

Unveiling the Layers: Mental Health Dynamics in Orthopedic Trauma Patients and Future Implications

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Abstract

Orthopaedic trauma care has traditionally operated within the confines of the biomedical model, focusing on physical recovery markers such as bone healing and functional restoration. However, this narrow approach often overlooks the profound influence of psychological and social factors on recovery. Emerging evidence underscores that mental health conditions—including depression, anxiety, PTSD, and substance use disorders—substantially affect rehabilitation outcomes in orthopaedic trauma patients. Psychological distress not only prolongs recovery times but also impairs treatment adherence and functional return. Moreover, patients' cognitive responses, such as catastrophizing and self-efficacy, play pivotal roles in shaping their rehabilitation trajectories. Catastrophizing magnifies perceived disability and pain, while high self-efficacy fosters resilience and active engagement in recovery.

To address these psychosocial dimensions, the biopsychosocial model of care is gaining traction. Targeted interventions such as cognitive behavioral therapy (CBT), psychoeducation, graded physical exposure, and goal-setting have proven effective in reducing distress and enhancing recovery motivation. Furthermore, injury-specific strategies—for conditions like femoral fractures, ACL tears, and spinal surgeries—can be tailored to address patients' unique informational and emotional needs through in-hospital counselling, digital resources, and home-based support.

The integration of mental health screening, early referral, and multidisciplinary intervention is essential in orthopaedic practice. Clinical guidelines from leading orthopaedic bodies now recommend psychosocial evaluation as part of trauma care. Ultimately, incorporating structured, time-efficient, and scalable interventions into routine orthopaedic workflows—especially in high-volume settings—can improve both mental health outcomes and physical rehabilitation. This shift toward holistic, patient-centred care is imperative for optimizing outcomes in orthopaedic trauma recovery.

Keywords: orthopedics, mental health, caregivers

Introduction

Orthopedic surgeons encounter a significant challenge in patient care when they adhere strictly to the conventional boundaries of professional responsibility, often leading them to concentrate solely on the injury rather than considering the patient's overall health. The prevailing biomedical model

traditionally evaluates outcomes such as bone healing and the functional status of the patient, neglecting the broader social, psychological, and behavioral aspects of disease or injury. Despite successful healing post-treatment, patients may experience diverse recovery trajectories. Engel challenged this dogmatic biomedical approach, urging physicians to extend their scope of responsibility to include a psychosocial component in disease or injury treatment [1].

Recent literature highlights numerous factors influencing a patient's recovery after trauma, with mental health and well-being significantly impacting the process [2]. It is imperative for

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orthopedic surgeons to identify patients at risk of poor outcomes due to mental health issues and refer them to appropriate resources [3]. Moreover, evidence suggests that traumatic events often trigger post-traumatic psychopathology, rather than stemming from pre-existing vulnerabilities, challenging misconceptions that may lead surgeons to blame patients rather than provide necessary mental health support [4]. In response, the American Academy of Orthopedic Surgeons and Major Extremity Trauma and Rehabilitation Consortium have issued clinical practice guidelines to assist surgeons in evaluating psychosocial factors affecting recovery from orthopedic trauma [5].

Influence of Mental Health on Orthopedic Trauma Outcomes

The influence of mental health on orthopedic trauma outcomes is increasingly recognized as a crucial determinant of patient recovery. Studies have consistently shown that psychological factors play a significant role in the rehabilitation process following orthopedic trauma. For example, research by Large et al demonstrated that patients with higher levels of psychological distress, such as depression and anxiety, experienced poorer functional outcomes and longer recovery times [6]. In addition, a study by Yang et al found that individuals with comorbid mental health conditions were at a higher risk of complications and rehospitalization following orthopedic trauma surgery [7]. These findings underscore the importance of addressing mental health issues in conjunction with orthopedic treatment to optimize patient outcomes and improve overall well-being.

The spectrum of mental health conditions observed in orthopedic trauma patients encompasses a wide range of disorders, each with its unique impact on recovery and rehabilitation. Among the most prevalent conditions are depression and anxiety, which can significantly impair a patient's ability to cope with the trauma, adhere to treatment plans, and engage in rehabilitation efforts. Post-traumatic stress disorder (PTSD) is another common mental health issue seen in orthopedic trauma patients, particularly those who have experienced severe injuries or life-threatening events. PTSD can manifest as intrusive memories, hyper vigilance, and avoidance behaviors, all of which can interfere with the healing process and functional recovery. Strong emotions arising out of this context can create mental barriers to full and functional recovery. These can be in the ability to return to work, self-portrayal, and physical fulfillment [8].

Apart from this, factors like substance use disorders, including alcohol and drug abuse, are also prevalent among orthopedic trauma patients and can exacerbate physical and psychological symptoms while hindering rehabilitation progress [9]. In addition, adjustment disorders, such as difficulty coping with the consequences of the trauma, may arise, further complicating

the recovery journey. It is crucial for healthcare providers to recognize and address these mental health conditions promptly to optimize patient outcomes and promote holistic recovery.

Role of Catastrophizing and Self-efficacy

Catastrophizing and self-efficacy play significant roles in the recovery journey of orthopedic trauma patients. Catastrophizing tendencies, characterized by exaggerated perceptions of pain and disability, can intensify distress and impede rehabilitation progress. Orthopedic trauma patients prone to catastrophizing may experience heightened fear, anxiety, and avoidance behaviors, which can negatively impact their adherence to treatment and functional outcomes. Conversely, self-efficacy, reflecting patients' belief in their ability to manage challenges and achieve goals, is a critical determinant of resilience and recovery. High self-efficacy enables patients to approach rehabilitation with confidence, motivation, and determination, fostering greater engagement in therapy and promoting faster progress toward recovery milestones. This comes under the biopsychological model of health. The biopsychosocial model of health is an approach to understanding health and illness that considers biological, psychological, and social factors in explaining health and disease. It was first proposed by psychiatrist George Engel in 1977 as a response to the limitations of the traditional biomedical model, which primarily focuses on biological factors such as genetics, pathogens, and physiological processes in explaining health and illness [1]. The biopsychosocial model recognizes that health and illness result from complex interactions between biological, psychological, and social factors, including individual characteristics, environmental influences, social support networks, and cultural beliefs. This holistic perspective emphasizes the importance of considering the whole person and their broader context in healthcare delivery and treatment planning. It has become increasingly influential in medical practice and research, leading to a more comprehensive understanding of health and the development of multidisciplinary approaches to patient care.

Role of Targeted Interventions

Interventions aimed at reducing catastrophizing and enhancing self-efficacy in orthopedic trauma patients can therefore improve treatment adherence, functional outcomes, and overall well-being throughout the rehabilitation process [10]. Targeted interventions tailored to address catastrophizing and enhance self-efficacy can significantly benefit orthopedic trauma patients throughout their recovery process. Cognitive-therapy (CBT) represents a well-established approach for reducing catastrophizing by identifying and challenging maladaptive thought patterns. In CBT sessions, patients learn coping skills, such as cognitive restructuring and relaxation techniques, to

manage pain-related distress more effectively. In addition, psycho-education about the nature of pain and injury can help patients develop a more realistic understanding of their condition, reducing catastrophic thinking and empowering them to take an active role in their recovery.

In tandem with addressing catastrophizing, interventions aimed at enhancing self-efficacy can promote resilience and motivation in orthopedic trauma patients. Goal-setting exercises tailored to patients’ individual abilities and preferences can help cultivate a sense of mastery and accomplishment, bolstering self-efficacy beliefs. Furthermore, providing patients with opportunities for incremental successes and positive feedback can reinforce their confidence in their ability to overcome challenges and achieve rehabilitation milestones. Peer support groups and mentoring programs can also play a crucial role in enhancing self-efficacy by fostering a sense of camaraderie, shared experiences, and collective encouragement among patients facing similar orthopedic trauma challenges.

Moreover, incorporating physical rehabilitation strategies that emphasize progressive exposure to activities and graded exercise can contribute to enhancing self-efficacy while reducing catastrophizing in orthopedic trauma patients. By gradually increasing patients’ confidence in their physical abilities and tolerances, these interventions can help alleviate fears of re-injury and promote a sense of control over their recovery trajectory. In addition, involving patients in shared decision-making regarding their treatment plans and rehabilitation goals can further empower them to take ownership of their recovery journey, bolstering self-efficacy

beliefs and fostering a positive outlook on their rehabilitation prospects. Overall, targeted interventions addressing catastrophizing and enhancing self-efficacy hold considerable promise for optimizing outcomes and promoting resilience in orthopedic trauma patients.

Injury-specific Examples

In orthopedic trauma patients, injury-specific examples of targeted interventions to reduce catastrophizing and enhance self-efficacy can be tailored to address the unique challenges associated with different types of injuries (Table 1). For instance, in patients recovering from fracture neck femur or neck femur surgeries, education about the expected healing timeline, rehabilitation process, and potential setbacks can help alleviate fears and uncertainties, reducing catastrophizing related to the injury’s severity or long-term impact. In addition, incorporating specific exercises and rehabilitation protocols designed to gradually improve mobility, strength, and function can empower patients to regain confidence in their ability to perform daily activities and participate in their recovery actively, thereby enhancing self-efficacy. Similarly, in patients with traumatic joint injuries such as ligament tears or dislocations, targeted interventions may focus on teaching proper joint protection techniques, providing strategies to manage pain and swelling, and offering guidance on gradually returning to physical activities to rebuild trust in the injured joint and enhance self-efficacy in movement and function. Overall, injury-specific interventions that address the unique physical and psychological needs of orthopedic trauma patients can play a vital role in optimizing their recovery outcomes and

Types of injury	Specific Knowledge Impartment	Where it can be given	By whom it can be given
Fracture neck of femur	•Expected healing timeline (optimistic, pessimistic time and average time for healing)	In Hospital/postoperative room/digital counselling (live or pre-recorded video) /Residence	In post -operative rooms-by surgeons
	•Rehabilitation process (partial load bearing/full load bearing)		In homes-Counsellor
	•Potential setbacks		Digital counselling-by counsellor
Anterior Cruciate Ligament Reconstruction	•Recovery timeline (from bearing weight to walking to running to sports activity)	In Hospital/postoperative room/digital counselling (live or pre-recorded video) /Residence	In post-operative rooms-by surgeons
	•Immediate post-operative recovery protocol		In homes-Counsellor
	•Precautions needed to prevent future injury		Digital counselling-by counsellor
Spine Surgery	•Timeline of treatment		
	•Cost to be incurred		
	•Post-operative skin scarring		
	•Immediate post-operative recovery		
	•Rehabilitation protocol		
	•Improvement of quality-of-life post-recovery		

Table 1: .Injury-specific Examples.

promoting resilience in the face of adversity. (need more ortho-specific examples for these tables as well as in text).

The Way Forward

Implementing injury-specific targeted interventions to reduce catastrophizing and enhance self-efficacy in a busy orthopedic setting requires a collaborative approach involving various healthcare professionals. Orthopedic surgeons, nurses, physical therapists, and mental health specialists can work together to integrate these interventions seamlessly into the patient care pathway. Utilizing multidisciplinary teams allows for comprehensive assessment and individualized treatment planning tailored to each patient's unique needs and injury characteristics. In a busy clinical setting, time-efficient

strategies such as group education sessions, standardized protocols, and interdisciplinary communication channels can streamline the delivery of targeted interventions while ensuring consistency and continuity of care. In addition, leveraging technology platforms for remote monitoring, telemedicine consultations, and digital health resources can extend access to supportive interventions beyond traditional clinic visits, accommodating the demands of a busy orthopedic practice while maximizing patient engagement and outcomes. By fostering a culture of collaboration, innovation, and patient-centered care, busy orthopedic settings can effectively integrate injury-specific interventions to enhance the psychological well-being and recovery trajectories of orthopedic trauma patients.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the Journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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