

EDUCATING STUDENTS AFTER ACQUIRING A TBI

Educating Students After Acquiring a Traumatic Brain Injury:
A Meta-Synthesis

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Abstract

Since the addition of traumatic brain injury, as a specific category, to the Individuals with Disabilities Act of 1990, schools around the United States have become more aware of this complex, unique disability. More students are now being serviced correctly by special education teachers and support personnel, in the educational setting. As more students are entering the education system, under the disability category of traumatic brain injury, and receiving the correct individualized services for their disability, the more students are graduating from high school and going on to be successful in a college education. These individuals are able to have access to accommodations they need in school and possibly for the rest of their lives. This meta-synthesis of the literature on student reentry after a traumatic brain injury, investigates the sudden onset of injury, the academic reentry process, common characteristics as a result of injury, family dynamics caused by an injured member, and the life of an individual, post injury.

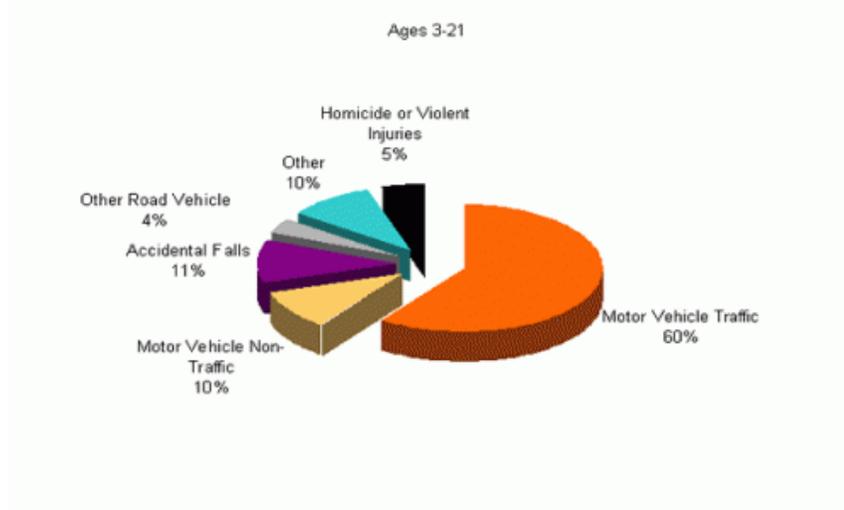
1. Introduction

1.1. Background

“Brain injury is not an event or an outcome. It is the start of a misdiagnosed, misunderstood, under-funded neurological disease,” confirms the Brain Injury Association of America. (BIAA)

According to the BIAA, “Brain injuries come in many forms, and different intensities. The sustained head injury or traumatic brain injury, (TBI) is one that occurs after birth by an outside force”. This meta-synthesis is written for those students who have entered or re-entered the school system after sustaining a traumatic brain injury; in an effort to assist them and the professionals who work with them.

“Educators began to give increased attention to traumatic brain injury (TBI) after the U.S. Congress included this category in the Individuals with Disabilities Education Act (IDEA) in 1990”. (Doelling & Byrde, 1995) A TBI can impact an individual’s brain function in many ways causing mental impairments that can significantly affect their way of life. TBIs vary greatly in intensity and resulting impairments. Each individual is different in the way they are affected, however, there are usually some similarities with this disability, resulting from which area of the brain was impacted, how much force was sustained, and the duration of time an individual remained unconscious. In the United States many children through young adults are affected by brain injuries each year. The graph below illustrates the most common ways that an individual may sustain a traumatic brain injury.



“Students, who have sustained a traumatic brain injury, represent a diverse population that exhibit the full spectrum of educational needs.” (Stavinoha, 2005, pg. 11) Due to the nature of this disability, students may have a hard time re-entering school after the initial stages of recovery. If there has been minimal damage to the brain resulting from a concussion, the student might not have the effects that someone who has extensive damage to their brain.

In many cases the resulting brain damage is the main injury an individual has received. Other injuries may be external, such as cuts and bruises, possibly broken bones or damaged internal organs; however if there is no other external injuries, it is the brain damage that is the differentiating factor for the individual. This type of injury is invisible to others around them. There are many different variations of this disability, yet none should be excused and unmonitored.

1.2. Author's beliefs and experiences

During the summer between my freshman and sophomore year of high school I sustained a severe head injury, following a motor vehicle accident. The accident left me

unconscious at the scene, when I was rushed to the hospital with a head wound and punctured lung, I was placed into the intensive care unit with multiple life supports to wait out my coma. I was admitted to two different hospitals for a total time period of a month. While in the first hospital I was in a coma for two and a half of the four weeks. I do not remember anything about my stay at the first hospital. As I was waking up, from my coma, I was transferred to another hospital for my beginning stages of recovery, and inpatient therapy. I only remember a couple things from this hospital stay, overall I lost a month of my life and cannot recall any information about what happened. The personal information in this paper comes from what others have told me about my hospital stay, my personality, my schooling, and my own experiences while dealing with the effects of a severe traumatic brain injury.

I have been told that my hospital stay consisted of two and a half weeks in a nonresponsive comatose state, until I began to wake up. After I woke up and relearned basic survival needs, I was moved to a different hospital, where I began to complete inpatient physical, occupational, and speech therapy. These therapies helped me learn basic skills, such as walking, communicating effectively, and how I could best get on with my life. I was released after a month long hospital stay, even then I had to continue receiving physical, occupational and speech therapy, before attempting to reenter school. My days were shorter than normal because I tired easily, I don't remember anything about my recovery other than how I felt, and some of the tasks I struggled to complete.

Going back to school was exceptionally hard; everything I had previously learned was forgotten; relearning was frustrating, I could remember some tasks that I used to

complete easily and now they took me twice as long. I was unable to process information quickly like before, and holding information in my short term memory long enough for it to go into my long term memory, was a different story all together.

My physical appearance is normal, there is some scarring but it is covered with clothing, or my own hair; however at the time of injury I had extensive neurocognitive deficits that led to, a personality shift, new behavioral disturbances such as; angry outbursts, impulsivity, and lack of attention, slower cognitive functioning, lack of memory abilities, and withdrawal from peers. Now almost twelve years later, I still look normal, but I still have memory loss, childhood memories that were never recovered, and new memories that I am unable to make, slower processing speed, especially when conversing with others, and sensitivity to light and sound. My journey to this point has been both challenging and rewarding,

I believe the hardest part of going back to school for me, and for many, is that my physical appearance did not change. I remember teachers telling me they would not accommodate for me, based on my physical appearance, "I was not injured." My friends and family quickly realized I was not the same person, and I required an exceptional amount of help to be able to function in a school setting again.

A traumatic brain injury can be acquired at any age after birth, sometimes an infant has a traumatic experience resulting in a TBI, other times children or teenagers have an experience that results in a TBI. These injuries and resulting disabilities are similar in the aspect that the brain has been damaged by an outside force, and the injury is a sudden onset. Children like this are within our classes in elementary schools around the

world. They are often misdiagnosed and being serviced by special education teachers under a different disability category that has similar characteristics. The difference between an infant sustaining a TBI and an older child, who has one, is in their education. All ages of individuals may undergo a changed personality, trouble with social skills and memory; however it is the older individuals who have entered the school system that generally have the hardest time or the most difficulty coping with their newly acquired disability.

Brain injuries come in many different forms, from mild to severe, with varying amounts of neurocognitive deficits. Depending on the severity of brain damage, these individuals may require assistance controlling their behaviors, and remembering different aspects of their life, most often these individuals need to relearn the academics that they have established up until the time of injury. These students are going through the same path of re-learning that I required when I came back to high school after my injury. I have had the opportunity to work with students such as this, during different stages of my teaching career. When I tell them about my struggles and achievements, they often relate to me very well, knowing that I was in their shoes and had to overcome the same struggles that they face themselves.

My mission is to help make teachers, principals, and other school administrators aware of the, sometimes unseen, disability that this population of students can have. I have a passion for teaching those who are in the same shoes I can remember. I know how hard it is to learn with a disability, and I want to help other students who may be going through the same struggles, to succeed and have high hopes from their futures.

1.3. Purpose of this meta-synthesis

This meta-synthesis includes; information about brain injuries, experiences from individuals who have a brain injury themselves, experiences from individuals who know those that have brain injuries, experiences from teachers who work with these students; and ways to possibly help these students as they re-enter school, and thus had multiple purposes.

One purpose was to locate journal articles and/or other literature that contained general information about traumatic brain injuries. The second purpose was to locate journal articles and/or other literature that contained information about individuals who had sustained traumatic brain injuries and their recovery process. The third purpose of their meta-synthesis was to locate journal articles and/or other literature that showed a successful re-integration of individuals, particularly students into their everyday life, with accommodations. The fourth purpose was to find journal articles and/or other literature that specifically contained information about students with traumatic brain injuries and their re-integration into the school system. My final purpose in this meta-synthesis was to gather information from these articles about ways to help these individuals get back to and maintain as “normal” of a life possible and make this information available to the general public, caregivers, and educators.

2. Methods

2.1. Selection Criteria

The 38 journal articles, and one web site, included in this meta-synthesis met the following criteria:

- 1) All explored issues relating to traumatic brain injuries.
- 2) All explored issues relating to students with traumatic brain injuries.
- 3) All explored the results of a TBI on emotional stability of individuals.
- 4) All explored the emotional effects on family's and those close to individuals with TBI's/
- 5) The articles picked were published in peer-review journals.
- 6) The articles and books were published between 1993 and 2012.

2.1. Search procedures

Database searches and ancestral searches were conducted to locate articles for this meta-synthesis.

2.2.1. Database searches

Beginning in August 2012, I conducted systematic searches of databases, and library book records, which held information related to the effects on and an individual's life after sustaining a brain injury, the emotional impact it had on those close to the individual, and how their education was effected.

The data bases included; (a) Education Resources Information Center (ERIC, Ebscohost); (b) Education Journals (ProQuest); (c) Loussac Library (book database); University of Alaska Library (book database); I used the following search combinations to conduct searches of each database:

1. ("Special education") and ("elementary education") and ("brain injury")

2. (“Elementary education”) or (“special education”) and (“brain injury”)
3. (“Brain injury”) and (“emotional”)
4. (“Brain injury”) and (“emotional”) and (“elementary education”) or (“special education”)
5. (“Brain injury”) and (“emotional”) and (“elementary”) or (“special education”) and (“advocacy”)
6. (“Brain injury”) and (“education”) and (“advocacy”)
7. (“Traumatic Brain Injury”) and (“Personality Change”)
8. (“School reentry following head injury”)
9. (“Students”) and (“school”) and (“TBI”)

The various database searches yielded a total of 32 articles that met my selection criteria: (Arryos & Savage, 2008; Bowen, 2005; Bullock, 2005; Bush, Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012; Carter & Spencer, 2007; Chesire, Buckley & Canto, 2011; Cools & Manders, 1999; Degeneffe & Lynch, 2007; Degneffe & Olney, 2008; Doelling & Bryde, 1995; Doelling, Bryde & Parette, 1997; Feeny & Ylvisaker, 2008; Fowler & McCabe, 2011; Kehle, Clark & Jenson, 1996; Kirkwood, Yeates, Randolph & Kirk, 2012; Lash, Savage & DePompei, 1998; Lucas, 2010; Mayfeild & Homack, 2006; McPherson & Pentland, 1997; Noreau, Lepage, Bossere, Picard, Fougeryrollas, Mathieu, Desmarais & Nadeau, 2007; Nykorchuk, 2008; Schessman, 2010; Schutz & McNamara, 2011; Schutz, Rivers, McNamara, Schutz & Lobato, 2010; Shilling & Yvette, 2012; Singer & Nixon, 1993; Stavinoha, 2006; Sutton, Barchard, Bello, Thaler,

Ringdahl, Mayfeild & Allen, 2011; Telzrow, 2001; Witte, 1998; Wolcot, 1995; Zable, Gray, Gradner, Ackerman, 2005)

2.2.2. *Ancestral searches*

An ancestral search is when one reviews the reference lists of previously published works to locate literature relevant to one's topic of interest. I conducted ancestral searches using the reference lists of the previously retrieved articles. These ancestral searches yielded four additional articles that met the selection criteria (Lash, Savage, DePompei & Blosser, 1998; Mayfield & Homack, 2005; Telzrow, 1987; Wade, Cassidy, Walz, Taylor, Stancin & Yeates, 2011; Wolcott, 1995).

2.3. *Coding procedures*

I generated a coding form to categorize the information found in each of the 36 articles. The coding form was based on (a) publication type; (b) research design; (c) participants; (d) data sources; and (e) findings of the studies.

2.3.1. *Publication type*

I evaluate each article according to its publication type, (e.g., research study, informative articles, guides, opinion/position piece, annotated bibliography, review of the literature). *Research studies* are classified as systematic methods used for gathering and describing quantitative and/or qualitative data. *Informative articles* are classified as *Guides* are recommendations and strategies that explain how others might implement a particular programs, or policies. *Opinion/position piece* are explanations of an author's opinion about an issue. An *Annotated bibliography* is a list of articles on a specific topic

with a brief summary about each article included. *Review of the literature* summarizes the essential themes of previously published articles centered on a particular topic.

2.3.2. *Research design*

Each empirical study was further classified by research design (i.e., quantitative, qualitative, mixed methods research). *Quantitative* research utilizes numbers to convey information. Instead of numbers, *qualitative* research uses language to explore issues and phenomenon. *Mixed methods* research involves the use of both quantitative and qualitative methods to present information within a single study.

2.3.3. *Participants, data sources, and findings*

I identified the participants in each study; (e.g., kindergarten-twelfth grade students, teachers, psychologists, paraprofessionals, siblings, and parents of these students). I also identified the data sources used in each study (e.g., observations, surveys, and data collection). Lastly I summarized the findings of each study (Table 2).

2.4. *Data synthesis*

I analyzed each of the 36 articles included in this meta-synthesis using the modified version of the Stevick-Colaizzi-Keen method previously employed by Duke (2011) and Duke and Ward (2009). I began by identifying the significant statements within each article. For the propose of this meta-synthesis, significant statements were identified that addressed issues related to: (a) the misdiagnosis of students with a traumatic brain injury (TBI);(c) the sudden onset of this disability, makes students' needs vary greatly from peers; (c) the transition of those students back to school, kindergarten-twelfth grade; (d) lack of direct research on the best reentry process for

these students; (e) significant cognitive deficits effect classroom functioning and possibly result in behavioral and/or emotional modifications; (f) the changes that occurred after 1990 when TBI was recognized by the Federal Government as a disability category in special education; (g) ideas for reentry into the general education classroom, involving one-on-one aids; (h) the continual assessment of students with traumatic brain injuries. I then generated a list of verbatim significant statements with paraphrased formulated meanings. These meanings are representative of my interpretation of each significant statement. Lastly I formulated meanings from all 36 articles, and grouped them into theme clusters, representing emergent themes. These emergent themes are representative of the fundamental elements of the entire body of literature.

3. Results

3.1. Publication type

I located 36 articles that met my selection criteria. The publication type of each article is located in Table 1. (Arryos & Savage, 2008; Bowen, 2005; Bullock, 2005; Bush Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012; Carter & Spencer, 2007; Chesire, Buckley & Canto, 2011; Cools & Manders, 1999; Degeneffe & Lynch, 2007; Degeneffe & Olney, 2008; Doelling & Bryde, 1995; Doelling, Bryde & Parrette, 1997; Feeney & Ylvisaker, 2008; Fowler & McCabe, 2011; Kehle, Clark & Jenson, 1996; Kirkwood, Yeates, Randolph & Kirk, 2012; Lash, Savage & DePompei, 1998; Lash Savage, DePompei & Blosser, 1998; Lucas, 2010; Mayfeild & Homack, 2005; Mayfeild & Homack, 2006; McPherson & Pentland, 1997; Noreau, Lepage, Boissere, Picard, Fougeyrollas, Mathieu, Desmarais & Nadeau, 2007; Nykorchuk, 2008; Schlessman,

2010; Schutz & McNamara, 2011; Schutz, Rivers, McNamara, Schutz & Lobato, 2010; Shilling & Yvette, 2012; Singer & Nixon, 1993; Stavinoha, 2006; Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild & Allen, 2011; Telzrow, 1986; Telzrow, 2001; Wade, Cassedy, Walz, Taylor, Stancin & Yeates, 2011; Witte, 1998; Wolcott, 1995; Zable, Gray, Gardner & Ackerman, 2005)

Table 1

Author(s)/ Year of Publication	Type of Publication
Arryos & Savage, 2008	Descriptive Work
Bowen, 2005	Descriptive Work
Bullock, 2005	Descriptive Work
Bush, Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012	Research Study
Carter & Spencer, 2007	Research Study
Chesire, Buckley & Canto, 2011	Descriptive Work
Cools & Manders, 1999	Research Study
Degeneffe & Lynch, 2007	Research Study
Degeneffe & Olney, 2008	Research Study
Doelling & Bryde, 1995	Guides
Doelling, Bryde & Parrette, 1997	Guides
Feeney & Ylvisaker, 2008	Research Study
Fowler & McCabe, 2011	Descriptive Work
Kehle, Clark & Jenson, 1996	Guides
Kirkwood, Yeates, Randolph & Kirk, 2012	Research Study
Lash, Savage & DePompei, 1998	Guides
Lash, Savage, Depompei & Blosser, 1998	Descriptive
Lucas, 2010	Descriptive Work
Mayfeild & Homack, 2005	Descriptive Work
Mayfield & Homack, 2006	Descriptive Works
McPherson & Pentland, 1997	Research Study
Noreau, Lepage, Boissere, Picard, Fougeyrollas, Mathieu, Desmarais & Nadeau, 2007	Research Study
Nykorchuk 2008	Research Study
Schlessman 2010	Descriptive Work
Schutz & McNamara, 2011	Descriptive Work
Schutz, Rivers, McNamara, Schutz & Lobato, 2010	Theoretical Work
Shilling & Yvette, 2012	Descriptive Work
Singer & Nixon, 1993	Research Study
Stavinoha, 2006	Descriptive Work
Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild & Allen, 2011	Research Study
Telzrow, 1987	Descriptive
Telzrow 2001	Theoretical Work
Wade, Cassedy, Walz, Taylor, Stancin & Yeates, 2011	Research Study
Witte, 1998	Research Study
Wolcott, 1995	Books; Guides
Zable, Gray, Gardner & Ackerman, 2005	Research Study

3.2. Research design, participants, data sources, and findings of the descriptive works, research studies, guides, and theoretical works.

As stated previously, I located fifteen research studies that met my selection criteria (Bush, Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012; Carter, & Spencer, 2007; Cools, & Manders, 1999; Degeneffe, & Lynch, 2007; Degeneffe, & Olney, 2008; Feeney, & Ylvisaker, 2008; Kirkwood, Yeates, Randolph, & Kirk, 2012; McPherson, & Pentland, 1997; Noreau, Lepage, Boissere, Picard, Fougereyrollas, Mathieu, Desmarais, & Nadeau, 2007; Nykorchuk Mccaleb, 2008; Singer, & Nixon, 1993; Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild, & Allen, 2011; Wade, Cassedy, Walz, Taylor, Gerry, Terry, & Keith, 2011; Witte, 1998; Zable, Gray, Gardner, & Ackerman, 2005). The research design, participants, data sources, and findings of each of these studies are identified in Table 2.

Table 2

Author(s)	Research Design	Participants	Data Sources	Findings
Bush, Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012	Mixed Methods	Four college students, people associated with them; such as parents, fellow students, and teachers.	Descriptive data, case study data, interviews	Participants showed different awareness levels to their disabilities. Some accommodations to assist in academic achievement may not be appropriate depending on the individual’s severity of injury.
Carter, & Spencer, 2007	Qualitative	seventeen year old male TBI survivor	Archival records, documents, interviews, participant-observation, direct observation	This investigation explores a successful recovery for this twelfth grade student after a moderate to severe TBI. Support from his family, educational personnel, and medical professionals coalesced to aid his recovery. The adolescent had entered into the acknowledgement and acceptance phase, his success stemmed from this point in time.
Cools, & Manders, 1999	Mixed Methods	10 adults with TBI, and 10 control subjects	Test results, interviews, surveys	This study showed that subjects with TBI had problems with procedural function, descriptive function, cohesion relations, and narrative function. They also showed problems in functional communication, and general pragmatic ability, and discrete problems in comprehension and in presuppositional abilities.

<p>Degeneffe, & Lynch, 2007</p>	<p>Qualitative</p>	<p>270 adult siblings of persons with TBI</p>	<p>Surveys, interviews</p>	<p>Siblings of persons who sustained a TBI show clinically significant depressive symptoms. These symptoms may be from lack of valued family activities, less accessibility to social support.</p>
<p>Degeneffe, & Olney, 2008</p>	<p>Qualitative</p>	<p>280 adult siblings of person with TBI</p>	<p>Surveys, interviews</p>	<p>Common concerns about a sibling's future included, concerning future caregivers, quality of professional care, injured siblings independence, recovery, and relationships with family and friends.</p>
<p>Feeney, & Ylvisaker, 2008</p>	<p>Mixed methods</p>	<p>Two young elementary students</p>	<p>Single subject reversal designs, single subject experiments, observations, numerative data collected over a time period</p>	<p>This study showed the effects of multicomponent cognitive-behavioral intervention on challenging behaviors exhibited by young school age children after a TBI. The intervention included integrated components of positive behavior supports, cognitive supports, and an executive function routine. Results included reduced frequency and intensity of challenging behaviors, and increased quantity of work completed.</p>
<p>Kirkwood, Yeates, Randolph, & Kirk, 2012</p>	<p>Quantitative</p>	<p>276 children age eight-sixteen, earlier study included seventeen year old students</p>	<p>Test results accumulated after proctors administer neuro-psycho assessments</p>	<p>Students with TBI preformed significantly worse on nearly all neuropsychological tests. Practitioners should add other tests when a student enters school to</p>

				accurately show their abilities and difficulties.
McPherson, & Pentland, 1997	Mixed Methods	54 individuals with head injuries	Test results, accumulated after proctors administer the Barthel assessment, surveys, interviews	When a student comes back to school, what is the best measure to show their ability? The Barthel measures intellectual functioning, communication, behavior and mobility, this study showed that there is a need for additional scales to be used when describing a student's ability following a TBI.
Noreau, Lepage, Boissere, Picard, Fougeyrollas, Mathieu, Desmarais, & Nadeau, 2007	Mixed Methods	Children between five and thirteen years of age. 94 parents of children with disabilities.	Interviews, test results	Testing showed the lacking life skills in those children who had sustained a TBI, these results were very similar to those of other same aged peers with other disabilities causing a developmental delay.
Nykorchuk, 2008	Mixed Methods	Parents of students enrolled in kindergarten –twelfth grade	Parent completed questionnaire data	Prior to 1990, brain injury was not recognized by the Federal Government as a disability category in special education. As a result many children were misidentified, or not identified at all. Results of study suggest, students are less likely to receive Section 504 services and also are less likely to receive special education services under the disability category of Traumatic Brain Injury.
Singer, & Nixon, 1993	Qualitative	Twenty five parents, children ranging from the	Participation, interviews	The human tragedy of the permanent damage of a child takes place in the context of social

ages of three-forty.

institutions that are only minimally cognizant of the social and emotional impacts of the trauma on the family. Parents reacted to the personality changes and behavior problems, social isolations due to being away from school, and the rehabilitation phase.

Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild, & Allen, 2011	Quantitative	123 children with sustained TBI, sixty five children diagnosed with ADHD	Test scores	Visual-motor integration scores are sensitive to motor deficits in children with developmental and acquired brain dysfunction, these are among the most common acquired forms of brain dysfunction in children.
Wade, Cassedy, Walz, Taylor, Gerry, Terry, & Keith, 2011	Quantitative	Children three-seven years of age, their parents	Videotapes, behavior ratings, surveys, interviews	Findings suggest that parenting quality may facilitate or impede behavioral recover following early TBI. Interventions that increase positive parenting may partially ameliorate emerging behavior problems.
Witte, 1998	Quantitative	Seven year old male, his parents, teacher, principal, nurse, and school psychologist	Informal data, surveys, test results	A young boy affected by sustaining a (TBI) has major impulse control; self-control continues to be the number one behavioral priority with his recovery. The school implemented preventative strategies, including structure in the classroom, and different accommodations for learning.

Zable, Gray, Gardner, & Ackerman, 2005	Qualitative	Students with TBI, school paraprofessionals,	Surveys, observational data	One-to-one aides can be important intervention resources for the reintegration of children into school following TIB'S. The intervention model allows for continuous feedback, and the reacquisition to functional classroom skills.
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3.2.1. Research design

Four of the 15 studies (27%) used quantitative research design (Kirkwood, Yeates, Randolph & Kirk, 2012; Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild, & Allen, 2011; Wade, Cassedy, Walz, Taylor, Stancin, Yeates & 2011; Witte, 1998). Six of the studies (40%) utilized a mixed methods research design (Bush, Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012; Cools, & Manders, 1999; Feeney, & Ylvisaker, 2008; McPherson & Pentland, 1997; Noreau, Lepage, Boissere, Picard, Fougeryrollas, Mathieu, Desmarais, & Nadeau, 2007; Nykorchuk Mccaleb, 2008). Five of the studies (33%) used a qualitative research design (Carter & Spencer, 2007; Degeneffe & Lynch, 2007; Degeneffe & Olney, 2008; Singer & Nixon, 1993; Zable, Gray, Gardner & Ackerman, 2005).

3.2.2. Participants and data sources

The majority of the 15 studies included in this meta-synthesis analyzed data that included school age children who have Traumatic Brain Injuries and are receiving special education services in one or more areas of their lives. Nine of the studies (60%) analyzed data that was collected from school aged children and their caregivers or school

personnel (Noreau, Lepage, Boissere, Picard, Fougeyrollas, Mathieu, Desmarais, & Nadeau, 2007; Kirkwood, Yeates, Randolph, & Kirk, 2012; Feeney, & Ylvisaker, 2008; Bush, Hux, Zickefoose, Simanek, Holmberg & Henderson, 2012; Carter & Spencer, 2007; Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild, & Allen, 2011; Wade, Cassedy, Walz, Taylor, Gerry, Terry, & Keith, 2011; Witte, 1998; Zable, Gray, Gardner, & Ackerman, 2005). Four of the studies (27%) analyzed data from adults who had a Traumatic Brain Injury themselves or related directly to someone with a Traumatic Brain Injury (McPherson, & Pentland, 1997; Degeneffe, & Lynch, 2007; Degeneffe, & Olney, 2008; Cools, & Manders, 1999). Two of the studies (13%) analyzed data that was taken from the parents of individuals who had a Traumatic Brain Injury in their childhood. (Nykorchuk, 2008; Witte, 1998) In addition to students, families, school personnel, and paraprofessionals, data was also analyzed by other participants, including but not limited to doctors and lawyers.

Surveys, testing data, and interviews provided the most data sources that were used in these research studies. Five of the studies (33%) used surveys to collect data from participants (Zable, Gray, Gardner & Ackerman, 2005; Witte, 1998; Wade, Cassedy, Walz, Taylor, Gerry, Terry & Yeates, 2011; Degeneffe, & Lynch, 2007; Nykorchuk, 2008). Five of the studies (33%) used testing results to collect data from participants (Sutton, Barchard, Bello, Thaler, Ringdahl, Mayfeild, & Allen, 2011; Cools, & Manders, 1999; Feeney, & Ylvisaker, 2008; Kirkwood, Yeates, Randolph, & Kirk, 2012; McPherson & Pentland, 1997). Five of the studies (33%) used interviews to collect data from participants (Singer, & Nixon, 1993; Bush, Hux, Zickefoose, Simanek, Holmberg &

Henderson, 2012; Carter & Spencer, 2007; Degeneffe, & Olney, 2008; Noreau, Lepage, Boissere, Picard, Fougeyrollas, Mathieu, Desmarais & Nadeau, 2007). Other data sources were also used in the research studies, including questionnaires, experiments, descriptive data, case study data, observation data, and video analysis.

3.2.3. Findings of the studies

The findings of the 15 research studies included in this meta-synthesis can be summarized as follows.

1. Students who sustain a Traumatic Brain Injury are often misrepresented in the general school setting and do not get the individualized help they require to achieve with their permanent disability. Since this disability has been recognized by the Individual's with Disabilities Education Act (IDEIA), in 2004, schools are beginning to be more careful when classifying special education students with relation to their specific disability.

2. There are specialized tests that are beneficial for students transitioning back into school after sustaining a TBI. These tests need to be administered by a trained professional, who understands the different characteristics resulting from the sudden onset of a traumatic brain injury. These students need to be accommodated for, in order for them to become successful in the classroom.

3. Teachers and special education students need to work together with paraprofessionals and family members to create the best possible outcome when returning to school, after a (TBI) has occurred. The team should create an educational plan that covers potential social and psychological needs of the individual, look into what

adaptive needs the student has, and produce an educational program that focuses on strategies to accommodate deficits in cognition that manifest in all instructional areas.

4. The sudden onset and tragedy of permanent damage caused when an individual obtains a traumatic brain injury, is only one side of the social and emotional impact that this event has on a family. Family members and friends react to the personality changes, and potential behavior problems that can occur. Family members worry about the wellbeing of the individual well into their adult lives.

3.3. Emergent themes

Eight themes emerged from my analysis of the 36 articles included in this meta-synthesis. These emergent themes, or theme clusters, include (a) traumatic brain injury, “*Silent Epidemic*”;(b) sudden onset and permanence of disability;(c) how family dynamics change after a member receives this type of injury (d) transition back to regular life after a traumatic experience; (e) most common academic, behavioral, and social characteristics after a traumatic brain injury; (f) planning for this type of student to share a classroom; (g) useful accommodations should be made for a TBI student to be successful; (h) life after sustaining a TBI. These eight theme clusters and their formulated meanings are represented in Table 3.

Table 3

Theme Clusters

Traumatic Brain Injury,
“Silent Epidemic”

Formulated Meanings

- Traumatic Brain Injury is the most frequent cause of disability and death among children in the United States
- Students with TBI have been entitled to special education services through provisions of the Education for All Handicapped Children’s Act of 1975, under the category of “other health impaired”
- Traumatic Brain Injury was added, as a specific category, to the Individuals with Disabilities Act until 1990, due to its seriousness and complexity
- Traumatic Brain Injury applied to both open and closed head injuries resulting in impairment in one or more areas
- Frankowski (1986) estimates that seven million brain injuries occur annually in the United States, with 500,000 requiring hospitalization and follow-up treatment
- This disability is often misdiagnosed as another disability
- Much of the education of individuals with TBI is spent in public school classrooms
- *Most students show no physical evidence of disability*
- When students are permanently disabled by TBI, return to school, most are placed in mainstream classrooms and incorrectly presumed capable of resuming their education
- Educators generally presume TBI is a low incidence disability, belief is incorrect
- Most children with severe TBI, have less obvious deficits, and their appearance is normal giving parents and teachers the false impression that the injury is healed and the child can function normally in a general education classroom
- Most TBI survivors have no obvious physical, communicative, or intellectual deficits

<p>Sudden Onset and Permanence of Disability</p>	<ul style="list-style-type: none"> ● TBI differs from other disabilities, it happens suddenly ● Family members may have little knowledge of special education services and procedures (due to suddenness of disability) ● TBI often result in both short and long term changes to cognitive, behavioral, and social functioning ● *Complete recovery form a brain injury is a myth*
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	<ul style="list-style-type: none"> ● Major factor causing student needs to be different than those of others with disabilities is the sudden and traumatic onset of disability
<p>How Family Dynamics Change After a Member Receives This Type of Injury</p>	<ul style="list-style-type: none"> ● Change in family dynamics, (Mother, Father, Siblings) how they relate to one another and/or interact with each other ● Reaction to sudden onset of disability, most parents state their children are different, and “not the child they once were” ● Parent behaviors play a critical role in child’s recovery (studies suggest that parenting quality may facilitate or impede behavioral recovery following a TBI) ● Family members become concerned about an individual’s future, related to caregiving, independence, recovery, ● Strained relationships with family and friends ● Higher rates of depression for individual and those around the individual ● More restrictions in valued family activities (usually to accommodate for TBI individual) ● Increased stress throughout family members ● Large social and emotional impacts on the family, following TBI ● Parents reacted to the personality changes and behavior problems, social isolations due to being away from school, and the rehabilitation phase.
<p>Transition Back to Regular School Life After a TBI</p>	<ul style="list-style-type: none"> ● It is not unusual for students with TBI to require many months, or years of therapy to assist in their recovery ● The effects of brain injuries often last for many years beyond date of injury, total number of children enrolled in school with a TBI is estimated to be greater than 3% ● One of the most difficult times can be the return to past environments ● Primary goal of school reentry, ensuring the academic and social success of the child in the least restrictive environment ● As students’ progress (recover) both program and placement changes will be necessary

	<ul style="list-style-type: none"> ● Students will benefit the most from a quiet classroom, with reduced distractions and a low student-teacher-ratio ● Students with TBI react poorly to change and worse with surprises ● Support from family, educational personnel, and medical professionals aid in recovery of all individuals ● Successful educational programs for students with TBI include the provision of training and support for teachers and other personnel involved in the provision of services ● Transition back into the educational setting should be completed gradually, often students only attend half day schooling until they gain the stamina to make it through a full day of school
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Most Common Academic, Behavioral, and Social Characteristics, or Needs, After a Traumatic Brain Injury

- Students will spend more time studying if they are to retain a normal amount of instruction (usually the time as before, doubled)
- Personality change, speech impairments
- Cognitive impairment following a TBI is inevitable and varies according to the severity of the injury
- Students with TBI exhibit the full spectrum of educational needs
- Students with TBI have more variability in abilities than do students with learning disabilities
- Varied levels of injury in children result in a range of characteristics and resulting needs
- Recall deficits, higher levels of frustration
- Reduced stamina, possible seizures and coordination problems
- Impulsive behavior
- Headaches, vision and hearing problems
- Display frustrations in response to classroom demands
- Exhibit lowered self-esteem, depression
- Rapid behavioral and educationally relevant changes (students usually do not perceive these difficulties as related to the injury)
- Difficulty with effective communication among peers and instructors
- Possible physical limitation and medical impairments

- Mild to significant memory impairment
- Changes to individuals cognitive abilities, and ability to maintain attention
- Anxious overload to testing or giving presentations
- Testing showed the lacking life skills in those children who had sustained a TBI

<p>Planning and Useful Accommodations for This Type of Student to Share a Classroom and Become Successful</p>	<ul style="list-style-type: none"> ● The reentry process is critical to the students success, it should be led by the parent and include everyone who will be a part of the students school life ● Pace the school reentry process as to not add additional stress to student, family, teacher(s), or classroom, gradual reentry: attending school for half days before starting back to a full day schedule ● School reentry should be completed as soon as feasible, it may help reduce the isolating effects from being absent for an extended amount of time ● Ongoing multidisciplinary assessment strategies ● Objectives should address long term life goals, as well as more immediate transition needs ● Assistive technology devices ● Collaborative efforts among family, educational, and rehabilitation professionals ● Students peers may need special preparation for their classmate to return, involving peers in reentry may make the process less stressful ● Safety concerns with plans to follow ● Allow student frequent breaks, adequate rest time between activities ● Break activities/assignments into smaller chunks for student, alternate assignments may become necessary ● Provide written outlines of lectures, copies of notes ● Provide detailed timeline to student that includes completion dates of assignments ● Offering behavior supports: positive reinforcement, nonverbal cueing, verbal feedback, and eliminating external distractions ● Offering academic supports: adequate test time possible alternate assessments, extra time and alternate assignments,
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	<p>assistive technology, limited academic load, direct instruction</p> <ul style="list-style-type: none"> ● Offering social supports: ongoing counseling, social skills group, TBI support groups ● Predictable and consistent routines ● Training of students in self-management techniques ● Positive reinforcements, specific rewards and consequences ● Initial IEP should be closely aligned to monitoring the students behavior, concept learning, and academic performance ● Optional counseling through school or an outside agency ● One-to-one aids can be an important intervention resource for reintegrating these students
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Life After Sustaining a TBI

- Statistically 98-99% of students with disabilities are either misclassified into educational programs that cannot help them or unclassified and left to learn on their own.
- Many students returning to school after experiencing a TBI, are very different from their prior selves
- Children who functioned above average before injury take even longer to fall significantly below grade level
- Most of the early impairments are temporary
- Many TBI survivors are classified into a different form of exceptionality and earn a special diploma, other become frustrated and alienated by how helpless they have become and drop out
- Cognitive deficits often take the longest time to recover from the impact of injury
- Many young students have gone on, graduated and attended colleges. Usually these students have utilized accommodations throughout the rest of their school careers and some individuals need accommodations for the rest of their lives
- Entering into the acknowledgement and acceptance phase is what allows an individual to have a successful recovery

4. Discussion

In this section I have summarized emergent themes from my analysis of the 36 articles included in this meta-synthesis. These emergent themes were connected to my own personal experience being a student with a traumatic brain injury, and my practices as a special education teacher.

4.1. Traumatic Brain Injury, “Silent Epidemic”

The term Traumatic Brain Injury (TBI), refers to an injury to the brain that occurs after birth, in relation to an impact of the head by an object. Both open and closed head injuries are classified as TBI's. This injury or disability is the most frequent cause of disability and death for children in the United States. The important thing to remember about a traumatic brain injury is the lasting effects are permanent, an individual has the ability to regain much of what was lost, but their brain will be forever damaged. Another important factor to remember about this disability is, the damage may be completely internal, leaving the individual without physical evidence of their disability.

In relation to education, TBI, has been a part of children receiving special education services under the, Education for All Handicapped Children's Act of 1975, classified as “other health impaired.” Then in 1990 TBI was added, as a specific category, to the Individuals with Disabilities Act until 1990, due to its seriousness and complexity. Students with this disability are often miss-diagnosed as having another disability, this lead to inadequate services being provided due to the disabilities nature. One of the most common misdiagnosis is ADHD, because of the inability to sustain attention for long periods of time. As an educator who has the lasting effects of a traumatic brain injury, I

would like for more professionals in the education carrier to become more aware of the lasting effects of a TBI, and how to best help these students.

4.2. Sudden onset and permanence of disability

The biggest misconception about traumatic brain injury is that, the student will make a full recovery. A TBI is a lifelong disability, which will forever change the makeup of an individual's brain. This disability differs from other childhood disabilities because it happens suddenly, and they often result in both short and long term changes to cognitive, behavioral, and social functioning. An individual has the ability to recover some of the lost information that they used to have, depending on how sever their injury was.

Students in our schools, who have been recognized as students with a traumatic brain injury, usually make the bulk of their recovery before reentering the school setting. This recovery takes place in hospitals, if they required medical care, or therapists seen outside of the school day. Due to the sudden onset of this disability, parents may not be aware of the services and policies that are related to special education. Care is needed when communicating with the families of these students, most parents state that their child is "not who they once were."

4.3. How family dynamics change after a member receives this type of injury

The sudden onset of this disability has large effects on the stress level, and social emotional effects of a family. The parents have seemingly lost the child they once knew, and now have a child who acts different in various ways. Due to the difference in behaviors there are strained relationships within the family unit in relation to the individual with the injury, and often these strained relationships travel outside of the

family to friends of both the effected individual and family members. These strains are most common a result of the other family members worrying about the individuals and can lead to higher rates of depression within the family.

I know these strains all too well, looking back on my personal recovery I now recognize the strain a TBI injury has on a family unit. These effects can and usually do last well into the future years after the initial injury stage. If a child still requires medical assistance well into their life time, the effects of the disability on the family will be different than those of a family who has an individual who was able to recover and strive to high expectations. The reaction of the family plays a large role in the recovery of a child with TBI. If the family ignores the disability and does not offer assistance, the individual will not recover as quickly or to the fullest extent as an individual with a family that supports recovery. Family dynamics are sure to change, either in a positive or negative way after a member receives a traumatic brain injury. That individual, adult or child will never be the individual they once were.

4.4. Transition back to regular school life after a TBI

Depending on the severity of the TBI, and other injuries sustained at the time, it is possible to make a transition back to a relatively normal life. Some of the variability's of recovery are determined by the age of an individual at the time of injury, and others are determined by location and force of an impact on the skull. Students who suffer from an impact to the skull resulting in a TBI may have months to year of additional therapy to assist in their recovery. It is not uncommon for some effects to last for months or years beyond the initial impact of injury, complete recovery is a myth and can never be

obtained once the brain cells have responded to the force of impact. One of the most difficult times for an individual to transition back to, can be returning to past environments. Some individuals may begin to remember those past environments, and the activities they used to complete while that they are unable to participate in now, due to their injury. I remember returning home from the hospital and not having the ability to climb into the bunk bed where I had slept in years prior to my injury. Individuals who have traumatic brain injuries react poorly to change and even worse with surprises; when transitioning back to their old lives, things should be kept as normal as possible for the recovering individuals.

As students return to school, support will be needed from family, educational personnel and medical professionals to aid in the continued recovery of all individuals. Some of the most successful educational programs for students with TBI included the provision of training and support for teachers and other personnel involved in the provisions of services. The primary goal of school reentry should be to promote the academic and social success of the child, while keeping them in the least restrictive environment. As a student recovers both the program and their instructional placement should be changed to meet their individual needs. These students will benefit the most from a quiet classroom, with reduced distractions and a low student teacher ratio, though this set up is not always possible the teacher should be aware of how to best accommodate the newly returning student in their classroom. It should be noted that as a student returns, it is common for them to return to the education setting gradually, often attending part day school for a while until they become able to maintain themselves for

the entire school day. As an educator, with a traumatic brain injury, I have gone through the transition stages, myself, to reenter school, and I strongly believe in pacing and only having the student stay in a structured setting for the amount of time their body will allow. If a student comes back to school quicker than their recovery allows, they will often become tired in the middle of the day, and have emotional outbursts that they cannot control due to their irritability and loss of strength.

4.5. Most common; academic, behavioral, and social characteristics after a traumatic brain injury

Educators need to keep in mind that students with a traumatic brain injury have more variability in abilities than do students with other learning disabilities, their varied levels of injury play a major role in the resulting range of characteristics and resulting needs. One of the most common characteristics that most students have when returning to school after a TBI is, that the student will need to spend more time studying if they are to retain a normal amount of instruction, (usually the time studying is doubled). Extra study time can be accomplished at home, with family helping or outside agencies, or with a special class designed for the student within the regular school day.

The most common noticeable characteristics may be; changes in personality, speech, cognitive ability, behavior, frustration levels, self-esteem, memory, recall ability, and possible medical problems including; headaches, seizures, vision and or hearing problems, and as stated above reduced stamina. Students with TBI's can easily go into depressive states, and don't often see their difficulties as a result of their injury. These are some of the most common characteristics that most students have upon returning to

school, there are still other characteristics on an individual basis, and each individual has their own way of coping with their disability.

4.6. Planning and useful accommodations for this type of student to share a classroom and become successful

The planning and reentry process is critical to the student's success. This process should be led by the parent(s), and include everyone who will be a part of the student's continued school life. It is recommended to pace the school reentry process as to not add additional stress to the student, family, teacher(s), or classroom. Gradual reentry, attending half day school first, is the most common practice used for returning TBI survivors. When planning for a student, the educational team should meet and discuss objectives that address long term life goals, as well as the more immediate educational and transitional needs. A teacher should offer behavioral supports such as positive reinforcement, non-verbal and verbal cueing and feedback. In the same manner the teacher should also provide educational supports such as adequate testing and assignment completion time, alternate assignments, possible assistive technology, limited academic load, and additional direct instruction as needed. Additionally the team may want to offer the student and family social supports, such as counseling, social supports within school, and TBI support groups from student and their family.

Enough research has not been completed to determine what classroom accommodations are most effective for a student with a TBI, to return to general education and succeed to the best of their ability. Some common accommodations that have worked for students across grade levels are; creating smaller assignments, providing

written outlines of the assignments, having a visual or written schedule, having a predictable and consistent routine, and if staffing allows an additional adult in the classroom to assist the student when needed is beneficial to all. School reentry should be completed as soon as feasible, this may help reduce the isolating effects from being absent for an extended amount of time.

4.7. Life after sustaining a TBI

An individual's life after sustaining a traumatic brain injury is drastically different than their life post injury but it is not an ending point. Most individuals are able to recover enough to enjoy life again, even if they still deal with side effects from their injury. Most of the early severe impairments are temporary; however cognitive deficits often take the longest time to recover from. Once an individual enters into the acknowledgement and acceptance stage it allows them to continue into the remainder of the recovery stage. I accepted my brain injury quickly and recovered remarkably, while another male student from my same class had a harder time accepting his injury, and in turn didn't recover as well or as quickly as I did.

Many students are very different from their previous self upon their return to the school setting. Unfortunately, 98%-99% of disabled students are either miss-classified into educational programs that cannot help them, or are left unclassified and on their own. One report stated that many TBI survivors who are not recognized and are classified into other disability areas, earn a different form of a high school diploma, or give up and drop out. Another report stated that many young adults, who are classified correctly, go on

from high school and attend colleges. Some of these individuals will need assistance and accommodations for the rest of their lives.

5. Conclusion

The findings of this meta-synthesis illustrate the importance of correctly identifying students with traumatic brain injuries, and making accommodations for them to successfully reenter the structured school setting and go on with their lives post-accident. Evidence shows that each individual is different as are their injuries and recovery pertaining to time allotted and ability. Also included in this meta-synthesis are the outlying effects of this sudden injury and family dynamics with relation to the injured individual, family dynamics, and outside friends and acquaintances.

When welcoming a student who has sustained an injury such as TBI back into their normal lives, or the school system, it is important to remember this individual is different than before. Though their physical appearance may not have changed, their cognitive abilities and emotional stability have definitely shifted. It is important to treat the individual fairly based upon their new abilities, and not their abilities post-accident.

When developing a reentry process for an individual, it is necessary to contact all those people involved with the wellbeing of a student, emotionally, physically, and academically. It is important for the reentry process to move slowly and at the students pace, so they do not become overwhelmed. As listed above a variety of accommodations will be required for a students continued academic success. If the student is correctly identified, correct accommodations put into place, and the individual, close friends,

teacher, and family members all work together the student has a higher chance to be successful in the years following their traumatic brain injury.

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