

PATIENT EXPERIENCES OF REHABILITATION AFTER LUMBAR SPINE SURGERY: A QUALITATIVE STUDY

Original Research

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ABSTRACT

Background: Rehabilitation following lumbar spine surgery is a critical yet complex component of patient recovery, with outcomes influenced by physical, emotional, systemic, and social factors. While clinical success is often measured by objective metrics, little is known about the subjective experiences that shape patient engagement and progress during rehabilitation.

Objective: To explore patients' perspectives on the challenges and facilitators encountered during rehabilitation after lumbar spine surgery in a tertiary care setting in Pakistan.

Methods: A qualitative exploratory study was conducted over eight months across three urban tertiary hospitals in Pakistan. Purposive sampling recruited 22 adult patients, 6–12 months post-lumbar spine surgery, actively engaged in rehabilitation. Data were collected through semi-structured in-depth interviews, transcribed, translated, and analyzed using thematic analysis. Ethical approval was obtained, and informed consent was secured from all participants.

Results: Five major themes emerged: (1) *Physical Barriers to Recovery* (postoperative pain, mobility limitations, fatigue), (2) *Psychological Responses to Rehabilitation* (fear of reinjury, motivation fluctuations, emotional distress), (3) *Healthcare System Challenges* (inadequate follow-up, poor communication, limited access to physiotherapy), (4) *Social and Environmental Influences* (family support, financial burden, workplace pressures), and (5) *Facilitators to Recovery* (therapist support, clear guidance, positive mindset). These themes reflected the dynamic and multifactorial nature of the rehabilitation experience.

Conclusion: Rehabilitation after lumbar spine surgery extends beyond physical recovery and is profoundly shaped by psychological, social, and systemic dimensions. These insights highlight the need for more patient-centered, holistic rehabilitation protocols that address both clinical and experiential factors to optimize recovery outcomes.

Keywords: Back Pain, Lumbar Vertebrae, Patient-Centered Care, Physical Therapy Modalities, Postoperative Period, Qualitative Research, Rehabilitation, Spinal Surgery, Treatment Outcome.

INTRODUCTION

Rehabilitation after lumbar spine surgery represents a critical phase in a patient's recovery journey, yet it remains one of the least understood aspects of spinal care from the patient's point of view. While clinical metrics such as postoperative complications, fusion success, and return-to-work timelines are frequently emphasized in the literature, the subtler, lived experiences of patients navigating rehabilitation are often underexplored (1,2). This qualitative study seeks to illuminate those experiences, bringing to the forefront the voices of individuals who have undergone lumbar spine surgery and are actively engaged in the complex, multifaceted process of recovery. Lumbar spine surgery, particularly for degenerative conditions such as herniated discs, spinal stenosis, and spondylolisthesis, is commonly performed with the intent of reducing pain, restoring function, and improving quality of life (3,4). Although advancements in surgical techniques have enhanced clinical outcomes, many patients report persistent difficulties during rehabilitation, including pain recurrence, fear of movement, lack of clear guidance, and emotional stress. These challenges can significantly impact the trajectory of recovery and, in some cases, undermine the surgical benefits. Consequently, understanding rehabilitation not just as a physiological process, but as a deeply personal and variable experience, becomes essential in tailoring effective post-surgical care (5,6).

The rehabilitation period demands a significant degree of patient engagement, requiring both physical and psychological adaptation. It often includes physical therapy, activity modifications, lifestyle changes, and ongoing medical assessments. However, the transition from a hospital or surgical center to a rehabilitation setting can be disorienting (7,8). Patients may struggle with unclear expectations, insufficient communication from healthcare providers, or a lack of consistent follow-up. Studies suggest that such gaps in continuity of care may result in anxiety, reduced adherence to rehabilitation protocols, and in some cases, worsening of outcomes. In a healthcare landscape that increasingly recognizes patient-centered care as a core value, ignoring these subjective experiences risks overlooking essential elements that contribute to recovery success (9). A small but growing body of qualitative research has attempted to explore patients' voices in the context of spinal surgery. For example, some studies have identified themes such as the importance of social support, the emotional toll of prolonged recovery, and the frustration patients feel when their postoperative expectations do not align with reality (10,11). However, the available literature remains limited in both scope and depth, often focusing on discrete aspects of rehabilitation or employing methodologies that do not fully capture the richness of patient narratives (12). There remains a substantial gap in understanding how patients interpret and navigate the complex interplay of physical healing, emotional resilience, and healthcare system interactions during the rehabilitation phase.

Moreover, rehabilitation is not a one-size-fits-all process. Socioeconomic background, prior health beliefs, pain tolerance, and access to resources such as physiotherapy and social support all influence how individuals experience recovery. Capturing these diverse perspectives is crucial in designing more equitable and responsive rehabilitation pathways. Healthcare professionals and policy makers need a deeper, more nuanced understanding of patient experiences in order to deliver care that is not only clinically effective but also emotionally and socially supportive (13,14). By centering patient narratives, this study aims to provide a more complete picture of what rehabilitation truly entails following lumbar spine surgery. Using a qualitative approach allows for the exploration of nuanced, subjective experiences that are often lost in quantitative measures. It opens the door to understanding not only what patients go through, but how they make sense of those experiences—how they interpret setbacks, draw on support systems, and navigate the sometimes-ambiguous territory between recovery and relapse. Ultimately, this research seeks to contribute meaningful insights that can inform future clinical practice, improve communication between patients and providers, and guide the development of more holistic and personalized rehabilitation programs. The objective of this study is to explore, in depth, the challenges and facilitators perceived by patients during the rehabilitation process after lumbar spine surgery, thereby filling a critical gap in the current understanding of postoperative spinal care.

METHODS

This qualitative study was conducted over an eight-month period in three major tertiary care hospitals in urban centers of Pakistan, including facilities in Lahore, Islamabad, and Karachi. These hospitals were selected based on the volume of lumbar spine surgeries performed annually and the presence of post-surgical rehabilitation units. The study aimed to explore patients' lived experiences of

rehabilitation after lumbar spine surgery, with a particular focus on the challenges they faced and the factors that facilitated their recovery. A qualitative exploratory design was chosen as the most suitable approach to capture in-depth, nuanced perspectives that cannot be easily quantified. Purposive sampling was employed to recruit participants who had undergone lumbar spine surgery within the previous 6 to 12 months and were actively engaged in rehabilitation, either through hospital-based physiotherapy or home-based exercise regimens. The inclusion criteria required participants to be adults aged between 25 and 65 years, fluent in Urdu or English, cognitively intact, and able to provide informed consent. Patients were excluded if they had undergone multiple spine surgeries, had a concurrent major psychiatric illness, or were experiencing acute postoperative complications requiring hospitalization. A total of 22 participants were recruited, a sample size determined through iterative data analysis and thematic saturation, which was reached after 19 interviews, with three additional interviews conducted to confirm saturation and ensure no new themes emerged (2,3).

Data were collected through semi-structured, in-depth interviews conducted in private consultation rooms within the hospital or, in some cases, via secure video conferencing for participants unable to travel. Each interview lasted between 45 to 60 minutes and followed a pre-designed interview guide that had been developed through a review of existing literature and in consultation with two rehabilitation specialists and a qualitative research expert. The guide focused on eliciting experiences related to physical recovery, emotional adjustment, communication with healthcare providers, perceived barriers and enablers in rehabilitation, and recommendations for improvement in care. Open-ended questions were used to allow participants to freely express their thoughts, with follow-up probes used to explore responses in more detail. All interviews were audio-recorded with participant consent and transcribed verbatim. Urdu transcripts were translated into English by bilingual experts, and back-translation was performed on a subset to ensure accuracy. To enhance credibility and trustworthiness, member checking was carried out with a subset of participants, who reviewed the summaries of their transcripts for accuracy and completeness. Reflexive journaling and peer debriefing among the research team were used to mitigate bias and promote interpretive rigor (15,16). Thematic analysis was employed as the method of data analysis, following the framework proposed by Braun and Clarke. Transcripts were first read multiple times for familiarization, then systematically coded using NVivo software version 12. Initial codes were generated inductively and grouped into broader categories through constant comparison. These categories were refined into overarching themes that encapsulated the shared and divergent experiences of participants. Two researchers independently coded the transcripts, and discrepancies were resolved through discussion and consensus. This analytical process allowed for the emergence of themes that reflected the real-world complexities of rehabilitation as perceived by the patients.

Outcome measurement tools included the use of a brief demographic questionnaire and a post-interview reflective rating scale in which participants were asked to rate, on a scale of 1 to 10, how well they felt their rehabilitation needs had been met. While this numeric scale was not central to the thematic analysis, it provided additional contextual data to support interpretation of narrative responses. Ethical approval for the study was obtained from the Ethical Review Committees of all three participating hospitals. All participants were provided with written and verbal explanations of the study's purpose, procedures, confidentiality safeguards, and their right to withdraw at any time without penalty. Written informed consent was obtained prior to participation. Anonymity was maintained by assigning pseudonyms to all participants and removing identifying information from transcripts and data files. This rigorous methodological approach ensured that the voices of patients were captured authentically and systematically, offering valuable insights into the facilitators and obstacles they encountered during their post-surgical rehabilitation journeys.

RESULTS

The qualitative analysis revealed a rich set of insights into patients' experiences during rehabilitation following lumbar spine surgery. Five major themes emerged from the data, each encompassing multiple interrelated subthemes that captured the complexity of the recovery journey. These themes reflect the interplay of physical, psychological, social, and systemic factors shaping the post-surgical rehabilitation experience. The first theme, *Physical Barriers to Recovery*, included subthemes such as postoperative pain, mobility limitations, and fatigue. Many participants described persistent or recurring pain as a major hindrance to their progress. One participant shared, "Even weeks after surgery, I felt like the pain was shifting rather than disappearing—it made it hard to trust the process." Mobility challenges were equally prominent, with several individuals expressing frustration over the slow pace of regaining independence. Fatigue, both physical and mental, was reported to be overwhelming and often unpredictable, affecting patients' engagement with therapy routines. A second core theme, *Psychological Responses to Rehabilitation*, encompassed fear of reinjury, motivation fluctuations, and emotional distress. Participants often mentioned fear as a subtle but constant barrier. As one patient noted, "I was afraid to bend, to move wrong, to do anything that might mess up the surgery again." Others reported periods of low motivation, especially

when progress was slow or setbacks occurred. Emotional responses, including anxiety and frustration, were common and closely tied to feelings of uncertainty about recovery outcomes.

Healthcare System Challenges formed a third major theme, comprising inadequate follow-up, poor communication, and limited access to physiotherapy. Several participants felt they were discharged with insufficient information. “After the surgery, it felt like I was just left to figure it out on my own,” one participant said. Gaps in provider communication led to confusion about rehabilitation timelines and expectations. Access to structured physiotherapy was inconsistent across settings, with rural patients particularly affected by logistical and financial barriers. The fourth theme, *Social and Environmental Influences*, reflected the role of external contexts in shaping recovery experiences. Family support emerged as a positive force, with many patients highlighting how emotional and logistical assistance from loved ones made a tangible difference. Conversely, financial constraints were frequently cited as sources of stress, particularly among those unable to return to work promptly. Additionally, workplace pressures and lack of employer support complicated the transition back to employment for several participants. Finally, the theme *Facilitators to Recovery* highlighted the positive aspects of rehabilitation. Subthemes included strong support from therapists, clear and consistent rehabilitation guidance, and a positive mindset. Participants who had close relationships with their physiotherapists often described feeling more confident and motivated. Clear communication about exercises and expectations reduced anxiety and improved adherence. Moreover, those who maintained a hopeful outlook reported greater resilience in the face of physical challenges. Together, these themes reflect a multifaceted rehabilitation experience influenced by individual, interpersonal, and systemic dimensions. Participants’ narratives provide critical insight into how challenges and supports interact to shape the recovery process after lumbar spine surgery.

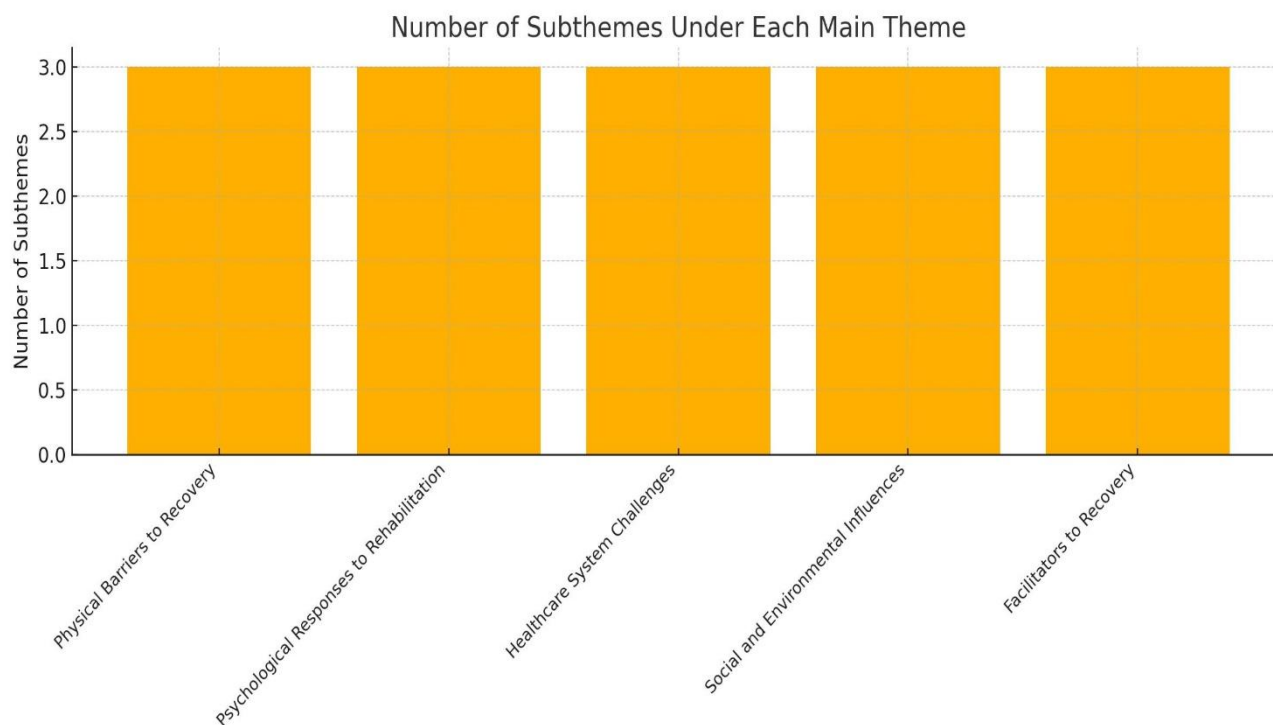


Figure 1 Numbers of Subthemes Under Each Main Theme

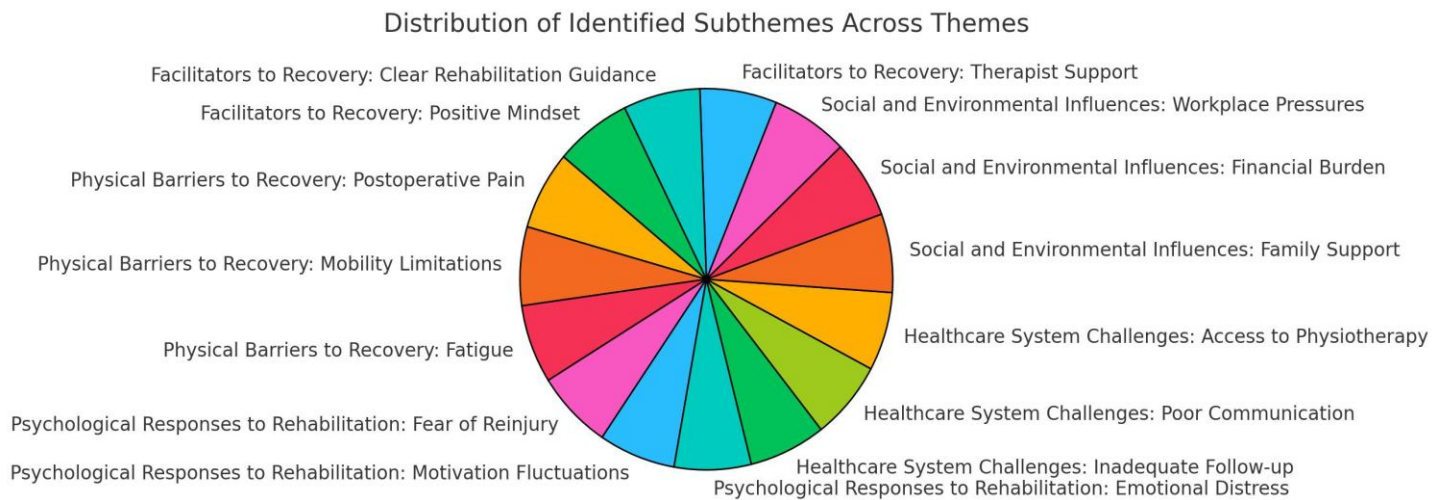


Figure 2 Distribution of Identified Subthemes Across Themes

DISCUSSION

The findings of this qualitative study underscore the intricate, multifactorial nature of rehabilitation following lumbar spine surgery, reflecting similar observations in global literature. Participants highlighted physical limitations, psychological barriers, healthcare system challenges, and external social factors as influential components of their recovery experience. These patient-centered insights align with recent qualitative syntheses emphasizing the subjective and often unmet needs of patients navigating postoperative rehabilitation pathways (16). Consistent with international trends, postoperative pain and mobility constraints were central themes in this study. Similar findings were reported by a study, which emphasized that tailored rehabilitation strategies that address surgical technique and specific muscular impairments can significantly influence functional outcomes (17,18). Emotional distress and fear of reinjury emerged prominently in participant narratives, reflecting broader evidence that psychosocial stressors are often underestimated in traditional rehabilitation models. Another study demonstrated that although supervised rehabilitation enhances self-efficacy, its impact on psychological dimensions like fear-avoidance or depression remains inconsistent (19,20).

Participants also described confusion and dissatisfaction stemming from fragmented communication with healthcare providers, echoing concerns in the study, which identified unclear information and systemic disorganization as major barriers to rehabilitation engagement (21). These observations support calls for integrated care models and emphasize the necessity of involving patients in shared decision-making during both preoperative and postoperative phases. Social and environmental determinants—particularly family involvement and financial strain—were found to deeply influence recovery. These observations mirror those of a study which recognized the heterogeneity in patient experiences and advocated for personalized, context-aware rehabilitation protocols (22,23). The inclusion of family education and structured home-based plans may improve continuity and adherence in regions with limited access to formal physiotherapy services. A noteworthy strength of this study lies in its rigorous, context-sensitive qualitative methodology, capturing the lived experiences of patients in Pakistan—a region where qualitative spinal rehabilitation research remains limited. The use of triangulated coding and thematic saturation supports the trustworthiness of the data. Additionally, the inclusion of participant quotes adds authenticity and depth, allowing the reader to grasp not only what patients experienced, but how they made sense of those experiences.

Nevertheless, some limitations should be acknowledged. The study sample was limited to patients from urban tertiary care centers, which may not reflect the challenges faced by those in rural or resource-constrained settings. Language translation from Urdu to English, while carefully managed, may have influenced the subtlety of participant expression. Furthermore, as with all qualitative research, findings are not intended for statistical generalization, though they offer transferable insights for similar healthcare settings. These findings call for several implications in both clinical practice and research. First, rehabilitation programs should be designed with greater psychological support and clearer communication strategies. The incorporation of patient-reported experiences into care planning can foster a more holistic and effective approach. Second, future research should explore longitudinal perspectives of rehabilitation,

including the experiences of rural populations and outcomes of digitally delivered interventions. Trials investigating multidisciplinary models that combine physical therapy with cognitive-behavioral strategies may also provide valuable direction (24). In conclusion, this study offers compelling qualitative evidence that rehabilitation after lumbar spine surgery is shaped by more than physical recovery. Addressing emotional, social, and systemic dimensions is essential to improving outcomes. As spine surgeries continue to rise globally, health systems must align clinical effectiveness with the realities of patient experiences to ensure recovery is not only anatomical but truly rehabilitative.

CONCLUSION

This study revealed that rehabilitation after lumbar spine surgery is shaped by interlinked physical, psychological, systemic, and social factors. The five key themes—**Physical Barriers to Recovery**, **Psychological Responses to Rehabilitation**, **Healthcare System Challenges**, **Social and Environmental Influences**, and **Facilitators to Recovery**—along with their subthemes, reflect the complex, human experience of healing. These findings underscore the need for individualized, holistic rehabilitation strategies that integrate emotional support, accessible care, and patient education to optimize outcomes in spine surgery recovery pathways.

AUTHOR CONTRIBUTION

Author	Contribution
Irfan Adil*	Substantial Contribution to study design, analysis, acquisition of Data
	Manuscript Writing
	Has given Final Approval of the version to be published
Aamna Anwaar	Substantial Contribution to study design, acquisition and interpretation of Data
	Critical Review and Manuscript Writing
	Has given Final Approval of the version to be published
Urooj Rafi	Substantial Contribution to acquisition and interpretation of Data
	Has given Final Approval of the version to be published
Muhammad Mobeen	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Muhammad Naseeb Ullah Khan	Contributed to Data Collection and Analysis
	Has given Final Approval of the version to be published
Evangel Faraz Bashir	Substantial Contribution to study design and Data Analysis
	Has given Final Approval of the version to be published

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