Traumatic Brain Injury: Informed accommodation in the classroom

Trent Martin
Avondale College of Higher Education, Cooranbong, NSW

Stuart Campbell
Avondale College of Higher Education, Cooranbong, NSW

Marion Shields
Avondale College of Higher Education, Cooranbong, NSW
marion.shields@avondale.edu.au

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Abstract

This paper discusses traumatic brain injury (TBI) and the symptoms that affect a student emotionally, cognitively and socially after experiencing a TBI. Traumatic brain injuries can have a profoundly negative impact on a child's ability to learn at school and interact with peers in social situations. Recent research shows how TBI affects brain function and the impacts that this can have on education. However, research also suggests effective strategies that teachers can use in their classroom when teaching a student who has experienced a TBI.

> *"The occurrence of TBI is increasing … [it] will be the third leading cause of death and disability by 2020 … Children and adolescents belong to the highest risk age group"*

Introduction

Acquired brain injury (ABI) is a term that describes the result of any damage to the brain that occurs after birth; and can be due to lack of oxygen, strokes, neurological disease or accidents. This paper focusses on Traumatic Brain Injury (TBI), a subset of ABI, which results from a 'traumatic' event—such as a car accident or a blow to the head—that causes brain impairment (Australian Institute of Health & Welfare, [AIHW], 2007). There are two classifications of TBI: open-head and closed-head injuries. Open-head injuries occur when the scalp or skull is pierced and the damage is usually localised. Closed head injuries result from an external force which damages the tissues beneath the skull, including where the head moves backwards and then forwards (as in whiplash or Shaken Baby syndrome) when the damage is likely to be on both sides of the brain (Aldrich & Obrzut, 2012). The occurrence of TBI is increasing globally due to increased vehicle use and according to the World Health Organisation, will be the third leading cause of death and disability by 2020 (Hyder, 2007). The severity of a TBI is measured by the length of time the person is unconscious using the Glasgow Coma Scale (GCS). The ratings that originate from the GCS inform both immediate surgical and other medical interventions for the individual (Sherer et al., 2017, p. 125). Traumatic brain injury is potentially lethal; however, with correct rehabilitation and care, the majority of individuals can recover successfully.

Why is this topic important for teachers?

Children and adolescents belong to the highest risk age group for receiving a TBI (Lewandowski & Reiger, 2009). Therefore, it is likely that educational professionals will be required to teach students who are suffering with symptoms related to TBI. In Australia TBI is common—approximately 2.2% of Australians have had a TBI (AIHW, 2007, p. 1). The exact incidence of TBI is difficult to measure, depending on which data is used: length of unconsciousness, hospital admissions, emergency room visits or G.P. visits in addition to under-reporting for mild injuries (Schilling & Getch, 2012). In the US during 2013, just over 54% of all TBI-related hospitalisations and deaths in children were caused by falls and in general, TBI contributes around 30% of all deaths from injuries (Centers for Disease Control and Prevention [CDCP], 2017). The three major causes of TBI in children aged between 0-14 are falls (40%), vehicle accidents (31%) and abuse, which includes shaking or pushing children (14%) (CDCP, 2017; AIHW, 2007).

It is important to understand that the majority of students will return to school still experiencing some symptoms from their traumatic brain injury (Clark, 2012). Unfortunately, research has shown that

many teachers don't realise that these symptoms may not be physical, thus gaining the impression that the child is fully recovered (Glang et al., 2015). Researchers (Glang et al., 2015, p. 216) assert there is a "significant discrepancy between the number of children with TBI reported by hospitals and the number of students receiving special education" due to TBI. It has been suggested that at best, "only one in six children who need post-TBI special education and related services are receiving educational programming designed to address their specific needs" (Glang et al., 2015, p. 213). In fact Ball & Howe, (2013, p. 74) comment: "Children who experience moderate to mild head injuries are unlikely to go to specialist rehabilitation services, may be out of hospital within days of their injury; thus this much larger group is even less likely to receive professional support outside of their initial medical care". Rushworth (2012, p. 8) also notes: "lack of societal awareness compounds the problem. The majority of children with an ABI make a good *physical* recovery and often they will show no outward signs of disability. The common effects of injury, such as poor short-term memory, fatigue or irritability can be misinterpreted as simply flaws in the person."

What else do we know about TBI?

The initial recovery process from TBI is rapid, occurring over an 18-36-month period, with about 80 percent of recovery occurring during the first 6 months (Valente & Fisher, 2011). According to Jagoda (2010) the majority of mild TBI patients will recover quickly and return to somewhat normal functioning within 3 months. However, unfortunately 20% of people who experience a mild TBI continue to live with symptoms needing ongoing medical care. Traumatic brain injuries can result in varying outcomes due to factors such as "the severity of impact, as well as the involvement of varied and often multiple areas of the brain" (Wright, Zeeman & Biezaitis, 2015, p. 1).

Who should assist a child with TBI?

As a consequence of its varied nature, TBI leads to a different range of "physical, psychological and social difficulties, and as a result, requires a diverse range of rehabilitation efforts from a variety of health practitioners across different settings, over the course of the recovery process" (Wright, Zeeman & Biezaitis, 2015, p. 1). Along with health practitioners, school counsellors and psychologists also need to play a vital role in helping students and school staff with management of symptoms caused by the TBI (Canto, Chesire, Buckley & Andrews, 2014). The starting point for teachers in understanding students with TBIs is to either obtain or request a neurophysical evaluation from the case manager of the child's TBI rehabilitation (Mayfield & Homack, 2005). This will give in-depth detail on the extent of the deficits of the student, allow comparisons with prior-to-TBI performance and will also allow the creation and implementation of an Individualised Education Program (IEP) (Levesque, 2011). This program should be created in collaboration with relevant health professionals and should involve the parents in order to meet all the needs of the child.

What are symptoms that teachers need to recognise?

Sherer et al., (2017, p. 126) note that TBI commonly results in a wide range of emotional, sensory and cognitive impairments and these often lead to further neurobehavioral issues such as impaired concentration, insomnia, restlessness and fatigue. In the classroom setting, symptoms of traumatic brain injury can be misunderstood as common behavioural or learning issues (Jantz & Coulter, 2007). Therefore, teachers need to have an understanding of the various intellectual, physical, emotional and social outcomes of TBI so they can recognize and support these students who are struggling to cope. Children that sustain a TBI may have impaired functioning in the classroom such as experiencing cognitive difficulties in concentrating, solving problems and understanding what is required by their teacher (Mayfield & Homack, 2005). However, children with TBI can become capable learners if teachers are willing to investigate their learning difficulties, collaboratively develop effective IEPs and differentiate their teaching to accommodate their needs.

> *"only one in six children who need post-TBI special education … are receiving educational programming designed to address their specific needs"*

Long-term symptoms

Children who sustain a TBI under the age of five will typically report "disruptive behaviour, poor empathy and a lack of moral reasoning when they become older" (Tonks, Slater, Frampton, Wall, Yates & Williams, 2009). This type of behavioural change can be more disturbing for parents than the actual cognitive deficit (Tonks, Yates, Williams, Frampton, & Slater, 2010).

Individuals who have experienced a traumatic brain injury are likely to have difficulties with their social and emotional behaviour (Glang et al., 2015). Individuals with TBI often report poor conduct, emotional distress, and problematic peer relationships (Tonks et al., 2009). Multiple long-term studies have indicated that symptoms of TBI often continue or get worse as the child develops (Fulton, Yeates, Taylor, Walz, & Wade, 2012). This results in children with traumatic brain injury, falling behind their peers in both academic performance and social skills as the educational requirement of independent learning and functioning becomes greater (Fulton, et al., 2012). Perhaps this may explain why a study conducted in

New York City revealed that 50 percent of males and 49 percent of females admitted into the juvenile prison system had a history of traumatic brain injury (Kaba, Diamond, Haque, Macdonald, & Venters, 2014).

Educational challenges

In the classroom setting, children with TBI "present a unique constellation of learning and behavioural challenges" (Glang et al., 2015, p. 212) and struggle with both educational and behavioural challenges. Studies have shown that TBI affects a person's cognitive, academic, emotional, behavioural and social functioning that can have a profound impact on a student's ability to succeed at school (Jantz & Coulter, 2007). Students with TBI can experience similar deficits to children with neurodevelopmental disorders and may have "difficulties with self-regulation like students with emotional disturbance, or may struggle with attention and concentration like students with attention deficit and hypoactive disorder" (Glang et al., 2015, p. 212). Students with TBI may also experience cognitive problems with memory and knowledge gaps as they struggle to remember or relearn previously mastered skills (McAllister, Flashman, Sparling & Saykin, 2004).

According to Arroyos-Jurado and Savage (2008) "these effects can influence students' ability to navigate the behavioural, social, and academic demands of the classroom" and cognitive impairment following TBI is "inevitable and varies according to the severity of injury" (p. 252). Impairment due to TBI can include disorders of learning and memory, complex processing, perception and communication (Arroyos-Jurado & Savage, 2008).

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Strategies for teachers

Given the physical, cognitive, and behavioural deficits faced by students with TBI, Harvey (2006) recommends two concepts as essential to the effective teaching of students with TBI: variability and flexibility. This suggestion serves as a broad and general principle for overcoming emerging challenges. However, more specific guidance is needed to address precise difficulties such as impacts on memory, attention, speech and communication, vision and behaviour (Clark, 2012).

Memory support

After experiencing a TBI, it is common to lose recollection or have memory loss to the point where one may forget how to conduct simple, everyday tasks (Ylvisaker, Jacobs, & Feeney, 2003). Going back to school with memory deficits can be extremely difficult. According to Schutz, Rivers, McNamara, Schutz and Libato (2010), poor memory is one of the most common symptoms of TBI and "the way to help assist these children is to first understand as much as one can about memory and the different types that are affected by the injury" (Clark 2012, p. 9). Researchers (Knight, Harnett & Titov, 2009) assert multiple areas of memory—short term, intermediate, functional, working, and complex —can be damaged by TBI. However, there are ways teachers can help improve the memory of students after a TBI. These strategies include: coming up with a routine of daily tasks, being organised, using tools that aid the memory, such as posters and check-lists (Clark, 2012). Additionally, Schilling and Getch (2012), suggest strategies and solutions should include providing the students with regular breaks from routines, supplying outlines of lectures and content of classes, and giving alternative assessments.

Issues of attention

Another common deficit caused by TBI is difficulty paying attention. According to Clark (2012) there are four common sense ways to assist students with their attention: find a place to work that limits distractions, avoid multitasking, allow the student to work at a pace that is realistic for them, practice focus and attention skills by doing everyday tasks, such as reading a short story and performing simple mathematics problems, and give breaks when needed. Assistive technology is also highly useful for supporting students with TBI (Dettmer, Ettel, Glang, & McAvoy, 2014). Devices and tools such as daily diaries (electronic) —aiding attention by reminding, smartphones, iPad and computers with educational applications—can provide increased motivation through immediacy of interaction and response, engaging graphic interfacing and individualisation of tasks. All these can help students function proficiently, support memory and reduce cognitive strain (Brain Injury Association, 2015).

Behaviour challenges

Behaviour management plans are also vital in creating a positive and effective learning space for the student. These plans do not only involve reactive discipline but are more focused on proactive discipline by targeting trigger points for the child and giving them a 'safe space' to retreat to if the classroom environment becomes overwhelming (Linden, Braiden, & Miller, 2012, p. 95). Determining the antecedent prior to an outburst or withdrawal is vital in eliminating triggers. Proactive preventive measures include: creating a routine that avoids (where possible) identified antecedents, preparing the student before changes take place in the routine, and redirecting the student as soon as the behaviour begins (Mayfield & Homack, 2005.). Students with TBI are also highly likely to become physically and

mentally fatigued throughout the day so it is important to vary academic and non-academic classes regularly, so they can rest in addition to providing 'brain breaks'. This is will increase productivity dramatically and furthermore improve a student's sense of well-being and self-esteem (Mayfield & Homack, 2005

Regardless of the severity of the injury, communication between the hospital, other supporting services, the parents and other school staff involved with the student is vital in order to have a successful transition into the classroom. The aim of this communication should be to collect "medical and functional information to help the school in developing an appropriate and individualized plan for the student's re-entry into school" (Bowen, 2008, para. 3).

The following table (Adapted from Bowen, 2005) suggests strategies and external aids to support a student with various cognitive deficits.

Social emotional issues and strategies

A frequent and critical result of a TBI for children is the loss of both memory and ability to perform certain tasks at which they previously excelled. Returning to school can be distressing for a student who is recovering from a TBI particularly

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Table 1: Strategies and external aids to support a student with cognitive deficits

Cognitive Impairment	Teaching/Learning Strategies	External Aids
ATTENTION • Difficulty concentrating • Easily distracted • Hard to multitask • Easily bored • Unable to complete things • Can't remember • Changes subjects often	• Control noise & activity • Preferential seating • Simple instructions • Slow pace • Allow breaks & rest • Small sections of work • Use cues (verbal gestural, visual) to remind • Repeat instructions	• Earplugs to reduce noise • Timer to focus attention • Place symbols & signs to remind students
MEMORY • Forgets people, places, things • Forgets specific routines & rules • Forgets instructions • Frequently loses things	• Repeat new information • Teach visual imagery • Simplify information • Task analysis • Use fact cards & cue sheets • Teach study skills • Teach note-taking • Teach self-questioning	• Checklists, Post it notes • Keep items in specific locations • Use labels, maps, journals, calendars, planners • Memory notebook • Timers & alarms
ORGANISATION • Forgets specific routines & rules • Frequently loses things • Difficulty starting or finishing a task • Difficulty sequencing tasks	• Review daily routines • Specific locations & labels • Assign an in-class peer buddy • Involve an older student mentor/ learning coach	• Use a visual schedule • Highlighting & colour-coding • Checklists for tasks • Binder with subject sections & homework pockets • Daily planner to record homework • Graphic organisers for sequencing • Timelines for assignment completion
WRITING & INFORMATION PROCESSING • Difficulty starting writing • Losing place and confusion	• Reduce written work • Allow extra time • Allow verbal response • Enlarge print on worksheets • A catch up period at end of the day	• Use digital recorders • Assign peer note-taker • Use word processor • Use peer scribe

> *teachers need to be observant and ensure that the student with a TBI is neither isolated nor bullied*

if medical appointments and hospital visits increase their social isolation (as well as their academic disadvantage). Schilling & Gretch (2012, p. 57) suggest three strategies to address these difficulties: "ongoing guidance and counselling; community or school based coaching of social skills; and Community TBI support groups." The latter enable the student to interact with others who are struggling with the same issues. Teachers who are alert to this difficulty can facilitate interactions with other students through partner and group work, as well as incidental coaching through role plays as needed. In addition, teachers need to be observant and ensure that the student with a TBI is neither isolated nor bullied. Above all, communication between teachers, parents and students, needs to be calm, collaborative, positive and encouraging.

Conclusion

As has been shown, traumatic brain injury has serious and often lasting negative effects on a person's ability to learn and have a successful education. Teachers need to have an understanding of the signs and symptoms of TBI so that they can recognise when a student in their class may be experiencing symptoms related to a head injury. The hospital system, family and school system need to work together to improve the outcomes for young people with traumatic brain injury, beyond initiating an IEP. When compassion, effort and perseverance characterise the teacher's approach, and this is demonstrated in a planned implementation of differentiation within the evaluated facilitation of an effective IEP, progressive improvement in the all-round well-being and self-esteem of the student with a TBI can be expected. TEACH

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Author information
Trent Martin and Stuart Campbell were Master of Education students when co-authoring this study, both graduating in 2017.

Marion Shields is a Senior Lecturer in the Discipline of Education, currently completing a second doctorate researching Early Childhood Christian Leadership.