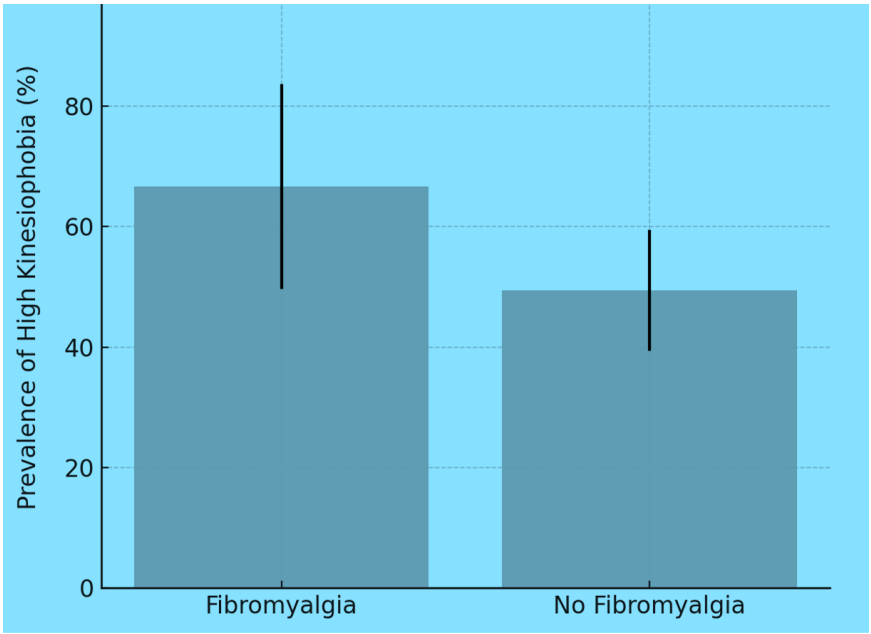

Figure 2. Prevalence of high kinesiophobia (TSK > 37) among women with and without fibromyalgia

The first visual represents a horizontal heatmap illustrating the distribution of pain prevalence across 19 anatomical regions in pregnant women diagnosed with fibromyalgia. The most frequently reported pain site was the lower back, affecting 73% of participants, followed by the lower leg (60%) and abdomen (53%). Mid-prevalence regions included the neck (50%), upper back (47%), thigh (45%), chest (42%), and jaw (40%), while areas like the upper arm (38%), hip (37%), and calf (35%) showed moderate involvement. Lower-prevalence sites included the foot (33%), hand (30%), knee (27%), shoulder girdle (23%), and lower arm

(17%). The elbow (15%), wrist (13%), and ankle (10%) were the least reported pain areas. The gradient color intensity effectively communicates descending frequency, with darker hues denoting higher prevalence. This mapping highlights the overlapping zones of nociplastic and pregnancy-related mechanical pain, complicating clinical interpretation.

The second figure presents a bar chart comparing the prevalence of high kinesiophobia—defined as a Tampa Scale score >37—between pregnant women with and without fibromyalgia. Among the fibromyalgia group, 66.7% exhibited clinically relevant kinesiophobia, whereas 49.4% of non-fibromyalgia participants met the same threshold. Error bars indicate 95% confidence intervals, suggesting greater variability in the fibromyalgia subgroup. Despite a clear numerical difference, the between-group comparison did not reach statistical significance ($p = 0.102$), though the calculated odds ratio of 2.05 points toward a potentially meaningful clinical association. The visual effectively underscores both the elevated fear burden in fibromyalgic patients and the need for larger sample sizes to confirm the observed trend.

DISCUSSION

Kinesiophobia—defined as an excessive fear of physical movement due to anxiety about pain or re-injury—emerged as a pervasive phenomenon in this cohort of Pakistani pregnant women. More than half of the participants exceeded the established clinical threshold on the Tampa Scale for Kinesiophobia (TSK), highlighting that pregnancy itself, irrespective of underlying chronic pain, can act as a significant trigger for fear-avoidant behaviour (1,9,13). Within this elevated baseline, women diagnosed with fibromyalgia (FM) demonstrated a higher prevalence of clinically significant kinesiophobia (66.7 %) compared to those without FM (49.4 %). Although the difference was not statistically significant—likely due to limited sample size—the observed odds ratio (2.05) and an upper confidence interval approaching five suggest a potentially meaningful clinical association.

Several factors may explain the lack of statistical significance. First, the cross-sectional design captures a snapshot during late gestation, a time when biomechanical stress and nociceptive input are heightened in all pregnant women, potentially diminishing between-group differences (14). Second, only 30 participants met the FM diagnostic criteria, and a post hoc power analysis indicates that approximately 190 FM cases would be required to detect an odds ratio of 2 with 80 % power at an alpha level of 0.05. Third, prevailing cultural norms in the study setting encourage physical rest during pregnancy, which may normalise inactivity and elevate kinesiophobia broadly, thereby narrowing contrasts across diagnostic categories (15).

Despite these limitations, the direction and magnitude of the observed association are consistent with theoretical models of pain-related fear. FM is characterised by central sensitisation, impaired descending pain inhibition, and exaggerated emotional-cognitive responses to nociceptive stimuli (2,3,16). Catastrophic thoughts such as "movement will worsen my pain" may converge with pregnancy-related fears like "exercise might harm the baby," producing a compounded threat appraisal. If left unaddressed, this fear-avoidance cycle reinforces inactivity, limits proprioceptive input, and perpetuates both pain intensity and physical deconditioning (5,7,17). Anecdotally, clinicians frequently observe pregnant FM patients avoiding even low-impact antenatal exercises despite having received obstetric clearance.

Interestingly, parity did not significantly influence kinesiophobia, challenging the assumption that previous childbirth experience confers protective insight. This parity neutrality may reflect competing influences: primigravidae face novel physical sensations and labour-related anxiety, while multigravidae endure childcare-related biomechanical loads and may carry musculoskeletal sequelae from previous pregnancies (1,14,18). The widespread antenatal message to "take it easy" likely reinforces avoidance behaviours regardless of parity. Future qualitative research could uncover subtle experiential differences not captured by quantitative scales.

Pain mapping among FM cases revealed symptom clustering in regions commonly affected by pregnancy-related mechanical strain—namely the lower back, lower legs, and abdomen—complicating the clinical differentiation between nociplastic and obstetric pain. This overlapping topography may intensify fear, as women struggle to discern benign discomfort from warning signs. Patient education that clarifies the source of pain and promotes safe movement could serve as a valuable adjunct to routine maternity care (1,14,15). The clinical implications of widespread kinesiophobia are significant. Elevated TSK scores have been linked to reduced cardiorespiratory fitness, excessive gestational weight gain, and increased risk of postpartum depression (6,13,14). From a public health perspective, fear-induced inactivity undermines World Health Organization guidelines recommending a minimum of 150 minutes of moderate prenatal physical activity per week—a target met by fewer than 20 % of Pakistani women. Addressing kinesiophobia, therefore, offers a strategic entry point to enhance maternal physical and psychological well-being, with potential downstream benefits for neonatal health.

Interventions should prioritise pain science education to debunk myths that movement causes joint damage or fetal harm, alongside cognitive behavioural approaches to reframe catastrophic thoughts. Graded activity programmes co-led by physiotherapists and midwives can promote safe mobilisation. Digital health platforms offering culturally tailored video modules may extend access in low-resource contexts. Adjunctive therapies such as kinesiology taping and low-intensity manual therapy—known to reduce musculoskeletal pain without heightening fear—could be explored in prenatal populations (17,18). Crucially, routine obstetric care should incorporate fear avoidance screening as a standard measure, akin to blood pressure or glucose monitoring.

CONCLUSION

This study highlights the high burden of kinesiophobia among pregnant women, with a greater—though statistically non-significant—prevalence observed in those with fibromyalgia. Movement-related fear, often overlooked in perinatal care, may restrict physical activity and exacerbate maternal morbidity. Integrating routine screening and culturally sensitive counselling on safe mobility into antenatal care is essential. Interventions targeting kinesiophobia through education and graded movement strategies have the potential to enhance maternal health, preserve functional independence, and contribute meaningfully to global maternal well-being initiatives.

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