

Traumatic Brain Injuries in Pediatrics

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N201 Nursing Care of Special Populations

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November 6th, 2023

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In the United States, it is estimated that more than 2,600 children between the ages of zero to fourteen die due to a traumatic brain injury (TBI), with an estimated 1.8 million pediatric TBIs occurring each year (Ciccio et al.,2023). TBI is also the leading cause of death or disability in pediatrics. The leading direct causes of brain injuries are due to a fall from elevation, a hard impact to the head during sports, or a blunt hit from a motor vehicle accident. Once a TBI takes place, brain swelling occurs immediately causing damage to brain cells and increased intracranial pressure. Children who have experienced TBI may lose consciousness, have a severe headache, nausea, vomiting, and, in some cases, have short term memory loss regarding the event (Scarboro et al.,2020). According to Roher-Baumgartner “survivors frequently struggle with chronic cognitive, behavioral, social, and emotional problems, resulting in reduced everyday functioning and quality of life” (Roher-Baumgartner et al.,2022, p.2). Children who experience a TBI early in their life not only struggle with daily functioning throughout their childhood but can also follow them into adulthood. After doing extensive research it is apparent that traumatic brain injuries in children cause cognitive and emotional delays in their development. These children can benefit greatly if they receive cognitive behavior therapy (CBT), helping to reduce long-term effects as they develop.

“TBI is a blunt force or penetrating injury to the head that disrupts normal brain functioning such as a loss of consciousness” (Scarboro et al.,2020, p.332). There are three different classifications of brain injuries: mild, moderate, and severe concussion. A mild concussion injury can cause a low-grade headache, slowness in thinking, acting, speaking and reading, poor concentration, and being easily agitated. A moderate injury can cause loss of memory for up to 24 hours and loss of consciousness. Severe injury is a loss of memory for more than 24 hours,

coma/loss of consciousness, and seizures. (Scarboro et al.,2020). It can alter the central nervous system and how it matures, which can affect the whole life-course of the individual (Roher-Baumgartner et al.,2022). Since pediatrics are still developing mentally, they can suffer substantially due to the fact their brain is still growing. The individual may discover challenges are more apparent over time especially as social demands increase. In order to assist in the rehabilitation of a TBI one needs to understand how it effects a child's cognition.

According to an article by Flint Rehab, most brain injuries, regardless of the severity, will cause an individual to experience some form of emotional and/or behavioral changes. These changes may include the following:

- emotional lability, causing possible extreme mood swings
- anxiety disorders, which can cause panic disorders and/or obsessive-compulsive disorders
- depression
- impulsive behaviors and/or personality disorders
- lack of emotions
- lack of empathy and/or social skills (Maher, 2021).

Considering these findings, it can be difficult for a child with a TBI to engage in social relationships especially as they mature without the proper rehabilitation. Cognitive behavior therapy is the most studied form of psychotherapy treatment available today and can help an individual manage the effects of a traumatic brain injury. CBT's primary goal is to help people understand why they behave the way they do. There are three core principles which CBT is built upon. These core principles are:

- beliefs create feelings
- feelings dictate behavior

- behavior reinforces beliefs

Unearthing unhealthy thinking patterns is the focus of CBT and is basically training your brain to replace negative thoughts with positive ones (Flint Rehab, 2021). Once the brain continues the same behaviors over and over again, they stay and soon become subconscious behavior which is the purpose of CBT therapy.

There are several strategies a therapist may use when focusing on cognitive behavior therapy. One is cognitive restructuring technique. This technique helps a person to question their thoughts, specifically, the negative ones. Normally, we accept our thoughts as true and accurate, however, after a TBI, these thoughts tend to be dysfunctional. (Maher, 2021). Cognitive restructuring helps one to get rid of negative thoughts and, rather, focus on what is real. With the successive approximation approach, the therapist focuses on an individual's lack of motivation. An individual is given a task with a less taxing difficulty than the one they are dealing with at the moment. When the patient tackles the less difficult item, the more daunting task doesn't seem as hard or overwhelming. Activity scheduling is a technique that helps one to initiate positive behaviors. It focuses on planning things throughout the day that promote a person's well-being, such as reading a book, taking a walk, meditation, etc. It also helps the person to recognize those things that trigger negative behaviors and thoughts, such as too much alone time or even lengthy periods of time in crowded places. The last technique is called skills training. This focuses on helping the individual improve upon or learn how to handle certain situations such as social communication, problem-solving, and assertiveness (Maher, 2021). These four techniques are great ways to assist patients who have a TBI, however, it is important to note, those with severe cognitive deficits may not benefit from CBT, as it does require an individual to recognize they are having difficulties with their social, emotional, and cognitive issues. Those that do not see a

difference or a problem with their behavior will most likely not seek help and get the therapy they need.

Because neurocognitive skills are not as fully established in children as they are in adults, it is imperative they receive the proper therapy necessary for them to lead a normal life (Gomez-de-Regil et al.,2019). The education system is starting to recognize the importance of some type of intervention needed for children with TBI's. Understanding how to identify students who might benefit from these services will be crucial and will likely require moving beyond historically standardized tests that don't adequately identify areas that are associated with the TBI population. According to an article by Angela Ciccio, students more than a year past their injury had poorer social outcomes than those students with recent injuries (Ciccio et al.,2023). This could be due to their continued frustration of not being able to handle everyday tasks and issues. These students may benefit from noise reduction in the classroom, extra breaks and extra time to complete tasks, and an understanding from their classmates to reduce negative and hurtful comments. A combination of family and school intervention will enable parents and teachers to work together so these children with TBI's can have a feeling of control and self-efficacy, ensuring they have problem-solving strategies which will have long-term effects on their leaning as well as their social/emotional difficulties (Rohrer-Baumgartner et al.,2022). When these approaches are added to CBT, it increases the child's ability to lead a normal functioning life.

Studies have proven that CBT does work. An article from Frontiers took several reported studies to analyze how well, and if, cognitive behavioral therapy does improve a child's well-being and quality of life. They found that CBT has been shown to be effective in reducing depression symptoms, improving emotional function, reduced anxiety levels and decreases in behavioral and psychological problems (Jeffries et al.,2022). The findings also reported that

those children who received CBT therapy over other types of interventions continued to show decreases in anxiety levels after therapy, indicating this type of therapy has greater rewards on the child for maintaining wellness in the future. Including parents in the therapy sessions could have a greater affect on the child's success as well. Goals are often set which are specific, measurable, achievable, realistic/relevant as well as timed (Rohrer-Baumgartner et al.,2022). Changes in the family's dynamics as well as everyday life will inevitably be altered. Helping the parents, and even siblings, understand their child's/sibling's limitations and roadblocks will allow them to better appreciate what the child is going through and be more tolerant/supportive, which, no doubt, will ease some of the tension that could otherwise be in the household.

In conclusion, CBT is crucial to a child who has a TBI and getting them the proper care, they need as quickly as possible is crucial. Once a child is physically stable, cognitive, emotional, behavioral, and social difficulties can manifest, hindering their daily activities (Gomez-de-Regil et al.,2019). Depending on the severity of the injury, CBT could be a lengthy process and may be ongoing for the rest of their lives, requiring a transition of CBT into adulthood due to the way the brain changes every day. The success and future of a TBI patient really is a team effort by many, but, if initiated, can aid in the well-being and future of the individual.

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