

Challenges and Supports During the Transition from High School to College for Students with Traumatic Brain Injuries

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Abstract Students who have sustained traumatic brain injuries (TBIs) may experience a number of consequences, all of which can impede the transition from high school to postsecondary educational settings. This study, which relied on interviews with students who had sustained TBIs and who had persistent problems related to their traumas, helped gain an understanding of their postsecondary transition experiences. Students' parents were also interviewed to provide a point of comparison. The reports of these students—all of whom were enrolled in college at the time of the study—revealed significant challenges with attention and focus, fatigue, short-term memory, and social situations. Comments from the parents offered corroboration. This report concludes with suggestions for school-based practice to promote strategies and services supporting this population of students in their transition to postsecondary educational settings.

Keywords Traumatic brain injury · Concussion · Transition · Postsecondary

Traumatic brain injuries (TBIs) are caused by a bump, jolt, or blow to the head or body that disrupts the normal function of the brain (Centers for Disease Control and Prevention [CDC] 2014). Approximately 1.7 million people sustain a TBI each year; of these, nearly 700,000 are children ages 0 to 19 (Faul et

al. 2010). Most of these children survive their injuries and return to school.

Causes of TBI may include injuries sustained from motor vehicle accidents, falls, and assaults. Because adolescence is characterized by risk-taking behavior, this age group is particularly susceptible to these injuries and thus have an increased likelihood of sustaining a TBI (Asemota et al. 2013).

Consequences of TBI

Students who have sustained a TBI may experience a number of cognitive, physical, behavioral, social, emotional, and academic issues. The extent of these issues varies considerably based upon a number of factors, including the student's age, injury severity, injury mechanism, preexisting conditions, and family support. Some students with more mild injuries may see resolution of symptoms fairly quickly, as in the case of the majority of concussions. Other students, particularly those with severe TBIs, have lifelong impairments. Cognitive problems often include impairments in memory and information processing, as well as difficulties in executive functioning. Executive functioning refers to one's ability to reason, solve problems, set goals, prioritize, self-monitor, initiate or inhibit response behavior, organize and plan, and execute purposeful behavior effectively (Jantz and Coulter 2007). Difficulties with executive functioning can lead to issues with cognition, academics, behavior, emotional regulation, and social relationships. Individuals with TBI may have increased impulsivity, depression, anxiety, anger, and irritability, as well as an overall difficulty regulating their emotions. Individuals who sustain a TBI, regardless of the severity level, also often experience physical symptoms, such as post-traumatic headaches, sleep–wake disturbances, sensory-motor difficulties, and seizures.

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As a result of such issues, students with TBI often experience academic problems, experiencing difficulties in any of the following: learning and processing new information, processing speed, retrieving previously learned information, integrating new and previously learned information, short- and long-term memory, attention, psychomotor skills, and executive functioning skills that can impact all academic areas (Jantz et al. 2014).

The nature, location, and severity of the injury, a student's age at the time of the injury, and the availability and quality of medical and rehabilitation services all contribute to a student's recovery and the difficulties experienced (Jantz and Coulter 2007). Typically, there will be an accelerated rate of cognitive recovery during the first five months following a TBI (Spitz et al. 2012). Post-injury difficulties may also be delayed, however, not surface until a later time. For example, a student who was injured in early childhood may not show difficulties with higher-order executive functions, such as abstract reasoning, sustained attention, and project planning until middle school, when there are greater expectations for such skills.

Transition Considerations

To maximize recovery efforts and minimize issues in students who have persistent difficulties due to a TBI, school-based professionals realize the importance in providing appropriate services that support students at each transition point in their life, including the transition of returning to school after a trauma, transitions between classes, transitions to new schools, and the overall transition from adolescence to adulthood. Any student in the K–12 setting who meets eligibility criteria for special education services under the Individuals with Disabilities Education Improvement Act (IDEIA, [IDEIA 04], P.L. 108–446, §601 et seq., 118 Stat. 2647 (2005) receive such services and are required to have a transition plan in place for after high school. This plan is a part of the student's Individualized Education Program (IEP). The written plan includes the student's strengths, preferences, needs, and interests, as well as measurable postsecondary goals related to training, education, employment, and independent living skills. Furthermore, if the student does not meet the criteria for special education services, the student may be eligible to receive accommodations such as a 504 Plan under the Americans with Disabilities Act (ADA42 U.S.C. § 12101 et seq., 1990).

However, while IDEA protections help prepare students for life after high school, postsecondary students are no longer eligible for the modified instruction offered through IDEA. They are, instead, permitted appropriate instructional accommodations under the American with Disabilities Act, or ADA, of 1990. Such accommodations might include a shortened day, extra travel time to and from class, elevator keys, an extra

set of books for home, a shortened workload, class or schedule changes, assistive technology, waived physical education requirements, frequent breaks, peer buddies, note takers, and advanced organizers (Cheshire et al. 2011).

Students who do not qualify for special education services prior to entering a postsecondary institution may or may not receive transition supports. They may also lack the data and documentation that postsecondary institutions often require for students to receive services (McGuire 2010; Shaw et al. 2009). Therefore, such students may experience adverse short-term and long-term consequences during and after the postsecondary transition process, including challenges with organizing class materials, planning long-term projects, and managing finances because of the cognitive and social impairments resulting from a TBI.

Transition from high school to college or independent living can be particularly challenging. Such a transition requires several skills that may be difficult for students who have sustained a TBI, such as coping with the loss of school friends, forming fresh relationships and groups, potentially moving away from home and becoming acquainted with new college roommates, dealing with different methods of learning, and dealing with the expectation of increased autonomy in life and studies (Cleary et al. 2011). Further, college students, especially for those students living away from home, generally have complete responsibility for self-management of their own mental and physical health, such as seeking care, taking medications, and keeping medical appointments (Cleary et al. 2011). Many students transitioning to college are often ill-prepared for these academic and social adjustments and have difficulty effectively managing study, work, and extracurricular demands (Cook 2007).

In higher education institutions, students with disabilities are held to the same academic standards as their non-disabled peers, and it is the responsibility of students with disabilities to inquire about eligibility for accommodations through a university's office of disability resources. Colleges are required to offer reasonable accommodations to students with disabilities who qualify for services, as long as documentation is provided (McGuire 2010; Shaw et al. 2009). Postsecondary students are responsible for disclosing their disabilities, presenting supporting documentation outlining the nature of their disabilities, making sure appropriate accommodations are implemented and executed, and monitoring the effectiveness of the accommodations (Shaw et al. 2010).

There is limited research regarding the specific transition challenges that students who have sustained a TBI experience. However, studies examining the challenges that students with other disabilities (arthritis, learning disabilities, seizures, ADHD, schizophrenia and blindness) face may provide useful information for students with TBI. For example, Marshak et al. (2010) investigated barriers that students may encounter in seeking and utilizing accommodations in higher education

institutions. These include desire for self-advocacy and self-sufficiency, fear of a potential negative social stigma, lack of knowledge about a disability, inferior quality of services, and past negative experiences with professors and other university personnel.

School-based professionals (e.g., psychologists, counselors, nurses, teachers, speech-language pathologists, occupational therapists, physical therapists) often lack adequate training in assessment and intervention for students with TBI, which can make effective transitions quite challenging. These professionals often do not know how to best meet the needs of students who have sustained a TBI (Glang et al. 2006; Jantz and Coulter 2007), nor do they know the consequences and difficulties students with TBI experience (Davies 2013).

The purpose of this study was to explore the postsecondary transition experience of young adults who had sustained a TBI prior to high school graduation. The study also explored parents' reports of the postsecondary transition experience of their child. This allowed for some comparisons to be drawn between the perspectives of the person who sustained the injury and a person who was perhaps the closest observer of their recovery and subsequent life experiences.

Method

This study examined the postsecondary transition experiences and perceptions of older adolescents and emerging adults who had sustained a TBI, as well as the perceptions of their parents. A qualitative design was selected for this study because the goal was to gather rich and detailed descriptions from participants about their experiences and perceptions. While the previous literature has described and discussed adverse effects of TBIs and how they can pose difficulties when students transition to post-secondary settings, no published studies have examined this issue from the student's perspective through one-on-one in-depth conversations. Qualitative data were collected through in-depth one-on-one interviews with participants. Triangulation of data was met by interviewing both the student and the parent participant in order to enhance the study's validity and credibility.

Part of the nature of qualitative research involves using the interviewer as an instrument. In this study, interview questions and prompts were directed by the information the researchers were seeking, information based on what was known from the literature on TBI. Therefore, biases that existed in the researchers may have influenced the experiences and perceptions the participants in this study discussed.

Participants

Students Participants in the current study included three college students ages 18–23 attending a mid-size private

postsecondary institution in a mid-size Midwestern city. Participants had sustained at least one TBI at some point in their lives and had experienced persistent difficulties post-injury. Student participants were recruited and identified through criterion sampling because participants needed to meet the criteria of having sustained a TBI and experienced persistent symptoms.

“Kyle” was a 20-year-old third-year student in the pre-medicine/pre-dentistry program. Kyle had attended a private, Catholic high school, and he experienced four TBIs in the time span of 5 years. He sustained three soccer-related head injuries, the first of which resulted in a loss of consciousness. After the second concussion, he was out of school for 2 weeks and was advised to refrain from physical activity for 4 months. His third TBI resulted in the most significant symptoms; Kyle also ruptured his eardrum as a result of the accident. He lost consciousness and was immediately taken to the hospital. Following this injury, Kyle returned to school later that same week and realized his memory was significantly impaired when he attempted to take a calculus test and could not remember anything. Kyle reported that he did not receive any direct school-based services following his TBIs but that he did receive rehabilitative services that included speech, physical, and occupational therapies. Kyle's fourth TBI occurred from a car accident in which he was rear-ended. Kyle was eligible to receive accommodations for his disability upon enrolling at his postsecondary institution, including taking tests in an alternate setting because he had difficulties focusing in the classroom, but he chose not to continue taking advantage of those services.

“Jace” was a 20-year-old second-year student, currently majoring in biology. He had attended a suburban public high school. The first head injury Jace recalled sustaining occurred when he was a child and had hit his head on the corner of a kitchen table. The next and most significant reported head injury resulted from an accident that took place during marching band practice when he stood up into a steel beam while loading the band truck. Jace explained that the impact of the blow to his head also jammed his spine down, and he knew immediately it was something serious. Jace recalled telling an adult that he needed to go to the emergency room to be checked for a concussion, but no action was taken. Jace sat unsupervised in the truck for approximately 2 hours until the end of band practice. After band practice, he called his mother to pick him up, and she brought him to the emergency room that night. During the emergency room visit, Jace was put in a neck brace, which he continued to use for the next 2 months. He described that his most significant TBI-related symptoms after his injury included experiencing sleep–wake disturbances, having headaches, experiencing dizziness, and having difficulty focusing. Jace reported that a Section 504 plan was implemented following this TBI and that it included such accommodations as extended time on tests, home tutoring, shortened school days, frequent breaks, permission to leave

class early to avoid crowded hallways, and permission to wear earplugs in the hallway. At the postsecondary institution he currently attends, Jace receives extended time on tests, permission to take tests in an alternate setting, permission to take breaks during class, and excusal from class if experiencing symptoms of his brain injury.

“Aaron” was a 23-year-old fourth-year college student majoring in marketing with a concentration in sales management. Aaron sustained his first and most significant TBI during a basketball game in his junior year of high school when he was hit in the back of his head. He was 17 at the time of the injury. He reported that he was unconscious for approximately 2 to 3 seconds and had difficulty walking in a straight line back to the bench. He also reported that for about 20 seconds following the injury, the lights in the gym continued to dim. The medical staff at the game provided care and diagnosed Aaron with a concussion, but no other treatment was rendered necessary at that time. Aaron sustained another TBI 2 weeks after his first concussion. This TBI was a result of a collision during a baseball game when he fell and, again, hit the back of his head. Following this concussion, Aaron’s parents took him to the hospital. He experienced TBI-related symptoms for the next 8 weeks, including headaches and dizziness with physical exertion. For 4 months he received physical therapy following this TBI, therapy that included eye exercises and balancing exercises. Aaron sustained his most recent TBI from a falling accident that took place during college (post-transition). He hit the top left side of his head and was taken immediately to the hospital. According to Aaron, he was diagnosed with a moderate to severe concussion. Following this TBI, Aaron’s doctors recommended that he drop some classes and avoid computer screens, television, and loud music. Aaron reported that after this TBI, he experienced headaches and ringing of the ears for a while, but he also began to notice that his focus, attention, and memory were impaired significantly more than they had been previously. He reported that he received such accommodations at his postsecondary institution as extended time and having a note-taker.

Parents/Guardians Participants in this study included two parents/guardians of the students recruited and interviewed according to the inclusion criteria described above. If a student had two parents interested in participating, they were interviewed separately so that the researcher could obtain their perspectives individually.

“Mrs. J” was Kyle’s mother. She recalled additional head injury incidents that Kyle did not report. One TBI occurred when Kyle was much younger, while playing indoor soccer, as well as another one during his freshman year of college when he hit his head on the side of a pool while swimming. Mrs. J reported that Kyle was prescribed medication for his depression during his freshman year of college but that he quit taking it mid-year due to the side effects.

“Mrs. C” was Jace’s mother. Mrs. C reported that she experienced communication barriers with the postsecondary school following her son’s most recent TBI. She recalled additional head injury incidents that Jace did not report. For instance, she recalled Jace’s sustaining a TBI when he was child as a result of a roller skating accident, as well as another time when he fell into a flower pot. Mrs. C explained that she was against medication and that her family experienced some financial difficulties. As an alternative to taking medication, she encouraged Jace to take a multivitamin to maintain an elevated level of vitamin D, St. John’s wort to help manage symptoms of depression, magnesium to help manage symptoms of anxiety, and melatonin to help regulate his sleep cycle. According to Mrs. C, these vitamins and supplements seemed to help Jace’s functioning that was impaired by his TBI symptoms.

Aaron’s parents were contacted several times but were unable to coordinate an interview for this project.

Materials

Participants were interviewed separately by the researcher. The line of questions for all interviews included the following:

- Description of child pre-TBI
- TBI incident and experience
- Support services following TBI
- Challenges after high school
- Support services after high school

The interviewer guided each participant with open-ended prompts as needed. Interviews were audio recorded with a digital voice-recording device, and a computer was used for note-taking during the interviews. Data from each interview were transcribed in entirety using a word processor.

A computer software program, NVivo, was used to assist with coding the data. NVivo is software that supports qualitative research by allowing the researcher to collect, organize, and analyze content from interviews. NVivo’s search options facilitate interrogation of data to help with consistent and accurate data analysis (NVivo 2012).

Procedures

A pilot interview was conducted with a participant who fell within the target age range, who had neurological impairments, and who experienced the transition process—all criteria similar to that of the participants in the actual research study. This pilot interview was also used for peer debriefing to enhance the study’s credibility. Participants for the study were recruited by contacting hospitals, rehabilitation facilities, and other institutions or individuals who may have serviced TBI patients. Informed consent forms were given to participants to

sign and date upon their review, understanding, and agreement prior to the start of the interviews. The interviews were conducted individually and face-to-face in a semi-structured format. The interviewer engaged in pre- and post-interview rapport building and conducted a debriefing with each participant. Participants' names were replaced with pseudonyms to protect confidentiality. The transcription and the data collected did not include any identifying information to ensure that the data was kept confidential.

Results

Analysis of the research questions included the use of transcription, coding, and thematic analysis. The researcher reduced the data collected by exploring and “memoing” the data to select parts for coding (Mertens 2010). Thematic analysis of the narratives was used to identify themes, codes, groupings, or categories of reports (Turner et al. 2010).

Research Question 1: Postsecondary Transition Experiences of Students with TBI

After reviewing and coding the transcribed interview protocols, the researcher identified from the data four major themes regarding the TBI students' postsecondary transition experiences and perceptions of these students: (1) attention and focus difficulties, (2) fatigue and the need for unusual amounts of sleep, (3) short-term memory difficulties, and (4) social issues.

Attention and Focus Difficulties The most common theme that emerged from student participants was difficulties with attention and focus after sustaining their TBIs and transitioning to postsecondary settings. Participants reported that these attention and focus difficulties affected both their academics and social interaction.

Aaron explained that his attention difficulties were apparent during a normal conversation with others. He also noted that after transitioning to a postsecondary setting, he experienced difficulties focusing due to environmental changes. Jace described difficulties with focus that also affected his ability to have a conversation:

Focusing was number one, the most difficult. I called it like jello because every time I had a thought or conversation, I would have to grab onto this conversation and pull it in.

In addition, Kyle explained that he had difficulties paying attention and focusing in the classroom, especially when taking tests: “I used the Leaning Teaching Center (LTC) to take

tests and stuff just because I couldn't focus in the classroom to take tests.”

Fatigue and the Need for Unusual Amounts of Sleep

Student participants and their parents who participated in this study reported that after the last and most severe TBI, they were consistently fatigued and required a great deal of sleep. For example, Kyle explained how fatigue was the most prominent symptom following his second major soccer-related TBI:

I just was out of school for 2 weeks, just wasn't feeling right, but I didn't really notice any lasting stuff from that except just being tired a lot at the time. I just felt more fatigued and then I wasn't really allowed to do any physical activity for 4 months after that.

Kyle also reported that he continued to experience fatigue and exhaustion after his third major soccer-related TBI:

And trying to work on getting my stamina back up because I was constantly tired, my body was constantly tired, during this period too. . . Taking a test is probably one of the most tiring things I do in my daily life now.

Aaron's reported experiences with fatigue were related to the effort it took for him to focus:

It was very frustrating that if I really exerted myself cognitively after a half hour, 45 min, I was very exhausted. . . And throwing myself back into an environment with a lot of distractions and still when I would exert myself cognitively, I would just be really exhausted.

Aaron also discussed how he developed a time-management strategy that included incorporating breaks into his schedule that would allow his brain to rest in an attempt to avoid feeling so fatigued:

I was just really focused on my time management and setting the expectation that you're going to need to take breaks every, like, half hour when you're doing something in order to give you something to look forward to so you're not dwelling on the fact that you're about to get exhausted . . . And what I really learned was the time management of being able to structure my day through a calendar, sticking to it, and just giving myself the proper breaks in order for my brain to kind of reboot itself.

I put in a lot of hours in high school, but I guess that's the thing. When I look at the hours I put in high school and how it seemed like I was able to get through that

more without that like, “Oh my gosh, it feels like I just ran a marathon with my brain,” like how it is now, would be the biggest difference.

Short-Term Memory Difficulties Students with TBI who participated in this study also reported experiencing difficulties with memory after transitioning to a postsecondary setting. Kyle stated in the interview that his short-term memory difficulties were one of the most prominent experiences he had had since transitioning to a postsecondary setting. He explained that he has to write down more than he used to in order to remember information and that, in the past, he would be able to “hear or read something once and it would just be there.” He stated, “From that point on, I just started having issues with memory; where, prior to that, I could pretty much read something and remember almost every detail of it. But after that, I had a much harder time with that recall.”

Like Kyle, Aaron reported that short-term memory difficulties were one of his most prominent experiences after transitioning to a postsecondary setting: “I’d say it was pretty sound and concrete that the biggest things I took away from this concussion were struggles to retain my memory and my focus seemed to be a little worse.”

Aaron explained that work would take him a significantly longer period of time to complete than it used to because of his issues over retaining information. He stated that routine was an important aspect of his completing school work and that what became very important was scheduling breaks for himself and being on a specific schedule to do so. He also mentioned that not getting enough sleep may have heightened his short-term memory challenges:

He [Aaron’s doctor] actually really said almost every student has a calendar, but what I use is an hour-by-hour slot because that forces me to look at how I’m using my time. Whereas, okay, you spent 4 h in the library, but what did you get done in that 4 h? So it’s like you’re looking at a mirror, like what did you actually get done? They said how important your sleep is for your memory. And so I feel like where I would always stay up late freshman, sophomore year, I really try to focus on getting 7 to 8 h, which I’m pretty good at now. And they just said routine is just the biggest thing. I go to the same spot in the library now; I’m so comfortable there. Whereas, in the past, I’d much rather study in my room because that was a comfortable thing. But once I was able to develop that, now I enjoy going to the library because I see the work I’m getting done and everything like that.

Social Issues Kyle reported significant challenges with social relationships and situations following his TBIs. He described

social stimuli as being overwhelming and that, as a result, he had a difficult time being around people. This impacted his ability to make new friends and socialize with others as he transitioned from high school to a postsecondary institution. Kyle discussed his experiences with social anxiety as he drove to the postsecondary institution he was attending:

And there was almost this crippling social anxiety—and I drove to school, I wasn’t living at school—where every time I drove to school, I’d almost feel like I was going to throw up because I was just so nervous. I was like shaking, it was just bad. And this went on pretty much the whole first year.

Kyle also described what it was like for him as he tried to meet new people and make new friends. He explained how difficult it has been for him because he had not experienced social challenges in the past:

I just can’t make friends . . . I just can’t talk to new people, it’s really difficult . . . It’s not even that I don’t want to. I just feel like I can’t . . . All my roommates are people I went to high school with that I knew before all this stuff happened. I probably made about five friends that I didn’t know previously . . . All through college now. It’s just so frustrating. Because I wish I could. I tell myself before we go out and hang out on the weekend, ‘You’re going to talk to new people tonight, you’re going to get to know them’ and then I get there and just sit in the corner and act like a wallflower, I guess is the term. It’s just weird.

I feel like it was very demeaning to me I guess. Just go from being just a normal person to almost not being able to function regularly. And the thing is, I have a cousin who has some pretty bad learning disabilities, and I felt like him. Where you just can’t go to school because you can’t remember any of the information and then you’re just really awkward socially . . . You lose something. You just lose part of you. And it’s just gone. And you just have to try to find a way to get it back.

Kyle also explained that, prior to experiencing social difficulties associated with his TBIs, he would easily meet people his age when his family went on cruises. However, more recently, Kyle said that he avoids socializing, describing how his personality has changed from being outgoing to being much more introverted:

Before, we used to always go on cruises. And the cruises had the things for people all your age. And before this, I just loved hanging out with people there. It was fun. Had a couple week-long girlfriends. But since then I’d just pretty much lock myself inside the cabin and just read.

Like don't hang out with people even though there's more stuff to do now. Just don't do it. It's been like the trend for 3 years now I think...Where before it was always just like more outgoing.

Research Question 2: Parent Reports of Postsecondary Transition Experiences of Their Child with TBI

Upon reviewing and coding the transcribed interview protocols, the researcher identified in the data three major themes regarding the postsecondary transition experiences/perceptions of parents whose children sustained TBIs: (1) fatigue and the need for unusual amounts of sleep, (2) repeated injuries, and (3) social issues.

Fatigue and the Need for Unusual Amounts of Sleep The most common theme that emerged from parent participants is recognizing fatigue and the need for unusual amounts of sleep in their children. Following Kyle's most severe TBI, Mrs. J, Kyle's mother, reported,

He still struggles with fatigue. Every day, "I'm tired, I'm tired, I'm tired, I'm tired." And I only see him not fatigued when he's home in the summer. Because now even, he's not a social butterfly. He doesn't go out much. He's kind of a homebody. He's comfortable there. And he's not as tired at home. But during the school year, he's exhausted. And if you see him on the weekend, he's exhausted. So it does really take a lot out of him.

When discussing changes in Kyle's self-regulation and irritability, Mrs. J also stated that Kyle's attempt at controlling his impulsivity also resulted in him becoming very fatigued, stating,

And he doesn't have that as much anymore. He's got it a little. I mean he can drive and not get upset if somebody cuts him off or whatever. But yeah he doesn't have that totally in check all the time. And then when he has to, i.e., if he's in the class or he's at work, then he's really tired.

Mrs. C reported that Jace was sleeping for 20–22 h per day. She recalled that Jace was sleeping for the majority of the day for approximately 2 weeks following his most recent TBI. She recognized that Jace's recovery post-TBI required a considerable amount of sleep:

And then he would come home, sleep again, get up and do a little homework, go to sleep again, and do it. The main thing through the concussion is just that it required

lots and lots of sleep, time for the brain to shut down and heal.

Mrs. C also highlighted the importance of Jace's taking naps throughout the day, even today:

So through this whole time thing, it just takes sleep. We have just gently, gently been weaning him off of it. And he still takes naps. One of the scholarships he was awarded at UD was a counselor for freshmen that would call and help to make sure he was still on track. Had nothing to do with his head injury. It was just a scholarship he was awarded to help freshmen stay attuned, which was a blessing that we received it. Stay attuned and on track in classes. And one of the things she helped him realize is that when you plan your college days, you need to make sure, with your injury, you have to plan out nap time. And so by him working that into it, he was able to go back and take naps and then he continues. Yeah and this year we're barely up to any kind of naps. He might still take one a day or so.

Repeated Injuries All of the parent participants in this study reported that their children had sustained more than one TBI. Kyle sustained several brain injuries; the most significant were soccer-related injuries. Mrs. J, Kyle's mother, recalled three additional brain injuries Kyle had in the past that he did not report during his interview. Mrs. C, Jace's mother, reported that Jace sustained several TBIs. She recalled six to seven incidents in which Jace hit his head severely and probably could have been diagnosed with a TBI. However, Jace only reported three incidences. Aaron also sustained injuries, both prior to transitioning to a postsecondary institution and after he began attending college.

Mrs. J stated about Kyle's TBIs,

He had another one that was just a collision that was with club . . . He got hit in the head with a tube tubing up at our cabin in Wisconsin. So that was another one. And then the last one was senior year. It was during soccer . . . But the coach was sitting right here and he's like, "He's out for the season." Because he knew. He got clocked. So took him to the ER. He had a ruptured ear drum and another concussion.

Mrs. C also recalled Jace sustaining multiple head injuries:

Jace was a child who was very clumsy . . . So as we look back after all this had happened, we did realize, "Oh he did do this" and "Oh he did do this." So there was a roller skating accident. He fell into a flower pot. And

there are probably about three or four other times he hit head severely.

Social Issues Parents interviewed also reported that their children experienced difficulties with social situations and relationships post-injury and upon transitioning to postsecondary settings. Kyle's mother, Mrs. J, recalled changes and challenges with Kyle's social functioning in high school after his third soccer head injury:

His friends, and they didn't mean it to be malicious, they didn't see him. They came over for about a month or so just to visit, but he was not social whatsoever. He'd look away, he couldn't look at them.

He went to homecoming with kind of a girlfriend. And we kind of laid down the rules. She came over and got him and her parents came and my husband talked to her parents and said, "Kyle's not great. She needs to bring him home after the dance." And she was like kind of snitty and all of that...And then he didn't go to prom. She called him up and dumped him on the phone. She couldn't handle this.

Mrs. J also described her perception of Kyle's social experiences upon transitioning to a postsecondary institution:

And in a new situation, or if he's meeting a bunch of new people, he kind of hangs back. He's very uncomfortable about that. He's still got his core group of friends, and he's fine with that. My husband keeps saying, "You need to meet more kids in the pre-med." "No, I want to study by myself. I'll be fine." So that's a difference too.

Mrs. J also discussed the social difficulties Kyle had as he transitioned to independent living at the university he attended:

But since he's transitioned to college and living here [on the university's campus]—and this came out last summer, so after sophomore year—walking to classes, he still gets really anxious. And he said sometimes so much so that it's panic attacks.

Jace's mother reported in her interview that Jace experienced social difficulties following his most recent TBI as well, describing how his relationships with peers were impacted post-injury:

Friends didn't come around. He doesn't know this, but I would call his friends and be like, "Please, just stop by and visit him." Very few ever did. I would say maybe

we had five visits the whole 6 months. There was one friend that came a couple of times, but Jace's friends just kind of forgot him, and that was hard. And I don't think he knows that part of it. But yeah it was hard on him...The school is so big that you don't know that your friend's hurt. You forget. You just don't normally see your friends. So to forget that your friend is gone and had a head injury, you don't realize it because you don't see them every day. In the small school where I came from, you would know that your buddy was sick. But not here.

Other Findings

Results of the current study revealed that other issues discussed by students with TBI and their parents included (1) headaches, (2) personality change, (3) recognition of the injury's impact and (4) the need for a reduced course load. Although these themes were consistent among both groups, they were not as prominent. Participants did not elaborate upon these ideas as extensively as they did upon the major themes.

Aaron reported that his doctors suggested he avoid computer screens, television, and loud music, which he found to be challenging as a postsecondary student attending college. Aaron believes that because he found he could not avoid his computer for everything, his computer use may have contributed to the headaches he experienced as a result of his TBIs. He stated,

And they [the doctors] recommended don't be in front of a computer screen, no TV, avoiding loud music, and everything that's really hard to do when you're in college...So it definitely hampered the way I conducted myself as a student...And I couldn't avoid my computer screen for everything. And I think that's probably what really kept the headaches going for me, or really triggered it.

Jace underwent changes in personality post-injury:

I'm much more in tune with my body. And people see that. I'm more reflective. I'm more, a lot of people say spiritual, which is fun. Faith-based. But they see me still as an extrovert, and I can help get the party started. It's just kind of who I am when I'm in a group. Prior to the injury, it was very much more, I was super outgoing. It was 100 and 110 % just because. I didn't look at myself much. And the head injury was a blessing in the sake that I learned how to stop myself and slow down. Prior, I think a lot of people could see me as superficial too.

Mrs. J described Kyle's personality change as a result of his TBIs in much greater detail than Kyle:

And then his personality HAS changed HUGELY. He's no longer tolerant of people. He has a short fuse. He just gets SO frustrated with people in general. And if people do something wrong, "Ugh, gosh, I can't believe that." Before he wouldn't have done that. He would have just said, "Ah, well, you know, it is what it is."

Two participants in this study reported that after transitioning to postsecondary institutions, they recognized the impact of their injuries and the need for reduced course loads. Participants explained that they enrolled as full-time students but needed to reduce the number of credit hours they were taking in order to meet the often rigorous demands of the courses. Kyle explained that, when he started at his postsecondary institution, he had to work much harder than he had to in the past: "I was taking seven credit hours just to start off with, which isn't that much, and I was having to work a lot harder."

After Aaron's moderate to severe TBI that he sustained in college, Aaron's doctors recommended that he reduce his course load:

And through that, I would say the doctors recommended that I drop some classes because when I filled them in that this was my third or fourth concussion, they said, "Don't take this lightly." And so what I ended up doing was, I was taking 17 credit hours, and so I dropped, or put on hold, two of my classes to finish off whenever I healed.

Accommodations that the student participants reported as valuable included (1) reducing exposure to computer screens, TV, and loud music in order to help minimize headaches, (2) using flash cards and notecards to help with repetition (memory) and with focusing on one concept at a time (control strain), (3) journaling as a way to focus and collect thoughts, (4) using a calendar or an hour-by-hour planner, with breaks incorporated to help with remembering scheduled events and time management, (5) using either peer notes or recording devices to keep up with fast-paced lectures, (6) taking extended time on tests or taking the tests in places with fewer distractions, and (7) taking frequent breaks.

Discussion

The interviews with the student participants revealed that fatigue was a significant difficulty for all of them. This issue is particularly important to understand for individuals with TBI attending a postsecondary college or university

because of the lack of structure a typical college day may include compared to a high school setting. Students may benefit from planning their days and designating specific time for rest and sleep.

Findings also indicated that the students interviewed experienced difficulty with attention and focus, both academically and socially. This was consistent with the findings of Pineau et al. (2015), who indicated that individuals with mild TBIs reported significantly higher levels of distractibility and difficulties with focus. As a result, it may take them longer to complete their work than it did in the past, or pre-injury. In high school, the school day is typically very structured, with bell schedules and little time in between classes. In addition, parents often have a set of guidelines or rules for their high-school-aged students to follow. However, the postsecondary environment has multiple forms of distraction with less structured schedules. Attention and focus are important for postsecondary students in order to succeed academically.

Along the same line, the students with TBI who were interviewed for this research study experienced social issues as they transitioned from high school to a postsecondary setting. Relationships with friends and peers were challenging post-injury as a result of the students with TBIs being absent from school for an extended period of time. Other social issues resulted from difficulty with social adjustment related to newly acquired language deficits in pragmatic communication, as well as to the social anxiety experienced as a result of sustaining a TBI.

Results of this study revealed that student participants experiencing persistent difficulties had sustained more than one brain injury in the past. Therefore, this study highlights the crucial importance of preventing repeated brain injuries in an effort to avoid experiencing greater and more lingering challenges. Taking more precautions overall and using safety equipment when engaging in physical activity may, for instance, help to prevent repeated brain injuries.

Participants in this study recognized the impact of their injuries and the consequent need for reduced course loads in their postsecondary academic settings. Students with TBI often have difficulties keeping up with the rigorous demands of the academic environment (Jantz et al. 2014). Following the transition to a postsecondary institution, the participants realized that the challenges and changes experienced due to their TBIs required them to take fewer classes in order to succeed. Participants reported that it took more time and effort to accomplish tasks and complete work than it had previously. Issues with short-term memory also required them to work harder to learn and remember learn course material.

This study found that student participants used accommodations to promote their success in high school and at their postsecondary institutions. Findings suggest that students with TBI may require appropriate accommodations in order to

access the same curriculum as their peers. These accommodations may provide students with TBI successful strategies for overcoming challenges they may experience at the postsecondary level, and such accommodations may be especially beneficial to these students as they transition to independent living at a postsecondary institution.

Differences in Experiences and Perceptions

The students' and the parents' experiences and perceptions aligned in that themes that emerged from interviews with both college students and their parents regarding transition difficulties were fatigue and the need for unusual amounts of sleep. However, differences in reported experiences were that parents recalled a greater number of injuries that their children had sustained in the past, and the student participants reported experiencing a more significant level of difficulties with attention and focus than the parents reported. For example, weak attention was the primary issue Jace described. His mother, on the other hand, described Jace's post-injury difficulties fatigue, clumsiness, and social difficulties with much more depth and detail than her son provided when talking about himself.

According to Gfroerer et al. (2008), parents are often in the best position to evaluate a child's functioning following a TBI, and they are also able to recall more details from previous TBI experiences. As that study suggested, parents who were interviewed for this study were able to recall a greater number of previous brain injuries and they recalled details their children did not. However, whereas parents who live with their child may better evaluate that child's functioning following a TBI, the students interviewed for this study were no longer living with their parents. Although impaired self-awareness is common in students with executive functioning difficulties, there was no way to definitively state whether the parents or students in this study were more accurately evaluating their skills and difficulties. In the case of college students, it is very possible that the students are experiencing a number of issues of which their parents are not aware.

Parent participants may not have recognized as many difficulties with attention, focus, and short-term memory difficulties as experienced by the student participants because these difficulties are more covert and subtle. Clearly, however, sleep is a more overt and apparent symptom experienced as a result of a TBI, and parents may have recognized their children's increased sleeping before they would have recognized the attention and focus difficulties the children were experiencing.

Limitations

The nature of qualitative data collection and analysis involves a degree of inference and interpretation by the researcher. Further, this study utilized a small sample, the sample came from only one geographical region, the student participants

were all male students, the student participants attended the same 4-year, private, Catholic university, and the two parent participants were both female. The male and female experience may vary, both as student and parent; as a result this study is limited to the students' male perspective and experiences and to the parents' female perspective and experience. One student participant's parent did not participate in this study. Additionally, the culture and background attracting a student to a 4-year, private, Catholic university may differ from that attracting a student to a different type of university, such as a 2-year or public university. This limits the breadth of postsecondary experiences that the participants had to share. Furthermore, the sample cannot be considered representative of all postsecondary experiences for students with TBIs; therefore, the generalizability of this research is limited. This is a typical limitation of in-depth interviews with only a small number of participants—their perceptions may be unique and not indicative of a common experience.

The limited sample size prevented this research study from capturing all the different postsecondary experiences of students with TBIs. While the subject pool of the current research project did produce many of the same themes, due to the geographical and logistical limitations, theoretical saturation could not be reached. Further, the descriptive nature of some data gathered may have led to some degree of gender or cultural bias, again due to limited size.

The sample consisted primarily of middle-class to upper-middle-class students and parents from suburban areas with the financial means to access services that may aid in the recovery and/or rehabilitation process post-injury. Finally, changes that these students experienced may have been a natural course of life (developmentally, environmentally), so it is difficult to determine that all of their reported experiences are a result of their TBIs.

Implications for School-Based Practice and Future Research

While there is still no clear data to describe every postsecondary transition experience for students with TBI, the current study's findings indicate that support and accommodations may foster and promote the success of students with TBIs as they transition from high school to a postsecondary institution. School psychologists in particular are in a unique position to provide services and implement transition plans for students with TBIs (Table 1).

School psychologists may recognize the need for transition planning and are often in a position that would allow them to assess the student's anticipated postsecondary environment and determine needs. Students with disabilities transitioning to a postsecondary setting are often required to advocate for their needs themselves (Shaw et al. 2010). This includes advocating for appropriate and necessary accommodations.

Table 1 Checklist for transitioning students with TBI to college

-
- Conduct **records review** of student
 - Interview** parent, students, and teachers
 - Transition goals, plans, and concerns
 - Identify student's interests, and post-secondary goals
 - Discuss student post-secondary options (training, employment, education)
 - Identify student **strengths**
 - Identify student **weaknesses**
 - Identify **current accommodations** student receives
 - Identify **accommodations to recommend** the student seek in post-secondary plans
 - Identify student **post-secondary adaptive needs/skills** and plan for teaching them: (e.g., cooking/housekeeping, healthcare, balancing checkbook, scheduling classes, etc.)
 - Consider whether student should graduate with same-age peers or continue school-based services until age 21
 - Provide student with **counseling services** relating to transitioning (i.e., social situations, change of setting, making new friends)
 - Collect **data and documentation** of student TBI and accommodation plan for post-secondary placement to provide accommodations.
 - Contact possible post-secondary sites** to determine accommodation options and available resources.
 - Keep in contact** with student throughout process of planning transition.
-

Thus, as part of the transition planning process, school psychologists may teach students how to self-advocate for their needs in the postsecondary setting.

Prior research has found that a barrier to seeking out services is the fear of being classified as a “person with a disability” (Marshak et al. 2010). Thus, school psychologists in a high school setting may consider counseling and encouraging students with TBIs on seeking services. Disability services can provide support to students with TBIs to promote appropriate accommodations and a more positive academic and postsecondary transition experience (Table 2).

Recognition of Injury's Impact and the Need for a Reduced Course Load Findings from this research study suggest that difficulties with attention and focus, as well as with fatigue and the need for unusual amounts of sleep, were prominent experiences among students with TBIs transitioning to postsecondary institutions. Students with TBIs may have difficulty with such academic skills as learning and processing new information, processing speed, retrieving previously learned information, integrating new and previously learned information, short- and long-term memory, attention, psychomotor skills, and executive functioning skills (Jantz et al. 2014). Therefore, school psychologists may consider recommending that students with TBIs consider a reduced course load at a postsecondary institution.

Social Issues Given the results of this study, school psychologists may also consider counseling students with TBIs on social skills and the use of pragmatic communication. Behavioral, social, and emotional difficulties after TBIs are common, particularly with moderate and severe TBIs (Gouick and Gentleman 2004; Gould et al. 2011; Max et al. 2012; Williams and Wood 2010; Rapoport 2012). Students transitioning from high school to a college or university setting need to adjust to the required academic and social demands (Bayram and Bilgel 2008). A key finding from this study indicates that older adolescents and emerging young adults with TBIs experience difficulties with social adjustment and peer relationships. School psychologists may counsel students with TBIs who are having difficulties with social conversation and teach them specific skills on initiating and maintaining a conversation, turn-taking, and active listening. They may collaborate with the students on strategies that may be effective in using these skills in both the secondary and post-secondary environments. This can help prepare the students for the various social situations they will likely experience in their postsecondary environments.

Repeated Injuries Another finding from this research project is that repeated injuries were a recurring theme among participants. Repeated mild TBIs occurring over an extended period of time can result in cumulative neurological and cognitive deficits. School psychologists should educate coaches and administrators on TBIs, especially on preventing repeated injuries to the head. Additionally, school psychologists should educate school-based personnel and parents on identifying students with TBIs so they can be served early and appropriately. Training should include how to support students with TBIs and what is required to receive services at postsecondary institutions. School psychologists should be able to identify accommodations that are necessary in order for a student to have equal access to the curriculum. Finally, because findings from this study revealed that parents recalled more TBI incidents than their children, reported their children's experiences with TBI in greater detail, and recognized more changes in their children's functioning than the student participants, school psychologists should involve parents as much as possible in transition planning and services.

Future Research

There is a clear need for additional research in school psychology related to students with traumatic brain injuries (Smith and Canto 2015). An expanded version of this study, incorporating additional interviews with participants with more varied characteristics, might help to achieve theoretical saturation. Another valuable study might incorporate a longitudinal design in which participants with TBIs could be interviewed in high school and again after high school. More in-depth

Table 2 Accommodations for students with TBI transitioning to college

General-- look into resources & supports available		
Academic counselors, Writing Assistance Centers, Accessible Housing, Tutoring Centers, Academic Accommodations, Student Mentors, etc...		
Attention & Focus – Student may have trouble focusing in class and completing tasks in a classroom setting due to distractibility, and overall trouble with focus and attention.		
Allow student preferential seating away from distractions.	Provide student with direct training in self-management skills to assist with staying on-task and sustaining attention.	Consider self-management strategies (i.e., cue cell phone to emit a silent vibration to cue student to ask him/herself, “Am I paying attention?”)
Fatigue – Student may feel tired very often, and may require unusual amounts of sleep.		
Consider a shortened school day schedule (i.e., only one class per day, classes every other day)	Consider only registering for classes that align with student’s sleep schedule (i.e., no night classes if student goes to sleep earlier in the night, no classes before 10 a.m. if student sleeps later in the morning)	
Learning & Processing New Information – Student may have difficulty with learning and processing new information in the classroom and may have difficulty with transitioning into a new environment.		
Depending upon need and preference, assign a tutor or class partner to help plan assignment completion and learning new information	Train student in reading and writing strategies to assist with processing new information (i.e., outlining, mapping, editing, annotating)	Provide alternative testing or accommodations during test taking. (i.e., extended time on test)
Processing Speed – Student may have difficulty with automatically and fluently performing tasks, which can become more difficult when in the classroom setting.		
Provide guided notes from the professor (i.e., “fill-in-the-blank” notes).	Provide readings and presentation materials for review prior to class.	Allow extended time on in-class assignments (i.e., tests, quizzes, writing assignments)
Executive Functioning Skills - Student may have difficulty with managing time, paying attention, controlling impulses, organization and task initiation.		
Allow extended time on assignments. Work with student to create realistic due dates for assignments.	Assign student to a tutor or partner who can teach student organizational skills (i.e., How to set up and organize files in Google Drive..)	Send automated reminder emails when due dates for assignments are approaching to assist with task initiation and time management.
Psycho Motor Skills - Student may have difficulty with physical movement, coordination, and general motor-skills.		
Allow student to use the elevator and other alternative routes to classes, which will make traveling between classes easier.	Allow student to use assistive technology in class, as needed. (i.e., Allow student to type notes on laptop if that is preferable to hand writing.)	
Short - & Long-Term Memory – Student may have difficulty recalling memories or newly learned information.		
Have all learning materials presented in class (PowerPoints, recorded lectures, articles/videos presented in class) available and accessible to the student online.	Provide student with opportunities to repeat the class (after lecture, break class into smaller groups to discuss lesson, have student participate in study groups...)	Teach student (through tutor, writing center, etc..) to use check lists for multi-task steps, make lists and reminders, use graphic organizers to remember new information, etc..

discussions with personnel in college disability offices can also help clarify the level of understanding and services one might expect in different institutions.

Future studies must also evaluate the transition process for students with TBI who chose to enter the workforce rather than pursue postsecondary education. Finally, it would also be interesting to compare the outcomes for young adults with TBI to individuals with other disabilities—or no disability at all—using how well their high schools prepared them in college readiness skills as a variable.

Conclusion

The present study examined the experiences of students with TBI as they transitioned from high school to a postsecondary setting. Results suggested that persistent difficulties following a TBI that continued with the transition to a postsecondary institution included issues with attention and focus, the need for a reduced course load due to postsecondary academic demands, fatigue and the subsequent need for a great deal of sleep, and issues with social relationships. Strategies to manage

difficulties experienced as a result of a TBI were beneficial for the students who were interviewed. Such accommodations should be considered as school-based professionals and parents develop transition plans for high school students with TBI.

Compliance with Ethical Standards

Conflict of Interest Michaela Kramer and Susan Davies declare that they have no conflict of interest.

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