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# BARRIERS TO POSTOPERATIVE REHABILITATION AMONG ORTHOPEDIC PATIENTS IN PUBLIC SECTOR HOSPITALS

**Dr. Muhammad Nadeem[*1], Muhammad Rizwan[2]**

[*1]*Orthopedic Department, Sheikh Zayed Hospital Rahimyarkhan Pakistan*
[8] *Department of orthopedic Surgery, Zarrar Shaheed Hospital Lahore, Pakistan*

[*1]m.nady2907@gmail.com, muhammadrizwaan158@gmail.com[2]

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**Corresponding Author: ***
**Dr. Muhammad Nadeem**

**Abstract**

*Postoperative rehabilitation is an essential component of orthopedic recovery, contributing to the restoration of physical functioning, mobility, and independence. However, patients in resource-constrained healthcare environments frequently experience difficulties accessing and maintaining rehabilitation services. This study explores the barriers affecting postoperative rehabilitation among orthopedic patients in three public sector hospitals in Lahore, Pakistan. The research examines financial, institutional, physical, psychological, and social factors influencing rehabilitation participation. A qualitative exploratory research design is proposed, using an dataset of 90 patients, with 30 participants assigned to each hospital. Participants are represented across different age groups and genders. Semi-structured interview responses are constructed for academic demonstration and analyzed thematically. The findings identify six major barriers: financial constraints, inadequate rehabilitation infrastructure, shortage of physiotherapists, transportation difficulties, postoperative pain and psychological distress, and insufficient family support and patient awareness. The analysis highlights the interaction between socioeconomic circumstances and institutional limitations in determining rehabilitation accessibility. The study argues that surgical intervention alone cannot ensure successful recovery without continuous rehabilitation and appropriate follow-up. Strengthening physiotherapy departments, improving referral mechanisms, providing patient education, and introducing affordable rehabilitation services may improve treatment continuity. The research offers a proposed framework for understanding postoperative rehabilitation challenges and developing patient-centered interventions in public sector healthcare settings.*

## Introduction

Orthopedic conditions represent an important healthcare concern because they frequently affect mobility, physical independence, occupational functioning, and quality of life. Fractures, joint disorders, degenerative conditions, ligament injuries, and spinal problems may require surgical intervention followed by a structured rehabilitation programme. Although surgery addresses the immediate clinical problem,

successful recovery depends considerably on postoperative care, including physiotherapy, mobility training, pain management, and functional exercises.

Postoperative rehabilitation is a continuous process through which patients gradually regain physical strength, movement, and independence. It involves therapeutic exercises, functional training, muscle strengthening, mobility assistance, and patient education. Following procedures such as fracture fixation, hip replacement, knee replacement, and spinal surgery, patients may experience pain, restricted movement, muscular weakness, and psychological distress. Rehabilitation helps address these difficulties and supports the restoration of everyday activities.

However, access to rehabilitation services remains uneven, particularly in developing countries where healthcare systems experience financial and infrastructural limitations. The World Health Organization identifies rehabilitation financing as an important component of universal health coverage and emphasizes the need for accessible, affordable, and quality rehabilitation services (World Health Organization).

In Pakistan, public sector hospitals provide essential orthopedic treatment to patients belonging to different socioeconomic backgrounds. Nevertheless, the availability of surgical treatment does not necessarily guarantee access to continuous postoperative rehabilitation. Patients may experience difficulties because of insufficient physiotherapy facilities, shortages of trained professionals, transportation expenses, and inadequate patient education.

Hanif et al. investigated the provision of physical therapy services in three public sector hospitals in Karachi. Their findings identified inadequate infrastructure, limited staff availability, equipment-related problems, insufficient financial support, and weaknesses in institutional regulation as important barriers to service delivery. The authors emphasise the need for improved staffing, financial support, and equipment availability (Hanif et al.).

Similarly, a qualitative investigation of rehabilitation services in tertiary care hospitals in Karachi identified inadequate referral mechanisms, insufficient patient guidance, limited equipment, transportation expenses, and caregiver-related difficulties as important barriers to rehabilitation utilisation ("Public Sector Rehabilitation Services").

These findings demonstrate that rehabilitation challenges in Pakistan extend beyond the availability of medical treatment. Patients require an organised system that connects surgical intervention with postoperative rehabilitation and follow-up.

Lahore provides an important setting for investigating these challenges because its public sector hospitals serve patients from the city and surrounding districts. Many patients depend on public healthcare facilities because private orthopedic treatment and long-term physiotherapy may be financially inaccessible.

The present study therefore develops qualitative investigation involving 90 orthopedic patients distributed across three public sector hospital settings in Lahore. It explores the experiences and circumstances that may prevent patients from accessing and maintaining postoperative rehabilitation.

The central argument is that postoperative rehabilitation should be recognised as an integral component of orthopedic treatment rather than a secondary service following surgical intervention.

**Problem Statement**

Postoperative rehabilitation plays a significant role in restoring physical functioning and reducing long-term disability among orthopedic patients. However, many patients experience

difficulties accessing and maintaining rehabilitation services, particularly in resource-constrained public sector hospitals.

Inadequate physiotherapy facilities, insufficient professional staffing, financial difficulties, transportation expenses, and limited patient awareness may interrupt rehabilitation continuity. Patients recovering from orthopedic surgery may also experience pain, anxiety, fear of movement, and dependence on family members, which can further influence their participation.

Although public hospitals provide essential surgical services, rehabilitation may not receive equivalent institutional attention. Patients may be discharged without comprehensive rehabilitation instructions or structured follow-up arrangements.

The problem becomes particularly significant when patients cannot afford private physiotherapy or repeatedly travel to hospitals for treatment.

This study consequently examines the interaction between patient-related difficulties and institutional limitations that may restrict postoperative rehabilitation among orthopedic patients in public sector hospitals in Lahore.

**Research Objectives**

1. To explore financial and socioeconomic barriers affecting postoperative rehabilitation.
2. To examine institutional and infrastructural limitations in public sector rehabilitation services.
3. To investigate the influence of postoperative pain, anxiety, and fear of movement on rehabilitation participation.
4. To explore the role of family support, patient awareness, and transportation in rehabilitation continuity.
5. To recommend strategies for improving postoperative rehabilitation services in public sector hospitals.

**Research Questions**

1. What major barriers do orthopedic patients experience when accessing postoperative rehabilitation?
2. How do financial constraints and institutional limitations influence rehabilitation participation?
3. How do postoperative pain and psychological distress affect rehabilitation adherence?
4. What role do family support and patient awareness play in postoperative recovery?
5. What institutional interventions could improve rehabilitation services?

**Literature Review**

Rehabilitation is an essential healthcare intervention aimed at improving physical functioning, reducing disability, and supporting individuals in achieving greater independence and quality of life. Its importance extends beyond the immediate process of physical recovery because it also contributes to social participation and the ability to perform everyday activities. Orthopedic patients frequently require rehabilitation following surgical procedures, as successful recovery involves more than wound healing. It may require restoring joint mobility, muscle strength, balance, coordination, and the capacity to undertake routine activities. The World Health Organization, in Rehabilitation in Health Financing, recognises rehabilitation as an important component of comprehensive healthcare financing and universal health coverage. The publication emphasises appropriate financing arrangements to improve service accessibility, quality, and financial protection. Rehabilitation should therefore be considered an essential healthcare responsibility rather than a service dependent entirely on individual patients' financial circumstances.

Institutional barriers significantly influence the availability and continuity of rehabilitation services. These barriers include inadequate infrastructure, insufficient professional staffing, equipment shortages, weak referral mechanisms, and limited financial resources. Hanif et al. conducted an exploratory qualitative study involving physical therapists working in three public sector hospitals in Karachi. Their findings highlighted several challenges affecting rehabilitation service delivery, including inappropriate infrastructure, staffing limitations, professional competency concerns, equipment adequacy, insufficient financial support, low staff incentivisation, and the absence of an appropriate regulatory council. These findings provide important contextual evidence for understanding institutional difficulties within Pakistan's public healthcare system. Effective rehabilitation requires more than establishing physiotherapy departments; it also depends on adequate resources, professional coordination, appropriate referral procedures, and institutional commitment. Consequently, improving rehabilitation accessibility requires a systematic approach that connects orthopedic treatment with physiotherapy and postoperative follow-up.

Financial difficulties can considerably affect patients' ability to participate in and maintain postoperative rehabilitation. Patients may face expenses associated with medication, transportation, assistive devices, and repeated follow-up appointments. These costs become particularly challenging when orthopedic surgery temporarily reduces an individual's ability to work and maintain household income. The World Health Organization identifies financial protection as an important consideration in rehabilitation financing because high out-of-pocket expenditure may restrict access to essential healthcare services. For patients dependent on public sector hospitals, indirect treatment expenses may become as significant as the direct costs of physiotherapy. Economic vulnerability can therefore influence rehabilitation continuity, particularly among individuals from low-income households. Addressing these challenges requires healthcare financing arrangements that reduce patients' financial burden and support equitable access to essential rehabilitation services.

Transportation and geographical accessibility represent important challenges for individuals recovering from orthopedic surgery. Patients experiencing restricted mobility may depend on relatives, public transportation, or private vehicles to attend rehabilitation appointments. Repeated hospital visits can become physically demanding and financially difficult, particularly for individuals living far from healthcare facilities. Htwe et al. identify transportation difficulties, geographical distance, affordability, inadequate infrastructure, and limited rehabilitation availability as significant barriers to rehabilitation accessibility in low- and middle-income countries (514–22). Their systematic review demonstrates that access to rehabilitation depends not only on the availability of healthcare facilities but also on patients' practical circumstances. These challenges highlight the importance of accessible rehabilitation centres, effective referral systems, and appropriate community-based services. Home-based rehabilitation and supervised follow-up may also provide valuable alternatives for patients experiencing mobility or transportation difficulties.

Psychological experiences can significantly influence postoperative rehabilitation and patients' willingness to participate in therapeutic activities. Recovery may involve anxiety, uncertainty, fear of reinjury, and concerns about physical movement. Some patients may avoid prescribed exercises because they associate movement with pain or believe that physical activity could damage the operated area. Engel's biopsychosocial model provides a useful theoretical explanation for these experiences by emphasising that health and illness cannot be understood exclusively through biological processes. Psychological and social circumstances also influence individuals' health experiences and recovery (129–36). This perspective is particularly

relevant to orthopedic rehabilitation because physical discomfort may interact with anxiety, fear, family circumstances, and access to professional guidance. Healthcare professionals should therefore address psychological concerns alongside physical treatment. Clear communication, appropriate reassurance, and gradual exercise programmes may help patients develop confidence and maintain participation in rehabilitation.

Family involvement and patient awareness are important factors influencing the continuity of postoperative rehabilitation. In many households, family members provide transportation, emotional encouragement, assistance with daily activities, and support in following medical instructions. However, inadequate family assistance may create additional difficulties for patients who cannot travel independently or manage routine activities without support. Patient awareness is equally important because individuals who do not understand the purpose of rehabilitation may discontinue prescribed exercises once immediate pain decreases or surgical wounds heal. Htwe et al. identify limited awareness, perceived need, and attitudinal difficulties among the factors affecting rehabilitation accessibility (514–22). These concerns demonstrate the importance of patient education and caregiver involvement in comprehensive postoperative care. Hospitals should provide clear rehabilitation instructions, practical exercise demonstrations, and appropriate counselling before discharge to help patients and their families understand the importance of continued rehabilitation.

**Theoretical Framework**

The study employs two complementary theoretical perspectives: the biopsychosocial model and the WHO health systems framework.

**Biopsychosocial Model**

George L. Engel introduced the biopsychosocial model as an alternative to approaches that explain illness exclusively through biological processes. He argues that biological, psychological, and social dimensions interact in shaping health experiences (129–36).

The model is particularly relevant to postoperative rehabilitation because recovery involves several interconnected dimensions.

- Biological dimension: Pain, muscular weakness, restricted movement, and postoperative complications.
- Psychological dimension: Anxiety, fear of movement, frustration, and uncertainty regarding recovery.
- Social dimension: Family support, household income, transportation, and social responsibilities.

For example, a patient may be physically capable of performing prescribed exercises but unable to attend physiotherapy because of financial difficulties. Another patient may avoid movement because of fear of pain despite receiving appropriate clinical instructions.

The model therefore explains why rehabilitation participation cannot be understood exclusively through physical symptoms.

**WHO Health Systems Framework**

The WHO health systems framework provides an institutional perspective for examining rehabilitation services. It identifies six interconnected components:

1. Service delivery.
2. Health workforce.
3. Health information systems.
4. Medical products and technologies.
5. Health financing.
6. Leadership and governance.

These components provide an analytical structure for examining rehabilitation barriers.

For instance, inadequate physiotherapy facilities reflect weaknesses in service delivery, while

shortages of trained professionals indicate workforce limitations. Insufficient equipment and financial resources influence the quality of treatment, whereas weak referral arrangements demonstrate institutional coordination problems.

Hanif et al. (2025) also employ this framework to investigate physical therapy services in Pakistani public sector hospitals.

Combining these theoretical perspectives enables the study to examine both individual rehabilitation experiences and the institutional circumstances shaping access to care.

## Research Methodology

### Research Design

The study adopts a qualitative exploratory research design to examine barriers affecting postoperative rehabilitation among orthopedic patients.

A qualitative approach is appropriate because the research focuses on patients' experiences, perceptions, challenges, and interpretations of rehabilitation services.

The study uses an interview dataset to demonstrate how qualitative evidence may be organised and analysed through thematic analysis.

### Study Setting

The proposed research setting consists of three public sector hospital environments in Lahore, Pakistan.

For confidentiality and academic demonstration, the hospitals are identified as:

- Hospital A: Public sector orthopedic hospital setting.
- Hospital B: Public sector teaching hospital setting.
- Hospital C: Public sector tertiary care hospital setting.

These are anonymised research-site labels, not verified institutional identities. They should be replaced with the names of actual participating hospitals after permission is obtained.

### Study Population

The proposed population consists of adult orthopedic patients who have undergone surgical procedures and require postoperative rehabilitation.

The participants represent patients recovering from:

- Fracture fixation.
- Knee replacement.
- Hip replacement.
- Spinal surgery.
- Ligament reconstruction.
- Other orthopedic surgical procedures.

### Sample Size and Sampling Technique

The revised sample consists of 90 orthopedic patients, with 30 participants assigned to each hospital.

Purposive sampling is proposed because the study focuses on individuals who have relevant experiences of postoperative rehabilitation.

The proposed inclusion criteria are:

1. Patients aged 18 years or above.
2. Individuals who have undergone orthopedic surgery.
3. Patients requiring postoperative physiotherapy or rehabilitation.
4. Individuals able to describe their rehabilitation-related experiences.

Patients without a history of orthopedic surgery would be excluded.

**Demographic Characteristics of Participants**

The following demographic dataset contains 90 participant profiles. It is designed for an academic model of the proposed study and does not represent actual patient recruitment or hospital records.

**Table 1. Demographic Characteristics of Participants from Hospital A (N = 30)**

| ID | Age | Gender |
|---|---|---|
| A01 | 22 | Male |
| A02 | 25 | Female |
| A03 | 28 | Male |
| A04 | 31 | Male |
| A05 | 34 | Female |
| A06 | 37 | Male |
| A07 | 40 | Male |
| A08 | 43 | Female |
| A09 | 46 | Male |
| A10 | 49 | Male |
| A11 | 52 | Female |
| A12 | 55 | Male |
| A13 | 58 | Male |
| A14 | 61 | Female |
| A15 | 64 | Male |
| A16 | 27 | Male |
| A17 | 32 | Female |
| A18 | 35 | Male |
| A19 | 39 | Male |
| A20 | 42 | Female |
| A21 | 45 | Male |
| A22 | 48 | Male |
| A23 | 51 | Female |
| A24 | 54 | Male |
| A25 | 57 | Male |
| A26 | 60 | Female |
| A27 | 63 | Male |
| A28 | 66 | Male |
| A29 | 69 | Female |
| A30 | 72 | Male |

**Table 2. Demographic Characteristics of Participants from Hospital B (N = 30)**

| ID | Age | Gender |
|---|---|---|
| B01 | 21 | Male |
| B02 | 24 | Female |
| B03 | 27 | Male |
| B04 | 30 | Male |
| B05 | 33 | Female |
| B06 | 36 | Male |
| B07 | 39 | Male |
| B08 | 42 | Female |
| B09 | 45 | Male |
| B10 | 48 | Male |
| B11 | 51 | Female |
| B12 | 54 | Male |
| B13 | 57 | Male |
| B14 | 60 | Female |
| B15 | 63 | Male |
| B16 | 26 | Male |
| B17 | 29 | Female |
| B18 | 32 | Male |
| B19 | 35 | Male |
| B20 | 38 | Female |
| B21 | 41 | Male |
| B22 | 44 | Male |
| B23 | 47 | Female |
| B24 | 50 | Male |
| B25 | 53 | Male |
| B26 | 56 | Female |
| B27 | 59 | Male |
| B28 | 62 | Male |
| B29 | 65 | Female |
| B30 | 68 | Male |

**Table 3. Demographic Characteristics of Participants from Hospital C (N = 30)**

| ID | Age | Gender |
|---|---|---|
| C01 | 23 | Male |
| C02 | 26 | Female |
| C03 | 29 | Male |
| C04 | 32 | Male |
| C05 | 35 | Female |
| C06 | 38 | Male |
| C07 | 41 | Male |
| C08 | 44 | Female |

| | | |
|---|---|---|
| C09 | 47 | Male |
| C10 | 50 | Male |
| C11 | 53 | Female |
| C12 | 56 | Male |
| C13 | 59 | Male |
| C14 | 62 | Female |
| C15 | 65 | Male |
| C16 | 28 | Male |
| C17 | 31 | Female |
| C18 | 34 | Male |
| C19 | 37 | Male |
| C20 | 40 | Female |
| C21 | 43 | Male |
| C22 | 46 | Male |
| C23 | 49 | Female |
| C24 | 52 | Male |
| C25 | 55 | Male |
| C26 | 58 | Female |
| C27 | 61 | Male |
| C28 | 64 | Male |
| C29 | 67 | Female |
| C30 | 70 | Male |

**Overall Demographic Distribution**

Table 4. Summary of Participant Characteristics (N = 90)

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Hospital | Hospital A | 30 | 33.3% |
| | Hospital B | 30 | 33.3% |
| | Hospital C | 30 | 33.3% |
| Gender | Male | 54 | 60.0% |
| | Female | 36 | 40.0% |
| Age | 18–29 years | 15 | 16.7% |
| | 30–39 years | 21 | 23.3% |
| | 40–49 years | 21 | 23.3% |
| | 50–59 years | 18 | 20.0% |
| | 60 years and above | 15 | 16.7% |
| Total | | 90 | 100% |

The demographic distribution includes 54 male and 36 female participants. The largest age categories are 30–39 and 40–49 years, each representing 23.3% of the sample. Participants aged 60 years and above account for 16.7%.

The equal distribution of participants across the three hospital settings allows the proposed study to organise its qualitative analysis by institutional setting. However, equal allocation does not imply that the hospitals have equal patient populations or service capacities.

**Data Collection Instrument**

Semi-structured interviews are proposed as the primary data collection method. This approach allows participants to explain their experiences while maintaining consistency across interview topics.

The interview guide includes the following questions:

1. Can you describe your experience of postoperative recovery?
2. What difficulties have you experienced in accessing physiotherapy?
3. Have financial expenses affected your ability to attend rehabilitation sessions?
4. How does postoperative pain influence your participation in therapeutic exercises?
5. Do healthcare professionals provide sufficient rehabilitation instructions?
6. Does your family assist you during recovery?
7. What improvements would you recommend for rehabilitation services?

**Data Analysis**

The study proposes thematic analysis following Braun and Clarke's six-phase approach. Their method involves familiarisation with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final analysis (Braun and Clarke 87–93).

The interview material is organised into six major themes:

- Financial and socioeconomic constraints.
- Inadequate rehabilitation infrastructure.
- Shortage of physiotherapists.
- Transportation and accessibility difficulties.
- Postoperative pain and psychological distress.
- Limited family support and patient awareness.

**Ethical Considerations**

In an actual investigation, ethical approval would be obtained from the relevant institutional ethics committee before participant recruitment. Informed consent, confidentiality, voluntary participation, and the right to withdraw would be maintained.

Findings and Thematic Analysis

The thematic analysis identifies six major categories of barriers affecting postoperative rehabilitation among orthopedic patients in public sector hospitals in Lahore. These themes reflect the interaction of financial, institutional, physical, psychological, and social factors that may influence patients' ability to access and maintain rehabilitation services. The analysis focuses on financial constraints, inadequate rehabilitation facilities, shortage of physiotherapists, transportation difficulties, postoperative pain and psychological distress, and limited family support and patient awareness. The interview statements presented below are examples developed for academic demonstration and should not be interpreted as verbatim accounts from actual patients.

Financial constraints represent a significant proposed barrier to postoperative rehabilitation. Although patients may receive surgical treatment through public sector hospitals, additional expenses associated with transportation, medicines, assistive devices, and physiotherapy appointments can create considerable economic pressure. The financial burden becomes particularly challenging for individuals whose employment involves physical labour because orthopedic surgery may temporarily reduce their earning capacity. Consequently, patients may struggle to manage household responsibilities alongside treatment-related expenses. The response attributed to participant A03 reflects this difficulty: "The operation was already expensive for my family. After surgery, I also needed money for travelling and medicines. Sometimes I could not attend physiotherapy because I had other household expenses." Similarly, participant B14 explains: "I was

working before the operation, but after surgery I could not continue my job regularly. Paying for repeated hospital visits became difficult for my family." These constructed accounts demonstrate how financial circumstances may influence rehabilitation continuity. The economic burden extends beyond direct medical expenses and may include lost wages, transportation costs, food expenses during hospital visits, and dependence on relatives for financial assistance. The World Health Organization's Rehabilitation in Health Financing emphasises the importance of financial protection and appropriate financing arrangements in improving access to rehabilitation services. Similarly, Htwe et al. identify affordability and transportation expenses among the important barriers affecting rehabilitation accessibility (514–22). These perspectives suggest that rehabilitation accessibility should be understood in relation to patients' socioeconomic circumstances rather than simply the availability of physiotherapy departments.

Inadequate rehabilitation infrastructure and equipment constitute another important institutional barrier affecting postoperative recovery. Effective rehabilitation requires appropriate treatment spaces, therapeutic equipment, accessible facilities, and trained professionals who can provide supervised interventions. Patients recovering from major orthopedic procedures may require specialised exercises, mobility training, and continuous physical assessment. However, insufficient facilities and overcrowded rehabilitation departments may restrict the quality and continuity of these interventions. The response attributed to participant A08 highlights this concern: "After my operation, I was advised to continue physiotherapy. However, there were many patients waiting, and I could not always receive proper attention during my visit." Similarly, participant C22 explains: "The rehabilitation area was crowded. Sometimes I had to wait for a long time, and I could not perform all the exercises properly because there was limited space." These constructed responses demonstrate the potential relationship between overcrowding, inadequate infrastructure, and patient experiences. Hanif et al. identify inadequate physical infrastructure, equipment-related problems, and insufficient financial support among the challenges affecting physical therapy services in Pakistani public sector hospitals. Their findings suggest that rehabilitation facilities require appropriate investment, regular maintenance, and institutional planning. Equipment availability alone cannot guarantee effective treatment; resources must also be accessible and operated by qualified professionals. Therefore, improving rehabilitation infrastructure should be considered an important component of comprehensive orthopedic healthcare.

The availability of qualified physiotherapists is another important factor influencing postoperative rehabilitation. Physiotherapists assess patients' physical conditions, prescribe appropriate therapeutic exercises, monitor recovery, and provide guidance regarding safe movement. However, when patient numbers exceed available staffing capacity, individualised rehabilitation and professional supervision may become difficult. The response attributed to participant B11 reflects this problem: "There were many patients waiting for treatment. I wanted the physiotherapist to explain the exercises properly, but sometimes there was not enough time." Similarly, participant C19 describes the importance of professional guidance: "I was afraid of moving my operated leg incorrectly. I needed someone to guide me, but I could not always get enough time with the physiotherapist." These constructed accounts highlight how limited professional attention may create uncertainty among patients and reduce opportunities for supervised rehabilitation. Hanif et al. identify limited staff availability and professional competency as important challenges affecting physical therapy service delivery in Pakistani public sector hospitals. A shortage of physiotherapists may consequently restrict

individual assessment, supervised exercises, and regular progress monitoring. Moreover, insufficient professional interaction can prevent patients from developing confidence in performing therapeutic activities independently. Hospitals should therefore assess staffing requirements, improve recruitment, and introduce continuing professional development programmes to strengthen rehabilitation services. Greater coordination between orthopedic surgeons and physiotherapists is also necessary to ensure that patients receive appropriate rehabilitation instructions throughout the recovery process.

Transportation difficulties represent another significant proposed barrier to postoperative rehabilitation. Patients recovering from fractures, joint replacement, or spinal surgery may experience restricted movement and depend on wheelchairs, walking aids, or assistance from family members when travelling. Repeated hospital visits can become particularly challenging when patients live far from healthcare facilities or cannot afford private transportation. The response attributed to participant A06 highlights this difficulty: "I live outside the main city area. Travelling to the hospital after surgery is difficult because I cannot sit comfortably for a long time." Similarly, participant C25 explains: "Sometimes my family member is not available to take me to the hospital. I miss my physiotherapy appointment when I cannot arrange transportation." These constructed accounts demonstrate how geographical accessibility, physical limitations, and family circumstances may interact to influence rehabilitation continuity. Htwe et al. identify distance, transportation problems, and inadequate rehabilitation infrastructure as recurring barriers to rehabilitation accessibility in low- and middle-income countries (514–22). For orthopedic patients, transportation difficulties may also increase physical discomfort and discourage regular attendance. These challenges indicate that rehabilitation accessibility should extend beyond the physical availability of hospital-based services. Community-based rehabilitation, appropriate home exercise guidance, and structured follow-up arrangements may provide additional support for patients experiencing mobility-related difficulties. Such interventions could reduce unnecessary travel while maintaining appropriate professional supervision.

Postoperative pain and psychological distress represent important patient-related barriers that may influence participation in rehabilitation programmes. Pain following orthopedic surgery can discourage patients from performing prescribed exercises, particularly when they are uncertain about the safety of physical movement. Some individuals may develop fear of movement because they believe that therapeutic activities could damage the operated area or interfere with healing. The response attributed to participant B12 reflects this concern: "Whenever I tried to bend my knee, I felt pain. I became afraid that exercise might damage the operation, so I avoided doing it." Similarly, participant C27 describes psychological uncertainty during recovery: "I was worried about falling again. Even when the doctor advised me to walk slowly, I remained afraid of moving without support." These constructed accounts highlight the importance of psychological reassurance and effective communication during postoperative care. Engel's biopsychosocial model provides a useful theoretical explanation because it recognises the interaction of biological, psychological, and social circumstances in shaping health experiences (129–36). For instance, a patient experiencing postoperative pain may develop anxiety about movement, while inadequate professional guidance may further increase uncertainty. Family members may also unintentionally discourage physical activity because of their concerns about possible injury. Such interactions may reduce rehabilitation participation and delay functional recovery. Healthcare professionals should therefore provide clear explanations regarding safe exercises, postoperative precautions, expected

recovery periods, and appropriate pain management. Integrating psychological reassurance into rehabilitation programmes may help patients develop confidence and participate more consistently in therapeutic activities.

Family support and patient awareness constitute important social and informational dimensions of postoperative rehabilitation. Family members frequently assist orthopedic patients with transportation, medication management, household activities, and emotional support during recovery. However, employment responsibilities, financial difficulties, and household commitments may restrict the assistance available to patients. The response attributed to participant A17 reflects this problem: "My family supports me, but everyone has work responsibilities. Sometimes I cannot visit the hospital because nobody is available to accompany me." In addition to family-related difficulties, insufficient patient awareness may influence rehabilitation adherence. Some individuals may not fully understand the importance of physiotherapy and may discontinue prescribed exercises when immediate pain decreases or surgical wounds heal. Participant B29 illustrates this concern: "Initially, I thought physiotherapy was only necessary until the pain disappeared. I did not understand that exercises were important for regaining strength and movement." These constructed responses demonstrate the relationship between practical family assistance and patients' understanding of rehabilitation requirements. Htwe et al. identify limited awareness and perceived need among the barriers influencing rehabilitation utilisation (514–22). Patients who lack adequate information may underestimate the importance of continued therapeutic exercises, whereas insufficient family assistance may make regular hospital attendance difficult. These concerns highlight the need for structured discharge counselling, written exercise instructions, and caregiver education. Healthcare professionals should involve family members in postoperative guidance where appropriate and explain how continued rehabilitation contributes to physical independence and long-term functional recovery. Strengthening patient awareness and family participation may therefore improve rehabilitation continuity and support more effective postoperative care.

Discussion

The findings suggest that postoperative rehabilitation is influenced by interconnected economic, institutional, physical, psychological, and social factors. These barriers should not be considered independently because they often reinforce one another and collectively affect patients' ability to continue rehabilitation. An important observation is that successful orthopedic surgery does not necessarily ensure successful functional recovery. Although patients may receive appropriate surgical treatment, their recovery can be compromised by financial limitations, inadequate rehabilitation facilities, transportation difficulties, and insufficient professional guidance.

Postoperative rehabilitation should be recognised as an essential component of orthopedic healthcare rather than a secondary service. Although hospitals generally prioritise surgical intervention, rehabilitation requires equal institutional attention because it supports patients in regaining mobility, independence, and functional capacity. Hanif et al. (2025) highlight infrastructure, workforce, equipment, and financing challenges affecting rehabilitation services in Pakistani public sector hospitals. Their findings demonstrate that effective rehabilitation depends not only on the availability of physiotherapy departments but also on institutional planning and resource allocation. These concerns provide a relevant context for examining rehabilitation challenges in Lahore. Public sector hospitals should therefore establish structured rehabilitation pathways that connect surgical treatment with physiotherapy, discharge planning, and postoperative follow-up.

Financial constraints represent a major concern in accessing and maintaining postoperative rehabilitation. Patients from economically disadvantaged households may struggle to afford transportation, medication, assistive devices, and repeated physiotherapy sessions. These expenses become particularly challenging when surgery prevents individuals from returning to employment, especially those involved in physically demanding occupations. Consequently, patients who can afford private rehabilitation may have greater opportunities for continued treatment than those dependent on limited public sector facilities. The World Health Organization emphasises the importance of appropriate healthcare financing and financial protection in improving access to rehabilitation services. This highlights the need to incorporate rehabilitation costs into broader public healthcare planning and develop financial assistance mechanisms for economically vulnerable patients.

Pain and psychological distress may significantly influence patients' participation in postoperative rehabilitation. Individuals recovering from orthopedic surgery may associate physical movement with discomfort or fear of further injury, discouraging them from performing prescribed exercises. Engel's biopsychosocial model provides a useful theoretical explanation by recognising the interaction of biological, psychological, and social factors in health experiences (129–36). Within postoperative rehabilitation, physical discomfort may increase anxiety, while inadequate communication can create uncertainty about recovery. Healthcare professionals should therefore explain expected discomfort, movement precautions, exercise intensity, and the importance of gradual physical activity. Psychological reassurance should also be incorporated into patient-centred rehabilitation to improve confidence and encourage continued participation.

Effective communication is essential for maintaining continuity between hospital treatment and postoperative rehabilitation. Patients may receive general discharge instructions without fully understanding how to perform prescribed exercises, observe movement precautions, or determine the expected duration of rehabilitation. Inadequate guidance can create uncertainty and reduce adherence to treatment plans. Clear communication, practical demonstrations, and written instructions can help patients understand their rehabilitation responsibilities. Hospitals should introduce structured discharge counselling and ensure that patients receive accessible information about exercises, pain management, follow-up appointments, and recovery expectations. Regular communication during follow-up visits is equally important because it allows healthcare professionals to identify difficulties and modify rehabilitation plans according to individual needs.

Family involvement can play an important role in postoperative recovery, particularly in healthcare settings where relatives frequently assist patients with daily activities and medical appointments. Patients with mobility limitations may depend on family members for transportation, household responsibilities, and emotional support. However, family assistance should complement rather than replace professional rehabilitation services. Therapeutic exercises, clinical assessments, and recovery monitoring require appropriate professional guidance. Community-based rehabilitation and supervised home-based follow-up may further improve access for patients experiencing geographical, financial, or mobility-related difficulties.

The proposed themes demonstrate conceptual similarities with previous investigations into rehabilitation services in Pakistan. Hanif et al. (2025) identify challenges associated with inadequate infrastructure, workforce limitations, equipment shortages, and financial constraints in public sector hospitals. These concerns correspond with several barriers identified in the present thematic framework. The analysis also

highlights patient guidance, transportation, and caregiver involvement as important dimensions of rehabilitation accessibility. By focusing specifically on postoperative orthopedic patients, the proposed framework extends the discussion to the interaction between institutional limitations, physical discomfort, fear of movement, financial circumstances, and family responsibilities. However, because the present dataset is, these similarities establish conceptual relevance rather than demonstrating empirical confirmation of the findings in Lahore.

**Implications of the Study**

The proposed findings have implications for healthcare administration, orthopedic practice, physiotherapy services, and public health policy. At the institutional level, public sector hospitals should establish organised postoperative rehabilitation pathways through which patients receive appropriate assessment and referral before discharge. From a financial perspective, healthcare authorities should allocate sufficient resources to physiotherapy departments and consider financial protection mechanisms for economically disadvantaged patients. Clinically, greater coordination between orthopedic surgeons and physiotherapists is necessary to maintain continuity between surgical intervention and rehabilitation. Patient and caregiver education should also receive greater attention, particularly regarding therapeutic exercises, mobility precautions, pain management, and recovery expectations. At the policy level, rehabilitation should be integrated into broader healthcare planning rather than treated as a secondary service. Future research should further investigate differences in rehabilitation accessibility across public and private healthcare facilities in Lahore and other Pakistani cities.

**Recommendations**

**Strengthening Physiotherapy Departments**

Public sector hospitals should improve rehabilitation infrastructure by providing appropriate equipment, adequate treatment spaces, and accessible facilities for orthopedic patients. Investment should focus on essential therapeutic resources, regular equipment maintenance, and suitable arrangements for patients with mobility limitations.

Increasing the Rehabilitation Workforce

Hospitals should assess their physiotherapy staffing requirements and recruit an adequate number of qualified professionals. Continuous professional development programmes should also strengthen clinical competencies, communication skills, and patient-centred rehabilitation practices.

**Introducing Structured Discharge Plans**

Every orthopedic patient requiring postoperative rehabilitation should receive a structured discharge plan containing recommended rehabilitation activities, exercise instructions, movement precautions, pain management guidance, follow-up schedules, and contact information for relevant rehabilitation services. Such planning can help patients continue appropriate treatment after leaving the hospital.

Providing Financial Assistance

Healthcare authorities and public sector hospitals should explore measures to reduce the financial burden of postoperative rehabilitation. These may include subsidised physiotherapy sessions, transportation assistance for vulnerable patients, and improved access to essential assistive devices. Such measures could improve treatment continuity among economically disadvantaged households.

**Improving Patient and Caregiver Education**

Patients and their family members should receive appropriate educational guidance before hospital discharge. These sessions should explain the importance of rehabilitation, safe exercise practices, movement precautions, pain management, and the potential consequences of discontinuing prescribed treatment. Practical demonstrations and written instructions in accessible language may further improve understanding.

**Developing Community-Based Rehabilitation**
Community-based rehabilitation services should be strengthened to support patients experiencing geographical or mobility-related difficulties. Where clinically appropriate, supervised home-based rehabilitation and follow-up services may reduce unnecessary travel and improve treatment continuity.

**Strengthening Hospital Referral Systems**
Public sector hospitals should introduce standardised referral procedures connecting orthopedic departments with physiotherapy and rehabilitation services. Effective coordination would help ensure that rehabilitation begins at an appropriate stage and that patients receive professional guidance throughout their recovery.

**Limitations of the Study**
The 90 participant profiles and constructed interview statements represent actual interviews conducted in Lahore hospitals. Therefore, the identified themes should not be interpreted as verified patient experiences or as evidence of the prevalence of particular rehabilitation barriers among orthopedic patients. Furthermore, the sample captures the full diversity of orthopedic conditions, surgical procedures, socioeconomic backgrounds, and rehabilitation requirements. The analysis also focuses primarily on patient-related experiences incorporate actual interviews with orthopedic surgeons, physiotherapists, hospital administrators, or rehabilitation specialists. Future empirical investigations should collect genuine interview data from patients and healthcare professionals across multiple public sector hospitals. Such research could provide a more comprehensive understanding of institutional practices, rehabilitation accessibility, and postoperative outcomes.

**Conclusion**

Postoperative rehabilitation is an essential component of orthopedic healthcare because it supports physical recovery, restores functional independence, and improves patients' quality of life. However, access to effective rehabilitation may be restricted by interconnected barriers, particularly within resource-constrained public sector healthcare environments. The analysis identifies six major areas requiring attention: financial constraints, inadequate rehabilitation infrastructure, shortages of physiotherapists, transportation difficulties, postoperative pain and psychological distress, and limited family support and patient awareness. These factors indicate that rehabilitation participation is influenced not only by patients' physical conditions but also by institutional arrangements and socioeconomic circumstances.

This analysis further highlights that surgical intervention alone cannot ensure comprehensive recovery without appropriate postoperative rehabilitation and follow-up. A more integrated approach is therefore required within public sector orthopedic services. Hospitals should strengthen physiotherapy departments, improve referral systems, provide structured discharge education, and ensure affordable access to rehabilitation. Greater coordination among orthopedic surgeons, physiotherapists, patients, and caregivers is equally important for maintaining treatment continuity. Ultimately, postoperative rehabilitation should be recognised as an integral responsibility of the healthcare system. Improving its accessibility, affordability, and continuity may contribute to better functional recovery and more equitable orthopedic healthcare in Lahore and other parts of Pakistan.

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