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NURSING INTERVENTIONS IN THE REHABILITATION PROCESS OF PATIENTS WITH TRAUMATIC BRAIN INJURY.

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ABSTRACT

Traumatic brain injury is a leading cause of disability and mortality globally, and the most common causes are falls and accidents. This has an impact socially and emotionally on individuals, their families and the economy. The rehabilitation process after a traumatic brain injury requires a multidisciplinary approach with nurses playing a major role, ranging from the prevention of a secondary brain injury to physiological, psychological and social interventions as well as patient and family education.

Using a descriptive literature review, this thesis aims to describe the role of nurses in the rehabilitation process of a brain injury patient. The purpose was to produce research and reliable information about the physiological, mental, and social aspects of rehabilitation. The research question is: How can the rehabilitation of a traumatic brain injury patient be supported in nursing?

The research material consisted of data collected from reliable electronic databases with well-defined inclusion and exclusion criteria. The data were analyzed using a thematic analysis approach to identify recurring patterns in the literature.

The results of this study were grouped into four key themes identified as assessment and monitoring, patient and family education, emotional and behavioral support, and non-pharmacological therapy.

In conclusion, nursing interventions are essential in the support of traumatic brain injury patients' rehabilitation with emphasis on a holistic, patient-centered and evidence-based nursing approach to help improve their quality of life and recovery process. The findings of this thesis can be used in nursing education and in clinical practice, especially in the areas of rehabilitation and neurological nursing, with further research recommended to strengthen nursing competencies and develop rehabilitation practices for patients with traumatic brain injury.

Keywords: nurses, rehabilitation, traumatic brain injury, accidents.

CONTENTS

APPENDICES

1 INTRODUCTION

The number of cases of traumatic brain injury is significantly higher in men than in women, with men being 52- 82% more likely than women (Käypä hoito 2025). The brain can rewire itself, form new neural pathways and regain lost abilities – neuroplasticity. Internationally, the most common causes of brain injury are falls and accidents (Journal of Global Health 2024). Most people who get injured are under 25 years of age, and there is currently an increase in the number of elderly patients being admitted for brain injuries. An estimated 36,000 Finns sustain a brain injury each year, and up to 60% of these injuries are from falls and slips (Finnish Meteorological Institute 2024). According to Käypä Hoito (2025), 71-98% of brain injuries are mild, and an estimated 260 out of 100,000 persons with brain injuries across Europe need hospital treatment. In addition to falls, self-harm, brutal/fatal accidents, and mishaps are major causes of traumatic brain injury (Posti et al. 2022).

The rehabilitation process after a traumatic brain injury requires a multidisciplinary team. The roles of nurses range from clinical interventions such as wound management, prevention of secondary brain injury and monitoring glucose levels to physiological, cognitive and social interventions. In the long term, it is also worth pointing out the crucial role family plays. (Johns Hopkins Medicine 2026.)

On the 20th of March every year, several countries observe Head Injury Awareness Day. This day is dedicated to raising awareness on the impact of traumatic brain injuries, the risks and the precautionary measures. It is also a day to celebrate survivors and highlight the challenges they face (Abhishek 2021). Globally, traumatic brain injuries are the leading cause of disability and mortality, imposing substantial social and economic burdens on individuals, families, and healthcare systems (Ibid).

This thesis aims to describe the role of nurses in the rehabilitation process of a brain injury patient. The purpose is to produce research and reliable information about physiological, mental, and social aspects of rehabilitation.

The research question is raised from the purpose, hence the question: How can the rehabilitation of a traumatic brain injury patient be supported in nursing?

This thesis, with a literature review as a tool, focuses on people aged 14 and above who have been recently hospitalized because of closed brain damage caused by an accident or lifestyle choice. This thesis presents the post-surgical and post-critical monitoring of patients with TBI with more attention placed on the roles of nurses.

2 TRAUMATIC BRAIN INJURY CAUSES AND CLASSIFICATIONS

Traumatic brain injury is any damage caused by an external force that causes alterations to the normal function of the brain (Menon et al. 2010) and in more serious injuries, structural damage is also involved (Koivisto & Luoto 2022). According to a systematic analysis carried out by the Global Burden of Disease Study from 1990-2019 across 204 countries, including Finland, the leading cause of traumatic brain injuries are falls, followed by pedestrian road injuries and motor vehicle road injuries (Guan et al. 2023). Other common causes of accidents leading to brain injury are sports injuries, road crashes involving vehicles and pedestrians, gunshot injury and mishaps at home and in the workplace (Haarbauer-Krupa et al. 2021).

Traumatic brain injuries are rarely specific and localized, which makes it difficult to classify and categorize them using one method. As a result of this, they are grouped and classified based on a combination of the following: mechanism of injury (direct blow, penetration or rapid acceleration-deceleration), type of damage (open or closed brain injury), and severity of injury (Zhang et al. 2016). The severity of traumatic brain injury can be graded into mild (13-15), moderate (9-12), and severe (less than 8) with the use of the Glasgow Coma Scale (Geoffrey et al. 2025).

3 SYMPTOMS AND SEQUELAE OF BRAIN INJURY

The combination of pathoanatomic factors and imaging helps to identify the damage of the injury. The severity and extent of the damage caused is determined by Magnetic Resonance Imaging (MRI), Computed Tomography (CT scan) of the

brain, Glasgow Coma Scale (GCS) scores, duration of unconsciousness and neurological findings. (Koivisto & Luoto 2022.)

The type and severity of symptoms may vary based on the results of the injury. Skull fractures, brain haemorrhages such as subdural hematoma, subarachnoid, intracerebral haemorrhages, intraparenchymal haemorrhages and axonal injury are common results of traumatic brain injury. Traumatic brain injuries are often immediately accompanied by one or a combination of these; memory lapses and unconsciousness, convulsions, dizziness, disorientation, bleeding (intracranial and/or external), fractures and paralysis. (Traumatic Brain Injury 2025.)

In addition, it is important to consider the mechanism of injury when assessing the symptoms and creating a treatment plan for a patient with brain injury. This includes assessing whether it is a penetrating injury, acceleration-deceleration injury, fall or blunt trauma. The mechanism of injury is a key part in clinical assessment as it helps in diagnosis, prognosis and rehabilitation. The speed and quality of first aid is also imperative to the diagnosis and prognosis of the injury (Orr et al 2024; Traumatic Brain Injury (TBI) 2025.)

4 NURSING INTERVENTIONS

Nursing interventions are measures taken by nurses based upon clinical judgement and knowledge to enhance patient outcomes (Werezak 2025). In other words, nursing interventions are evidence-based actions that nurses carry out to positively influence the overall health and well-being of a patient. These interventions are patient-specific and based on clinical judgement, and they include activities carried out by nurses, such as constant monitoring of health status, reporting and communication with the health care team, promoting care, patient safety, and patient and family education. (Harper 2025.)

Within the context of traumatic brain injury rehabilitation, the interventions of nurses comprise a wide range of strategies aimed at preventing post-traumatic and post-surgical complications, improving cognitive and functional recovery, and providing comprehensive education and support in the continuity of care. This form of

intervention is most effective in a multidisciplinary environment; it focuses on assessment and well-defined goals that support rapid recovery (Zhang et al. 2025; Xu et al. 2024; WHO 2019; Maas et al. 2017; Ferreira et al. 2024).

5 NURSING METHODS IN THE REHABILITATION OF A BRAIN INJURY PATIENT

The word “rehabilitation” derives from the Latin “rehabilitare,” meaning “to restore or make fit again” (Etymology World, n.d.). Rehabilitation is a process to restore mental and/or physical abilities lost to injury or disease, to function in a standard or near-normal way (Wade 2020). Reuters-Sandquist et al. (2022) explains that rehabilitation is a care that can help a person regain, maintain, or improve abilities needed for daily life. These abilities may be physical, psychological, or social.

Rehabilitation is a momentous junction in the care of people who have experienced traumatic brain injury (TBI). Unlike acute care, which revolves around immediately fixing the patient and preventing supplementary injury, rehabilitation seeks to bring back function, improve independence, and enhance quality of life. (Turner-Stokes et al. 2016) In multidisciplinary convention, doctors, physiotherapists, occupational therapists, psychologists, and nurses alternate as continuous caretakers throughout the healing process.

By simplifying both clinical and comprehensive care, nurses play a central part in recovery. Physical care, psychological support, education for patients and their families, and compensation with social reintegration are some of their approaches. Individual rehabilitation therapy is essential since recovery differs based on the patient's age, comorbidities, psychosocial background, and the severity of the injury (Cicerone et al. 2019). In Rehabilitation, nurses and various health care professionals, such as therapists, all work towards a shared objective. These objectives may include restoring physical, psychological, and social functions, thereby improving the quality of life. (Rehabilitation after traumatic brain injury, 2025)

5.1 Role of the nurse in physiological rehabilitation and patient guidance

Research by Dale et al. (2013) highlighted that physical rehabilitation helps to observe and bring back numerous physical circumstances related to injury or dysfunction. Physiological rehabilitation is focused on making sure that patients can move around and be physically active again after injury. The nurse's role involves monitoring vital signs, preventing complications, and enabling gradual physical recovery. Key responsibilities include the following: Monitoring and managing physiological status by observing changes in neurological function, pressure in the head, breathing, and mobility. Early detection of deterioration, such as a declining level of consciousness or new problems with mobility, is essential in brain injury rehabilitation (Maas et al. 2017; Carney et al. 2016).

In rehabilitation, every patient has a personalized care plan tailored to their needs and situation. According to Wade (2020), two patients can have a similar rehabilitation plan. Individual arrangements, on the other hand, are made specifically to meet the needs of each patient. Age is one component that can influence how well a patient acts in response to physical therapy. The severity of the injury is also a common factor affecting the result of physical rehabilitation. Studies have shown that those aged 18-34 have significantly better outcomes than older adults, while those over the age of 65 are less favourable (Flint Rehab, n.d.).

According to Wylie and Flashman (2017), A traumatic brain injury patient can suffer from muscle weakness due to specific injuries that may have affected some parts of the brain, making it challenging to have coordinated movements. Physical inactivity can result in illnesses, including stroke, pressure ulcers, diabetes, and cardiovascular disease. Brain injury patients must include physical exercise in their daily lives to improve their health outcomes (Hassett 2023).

Collectively with physiotherapists, nurses centre attention on safe exercise, provide guidance on everyday movement, and observe for complexity such as breathing difficulties, pressure ulcers, contractures and prevent secondary complications such as infections, and deep vein thrombosis (DVT). These are common among patients with traumatic brain injury (TBI). Nurses are to take preventive measures

by ensuring proper positioning and regular turning, implementing passive and active range-of-motion exercises, encouraging early mobilisation when safe, and maintaining skin integrity (Xu et al. 2025).

Effective communication among these team members helps pinpoint areas for improvement, shortcomings, and suggestions for a better treatment approach. Effective communication is also essential to ensuring patient safety, smooth information transfer, and developing a follow-up approach that identifies areas to improve (Pamungkas et al. 2019).

More key roles include supporting nutrition, hydration and adherence to medication. Some patients may struggle with swallowing difficulties, fatigue, and decreased awareness connected with physiology. Nurses ensure adequate nutrition, manage enteral feeding when necessary and reinforce medication routines (Ganti et al., 2020). It is also recommended to participate in 150 to 300 minutes of balanced physical activity or a comprehensive physical exercise of 75 to 150 minutes per week, while taking into account each person's individual abilities, strengths, and health challenges (WHO 2020).

Nurses also provide clear explanations of the rehabilitation process, the expected recovery trajectory, and safety measures. This education empowers patients and families to play an active role in their care, thereby improving adherence and outcomes (Journal of Clinical Nursing, 2019). In physiological rehabilitation, nurses act as both clinicians and educators, stabilising the patient and guiding them towards being independent.

5.2 Role of the nurse in psychological rehabilitation, quality of life and adaptation

Psychological rehabilitation after traumatic brain injury is an essential part of recovery and the aim is to not only restore physical, physiological and cognitive deficits but also emotional and mental capacity to go through life again in the best possible way. Cognitive rehabilitation is a therapeutic, systematic, patient-specific treatment which aims to manage and improve memory, attention, language skills,

ability to handle anxiety, stress, grief, insomnia and other emotional concerns. It requires a multidisciplinary effort of physicians, nurses, speech therapists, physical therapists, occupational therapists, recreational therapists, and social workers to organise and implement cognitive stimulation programs. (Hulst et al. 2023.)

The first step is to assess the current level of impairment and preinjury abilities. After this, a restorative or compensatory approach is taken. A restorative approach focuses on strengthening and re-establishing behavioural, environmental and functional patterns that were present before the injury while a compensatory approach focuses on using compensatory mechanisms to maximise recovery of an impaired function. (Johnson et al 2023.)

Let us take, for example, a runner who has memory problems because of a traumatic brain injury. A restorative approach would be to gradually introduce very low intensity but consistent running drills, using repetitive rehabilitative exercise routines to stimulate memory, attention and identity. A compensatory approach would focus on using alarms, checklists, visual cues and assistive devices to assist memory and attention.

Restorative cognitive rehabilitation aims to reduce cognitive deficits and regain lost abilities long-term while a compensatory approach focuses on adapting to those deficits over a short-term period instead of trying to restore them. Psychological rehabilitation also involves family support to assist with effects such as personality changes, depression and anxiety. This aspect of rehabilitation is closely intertwined with social rehabilitation. Regardless of the methods used, the goal stays the same improving the quality of life.

Many patients with traumatic brain injury, especially those with mild to moderate TBI, often recover from symptoms within a couple of weeks. However, factors such as quality of life before injury, mechanism of injury, age, sex could take huge tolls mentally on patients, which may persist for months, years and could as well be lifelong (Journal of Neurotrauma 2021; Wilson et al. 2017). Pinpointing the areas in life that are significant and creating a treatment plan in line with them has been proven to yield better patient satisfaction. In other words, improving the quality of life through psychological and cognitive rehabilitation leads to better outcomes

when individual needs of the patient are given importance. A holistic approach is important but so is highlighting the aspects of life that mean most to the patient.

5.3 Role of the nurse in social rehabilitation, specific features of guiding brain injury patients.

The physical changes and abrupt constraints following a brain injury may alter a person's behaviour, leading to a range of negative feelings, according to Headway (2018). TBI can affect social behaviour, communication skills, and the ability to navigate social situations. Nurses play a crucial role in helping patients return to their normal social lives. Facilitating communication and social interaction is often championed by nurses. Cognitive and behavioural changes, such as impulsivity, disinhibition, and difficulty interpreting social cues, may impair relationships. Nurses can help patients practise appropriate communication strategies, and they can collaborate with speech therapists to address communication deficits (Oyesanya & Thomas, 2019).

Social rehabilitation emphasises rebuilding independence in activities such as transportation, financial management, and decision-making. Nurses guide patients through gradual exposure and ensure safety while fostering confidence. Nurses also support the reintegration into the community by helping patients prepare for returning to work, school, or any other day-to-day social scenery. They assess functional readiness, collaborate with social workers, employers, and community rehabilitation centres, and encourage participation in support groups (Joosub, Kruger & Basson, 2023).

Family members often find behavioural or personality changes difficult to understand. Nurses can help families to develop coping strategies, set realistic expectations, and create a supportive home environment (Lindlöf et al., 2024). Family members are pivotal in helping their loved ones standardize their affections (Headway 2018). By thoughtfully observing these states of mind, one can exceptionally apprehend and understand them, which will promote one's ability to care for them (Progressions Rehabilitation 2025).

Drawbacks, such as the inefficiency of sustaining everyday responsibilities, can provoke people, leading them to become uptight and stonewalled. When providing support, nurses should learn to be patient and, most importantly, to recognise these triggers. Relationships may suffer as a result of some people's tendency to isolate themselves, become self-centred, and occasionally experience mood swings (Headway 2018).

Psychotherapies (2024) explain that therapy is a type of treatment that can help people recognise difficult feelings, restore their confidence, and communicate their innermost thoughts, though they might not share them with friends or family, but rather with a qualified expert. Medication to support emotional stability or mental health well-being can be cautiously introduced into treatment if necessary. When an individual feels the utmost protection, they can gradually harmonize with the community and the possessions they enjoy.

It is pressing that their viewpoints are widely accepted and that their determination regarding how to continue their rehabilitation is well known. Several people return at a different pace and forcing them to withdraw from society against their wishes could seriously impede their development (Murphy 2021). Social reintegration centres on reintegrating into day-to-day life, interpersonal relationships, education, work, and societal activities. Therefore, the nurse’s role in social rehabilitation is heavily communication-based, relational and supportive, requiring patience, empathy and consistent guidance.

6 AIM, PURPOSE, AND RESEARCH QUESTIONS

This thesis aims to describe the nursing rehabilitation of a brain injury patient. The purpose is to produce research and reliable information about physiological, mental, and social rehabilitation. The information can be used in nursing education and when working with adolescents in nursing.

The research question is: How can the rehabilitation of a traumatic brain injury patient be supported in nursing?

7 LITERATURE REVIEW

This literature review examines existing research related to the rehabilitation of patients with traumatic brain injury (TBI), particularly focusing on the role of nurses in physiological, psychological, and social recovery. TBI presents complex, multidimensional challenges affecting mobility, cognition, behaviour, and social functioning. This makes rehabilitation a long-term, interdisciplinary process (Maas et al., 2017). Due to this complexity, nursing practice contributes not only to physical care but also to patient guidance, emotional support, education, and facilitating community reintegration (Turner-Stokes et al. 2016).

This chapter summarises the latest research on rehabilitation methods, nursing responsibilities, and patient outcomes, providing a solid basis for the study. It draws on peer-reviewed journal articles, international guidelines, clinical frameworks, and evidence-based rehabilitation models. By reviewing existing knowledge, the chapter highlights current understanding, identifies gaps in practice, and clarifies the relevance of nursing-led interventions in TBI rehabilitation.

A descriptive literature review approach was chosen because it enables a broad, integrative analysis of existing studies, rather than limiting the review to a single methodological tradition. This method is particularly well-suited to topics such as brain injury rehabilitation, which span multiple disciplines, including neurology, nursing, psychology, and social care. The following sections describe the review method used, outline the data collection and selection process, and present the analysis strategy that guided the organization of the findings.

7.1 Descriptive literature review as a research method

The research method adopted in this research study is a descriptive literature review, which is a qualitative research methodology that seeks to methodically find, review, and integrate current hypothetical studies associated with an appropriate research topic. Contrary to systematic and meta-analyses reviews, which focus on quantitative data and statistical gathering, descriptive literature review centers attention on contributing an in-depth unification of the existing knowledge (Snyder 2019).

In a descriptive literature review, there is the freedom to review previous work that has been done extensively. In studies where previous research has been conducted, it allows comparisons across studies and helps dissect prior work, identifying gaps and various ways to improve the chosen topic (Snyder 2019). In the area of nursing, descriptive literature is most appropriate as evidence-based practice, and its importance in improving the quality of care is usually emphasized in nursing studies.

This thesis has adopted a descriptive literature review to inquire into the nursing interventions in the rehabilitation process of patients with traumatic brain injury. The descriptive literature review allows for a broad examination of previous data without bias and aligns with evidence-based practice.

The goal of this review is to present a detailed analysis of the research study on nursing approaches used in the rehabilitation phase of traumatic brain injury patients. The study aims to highlight nursing interventions in rehabilitation. With this, the researcher can produce a comprehensive and evidence-based understanding of how nurses assist patients with traumatic brain injury in reclaiming and improving their quality of life.

The descriptive literature review allows for a relevant combination and comparison of carefully analyzed data, therefore guiding the best ways to support the nursing intervention of the rehabilitation of a traumatic brain injury patient.

7.2 Data collection

A database search that follows a structured approach helps to achieve a wide coverage of relevant data (Paré et al. (2015). According to Snyder (2019), well-defined exclusion and inclusion criteria bring clarity and transparency. To ensure a reliable data collection in descriptive literature, such data collection should follow a systematic and transparent approach (Cronin, Ryan & Coughlan, 2008).

The evidence for this descriptive literature review was efficiently accumulated from several electronic databases and enhanced by manual searches. To assemble up-to-date information on nursing interventions in the rehabilitation of patients with traumatic brain injury (TBI), the thesis search was restricted to studies published between the years 2015 and 2025.

Well-defined inclusion and exclusion criteria were used in this study. Master's theses, doctoral dissertations, scholarly publications, eBooks, and English-language work with open full-text access were all included in the review. The review focused on closed brain injuries, and the population of interest included people 14 years of age and older who have been hospitalized because of brain damage caused by an accident or lifestyle choice. Studies with children under the age of 14, congenital brain injuries, open brain injuries, or those without full-text accessibility were not included. Articles with just abstracts or released in languages other than English were not considered. These criteria are summarized in Table 1.

Table 1. Inclusion and exclusion criteria

Intake Criteria	**Exclusion Criteria**
2015 - 2025	Below 2015
Master’s theses, Doctoral Dissertations, Academic Journals, eBooks	Bachelor’s thesis
People above the age of 14	Children under the age of 14
Brain injury caused by lifestyle and accidents	Brain injury caused by congenital issues
English	Languages other than English
Free full text	Articles with only an abstract
Closed brain injury	Open brain injury

7.3 Analysis of the data

This analysis was carried out using a thematic approach, which is well-suited to synthesizing diverse sources and identifying recurring patterns in qualitative and

quantitative literature (Snyder, 2019). According to Paré et al. (2015), thematic organization, being a structured process, helps to promote clarity and aids the proper interpretation of results found from different studies by familiarizing oneself with the data and grouping the results into meaningful themes for assessment. The selected studies were read in detail after the inclusion and exclusion criteria outlined in Section 5.2 were applied, and relevant data were extracted and entered into a structured table. Key information was recorded to enable systematic comparison, including the author, year, study purpose, population, rehabilitation focus and nursing interventions.

After extraction, the material was repeatedly reviewed to identify similarities and differences across the studies. The findings were then organized into thematic categories based on concepts that appeared consistently throughout the literature. Particular attention was given to the role of nurses in each thematic area, since nursing practice was identified as a consistently important factor in patient recovery. The analysis involved comparing how different studies described nursing responsibilities, patient challenges and factors influencing rehabilitation outcomes. To provide a balanced interpretation of the findings, it was necessary to note any contradictions, gaps and variations in the evidence.

The research table in Appendix 3 is a summary of the key results which have been grouped into 4 categories: assessment and monitoring, family and patient education, behavioral and emotional support and non-pharmacological therapy.
Organizing the data thematically made it possible to integrate evidence from academic journals, dissertations, and e-books into a coherent narrative. This approach supported the identification of dominant themes and highlighted areas where research remains limited, thereby informing the conclusions presented in the Results chapter.

8 RESULTS

This section shows the results from several analysed studies using a descriptive literature review on nursing interventions in the rehabilitation process of traumatic

brain injury patients. The results have been grouped into themes that have been consistent across the analysed studies.

8.1 Assessment and monitoring

Emphasis has been made across several studies on the effectiveness of using a structured assessment protocol, shared language and good follow-up technique, and how it contributes positively to TBI rehabilitation. The work of nurses puts them mostly in close contact with patients, thereby allowing them to promptly detect changes in the health status of a patient. These changes can be behavioural, cognitive or internal and can indicate an improvement or a decline in the patient's health.

Articles have highlighted the importance of structured assessment in preventing the recurrence of a secondary brain injury. For example, Figueiredo, Castro, and Fernandes (2024) indicated that constant monitoring of the patient's well-being, such as vitals, metabolic regulation, signs of infections and the general condition of the brain, can help to prevent emergency conditions such as cerebral oedema or ischemic stroke. In addition, Derbyshire and Hill (2018) outline the importance of nurses making accurate assessments and recording of neurological observations in establishing and monitoring patients' status and consciousness. These reviews emphasize the importance of consistent monitoring, early identification of health deteriorations and how fast action can improve recovery.

The results of Zhou, Zhou, and Chen (2025), who studied integrated nursing interventions in acute TBI care, showed that stabilisations of TBI patients were faster, and rehabilitations were started early because of the effective and well-organised triage protocols, which include a consistent and constant assessment of the neurological well-being of TBI patients in triage and emergency settings. Their conclusion was based on the active involvement of nurses in the critical phase set the foundation for a positive rehabilitation outcome later.

Various studies also highlighted the importance of sensory and cognitive monitoring in the early stages of rehabilitation. Wen et al. (2025) note that patients progressed quickly out of unconsciousness because of sensory stimulation

programmes that nurses have implemented in the early rehabilitation phase. The continuous assessment of sensitivity, alertness and cognitive variations observed by nurses shows the progression of the rehabilitation.

Gao et al. (2025) highlighted the importance of nurses having professional training in cognitive assessment. Their findings underline that a nurse's knowledge of cognitive rehabilitation will determine how fast they can recognise deteriorations in health, ways to intervene, and assist in recovery. This theme emphasises intervention-driven processes in which nurses regularly gather data from patients, make clarifications and documentations and communicate it with the necessary teams involved in the rehabilitation process of a patient.

8.2 Family and patient education

Several studies have shown that families are often the long-term caregivers after discharge. A primary contributor to an effective and successful rehabilitation is the right educational support given to patients and family members. A systematic review by Lindlöf et al. (2024) found that it is of more advantageous to families when nurses provide a personalised, patient-centred education that includes well-detailed and easy-to-access care planning that advances throughout the rehabilitation process. It also emphasises the involvement of families and patients in the decision-making process. Bogner et al. (2019) found that family involvement in rehabilitation, supported by nurses, improved the cognitive outcome of the patient and also assisted in the social rehabilitation of the patient nine months after discharge.

Nurses act as links between families and multidisciplinary teams, and this ensures that relatives understand the goals of rehabilitation and can detect changes in the patient's well-being. Azman et al. (2020) also found that families of TBI survivors are usually faced with stress and emotional burdens, and that detailed explanation, follow-up and guidance provided by nurses has reportedly eased some of these burdens and improved competencies. Nurses' contribution to patient education, especially in guiding patients and family members in rehabilitation, improved understanding of various cognitive and emotional challenges patients may face and ways in which they can navigate them and integrate back into society

(Guldager et al 2019). Family and patient education is a continuous process, and the role of nurses in constantly informing and educating both patients and family members is of great importance.

8.3 Behavioural and emotional support

The reviewed literature shows how nurses have been able to assist in the management of post-traumatic challenges, such as emotional instability and behavioural changes that TBI patients often face. According to Lindlöf et al. (2024), open communication skills adopted by nurses in decision-making, follow-up, empathy and transparency with patients and family members have yielded a positive result in how they have handled emotional difficulties. Troeung et al. (2024) also demonstrated that the psychoeducational interventions developed in the ‘’myTBI’’ program yielded a great result when nurses have a proximity with patients. Nurses are seen as moderators in handling emotional difficulties.

The roles of nurses also involve assisting patients in handling anxiety problems and behavioural instability. A study by Herrera (2024) and Lindlöf et al. (2024) highlighted that the communication and reassurance skills of nurses contribute significantly to reducing the occurrence of behavioural outbursts. It is also important that nurses receive adequate training on how to manage behavioural issues associated with TBI. Oyesanya et al. (2017) found that a lot of nurses felt they lacked enough experience or skills to manage these behavioural issues. This emphasizes the need for professional development in areas such as early and acute rehabilitation and behavioural management.

With long-term care, a healthy nurse-patient relationship is integral to better outcomes, and a qualitative study by Burridge and Foster (2019) explains how fundamental and valuable compassion is to this aspect of rehabilitation nursing.
Emotional and behavioural support might prove to be difficult without a level of compassion. This study further highlights the difficulty in defining compassion and it highlights the challenges nurses face and overcome to show compassion, such as increasing workload, performance targets, working conditions, etc. However, it

points out that recognizing suffering and making actions to alleviate it are key characteristics of compassion.

In a descriptive study to understand experiences of agitation after mild-to-severe traumatic brain injury with a group of nurses aged 20-61 years carried out by Mckay et al. 2025 underlined that in early rehabilitation, patients go through a period of post-traumatic amnesia which is defined by all or a combination of the following: confusion, disorientation, formation of new memories, hallucinations, agitation, restlessness and aggression. Given that these behavioural changes pose risks to safety of both patient and nurses, the study analysed various strategies nurses can use to influence and support these behavioural changes - behavioural, medication, environmental and therapeutic strategies were analysed. Across these strategies, the importance of experience, teamwork, knowledge, empathy, compassion and the ability to adapt to patients' unique needs was highlighted.

The nurses further expressed how much training they still needed, regardless of how much they knew. These findings altogether indicate how demanding behavioural and emotional support is in the rehabilitation process of TBI. This aspect requires emotional intelligence, great communication skills, teamwork, good clinical reasoning, perseverance and resilience from nurses who take part in the rehabilitation process.

8.4 Non-pharmacological therapy

Across the reviewed literature, nurses have contributed significantly to implementing non-pharmacological therapies to support rehabilitation. An important part of non-pharmacological rehabilitation includes the ability to use other methods that do not involve the use of medications and the burden that comes with it, it also requires the input of other professionals in the team such as occupational, speech and music therapists.

A systematic review by Wen et al. (2025) points out various non-pharmacological therapies that have been effective in TBI rehabilitation. Some of these interventions include music therapy, sensory stimulation, routines and environmental control.

Music therapy, being the most relevant, has helped to reduce anxiety in early recovery phases. A study by Siponkoski 2022 which aimed to explore the benefits of music as a tool for neurological rehabilitation of moderate to severe TBI showed that music engages cognitive, motor and emotional functions, which makes it valuable in improving awareness, arousal and reducing agitation in early rehabilitation.

The involvement of nurses in facilitating therapy sessions and environmental adjustments has been reported to be of great significance. Wang et al. (2024) grouped effective non-pharmacological therapies into three sections: sensory stimulation, cognitive training, and structured routines. Nurses have been responsible for handling and coordinating these interventions, especially in subacute rehabilitation units. The roles of nurses in the implementation of non-pharmacological therapies have shown an improved orientation in multiple ways in cognitive rehabilitation programs.

The use of technology has also developed greatly. Shen et al. (2025) discussed developments such as virtual reality-assisted rehabilitation, tele-rehabilitation, brain-computer interface systems, and robotics. These technologies require interdisciplinary coordination, and nurses, however, are often supervisors in patient safety, monitoring and evaluation in the use of these technological interventions.

Herrera (2024) also talks about the importance of incorporating mindfulness in nursing procedures such as reducing stress, creating emotional awareness and participation-based therapy. These findings have shown that nurses have a significant role in guiding the emotional well-being of TBI patients through integrative therapeutic practices. A common factor across these studies has shown that non-pharmacological interventions are most effective when the care plan is personalized to each patient’s needs. When non-pharmacological interventions are coordinated by nurses, it supports holistic recovery that corresponds with biopsychosocial models of care.

9 REFLECTION

The reflection evaluates the key aspects of nursing interventions in traumatic brain injury rehabilitation by pointing out and connecting the results found. It also highlights the importance of a nurse-centred post-traumatic care and the obstacles faced. This section also explains the validity of sources used for this research as well as the reliability and ethical principles. In conclusion, observations, practical proposals and recommendations for better ways nurses can influence the rehabilitation process are discussed.

9.1 Examination of the results

This thesis has reviewed different studies which demonstrated that nursing interventions in the rehabilitation process of traumatic brain injury (TBI) patients have many features associated with it. Nurses at the centre of rehabilitation, in collaboration with the family have proven to be effective in early rehabilitation and prevention of a secondary injury. The results have highlighted that clinical outcomes, mental, emotional and social health improves when nursing care is organized and evidence based.

Azman et al. (2020) highlighted the emotional burden that relatives of patients with TBI face, mainly due to the lack of proper information received. The review further highlighted how the information gap caused a build-up of stress which in turn influences the result of rehabilitation of the patient. On the other hand, support from nurses yielded a positive result in family involvement in the rehabilitation process. Bogner et al. (2019) talked about how a higher level of family involvement reduced the length of hospital stay of the patient. These results together have shown how nurses play an important role in facilitating family involvement with empathy, quality of information and communication provided which in turn positively influences rehabilitation results.

Findings of Guldager et al. (2019) indicated that nurses having good communication skills, empathy and sharing evidence-based education with family members were key factors in neurorehabilitation. Similarly, Lindlöf et al. (2024), found these factors to have empowering strategies that helped in care planning

and improved family member's coping skills. These results have proven that non-clinical nursing skills such as communication and empathy are as important as clinical skills.

Across these studies, nursing interventions have been seen to be aimed at the prevention of a secondary brain injury. Figueiredo et al. (2024), highlighted the importance of continuous neurological assessment, which would help determine if there is a deterioration in the health of a traumatic brain injury patient hence, prompting timely intervention and the prevention of a secondary brain injury. Zhou et al. (2025) also found similar results, which highlights that in emergency departments, a fast neurological assessment and general assessment of the patient such as checking the airway, reduced complications and helped to improve stabilization of the patients.

The findings from Herrera (2024) and Troeung et al. (2024), identify the importance of emotional support and care and how the use of evidence-based nursing strategies has been used to reduce anxiety in TBI patients and also improved cooperation with nurses. The study also highlights the role of a nurse as an educator and how the importance of psychoeducation and the information gathered from this education helps TBI patients to cope and adjust to their situation better.

Herrera (2024) and Wen et al. (2025) also have similar results on how the use of non-pharmacological therapies such as music and sensory stimulation has helped to reduce anxiety in early rehabilitation phases. A study conducted by Wang et al. (2024) revealed that a nurse-led follow-up after a brain surgery achieved better outcomes and more positive patient reviews in comparison to neurologist-led follow-ups. This highlights the importance of the role of a nurse in traumatic brain injury management. However, Oyesanya et al. (2016), reported that nurses stated a limitation in their knowledge of cognitive and behavioural management and the need for education and training in this area.

In summary, these results highlight and support the importance of continuous assessment and monitoring, as it is crucial to the success of early rehabilitation. It also shows the importance of good communication skills in family and patient

education as well as behavioural and emotional support. Additionally, it pinpoints the significance of nurses in non-pharmacological therapy. The results emphasized the importance of nursing interventions in both clinical and psychological outcomes of traumatic brain injury rehabilitation. The findings also showed the need for nurses to obtain more knowledge in the behavioural and cognitive aspect of traumatic brain injury.

9.2 Ethics and reliability

The guiding principles for this research are fairness and transparency, reliability, respect, and accountability as stated by The European Code of Conduct for Research Integrity (ALLEA 2023). The researchers aimed to be fair and unbiased in the analysis of the reviewed works and carried out research in a way that shows respect towards colleagues and the research community. Throughout the entire process of this research, the researchers adhered to research guidelines provided by the South-Eastern Finland University of Applied Sciences (Xamk) and were accountable to supervisors and sought help and guidance when needed.
To ensure validity, materials were obtained from reliable databases and were carefully assessed.

Respect was shown to the ideas and work of other authors and publishers, and plagiarism was avoided in the best way possible by properly referencing texts and retrieved information according to Xamk's referencing guidelines and the Research Integrity guidelines given by the Finnish National Board on Research Integrity, TENK 2023.

As recommended by Arene 2023, Artificial Intelligence was used no more than a tool for assistance, rather than the main source of information. Grammarly, an AI writing assistant, has been used only to check for grammatical errors, provide clarity, and improve writing. ChatGPT was used as a support for general knowledge and suggestions for search words. The honesty of this work, however, has not been compromised.

9.3 Conclusion and recommendations

This literature review study explored how evidence-based nursing strategies are sustained in the rehabilitation of patients with traumatic brain injury (TBI). Traumatic brain injury not only results in physical damage, but it also presents cognitive, social and emotional challenges that require a coordinated and multidisciplinary approach over the entire course of rehabilitation. The complex nature of traumatic brain injury as stated in the theoretical background presents that from early acute care to long-term recovery, nurses contribute substantially and play an essential role in the rehabilitation process.

The findings of this literature review outline and demonstrate the significant roles nurses play in the rehabilitation process in terms of clinical and non-clinical interventions such as early mobilization, continuous assessment, emotional support, improving the involvement of family members by bridging the information gap between patients and loved ones, and supporting cognitive recovery. By reviewing 15 peer-reviewed articles, this thesis provided information that supports the successes and highlights the limitations of the impact of nurses.

From a solely clinical perspective, it has been established that in TBI rehabilitation, constantly monitoring intracranial pressure, glucose levels as well as neurological status and wound management is key to preventing a secondary brain injury hence, optimizing physical and cognitive recovery. On the other hand, creating a patient-centred care plan which also prioritizes the involvement of family through adequate TBI education as well as the input of empathy and compassion from nurses is crucial to social, behavioural and emotional recovery.

Additionally, nurses often being a constant presence and supervisors during the rehabilitation process means that they play a crucial role in the integration of non-pharmacological approaches such as the use of music, virtual reality-assisted rehabilitation and other technological interventions into the care plan. (Wang et al. 2024; Siponkoski 2022; Shen et al. 2025)

However, in the bid to make the best out of the influence of nurses, there's a risk of further increasing workload. The lack of sufficient knowledge and the difficulty in defining compassion in behavioural and cognitive management are limitations that nurses face. (Burridge and Foster 2019) The insufficiency of high-quality research on nurse-led TBI rehabilitation was a limitation faced by the researchers of this thesis. Despite these limitations, this thesis contributes somewhat to a better understanding of the nursing interventions in the rehabilitation of traumatic brain injury.

Based on the findings of this research work, it would be valuable for employers to provide supplementary training in the form of seminars, workshops and professional development programmes for nurses in the field to combat the honest ignorance faced by many nurses. Additionally, health care organizations could improve existing structured rehabilitation pathways to clearly define the roles of nurses to enhance productivity and reduce the risk of burnout. In conclusion, future research should focus on the long-term outcomes of nurse-led TBI rehabilitation.

REFERENCES

Abhishek, K. 2021. World Head Injury Awareness Day – “More than my brain injury.” Medindia. Web page. Available at: https://www.medindia.net/news/healthwatch/world-head-injury-awareness-day-more-than-my-brain-injury-200443-1.htm [Accessed 16 February 2026].

Aivovammatietoa. 2020. Aivovammaliitto. Web page. Available at: https://aivovammaliitto.fi/aivovammatietoa/ [Accessed 21 April 2025].

Allea. 2023. The European Code of Conduct for Research Integrity. Web page. Available at: https://allea.org/code-of-conduct/ [Accessed 04 March 2026].

Azman, A., Jali, N. A., Singh, P. S. J., Abdullah, J. M. & Ibrahim, H. 2020. Family roles, challenges and needs in caring for traumatic brain injury (TBI) family members: a systematic review. *Journal of Health Research*, 34(6), 495–504. E-journal. Available at: https://doi.org/10.1108/jhr-07-2019-0138 [Accessed 29 November 2025].

Bogner, J., Corrigan, J. D., Dams-O’Connor, K. & Wagner, A. 2019. Family Involvement in Traumatic Brain Injury Inpatient Rehabilitation: Outcomes Related to Participation. *Archives of Physical Medicine and Rehabilitation*, 100(9). E-journal. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0003999319303016 [Accessed 29 November 2025].

Brain Injury Information. 2025. Finnish Association for Brain Injury. Web page. Available at: https://aivovammaliitto.fi/aivovammatietoa/ [Accessed 21 April 2025].

Burridge, L. & Foster, M. 2019. Compassion in rehabilitation nurses who provide direct patient care: principles to pragmatics. *JARNA,* 22(1), 7-15. Academic Journal. Available at: https://doi.org/10.33235/jarna.22.1.7-15 Accessed [23 December 2025].

Carney, N., Totten, A. M., O’Reilly, C., Ullman, J. S., Hawryluk, G. W., Bell, M. J., Bratton, S. L., Chesnut, R., Harris, O. A., Kissoon, N., Rubiano, A. M., Shutter, L., Tasker, R. C., Vavilala, M. S., Wilberger, J., Wright, D. W. & Ghajar, J. 2016. Guidelines for the Management of Severe Traumatic Brain Injury, Fourth Edition. *Neurosurgery*, 80(1), 6–15. E-journal. Available at: https://doi.org/10.1227/neu.0000000000001432 [Accessed 16 February 2026].

Cicerone, K. D., Goldin, Y., Ganci, K., Rosenbaum, A., Wethe, J. V., Langenbahn, D. M., Malec, J. F., Bergquist, T. F., Kingsley, K., Nagele, D. & Trexler, L. 2019. Evidence-based cognitive rehabilitation: systematic review of the literature from 2009 through 2014. *Archives of Physical Medicine and Rehabilitation*, 100 (8), 1515–1533. E-journal. Available at: https://doi.org/10.1016/j.apmr.2019.02.011 [Accessed 7 October 2025].

Cronin, P., Ryan, F. & Coughlan, M. 2008. Undertaking a literature review: a step-by-step approach. *British Journal of Nursing,* 17(1), 38–43. E-journal. Available at: https://doi.org/10.12968/bjon.2008.17.1.28059 [Accessed 27 October 2025].

Dale, N.M., Myatt, M., Prudhon, C. & Briend, A. 2013. Using Mid-Upper Arm Circumference to End Treatment of Severe Acute Malnutrition Leads to Higher Weight Gains in the Most Malnourished Children. *PloS ONE*, 8(2), e55404. Available at: https://doi.org/10.1371/journal.pone.0055404 [Accessed 19 November 2025].

Derbyshire, J. & Hill, B. 2018. Performing neurological observations. *British Journal of Nursing*, 27(9), 1110-1114. Academic Journal. Available at: https://research-ebsco-com.ezproxy.xamk.fi/linkprocessor/v2-external?opid=b3hkfh&recordId=awcdlsh37f&url=https%3A%2F%2Fwww.doi.org%2F10.12968%2Fbjon.2018.27.19.1110 [Accessed 23 December 2025].

Duodecim Käypä hoito. 2023. Aivovammat. Web page. Available at: https://www.kaypahoito.fi/hoi18020 [Accessed 24 February 2026].

Elysium Healthcare, no date. Benefits of the SMART Assessment for PDOC patients and clinicians. Web page. Available at: https://www.elysiumhealthcare.co.uk/benefits-of-the-smart-assessment-for-patients-and-clinicians/ [Accessed 19 July 2025].

Etymology World Online. 2025. Rehabilitation – Etymology and origin of the word. Web page. Available at: https://etymologyworld.com/item/rehabilitation [Accessed 14 July 2025]

Ferreira, R., Pedrosa, A. R., Reis, N., Sousa. L., Nicolau. C., Ferreira. B., Rocha. B. & Baixinho. C. R. 2024. Transitional care for older persons with need of geriatric rehabilitation nursing interventions. BMC Nursing, 23(376). E-journal. Available at: https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-024-02050-4 [Accessed 23 January 2026].

Figueiredo, R., Castro, C. & Fernandes, J. B. 2024. Nursing Interventions to Prevent Secondary Injury in Critically Ill Patients with Traumatic Brain Injury: A Scoping Review. *Journal of Clinical Medicine,* 13(8), 2396. E-journal. Available at: https://doi.org/10.3390/jcm13082396 [Accessed 5 December 2025].

Finnish Meteorological Institute, *(n.d)*. Climate change has not slowed down. Web page Available at: https://en.ilmatieteenlaitos.fi/news/4WQB8y4Mx5Ye9FzxvQk1AR [Accessed 24 April 2025].

Flint Rehab (n.d.) Brain injury recovery statistics. Web page. Available at: https://www.flintrehab.com/brain-injury-recovery-statistics/ [Accessed 22 July 2025].

Ganti, L. et al. 2020. Traumatic Brain Injury: A multidisciplinary approach to diagnosis and management. *Nursing Clinics of North America*, 55(3), 287–302

Gao, Y., Zhou, W., Wang, Y. & Zhou, L. 2025. Evidence-based nursing interventions in cognitive dysfunction among adults with brain injury: a quasi-experiment. *Journal of Global Health*, 15, 04253. E-journal. Available at: https://doi.org/10.7189/jogh.15.04253 [Accessed 5 December 2025].

Geoffrey, T. M., Dams-O'Connor, K., Alosco, M. L., Awwad, H. O., Bazarian, J. J., Bragge, P., Corrigan, J. D., Doperalski, A.,Ferguson, A. R., Mac Donald, C. L., Menon, D. K., McNett, M., van der Naalt, J., Nelson, L. D., Wilson, L., Yuh, E. L., Zetterberg, H., Maas, A. I. R. & McCrea, M. A. 2025. A new characterisation of acute traumatic brain injury: the NIH-NINDS TBI Classification and Nomenclature Initiative. *The Lancet Neurology, 24(6), 512-523.* E-journal. Available at: https://doi.org/10.1016/S1474-4422(25)00154-1 [Accessed 20 January 2026].

Giacino, J.T., Kalmar, K. & Whyte, John. 2020. The JFK Coma Recovery Scale–Revised: measurement characteristics and diagnosed utility. *Archives of Physical Medicine and Rehabilitation*, *85(12), 2020-2029*. E-journal. Available at: https://doi.org/10.1016/j.apmr.2004.02.033 [Accessed 19 July 2025].

Gill-Thwaites, H. 1999. The Sensory Modality Assessment and Rehabilitation Technique (SMART): A Comprehensive and Integrated Assessment and Treatment Protocol for the Vegetative State and Minimally Responsive Patient. Research Gate, 9(3–4), 305–320. E-Journal. Available at: https://doi.org/10.1080/096020199389392?urlappend=%3Futm_source%3Dresearchgate.net%26utm_medium%3Darticle [Accessed 19 July 2025].

Guan B., Anderson D. B., Chen L., Feng S. & Zhou H. 2023. Global, regional and national burden of traumatic brain injury and spinal cord injury, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. BMJ open, 13(10), e075049. E-Journal. Available at: https://doi.org/10.1136/bmjopen-2023-075049 [Accessed 21 November 2025].

Haarbauer-Krupa, J., Pugh, M. J., Prager, E. M., Harmon, N., Wolfe, J. & Yaffe, K. 2021. Epidemiology of Chronic Effects of Traumatic Brain Injury. Journal of neurotrauma, 38(23), 3235-3247. E-journal. Available at: https://doi.org/10.1089/neu.2021.0062 [Accessed 6 December 2025].

Harper, D. 2025. Improving patient outcomes through evidence-based nursing interventions. Journal of Advanced Practice Nursing, 10(2), 417. E-journal. Available at: https://www.hilarispublisher.com/open-access/improving-patient-outcomes-through-evidencebased-nursing-interventions-114671.html S [Accessed 23 January 2026].

Headway 2018. Psychological effects of brain injury. Web page. Available at: https://www.headway.org.uk/media/12002/psychological-effects-of-brain-injury-publication.pdf [Accessed 10 August 2025].

Herrera, S. 2024. Mindful Care: Nursing Strategies in Traumatic Brain Injuries: A brief. Journal of Medical & Clinical Nursing, 5(1), 1–4. E-journal. Available at: https://doi.org/10.47363/jmcn/2024(5)174 [Accessed 11 December 2025].

Hassett, L. 2023. Physiotherapy management of moderate-to-severe traumatic brain injury. *Journal of Physiotherapy,* 69(3), 141–147 Available at: https://doi.org/10.1016/j.jphys.2023.05.015 [Accessed 22 July 2025].

Hulst, H. E., Dobryakova, E., Costa, S. L. & Donkers, S. J. 2023. Editorial: Cognitive Rehabilitation: a multidisciplinary approach. *Frontiers*, Editorial article. Available at: https://doi.org/10.3389/fresc.2023.1268531 [Accessed 06 March 2026].

The Importance of Family Support with TBI Recovery. 2025. Progressions Rehabilitation. Available at: https://progressionsrehab.com/blog/the-importance-of-family-support-with-tbi-recovery/ [Accessed 10 August 2025].

Johns Hopkins Medicine. 2026. Rehabilitation After Traumatic Brain Injury. Web page. Available at: https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/rehabilitation-after-traumatic-brain-injury [Accessed 23 January 2026].

Johnson L. W. & Weinberg A. 2023. Cognitive Rehabilitation Approaches to Traumatic Brain Injury: A Review of Efficacy and Outcomes. *Medical Research Archives,* 11(8). E-journal. Available at: https://doi.org/10.18103/mra.v11i8.4199 [Accessed 31 October 2025].

Jones & Bartlett Learning (n.d.) Rehabilitation Concepts and Strategies. Available at: https://samples.jbpub.com/9781449634476/80593_ch05_5806.pdf [Accessed 14 July 2025].

Joosub, N., Kruger, G. & Basson, P. 2024. A neuropsychological rehabilitation service delivery model for South African adults with acquired brain injury (RSDM-SA), *Frontiers in Rehabilitation Sciences*, 4, 1175963. Available at: 10.3389/fresc.2023.1175963 [Accessed 19 January 2026].

Karishma, A. 2021. World Head Injury Awareness Day - 'More than my brain injury'. Medindia. Web page. Available at: https://www.medindia.net/news/healthwatch/world-head-injury-awareness-day-more-than-my-brain-injury-200443-1.htm [Accessed 24 February 2026].

Koivisto, T. & Luoto, T. 2022. Mild Brain Injury. Duodecim, Physician's handbook. Available at: https://www.terveysportti.fi/apps/dna/ltk/article/ykt00431/search/brain%20injury [Accessed 19 January 2026].

Lindlöf, J., Turunen, H., Välimäki, T., Huhtakangas, J., Verhaeghe, S. and Coco, K. 2024. Empowering Support for Family Members of Brain Injury Patients During the Acute Care: Insights from family members, *Journal of Family Nursing*, 81(11), 7674–7689. E-journal. Available at: https://doi.org/10.1111/jan.16424 [Accessed 14 January 2026].

Maas, A.I.R., Menon, D.K., Adelson, P.D., Andelic, Nada., Bell, M. J. & Belli, A. 2017. Traumatic brain injury: Integrated approaches to improve prevention, clinical care, and research. *Lancet Neurology*, 16(12), 987–1048. E-journal. Available at: https://doi.org/10.1016/s1474-4422(17)30371-x [Accessed 15 January 2026.]

Mckay, A., Spiteri, C., Armao, V, Analytis, P., Stribling, J. & Ponsford, J. 2025. The experiences of nurses working with patients who are agitated following moderate-to-severe traumatic brain injury: a qualitative study. *Brain Injury*, 39(14), 1311-1320. E-journal Available at: https://doi.org/10.1080/02699052.2025.2558954 [Accessed 1 January 2026].

Menon, D. K., Schwab, K., Wright, D. W. & Maas, A. I. 2010. Position statement: Definition of traumatic brain injury. *Archives of Physical Medicine and Rehabilitation,* 91(11), 1637–1640. Available at: https://doi.org/10.1016/j.apmr.2010.05.017 [Accessed 11 December 2025].

Miranda 2024. What is rehabilitation after traumatic brain injury. Miranda's Physio Steps. Available at: https://mirandasphysiosteps.com/rehabilitation-after-traumatic-brain-injury/ [Accessed 16 February 2026].

Murphy, T. F. 2021. Social stress Theory. Psychology Fanatic. E-document. Available at: https://psychologyfanatic.com/social-stress-theory/ [Accessed 16 February 2026].

Orr, T. J., Lesha, E., Kramer, A. H., Cecia, A., Dugan, J. E., Schwartz, B. Einhaus, S. L. 2024. Traumatic Brain Injury: A Comprehensive Review of Biomechanics and Molecular Pathophysiology. *World Neurosurgery, 185, 74-88.* E-Journal. Available at: https://doi.org/10.1016/j.wneu.2024.01.084 [Accessed 05 March 2026].

Oyesanya, T. O., Brown, R. L., & Turkstra, L. S. 2016. Caring for Patients with traumatic brain injury: a survey of nurses' perceptions. *Journal of Clinical Nursing,* 26(11–12), 1562–1574. E-journal. Available at: https://doi.org/10.1111/jocn.13457 [Accessed 11 December 2025].

Oyesanya, T.O. & Thomas, M.A. 2019. 'Strategies nurses use when caring for patients with moderate-to-severe traumatic brain injury who have cognitive impairments'. *Journal of Neuroscience Nursing*, 51(5), 252–258. E- journal Available at: https://doi.org/10.1111/jocn.14958 [Accessed 11 December 2025].

Pamungkas, R.A., Chamroonsawasdi, K. & Vatanasomboon, P. 2019. Self-management and mutual assistance in diabetes care among older adults in Indonesia, *BMC Geriatrics*, 19: 223. E-journal Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6800217/pdf/nihms-1054310.pdf [Accessed 14 July 2025].

Paré, G., Trudel, M.-C., Jaana, M., & Kitsiou, S. 2015. Synthesizing information systems knowledge: A typology of literature reviews. *Information & Management,* 52(2), 183–199. E-journal. Available at: https://doi.org/10.1016/j.im.2014.08.008 [Accessed 27 October 2025].

Posti J. P., Cajanus K., Tornio A., Ruuskanen J. O., Luoto T. M., Rautava P., & Kytö V. 2023. Causes of fatal traumatic brain injury in Finland. *Journal of neurosurgery*, 139(6), 1506–1513. E-journal. Available at: https://doi.org/10.3171/2023.3.JNS23148 [Accessed 19 January 2026].

Psychotherapies. 2024. National Institute of Mental Health. E-journal. Available at: https://www.nimh.nih.gov/health/topics/psychotherapies [Accessed 25 August 2025].

Rehabilitation. n.d. National Cancer Institute, Web page. Available at: https://www.cancer.gov/search/results?swKeyword=rehabilitation [Accessed 26 Apr. 2025].

Rehabilitation. 2023. U.S. National Library of Medicine. Available at: https://medlineplus.gov/rehabilitation.html [Accessed 24 April 2025].

Reuter-Sandquist, M., Ernstmeyer, K., & Christman, E. 2022. Chapter 9: Promote Independence through Rehabilitation/Restorative Care. Nursing Assistant - NCBI Bookshelf. E-book. Available at: https://www.ncbi.nlm.nih.gov/books/NBK599390/ [Accessed 16 February 2026].

Shen, Y., Jiang, L., Lai, J., Hu, J., Liang, F., Zhang, X. & Ma, F. 2025. A comprehensive review of rehabilitation approaches for traumatic brain injury: efficacy and outcomes. *Frontiers in Neurology*, 16, 1608645. E-journal. Available at: https://doi.org/10.3389/fneur.2025.1608645 [Accessed 11 December 2025].

Siponkoski, S. 2022. Music therapy in the cognitive and neural rehabilitation of traumatic brain injury. University of Helsinki. Doctoral dissertation. Available at: http://hdl.handle.net/10138/343701 [Accessed 10 January 2026].

Snyder, H. 2019. Literature review as a research methodology: An overview and guidelines. *Journal of Business Research*, 104, 333–339. E-journal. Available at: https://doi.org/10.1016/j.jbusres.2019.07.039 [Accessed 27 October 2025].

Srinivasan, V. 2015. Deep brain stimulation for medically refractory obsessive–compulsive disorder: rationale, outcomes and neural mechanisms. *Acta Neurochirurgica*, 157(8), 1403–1409. E-journal. Available at: https://link.springer.com/article/10.1007/s00701-015-2512-7 [Accessed 24 April 2025].

Troeung, L., Sarunga Raja, T. L., Mann, G., Wagland, J., MacLeod, C. & Martini, A. 2024. Improving Psychosocial Adjustment to Traumatic Brain Injury from acute to chronic injury through development and evaluation of the myTBI online psychoeducation platform: Protocol for a mixed-methods study. *BMJ Open,* 14(3), e080030. E-journal. Available at: https://doi.org/10.1136/bmjopen-2023-080030 [Accessed 12 December 2025].

Traumatic Brain Injury (TBI). 2025. National Institute of Neurological Disorders and Stroke. Web Page. Available at: https://www.ninds.nih.gov/health-information/disorders/traumatic-brain-injury-tbi [Accessed 05 March 2026].

Turner-Stokes, L., Bavikatte, G., Williams, H., Bill, A. & Sephton, K. 2016. Cost-efficiency of specialist hyperacute in-patient rehabilitation services for medically unstable patients with complex rehabilitation needs: a prospective cohort analysis. *BMJ Open*, 6(9), e012112. E-journal. Available at: https://doi.org/10.1136/bmjopen-2016-012112 [Accessed 16 February 2026].

Varghese, R., Chakrabarty, J. & Menon, G. 2017. Nursing Management of Adults with Severe Traumatic Brain Injury: A Narrative Review. Indian journal of critical care medicine: peer-reviewed, official publication of Indian Society of Critical Care Medicine, 21(10), 684–697. E-journal. Available at: https://doi.org/10.4103/ijccm.IJCCM_233_17 [Accessed 19 January 2026].

Wade, D. T. 2020. What is rehabilitation? An empirical investigation leading to an evidence-based description. Clinical Rehabilitation, 34(5), 571–583. E-document. Available at: https://doi.org/10.1177/0269215520905112 [Accessed 14 July 2025].

Wang, J., Wu, Z., Shi, S., Ren, J. & Ren, X. 2024. Nurse-led care versus neurologist-led care for long-term outcomes of patients who underwent craniotomy in traumatic brain injuries: an efficacy analysis. *Frontiers in Neurology*, 15, 1382696. E-journal. Available at: https://doi.org/10.3389/fneur.2024.1382696 [Accessed 13 December 2025].

Werezak, L. 2025. What are Nursing Interventions? Definition, Types, and Examples. *Nurse.org.* Web page. Available at: https://nurse.org/education/nursing-interventions/ [Accessed 23 January 2026].

Wen, Y., He, Q., Qin, L., Du, Y., Yin, H., Xiang, X. & Xie, Y. 2025). Effectiveness and safety of nurse-led early cognitive and sensory rehabilitation in patients with severe traumatic brain injury: a systematic review protocol. *Frontiers in Neurology*, 16, 1659712. E-journal. Available at: https://doi.org/10.3389/fneur.2025.1659712 [Accessed 15 December 2025].

WHO 2021. Falls. Web page. Available at: https://www.who.int/news-room/fact-sheets/detail/falls [Accessed 23 April 2025]

WHO guidelines on physical activity and sedentary behaviour. 2020. World Health Organization. Web page. Available at: https://iris.who.int/bitstream/handle/10665/336656/9789240015128-eng.pdf?sequence=1 [Accessed: 22 July 2025].

World Health Organization. 2019. Rehabilitation in health systems: guide for action. Web page. Available at: https://www.who.int/publications/i/item/9789241515986 [Accessed 23 January 2026].

Wilson, L., Stewart, W., Dams-O'Connor, K., Diaz-Arrastia, R., Horton, L. & Manley, G.T. 2021. The chronic and evolving neurobehavioral effects of traumatic brain injury. *Journal of Neurology, Neurosurgery & Psychiatry*, 92(2), 104–111. E-journal. Available at: https://doi.org/10.1016/s1474-4422(17)30279-x [Accessed 19 January 2026].

Wylie, G.R. & Flashman, L.A. 2017. Understanding the interplay between mild traumatic brain injury and cognitive fatigue: models and treatments. *Concussion,* 2(4), CNC50 E-journal. Available at: https://doi.org/10.2217/cnc-2017-0003 [Accessed 22 July 2025].

Xu, J., Wang, S., Zhang, Q., Yao, Y., & Yu, J. 2025. Effectiveness of Nurse-Led Early Mobility Protocols on the Outcomes of Critical care Patients: A Systematic Review and Meta-Analysis. Nursing Open, 12(5), e70206. E-journal. Available at: https://doi.org/10.1002/nop2.70206 [Accessed 01 January 2025].

Xu, Y., et al. 2024. Theory-based and evidence-based nursing interventions for the prevention of ICU-acquired weakness in the intensive care unit: A systematic review. BMC Nursing. E-journal. Available at: https://pubmed.ncbi.nlm.nih.gov/39269947/ [Accessed 23 January 2026].

Zhang, H., Pei. X., Chen, L. & Li, Q. 2025. Effects of different nursing interventions for intraoperative acquired pressure injuries: A network meta-analysis. BMC Nursing, 24(1031). E-journal. Available at: https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-025-03645-1 [Accessed 23 January 2026].

Zhang, J., Puvenna, V., Janigro, D., Laskowitz, D. & Grant, G. 2016. Biomarkers of Traumatic Brain Injury and Their Relationship to Pathology. *In D. Laskowitz (Eds.) et. al., Translational Research in Traumatic Brain Injury*. E-journal. Available at: https://pubmed.ncbi.nlm.nih.gov/26583183/ [Accessed 27 October 2025].

Zhou, Y., Zhou, L. & Chen, X. 2025. The Role of Integrated Nursing Interventions in Traumatic Brain Injury Management in the Emergency Department: A Retrospective Study. *Therapeutics and Clinical Risk Management*, 21, 769–780. E-journal. Available at: https://doi.org/10.2147/tcrm.s512673 [Accessed 19 December 2025].

Appendix 1

Table 2. Data retrieval table

Databases (2010-2025)	**Search words**	**Results**	**Accepted for study**
PMC		14	3

Pubmed	traumatic brain injury OR brain injury OR TBI AND nursing OR nurse OR nurse-led OR nursing care OR nursing interventions OR nursing management OR neurorehabilitation OR rehabilitation nursing AND family support OR family involvement OR family education OR caregiver OR psychosocial OR patient education OR rehabilitation OR cognitive rehabilitation	10	2
Frontiers		611	3
MDPI		76	1
BMJ Open		8	1
ScienceDirect		5	2
Emerald		8	1
CINAHL	Traumatic brain injury OR brain injury AND nursing OR nurse care OR nursing interventions OR neurorehabilitation OR rehabilitation nursing OR long-term care	64	2

Appendix 2/1

Table 3. Data Collections

Authors, Year & Title	**Aim**	**Method & Journal Source**	**Key Results**

Azman et al. (2020). Family roles, challenges and needs in caring for traumatic brain injury (TBI) family members.	To review some of the salient roles, challenges and needs of the family caregivers in caring or nursing for their family members diagnosed with TBI.	Systematic Review. Journal of Health Research.	Examine the emotional burdens families face due to lack of proper information and how support from nurses is needed.
Bogner et al. (2019). Family Involvement in Traumatic Brain Injury Inpatient Rehabilitation: Outcomes Related to Participation.	To determine how family participation influences rehabilitation outcomes.	Quantitative study. Archives of Physical Medicine and Rehabilitation.	Family involvement in rehabilitation prompted early recovery and discharge from the hospital.
Burridge and Foster (2019). Compassion in rehabilitation nurses who provide direct care: principles to pragmatics.	To study the dynamics of nursing compassion in rehabilitation settings where direct patient care is provided	Qualitative study. Journal of the Australasian Rehabilitation Nurses' Association.	Expressing and sustaining compassion in rehabilitation requires both individual nursing and organizational actions.
Derbyshire and Hill (2018).	To discuss the process of neurological observation.	Clinical review. British Journal of Nursing.	The role nurses play in the accurate assessment and

Performing neurological observations.			recording of neurological observations to establish a patient's neurological status.
Figueiredo et al. (2024). Nursing Interventions to Prevent Secondary Injury in Critically Ill Patients with Traumatic Brain Injury	To map the range of nursing interventions to prevent secondary injury and improve patient outcomes	Scoping Review. Journal of Clinical Medicine.	ICP control, oxygenation management, and continuous neurological assessment are important mediations in improving patient outcomes.

Appendix 2/2

Authors, Year & Title	**Aim**	**Method & Journal Source**	**Key Results**
Gao et al. (2025). Evidence-based	To compare the effects of an	Quasi-experimental	Nurse-led cognitive

nursing interventions in cognitive dysfunction among adults with brain injury	evidence-based nursing intervention programme vs. conventional nursing care in patients with cognitive dysfunction following brain injury	study. Journal of Global Health.	programs yielded an improvement in cognitive functioning.
Guldager et al. (2019). Nurses' contribution to relatives' involvement in neurorehabilitation: Facilitators and barriers.	To identify possible facilitators and barriers that differently positioned relatives are facing when actively involved in the rehabilitation process of patients with traumatic brain injury.	Mixed-methods. Nursing Open.	Open communication, empathy and good education enable family engagement.

Appendix 2/3

Authors, Year & Title	**Aim**	**Method & Journal Source**	**Key Results**

Herrera (2024). Mindful Care: Nursing Strategies in Traumatic Brain Injuries.	To shed light on critical contributions of nursing in TBI management and emphasize the acute care setting and long-term rehabilitation care are essential for optimizing patient outcomes.	Brief review. Journal of Medical & Clinical Nursing.	Offering emotional support and good communication quality reduces anxiety and improves cooperation between patients and nurses.
Lindlöf et al. (2024). Empowering Support for Family Members of Brain Injury Patients in the Acute Phase	To identify, critically evaluate, and synthesize available evidence of empowering support for FMs in the acute phase of TBI patient hospital treatment, including emergency care, intensive care unit (ICU) care, and inpatient care	Mixed-methods systematic review. Journal of Family Nursing.	Good communication, emotional support, understanding, and involvement in care planning helps families to cope better in the acute phase of TBI patients.
Mckay et al. (2025). The experiences of nurses working	To explore how nurses understand, experience, and	Qualitative descriptive study. Brain Injury.	The lack of proper training and support from organization

with patients who are agitated following moderate-to-severe traumatic brain injury: a qualitative study	manage agitation after moderate to severe traumatic brain injury		poses as a barrier to the competence of nurses in managing the post-traumatic agitation.

Appendix 2/4

Authors, Year & Title	**Aim**	**Method & Journal Source**	**Key Results**
Oyesanya et al. (2016). Caring for Patients with traumatic brain injury	To determine nurses' perceptions about caring for patients with traumatic brain injury.	Survey. Journal of Clinical Nursing.	Nurses stated their limitations in cognitive/behavioral management and highlighted their need for further training.
Shen et al. (2025). A comprehensive review of rehabilitation approaches for traumatic brain injury: efficacy and outcomes.	To evaluate the effectiveness of TBI rehabilitation modalities.	Narrative review. Frontiers in Neurology.	The result of early multidisciplinary rehabilitations are positive long-term outcomes.
Wen et al. (2025). Effectiveness and safety of nurse-	To deliver a definitive synthesis of	Systematic review protocol. Frontiers in Neurology.	Nurse-led stimulation increases early

led early cognitive and sensory rehabilitation	evidence to directly inform the development and implementation of nurse-led neuro-rehabilitation protocols.		recovery as supported by early findings.

Appendix 2/5

Authors, Year & Title	**Aim**	**Method & Journal Source**	**Key Results**
Troeung et al. (2024). Improving Psychosocial Adjustment through the myTBI psychoeducation platform	Develop an online psychoeducation platform for people with traumatic brain injury (TBI), their family members/caregivers, and healthcare staff to improve psychosocial adjustment to TBI across different phases of injury (acute, postacute, and chronic), and (2) undertake an evaluation of efficacy, acceptability, and feasibility.	Mixed-methods protocol. BMJ Open.	An improvement in how TBI survivors cope with emotions, knowledge and socialization are expected.
Zhou et al. (2025). The Role of Integrated Nursing	To investigate and evaluate the impact of integrated nursing	Retrospective study. Therapeutics and	Quick assessment, securing the

Interventions in TBI Management in the Emergency Department	interventions on the management of TBI patients in the ED.	Clinical Risk Management.	airway, and all other integrated protocols has improved stabilization and reduced complications.

Appendix 2/6

Authors, Year & Title	**Aim**	**Method & Journal Source**	**Key Results**
Wang et al. (2024). Nurse-led care versus neurologist-led care for long-term outcomes after craniotomy in TBI.	To compare the effects of two different types of care (nurse-led and neurologist-led) on various the long-term outcomes (daily living activities (ADL), quality of life (QoL), depression, and anxiety of patients and burden of their caregivers) in patients who have undergone craniotomy due to traumatic brain injuries.	Comparative cohort study. Frontiers in Neurology.	Patients are more satisfied when follow ups are done by nurses and the follow ups done by nurses have led to better outcomes in comparison to neurologist led follow ups.

Appendix 3

Table 4. Thematic analysis table

Meaning Units	**Codes**	**Categories**
Continuous neurological and cognitive monitoring by nurses enables early identification of deterioration and guides timely, individualized interventions in patients with traumatic brain injury.	Neurological assessment, cognitive monitoring, early detection	Assessment and Monitoring
Structured education and clear communication provided by nurses empower patients and family members, reduce uncertainty, and improve engagement in care and rehabilitation planning.	Patient education, family education, empowerment, communication	Family and Patient Education
Emotional reassurance, therapeutic communication, and empathetic nurse–patient relationships help manage agitation, anxiety, and behavioral challenges during recovery.	Emotional support, therapeutic communication, behavioral management	Behavioral and Emotional Support
Nurse-led non-pharmacological interventions, including sensory stimulation, cognitive rehabilitation, and environmental modification, support recovery of consciousness and cognitive function.	Sensory stimulation, cognitive therapy, and non-pharmacological rehabilitation	Non-Pharmacological Therapy