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Executive Function and Social Skill Support After Traumatic Brain Injury

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Abstract

In the United States, there are 5.3 million people living with a traumatic brain injury (TBI) (CDC, 2017). Globally, it is estimated that by the year 2020, 10 million people will be affected annually (Humphreys, Wood, Phillips & Macey, 2013). The impact of TBI is immense not only for affected individuals, but also for caregivers, friends, colleagues, and families. From a psychosocial perspective, the economic effects of TBI have been projected over the course of a lifetime at $9.2 billion for medical expenses and $51.2 billion in productivity losses (Eakin, Baratz-Goldstein, Pick, Zindel, Balaban, 2014). The consequences of TBI are lifelong and far-reaching with a lot of variables influencing long-term rehabilitation. Many individuals experience lifelong physical, cognitive, and behavioral impairments that affect interpersonal, social, and occupational domains. Successful rehabilitation has the potential for substantial economic savings for both society and the affected individual (Humphreys et al., 2013). However, the challenges presented by TBI cross professional boundaries and necessitate a unified, integrated plan of treatment that extends beyond rehabilitation facilities to the individual's daily environment. It is critical that those comprising the support systems of persons with TBI gain an understanding of current challenges and potential hurdles on the road ahead. This article will discuss the social and emotional needs and the supports and treatment interventions required to maximize positive outcomes in daily living and employment arenas.

Keywords: traumatic brain injury, social problem solving, executive functioning

Traumatic brain injury, caused by sudden trauma to the brain, affects 1.4 million Americans each year (Langlois, 2004) and is the leading cause of disability among young adults in Western industrialized nations (Lezak, Howieson, & Loring, 2004). The results of TBI can vary depending upon the type and location of the injury, as well as the severity. Injury to the highly susceptible prefrontal and orbitofrontal areas of the brain can result in damages ranging from minor differences to injury-induced death (Brookshire, 2007). Roughly, 75% of traumatic brain injuries are considered mild and include injuries such as concussions.

Changes that result from TBI may impact the physical, cognitive, and/or emotional functioning of the individual. Some common physical changes are fatigue, seizures, chronic pain, clumsiness, dizziness, as well as changes in hearing, vision, smell, taste, and appetite. Difficulties with sleep and temperature regulation may also be noted (Ashman, Gordon, Cantor, & Hibbard, 2006). Cognitive problems may include impaired attention, concentration, memory, learning, and academic abilities (Ashman et al., 2006). Possible impairments in emotional functioning are apathy, irritability, moodiness, aggression, and impulsivity (Ashman et al., 2006). All of these changes have the potential for detrimental effects on the personal relationships, social life, and academic or workplace environments of an individual with TBI. The physical, cognitive, and psychosocial deficits resulting from TBI can have a substantial effect on quality of life—potentially affecting both daily living skills and employment functions—but a less obvious result of TBI is the impact it has on how these individuals perceive the world (Rassovsky et al., 2006).

Executive Function Impairment

The concept of executive function was established in 1986 by researchers Norman and Shallice (Brookshire, 2007). Since then, the idea has been expanded upon through research by professionals in many diverse disciplines (Meltzer, 2007). Executive functions have been likened to the CEO of the body, as these skills allow individuals to plan and prioritize. Executive function comprises skills related to memory, reasoning, attention, problem-solving, and planning. These abilities are essential to executing the intentional behaviors a person makes throughout daily life, such as prioritizing, minimizing distractions, reducing impulsive behavior, accomplishing goals, and maintaining routines (Meltzer, 2007). These control processes also play a role in functioning in social contexts as executive functions also allows for mental flexibility, which is crucial to the application of social skills.

Individuals with TBI may face a variety of challenges, if their injuries result in impaired executive functioning. The effect of TBI on executive function is dynamic in the sense that the abilities are impaired immediately following injury and, depending on the severity and location of the injury, the recovery rate will vary (Cicerone, Levin, Malec, Stuss & Whyte, 2006). Individuals with mild impairments to executive function may have difficulty staying on task or monitoring the appropriateness of their words and behaviors. Those with moderate disabilities may experience complications with everyday activities, such as shopping,

driving, keeping of the home, or managing medications (Brookshire, 2007). When a more severe impairment is present, a person may be unable to execute independently the actions needed to satisfy basic needs, such as thirst, which leads to significant reliance on family members and caregivers. The rehabilitation of executive function will depend on several variables: the individual's self-awareness and motivation, personal goals and readiness for treatment, the presence of mood disorders, and familial and community supports (Brookshire, 2007).

Traumatic Brain Injury Recovery

There is a somewhat predictable pattern of recovery from TBI described as a stair-step from little to no improvement followed by periods of rapid growth. (Brookshire, 2007). It is a long-recognized fact that the recovery process for individuals with milder injuries is more favorable than for individuals with more severe damage (Brookshire, 2007). Additionally, the age of the individual is also a factor that influences recovery. Older individuals have slower recovery time and a higher mortality rate than younger individuals, with those over 60 being twice as likely to die from their injuries, compared to those age 20 and younger (Wilson,1987).

Polinko (1985) describes three-tiers of TBI recovery: injury to stabilization, return to consciousness, and rehabilitation. The third stage is the most intensive one for family, and it is the one which is most critical for family involvement in the treatment process. During this phase, the family has moved beyond the initial shock and has had time to assess the future. Although this can be a period of high optimism, positive expectations may not be met. For the best possible outcomes, it is critical that service providers include the family in this portion of treatment because interdisciplinary collaborations involving the family are most vital during the early stage of injury when medical, physical, and behavioral issues are the most severe.

There are many reasons why friends and family may tend to interact less and less with an individual with TBI which in turn may cause social isolation and reduced opportunity to practice social skills after the injury (Godfrey & Shum, 2000). Friends and family may be expecting the individual to return to his or her pre-injury selves and may not understand the personality changes that have occurred. The extra effort required when interacting with individuals with TBI may become burdensome for families, resulting in frustration and even anger. While frustration and hopelessness are indeed understandable, the rehabilitation period is not the time for social isolation. Social problem solving is the way individuals adapt and cope with the day-to-day stressors within their environments including the adaptation to and alteration of the difficulties they face, and how they adjust their responses to those situations.

Role of Family in Traumatic Brain Injuries

Boyle (2002) discussed the importance of involving the family in the rehabilitation process and the benefits that come from the interdisciplinary team working in concert with family members to develop and implement both long-term and short-term care plans. The family is more familiar with the individual and knows details about both verbal and nonverbal communication skills. They are also the ones who are most aware of the personality traits, idiosyncrasies, likes, dislikes, and routines of the individual (Boyle, 2002).

Boyle further addressed the need for assuring that the family's voice is heard, and that open communication is established and maintained throughout the recovery process. A successful rehabilitation plan will include coping strategies to address planning deficits, mood changes, and social skill struggles (Meltzer, 2007). Family involvement at this stage is critical to the success of the treatment plan. For assisting with planning deficits, the family may assist with using a calendar to plan weekly events, helping with establishing new routines, and troubleshooting possible changes to scheduled events. When addressing situational mood differences, family members may assist by recognizing potential triggers and altering the environment when needed, thereby allowing the individual time to calm down before discussing emotional reactions to the situation. It is also vital that the family assures the individual that mood issues are to be expected and are injury-related and not reflective of moral character or the individual's position within the family.

Families and/or caregivers of individuals with TBI are affected by the injury as well. Caregivers may be forced to adopt suddenly new physical, financial, and emotional responsibilities, which often leads to significantly increased stress levels (Goldsworthy, 2015). As many as 75% of caregivers present with increased stress, and increased rates of depression, anxiety, social isolation, and changes in other familial relationships are also common (Backhaus, Ibarra, Klyce, Trexler, & Malec, 2010; Marsh, Kersel, Havill, & Sleigh, 1998). Backhaus and Ibarra (2012, as cited in Goldsworthy, 2015) state that the grieving process for families and caregivers of individuals with TBI is unique from those for other traumatic experiences in that the extent of the person's injury and prognosis for recovery are often difficult to identify with certainty, resulting in turbulent emotional states on the part of the caregivers and families. Additionally, the behavioral and emotional changes that commonly affect the individual with a TBI leave families feeling a sense of loss and uncertainty for how their familial roles and dynamics might be forced to change (Goldsworthy, 2015). Kolakowsky-Hayner, Miner, and Kreutzer found in their 2001 study, that the needs of the family change throughout rehabilitation and that their quality of life diminishes over time. It is crucial that caregivers develop proper coping and wellness strategies to ensure their health, while caring for a person with TBI.

Community Effects of Traumatic Brain Injury

The effect of TBI may also be seen in the individual's community and their place of work. According to McCrimmon & Oddy (2006), rates of unemployment following TBI run as high as 70% due to ensuing and long-lasting social and interpersonal issues that hinder reintegration into the workforce and community. Impairment in executive function can have a substantial impact on the psychosocial, cognitive, and communicative areas of a person's life and may explain why unemployment rates are so high for this population (Tate, Fenelon, Manning, & Hunter, 1991). While some long-term effects of TBI may merely hinder workplace and community success, other symptoms may prevent an individual from engaging in endeavors enjoyed in the past or returning to work at all (Mayo Clinic, 2011). Furthermore, executive dysfunction has been linked to changes in the affected individual's personality. Acquiring and maintaining gainful employment is a significant contributor to quality of life where as unemployment significantly limits personal financial means and healthcare options (Bogner, Corrigan, Mysiw, Clinchot, & Fugate, 2001).

While some symptoms of TBI may improve over time, many individuals have lasting effects. Several TBI symptoms can have a dramatic impact on an individual's professional and community relationships. An inability to focus on the task at hand, difficulty following conversations, decreased problem-solving ability, memory lapses, difficulty following instructions, lack of inhibition, fatigue, anxiety, or depression can all have significant effects on both occupational and social performance (Mayo Clinic, 2011). It is important that both employers and community members recognize the difficulties associated with TBI to understand the noticeable changes in the affected individual so that appropriate accommodations and workplace improvements can be made.

Both executive functioning and social problem solving entail the integration of a range of cognitive skills key to workplace success. For example, the ability to initiate and maintain goals allows workers to stay on task. Being able to monitor tasks increases work efficiency. Inhibiting irrelevant or inappropriate responses to workplace issues and appreciating multiple perspectives result in a more pleasing work environment. It is imperative for workers to monitor their behavior and make adjustments as needed. Adapting one's actions is critical to any given environment. It is imperative that family, friends, and colleagues provide the social interaction and social challenges that individuals with TBI need to return to the workplace. Social skills, particularly social problem solving, are paramount for the individual to gain and maintain employment and are a significant predictor of success on the career front (Godfrey, Partridge, Knight, & Bishara, 1993).

Along with unemployment, another particularly troubling statistic related to TBI is the divorce rate which is four times greater than the general U. S. population (Kerr, Kay, & Lassman, 1971). Social maladjustment, maladaptive personality, and substance abuse are factors thought to contribute to the increase in the rate of divorce. As seen in challenges with maintaining employment, social skills deficits, particularly social problem solving, have been implicated as a contributor to social maladjustment seen in individuals with TBI (Godfrey, Knight & Partridge, 1996). Deficits in social functioning (mediated by the dorsolateral frontal regions of the brain) and issues in regulation and expression of emotion (a function of the orbital frontal areas of the brain) can be the most debilitating aspects of severe TBI.

As social functioning is a primary concern for individuals with brain injury, training in social competence as part of the rehabilitation process becomes critical. It is easy to see the importance of including social skill training as part of the rehabilitation process. Along with not having sufficient opportunities to practice skills due to increased social isolation following TBI, having the mental flexibility to apply the appropriate social interactions is often inadequate.

Conclusion

Traumatic brain injury happens without warning and affects persons of all ages. Resulting injuries can range from mild to severe impairments (Boyle & Haines, 2002). Those with severe impairments can experience significant and lasting effects influencing interpersonal, social, and occupational performance. Families of individuals with TBI can be critical to the rehabilitation of individuals with TBI. According to Kolakowsky-Hayner, et al. (2001) the family is also impacted by the injury and their needs can change over the course of rehabilitation. It is important to take into account the needs of the family and their quality of life. Executive functioning and social problem solving have been shown to influence the well-being of individuals following TBI (Kendall, Shum, Halson, Bunning, & Teh, 1997; Muscara, Catroppa, & Anderson, 2008; Rath, Simon, Langenbahn, Sherr, & Diller, 2003). Executive dysfunction can result in personality changes and alterations in behavior which can affect not only relationships within the family but community and occupational interactions as well (Oddy, Humphry & Uttley, 1980). Social skill training will have little impact on the quality of life of the individual, if the executive functioning of the individual is not taken into consideration. Social problem solving can be addressed through role-playing and practicing appropriate verbal and non-verbal responses to new social situations. (Meltzer, 2007).

Integration of these critical components into the therapeutic rehabilitation process in conjunction with familial involvement will help individuals with TBI obtain the best possible outcomes for leading self-determined lives.

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