



HOLISTIC PRACTICE IN TRAUMATIC BRAIN INJURY REHABILITATION: THE ROLES OF NURSES, RADIOLOGISTS AND PHARMACISTS

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Abstract:

Background: Traumatic brain injury (TBI) is a significant public health concern with diverse outcomes and lasting impacts on individuals. Rehabilitation following TBI aims to maximize cognitive, functional, and physical capacity for independent post-injury life. The holistic approach, emphasizing physical, psychological, social, emotional, and motivational aspects, is considered essential for quality care in TBI rehabilitation. However, its implementation remains inconsistent, possibly due to various complex factors. Health practitioners, including nurses, radiologists, and pharmacists, play crucial roles in TBI management.

Objective: This review aims to explore the perspectives of health practitioners on the role of holistic practice in TBI rehabilitation, identify current practices and perceptions regarding holistic approaches, and assess the benefits and challenges of incorporating holistic practices from the perspectives of nursing, radiology, and pharmacy professionals.

Conclusion: The implementation of holistic practices in TBI rehabilitation remains inconsistent, highlighting the need for further research and efforts to enhance understanding and application. Health practitioners, including nurses, radiologists, and pharmacists, play vital roles in TBI management. The influence of rehabilitation services and settings underscores the importance of tailored, comprehensive care across the continuum of TBI recovery. Improved understanding and application of holistic practices in TBI rehabilitation are crucial for enhancing patient outcomes and addressing the complex needs of individuals with TBI.

Keywords: Holistic Practice, Traumatic Brain Injury, Nursing, Radiology, Pharmacy

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Introduction:

Traumatic brain injury (TBI) is characterized as damage to the brain resulting from an external physical force, such as incidents like traffic accidents, falls, and assaults. The outcome of TBI varies significantly due to factors like the intensity of the impact and the involvement of different brain regions. The resulting disability from TBI not only imposes substantial economic and social burdens on society but also leads to enduring harm for survivors, who often face increased long-term health issues compared to the general population [1].

Given the diverse nature of TBI, it presents a wide array of physical, psychological, and social challenges, necessitating a multifaceted approach to rehabilitation involving various healthcare professionals across different settings throughout the recovery process [2]. The primary objective of TBI rehabilitation is to help individuals reach their maximum cognitive, functional, and physical capabilities to enhance their independence post-injury.

Rehabilitation, as defined by Chua and colleagues, is described as a problem-solving educational process aimed at reducing disability and handicap resulting from disease or injury [3]. While there is a general consensus on the definition of rehabilitation, there is no singular, clearly outlined theoretical foundation for brain injury rehabilitation. The field continues to evolve, allowing for innovative treatment methods and support systems. Consequently, there is some variability in the rehabilitation therapies offered to individuals post-brain injury.

Despite the absence of a standardized approach, practitioners generally agree that rehabilitation in these scenarios should adhere to a holistic bio-psycho-social model [4]. This model, which emphasizes comprehensive care encompassing physical, psychological, social, emotional, and motivational aspects, is considered a cornerstone of effective brain injury rehabilitation. Its strengths lie in its adaptability to individual needs, flexibility in application, and promotion of creative healthcare strategies [5].

While the holistic framework is lauded for its patient-centered approach, it lacks a specific roadmap for healthcare providers working with brain injury survivors. Instead, it encourages practitioners to consider a broad range of factors when addressing a patient's health concerns in a holistic manner. Moreover, it underscores the importance of inter-professional collaboration in understanding and meeting the client's needs and objectives within a complex healthcare

environment [6]. Despite its recognized importance, the implementation of holistic practice in brain injury rehabilitation remains inconsistent and not thoroughly comprehended, potentially due to various practitioner-related, setting-specific, and client-based factors.

Objectives:

The main objectives of this review are:

1. To explore the perspectives of health practitioners, including nurses, radiologists, and pharmacists, on the role of holistic practice in traumatic brain injury rehabilitation.
2. To identify the current practices and perceptions of these health practitioners regarding holistic approaches in traumatic brain injury rehabilitation.
3. To assess the potential benefits and challenges of incorporating holistic practices into the care of traumatic brain injury patients from the perspectives of nursing, radiology, and pharmacy professionals.

Epidemiology:

Traumatic brain injury (TBI) represents a significant public health concern, leading to substantial mortality and long-term morbidity on a global scale, particularly affecting individuals below the age of 44 [7]. In the United States alone, the annual incidence of traumatic craniocerebral injuries is estimated to be around 1.6 million, resulting in over 50,000 fatalities and more than 70,000 individuals experiencing permanent disability. Studies conducted at both country and regional levels have reported crude incidence rates varying from 47.3 to 694 per 100,000 population per year and 83.3 to 849 per 100,000 population per year, respectively. Similarly, crude mortality rates have been documented to range from 9 to 28.10 per 100,000 population per year in country-level studies and 3.3 to 24.4 per 100,000 population per year in regional-level studies. The primary causes of these injuries were found to be traffic accidents and falls, with a potential decrease in the contribution of traffic accidents to overall TBI incidents over time [8].

The role of radiologist in traumatic brain injury:

Radiologists play a vital role in the evaluation and treatment of Traumatic Brain Injury (TBI) by utilizing a variety of imaging techniques. The standard imaging protocol for suspected TBI typically involves noncontrast CT and MRI, with the possibility of incorporating noninvasive angiography or catheter angiography for cases

involving primary vascular abnormalities [9]. While skull radiographs were previously used to assess calvarial fractures in children, their use has diminished due to the potential presence of significant intracranial pathology without associated skull fractures [10]. In certain instances of suspected pediatric non-accidental trauma, skull radiographs may still be included in a skeletal survey alongside CT scans, but CT remains essential when TBI is suspected.

Multi-detector CT (MDCT) without contrast has emerged as the preferred initial imaging modality for acute moderate to severe TBI due to its speed, widespread availability, high sensitivity to calvarial injuries and foreign bodies, and accuracy in detecting emergent neurosurgical conditions such as hemorrhage, herniation, and hydrocephalus. Additionally, MDCT findings have been integrated into various outcome prediction models, aiding in clinical prognostication [11]. While MRI is not typically the first-line imaging choice for TBI evaluation due to its lower sensitivity to fractures, longer acquisition time, limited availability, and higher cost, it excels in detecting subtle pathologic changes associated with mild TBI (mTBI) and plays a crucial role in assessing injury severity and predicting outcomes [12].

MRI is particularly valuable in detecting acute traumatic pathology in mTBI, including non-hemorrhagic contusions and Traumatic Axonal Injury (TAI), making it essential within the initial two weeks of moderate to severe TBI for precise evaluation of parenchymal injury [13]. For subacute and chronic TBI cases, MRI surpasses CT in identifying parenchymal atrophy, white matter injury, and microhemorrhages, especially in patients with new, persistent, or worsening symptoms. In situations where MRI is not feasible, NCCT can be considered for evaluating subacute/chronic TBI [14].

Radiologists are trained to interpret these imaging studies and identify any abnormalities or injuries in the brain post-TBI. They collaborate closely with neurosurgeons, neurologists, and other healthcare professionals to offer a comprehensive assessment and assist in treatment decisions. Radiologists may also monitor the progression of brain injuries through follow-up imaging studies in TBI cases [15].

The role of nursing in traumatic brain injury management:

The effective management of severe traumatic brain injury (STBI) in adults remains a significant challenge for healthcare professionals, including neurologists, neurosurgeons, and neuronurses.

Nurses play a critical role in the care of STBI patients, serving as frontline providers responsible for monitoring the patient's condition, administering medications, and coordinating care with other healthcare team members [16]. Moreover, nurses are instrumental in educating patients and their families about STBI, its potential complications, and the importance of adhering to the treatment plan.

In addition to their clinical responsibilities, nurses also provide essential emotional support to both patients and their loved ones, as coping with the physical and cognitive changes associated with STBI can be overwhelming. During the acute phase of STBI management, nurses are tasked with closely monitoring vital signs, neurological status, and treatment response, promptly intervening in case of deterioration. In the rehabilitation phase, nurses collaborate with physical therapists, occupational therapists, speech therapists, and other rehabilitation team members to assist patients in regaining lost skills and attaining the highest level of independence possible [17].

The role of pharmacist in traumatic brain injury management:

Despite advancements in understanding the cellular response to traumatic brain injury (TBI) and numerous clinical trials focusing on therapeutic agents targeting secondary injury mediators, effective treatment strategies for TBI patients remain a challenge [18]. Pharmacists play a critical role in the management of TBI by ensuring the safe and appropriate use of medications in this patient population. They are well-positioned to offer a range of medication management services, such as medication reconciliation, monitoring for drug interactions and adverse effects, and providing patient education on medication use and adherence. Collaborating with other healthcare professionals, pharmacists can optimize medication therapy and enhance patient outcomes. Moreover, pharmacists can contribute to TBI prevention by educating patients on medication adherence and proper disposal practices to reduce the risk of accidental overdose or poisoning [19].

Influence of rehabilitation services and settings:

Rehabilitation settings specifically designed for individuals with traumatic brain injury (TBI) have been developed to cater to their unique needs. These settings offer a comprehensive range of rehabilitation services to support the individual throughout their recovery journey, encompassing both the inpatient phase (including acute and sub-

acute settings) and the community phase (including tertiary community settings) [20].

The strengths of inpatient and community settings vary but are equally important, as they address different aspects of functioning based on the individual's stage of recovery and the availability of resources. While the overarching goal of rehabilitation services is to help the individual achieve the highest possible level of functioning, research indicates that healthcare outcomes can differ across settings [21]. Studies suggest that the type of rehabilitation setting and the associated factors can impact the outcomes of individuals. For example, Whyte and Hart found that acute rehabilitation settings tend to yield better rehabilitation outcomes compared to community-based programs, attributing this difference to the greater comprehensiveness and intensity of rehabilitation services provided in acute settings. However, the specific dimensions of treatment that contribute to these enhanced outcomes were not analyzed, leaving room for further investigation [22].

It is evident that the outcomes of individuals undergoing rehabilitation can be influenced by the settings in which they receive care, as well as the amount, intensity, and comprehensiveness of rehabilitation services offered in each setting. These factors play a crucial role in determining the ability of healthcare practitioners to deliver optimal and potentially holistic rehabilitation to individuals with TBI.

Conclusion:

In conclusion, traumatic brain injury (TBI) presents a significant public health concern due to its heterogeneous nature and lasting impact on individuals. Rehabilitation following TBI aims to maximize cognitive, functional, and physical capacity for independent post-injury life. The holistic approach, emphasizing physical, psychological, social, emotional, and motivational aspects, is considered essential for quality care in TBI rehabilitation. However, its implementation remains inconsistent, possibly due to various complex factors. Health practitioners, including nurses, radiologists, and pharmacists, play crucial roles in TBI management, with radiologists using imaging modalities, nurses providing frontline care and support, and pharmacists ensuring safe medication management. The influence of rehabilitation services and settings on outcomes underscores the importance of tailored, comprehensive care across the continuum of TBI recovery. Further research and efforts are needed to enhance the understanding and application of

holistic practices in TBI rehabilitation for improved patient outcomes.

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