5-10-2024

Exploring the Role of Occupational Therapy in Concussion Care in Young Athletes

Julia E. Watkins
Georgia State University

Exploring the Role of Occupational Therapy in Concussion Care in Young Athletes

by

Julia Watkins

A Capstone Project Presented to the
FACULTY OF OCCUPATIONAL THERAPY
GEORGIA STATE UNIVERSITY

In Partial Fulfillment of the
Requirements for the Degree
OCCUPATIONAL THERAPY DOCTORATE

April 2024

DEPARTMENT OF OCCUPATIONAL THERAPY
Byrdine F. Lewis College of Nursing and Health Professions

Mailing Address
P.O. Box 3995
Atlanta, GA 30302-3995

Phone 404-413-1446
Fax 404-413-1450

Georgia State University

CAPSTONE FINAL PAPER APPROVAL FORM

The Capstone Final Paper is the final product that the OTD students need to complete to report his/her Capstone Project and his/her Capstone Experience.

Student's Name	**Julia Watkins**
Degree Sought	Occupational Therapy Doctorate (OTD)
Department	Occupational Therapy
Program	Occupational Therapy Doctorate (OTD)

We, the undersigned, recommend that the Capstone Final Paper completed by the student listed above, in partial fulfillment of the degree requirements, be accepted by the Georgia State University.

Faculty Mentor's Printed Name	Faculty Mentor's Signature	Date
Veronica T. Rowe	Veronica T. Rowe	4/23/24
Anne Reed	Anne Reed	**4/12/2024**
Site Mentor's Printed Name	Site Mentor's Signature	Date
Carolyn R. Podolski	Carolyn Podolski	4/26/2024
Capstone Coordinator's Printed Name	Capstone Coordinator's Signature	Date

Acknowledgement

I am writing to express my appreciation to everyone who assisted me in the completion of this capstone project. Your dedication to my vision made my success possible. Every one of you played a crucial role in my experience and I am forever grateful for you all.

To my site mentor, Anne Reed, I cannot express my gratitude to you for your commitment to my project. I am very grateful for the time and effort you invested in me every step of the way.

To the Georgia State University faculty, your expertise provided me with the valuable knowledge to be successful in this experience. To my faculty mentor, Dr. Rowe, your enthusiasm, and commitment to my experience inspired and motivated me. Your influence on my learning has been pertinent to my success.

Finally, to my friends and family. I am forever indebted to you for your support and most of all patience with me throughout this process. The countless times that you served as a helping hand, or a listening ear did not go unnoticed. Your confidence in me has pushed me to strive for my goals. Thank you from the bottom of my heart for everything.

Once again, I want to express my appreciation to everyone for your unwavering support. I am extremely fortunate to have you as a part of my doctoral capstone experience.

Abstract

Background: Concussion or mild traumatic brain injury impacts approximately 4 million individuals per year making it one of the most common brain injuries (Concussion statistics and facts: UPMC: Pittsburgh, 2023). Approximately half of these concussions result from sports or recreation (Concussion statistics and facts: UPMC: Pittsburgh, 2023). The extremely high rates of concussions in young athletes have become a public health issue (Concussion statistics and facts: UPMC: Pittsburgh, 2023). Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications that may impact everyday functioning (Marar et al., 2012). Concussions can pose significant complications if not properly addressed by health professionals, caregivers, or the impacted individual. Literature has shown a gap in concussion knowledge in parents and caregivers which can worsen health outcomes for children at risk of concussions. Occupational therapists have a unique skill set that allows for a broad range of intervention for concussions from client education to remediation strategies for long-lasting symptoms. After diagnosis and the ruling out of more serious complications, the first form of treatment should be education for the individual and their family or caretakers (Silverberg et al., 2020). The problem is that there is currently a lack of comprehensive guidelines for occupational therapy services in concussion management and therefore a lack of occupational therapy professionals in the field. The purpose of this capstone project is to advocate for occupational therapy services in the field and improve health outcomes in youth athletes at risk of sustaining a concussion. This will be accomplished through a program to increase knowledge of the role of occupational therapy in concussion management for youth athletes through educational programs for parents of youth athletes and future occupational therapists. **Methods:** Based on the findings from the needs assessment, it was determined that two separate educational programs were needed. The first program being a video-based educational presentation for parents and caregivers of young athletes in the Cherokee County parks and recreation department and the second being a module for the Brain Injury Elective Course at Georgia State University. Both educational program materials were developed using pre-existing literature and expertise from mentors and stakeholders. Both programs were developed to increase concussion knowledge as well as advocate for occupational therapy services for individuals with concussion. **Outcomes:** The overall outcome of this capstone experience was an increase in concussion knowledge. The outcome materials developed include an educational video presentation, a sustainability plan, and a learning module. Evidence of knowledge increase is seen in the results from the pre-test and post-test results observed during the parent and caregiver education program. It is projected that the educational programs for parents, caregivers, and students will continue to increase knowledge in concussions in the future. **Discussion:** With a growing number of concussion cases reported each year, occupational therapists are in a unique position to not only help individuals experiencing symptoms that are impacting occupations but also advocate for their profession and educate more individuals on what the field of occupational therapy entails (Van Lew & Waskiewicz, 2020). In conjunction with the creation of practice guidelines, occupational therapy practitioners must advocate for the profession by defining the unique set of skills that can be used to improve health outcomes of individuals experiencing lasting concussion symptoms.

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Concussion or mild traumatic brain injury impacts approximately 4 million individuals per year making it one of the most common brain injuries (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). Approximately half of these concussions result from sports or recreation (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). The extremely high rates of concussions in young athletes have become a public health issue (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications (Marar et al., 2012). An individual who has sustained a concussion may experience a variety of somatic, cognitive, and emotional symptoms that could impact their everyday functioning if not properly treated (Marar et al., 2012).

In the past, concussions have been considered to not require medical management, but recent evidence now suggests that more interventions are necessary to ensure proper recovery and prevent chronic symptoms (Silverberg et al., 2020). To prevent post-concussion syndrome, management and care should follow the specific guidelines that have been published by the American Congress of Rehabilitation Medicine for facilitating a gradual return to occupations (McCrory et al., 2017). The first step of intervention should always be education for the client and caregiver (Silverberg et al., 2020). Following education, gradual return to all occupations begins (Silverberg et al., 2020). Because the current protocol focuses on a gradual return to daily occupations, occupational therapy can serve as a valuable rehabilitation method for individuals who are experiencing concussions (Finn, 2019).

Needs Assessment -

There is currently a tremendous amount of room for growth in the field of occupational therapy when treating patients with a concussion. While there are new guidelines on the horizon for occupational therapists working with concussions, there remains a lack of occupational therapy practitioners in the setting of concussions or mild traumatic brain injuries (Van Lew & Waskiewicz, 2020). There is a need for an increase in the comprehensive knowledge on concussions for occupational therapy students as well as an interest in practicing in the field of concussions during their career. After preliminary literature searches, discussion began regarding the outcomes of the project. During the review of literature, it was found that there are major gaps in knowledge of concussion, especially in parents and caregivers. This led to the development of an educational program. During discussion with faculty and my site mentor, it was decided that the target population for the program would be parents and caregivers of high-risk children, specifically young athletes.

Process & Plan -

Following the analysis of findings from the completion of a needs assessment, the planning of the intervention methods and the process of implementation began. Based on the findings from the needs assessment, it was determined that two separate educational programs were needed. The first program being a video-based educational presentation for parents and caregivers of young athletes in the Cherokee County parks and recreation department and the second being a module for the Brain Injury Elective Course at Georgia State University. Both educational program materials were developed using pre-existing literature and expertise from mentors and stakeholders. Clinical reasoning skills and the guidance from my mentors contributed to the decision on which components of the research should be included in the

educational program. Both programs aimed to increase concussion knowledge as well as advocate for occupational therapy services for individuals with concussions.

Specific Aims -

The outputs and results from this experience were discovered and organized through the creation of learning objectives. There were four learning objectives developed and adapted throughout the experience to ensure progress was being made towards the project. Learning objectives one, two, and three pertained to the development, implementation, and sustainability of the educational program for parents and caregivers. The final learning objective regarded the development of the educational program for occupational therapy students. Each learning objective had specific goals and short-term objectives that resulted in significant outputs and results. Learning objective #1 guided the development of the concussion education program for parents and caregivers of young athletes. Learning objective #2 directed the implementation and dissemination of the educational program for the parents and caregivers. Learning objective #3 guided the development of a sustainability protocol for Cherokee County to continue use of the educational program. Learning objective #4 guided the development of a concussion learning module for occupational therapy students.

Outputs & Outcome -

The overall outcome of this capstone experience was an increase in concussion knowledge. This was done through the development of outputs in the form of the educational materials outlined in the learning objectives. Materials included an educational video presentation, a sustainability protocol, and a learning module. The results of the pre-test, post-test, and survey displayed the increase in knowledge in parents and caregivers.

Clinical Relevance -

With a growing number of concussion cases reported each year, occupational therapists are in a unique position to not only help individuals experiencing symptoms that are impacting occupations but also advocate for their profession and educate more individuals on what the field of occupational therapy entails (Van Lew & Waskiewicz, 2020). It is imperative for more occupational therapy practitioners to enter the field of concussions and to advocate for the profession by defining the unique set of skills that can be used to improve health outcomes of individuals experiencing concussion (Van Lew & Waskiewicz, 2020).

CHAPTER 1

Literature Review

Background

Concussion or mild traumatic brain injury impacts approximately 4 million individuals per year making it one of the most common brain injuries (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). Approximately half of these concussions result from sports or recreation (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). This number may be even greater due to underreporting and difficulty in detection (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). The most common sport concussions are seen in football followed by female soccer and female basketball (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). These numbers estimate that 2 in 10 high school athletes will suffer a concussion this year alone (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023). The extremely high rates of concussions in young athletes have become a public health issue (*Concussion statistics and facts: UPMC: Pittsburgh,* 2023).

Concussions occur after a sudden bump, blow, jolt, or any force that causes the brain to move in the skull (Centers for Disease Control and Prevention, 2019). The rapid acceleration/deceleration causes a shearing and tearing between the gray and white matter of the brain which causes a chemical reaction (Braun et al., 2017). It is still unknown what exactly happens chemically to the brain after a concussion since there is no structural damage seen during neuroimaging (Choe M.C, 2016). The pathophysiology of concussions may include cellular imbalances, changes in cerebral blood flow, axonal injuries, and neuroinflammation (Choe M.C, 2016).

Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications that may impact everyday functioning (Marar et al., 2012). Symptoms of concussion can vary between individuals and vary based on the severity of the concussion (Marar et al., 2012). An individual who has sustained a concussion may experience a variety of somatic, cognitive, and emotional symptoms that could impact their everyday functioning if not properly treated (Marar et al., 2012). Common symptoms include, but are not limited to, headache, confusion, loss of consciousness, changes in behavior, blurry vision, balance problems, difficulty concentrating and problem solving, anxiety, depression, sensitivity to light, and changes in sleep patterns (*Concussion: Causes, symptoms, diagnosis, treatments, prevention* 2020; Marar et al., 2012). Therefore, concussions can impact all aspects of an individual's life.

Management of Concussion

In the past, concussions have been considered to not require medical management, but recent evidence now suggests that more interventions are necessary to ensure proper recovery and prevent chronic symptoms (Silverberg et al., 2020). The American Congress of Rehabilitation Medicine has set guidelines for all health professionals to follow when treating individuals with a concussion (Silverberg et al., 2020). After diagnosis and the ruling out of more serious complications, the first form of treatment should be education for the individual and their family or caretakers (Silverberg et al., 2020). Education should include, but is not limited to, an understanding of what a concussion is, advice on how to manage symptoms, and what favorable recovery looks like (Silverberg et al., 2020).

Early intervention is essential for recovery and the intervention begins after proper education. While the first 24-48 hours after sustaining a concussion should be characterized by

rest, a balanced return to activity as tolerated is recommended following the rest period (Silverberg et al., 2020). Strict rest on its own can have a negative impact on recovery and may be associated with increased post-concussive symptoms (Thomas et al., 2015). To prevent post-concussion syndrome, management and care should follow the specific guidelines that have been published by the American Congress of Rehabilitation Medicine for facilitating a gradual return to play and return to learning following a concussion (McCrory et al., 2017). If at any stage in the recovery process, symptoms worsen, the individual should return to the previous stage and wait 24 hours before progressing to the next stage (Silverberg et al., 2020).

The protocol for gradual return to learning includes four stages (McCrory et al., 2017). The first stage begins directly following the 24–48-hour rest period (McCrory et al., 2017). Stage one consists of the child gradually returning to daily activities at home such as minimal screen time and reading (McCrory et al., 2017). These activities should not exacerbate any symptoms (McCrory et al., 2017). After at least 24 hours with no increase in symptoms, the child can move into stage two (McCrory et al., 2017). Stage two allows the child to begin to incorporate school activities such as homework and other cognitive activities in the home (McCrory et al., 2017). This should increase their tolerance for schoolwork and only occur if symptoms do not worsen (McCrory et al., 2017). Stage three is characterized by returning to the classroom but only part time (McCrory et al., 2017). The child may need to begin with a partial school day or an increase of rest breaks during the day (McCrory et al., 2017). The final stage is constituted by a return to all academic activities and the opportunity to catch up on all missed work (McCrory et al., 2017).

The protocol for returning to play includes six stages and is followed once the return to learning protocol is complete (McCrory et al., 2017). It should be noted that the child should be symptom free for at least 24 hours before progressing to the next stage (McCrory et al., 2017).

Stage one includes returning to all daily activities including school with no symptoms (McCrory et al., 2017). Stage 2 begins to incorporate light aerobic activity such as walking or cycling while raising the heart rate (McCrory et al., 2017). Stage 3 allows the child to participate in sport-specific activities that incorporate movements in preparation for return to their sport (McCrory et al., 2017). Stage 4 permits the child to return to non-contact practice (McCrory et al., 2017). They may begin their training as long as there is no potential for further contact or head injury (McCrory et al., 2017). In stage 5, the child can return to their full contact sport (McCrory et al., 2017). This should allow for normal training and confidence building (McCrory et al., 2017). Finally, in stage 6, the child can return to full sport and game play. (McCrory et al., 2017)

When following proper recovery protocol, approximately 80%-90% of individuals will spontaneously recover from concussion within 10 to 14 days (McCrory et al., 2017). If symptoms are not properly treated, an individual may develop post-concussion syndrome which impacts physical, cognitive, and emotional/behavioral functioning in the long-term (Ryan, L. M., & Warden, D. L., 2003). These symptoms can persist for years and cause permanent disability if not addressed (Ryan, L. M., & Warden, D. L., 2003).

Individuals who experience more severe persistent symptoms may require more active medical treatment for their specific symptoms (Silverberg et al., 2020). These chronic symptoms may include headache, dizziness, vision problems, sleep disturbances, anxiety/depression, and fatigue (Silverberg et al., 2020). Treatment should be symptom specific and it may be necessary to refer the patient to specialty clinics, such as those with occupational therapy services available (Silverberg et al., 2020).

Current Occupational Therapy Scope of Practice in Concussion Management

Because the current protocol focuses on a gradual return to daily occupations, occupational therapy can serve as a valuable rehabilitation method for individuals who are experiencing concussions (Finn, 2019). The occupational therapy scope of practice revolves around the idea that all aspects of life are intertwined and impact each one's functioning (Wheeler et. al., 2017). Occupational therapy services in concussion management have the capacity to address every area in an individual's life that may be impacted by their injury and assist in recovery (Wheeler et. al., 2017) . The American Occupational Therapy Association recognizes that occupational therapists may help individuals with concussion through remediation of new skills and education on compensatory strategies in the academic environment (Wheeler et. al., 2017). Typical impairments seen in individuals experiencing concussion that may be addressed through occupational therapy services may include lower level of alertness, visual impairments, vestibular system and balance issues, difficulty with sleep, and psychosocial disorders including depression, irritability, and lack of motivation (Wheeler & Acord-Vira, 2023).

Due to the fact that every individual experiences differing concussion symptoms, care must be individualized, and client centered (Finn, 2019). The first step of treatment of an individual with concussion is evaluation and assessment (Finn, 2019). Possible categories of occupational therapy assessments may include perceived performance assessments, symptom reports, quality of life assessments, assessments of occupations, and sleep assessments (Finn, 2019). Specific assessments include but are not limited to the Canadian Occupational Performance Measure (Law et al., 1990), the National Institutes of Healthy Activity Record (Gerber & Furst, 1992), the Developmental Eye Movements Test (Facchin, 2021), the

Rivermead Post Concussion Symptoms Questionnaire (King et al., 1995), the Concussion Symptom Inventory (Randolph et al., 2009), the 36-Item Short Form Survey Instrument (RAND Health, n.d.), the Assessment of Motor and Process Skills (Fisher, 2012), and the Pittsburgh Sleep Quality Index (Buysse et al., 1989) (Finn, 2019; Van Lew & Waskiewicz, 2020). The occupational therapist should use clinical judgment to determine the specific assessments necessary to treat the individual (Finn, 2019).

Following the comprehensive evaluation, the therapist should determine the intervention plan (Van Lew & Waskiewicz, 2020). Interventions must be client-centered and individualized because no two individuals have the same set of concussion symptoms (Van Lew & Waskiewicz, 2020). Occupational therapists should use the protocols as a guide and build upon the improvement and expansion of client skills to address self-care, sleep, education, work, play, and leisure (Van Lew & Waskiewicz, 2020). Interventions may take a compensatory or remedial approach and may include a variety of accommodations and adaptations (Finn, 2019). Based on the symptoms experienced and assessment results, interventions may target visual-vestibular system rehabilitation, sensory processing re-integration, cognitive remediation, and symptom management education (Van Lew & Waskiewicz, 2020). Intervention methods for specific symptoms can be found below in *Table 1.*

Table 1 – Occupational Therapy interventions for Concussion Symptoms

Symptom	Intervention
Emotional Reactivity	Interventions to decrease emotional reactivity may include making the client aware of the triggers and the teaching of relaxation techniques (Van Lew & Waskiewicz, 2020).
Fatigue	Fatigue is one of the most common symptoms (Van Lew & Waskiewicz, 2020). It is important to address fatigue because it impacts the participation level in other occupations (Van Lew & Waskiewicz, 2020). The first step is to determine the causes of the fatigue and address them (Van Lew & Waskiewicz, 2020). Interventions may include providing the client with strategies to reduce fatigue such as recruiting assistance, taking rest breaks,

	or creating a schedule for a gradual return to occupations (Van Lew & Waskiewicz, 2020).
Sleep Disturbances	Interventions may include education of sleep hygiene, recommendation for adaptive equipment, and compensatory strategies (Van Lew & Waskiewicz, 2020). Some strategies may include completing an environmental evaluation of the client's bedroom and recommending a more conducive environment for sleep with a darker room, no screen time, or a noise machine (Van Lew & Waskiewicz, 2020).
Visual Functioning Deficits	Interventions include remediation of visual pursuits, eye range of motion, and saccades for daily function and occupations (Van Lew & Waskiewicz, 2020).
Sensory Processing Deficits	Interventions to compensate for over-responsiveness to visual stimulus, auditory stimulus, movement, and the environment. Including but not limited to proprioceptive input and assistive technology (Van Lew & Waskiewicz, 2020).
Cognitive Functioning Deficits	Interventions to remediate and compensate for deficits in executive functioning including self-awareness, problem solving, and memory (Van Lew & Waskiewicz, 2020). Compensatory strategies may include extra cueing and activity analysis (Van Lew & Waskiewicz, 2020). Remedial strategies may include tasks and activities that address planning, attention, and memory that can then be generalized to daily occupations (Van Lew & Waskiewicz, 2020).

Concussion rates have shown significant increase within the past few decades, but scientific progress regarding the pathophysiology, symptom management, and recovery has shown significant increase as well (Harmon et al., 2019). It has become imperative for healthcare providers and high-risk individuals to be knowledgeable on the topic to prevent further impairment caused from sustaining a concussion (Harmon et al., 2019). Occupational therapists have a unique skill set that allows for a broad range of intervention for concussions from client education to remediation strategies for long-lasting symptoms.

CHAPTER 2

Needs Assessment

There is currently a tremendous opportunity for growth in the field of occupational therapy when it comes to treating patients with a concussion. While there are new guidelines in process for occupational therapists working with these individuals, there is a lack of occupational therapy practitioners in the setting of concussions or mild traumatic brain injuries (Van Lew & Waskiewicz, 2020). With a growing number of concussion cases reported each year, occupational therapists are in a unique position to not only help individuals experiencing symptoms that are impacting occupations, but also advocate for their profession and educate more individuals on what the field of occupational therapy entails (Van Lew & Waskiewicz, 2020). It is imperative that more occupational therapy practitioners enter the field of concussions and advocate for the need of the profession. This can be achieved by defining the unique set of skills that can be applied to improve health outcomes of individuals experiencing concussion (Van Lew & Waskiewicz, 2020). Due to this research, my clinical reasoning skills, and expertise from Georgia State University faculty, we see that there is a need for the creation of a learning module to address the comprehensive knowledge on concussion, including assessment and intervention, for occupational therapy students.

After preliminary literature searches, discussion began regarding the outcomes of the project. During the review of literature, it was found that there are major gaps in the knowledge of concussion, especially for parents and caregivers. This led to the development of an educational program. Following discussions with faculty members and my site mentor, it was decided that the target population for the program would be parents and caregivers of high-risk children, specifically young athletes.

Due to the lack of medical professional presence during youth sporting events, it is critical for parents and coaches to have adequate knowledge of concussion signs and symptoms to protect the child (Feiss et al., 2020). Throughout literature, youth athlete coaches and parents have been found to have varying levels of concussion knowledge (Feiss et al., 2020). This may be attributed to the lack of mandated concussion-specific training for parents and coaches (Coxe et al., 2018). State laws vary throughout the country, and many do not include comprehensive concussion education for both the parents and the coaches of youth athletes (Coxe et al., 2018).

Coaches' Knowledge-

Concussion specific training is now required for coaches in every state (Coxe et al, 2018). This significantly increased the level of concussion knowledge among coaches (Feiss et al., 2020). Almost every coach was able to identify cognitive and physical symptoms associated with concussions (Kerr et al., 2018). In addition, most coaches understood the significant impact a single concussion can have on a child as well as the cumulative effects of having multiple concussions (Covassin et al., 2012). There was a significant gap in knowledge for coaches regarding the criteria for return to play and return to school protocols (Daugherty et al., 2019). Overall, the majority of the coaches studied throughout literature had adequate knowledge of concussions.

Parents' Knowledge-

Current literature has identified a significant gap in concussion knowledge in parents. This may be attributed to the lack of mandated education for parents of youth athletes (Coxe et al., 2018). Less than 25% of parents stated that they received information or education on concussions from the school's athletic trainers and/or coaches who are often responsible for administering this information (Weerdenburg et al., 2016).

The knowledge gap was noticed when reviewing basic concussion information including the mechanism of a concussion injury (Mannings et al., 2014). Just over half of the parents studied were able to correctly answer questions including whether a blow to the head is necessary for a concussion to occur or if loss of consciousness is necessary for a diagnosis of a concussion (Mannings et al., 2014). There are significant misconceptions held by parents regarding signs and symptoms of a concussion (Mannings et al., 2014). Almost all parents were able to identify and recall that concussion symptoms can include memory problems, disorientation, and confusion (Mannings et al., 2014). However, when it came to identifying the less common symptoms such as sleep disturbances and emotional dysregulation, most parents did not demonstrate their knowledge that those symptoms were possible causes of a concussion (Mannings et al., 2014; Kay et al., 2017).

The largest gap in knowledge was discovered when looking at the timeline of a concussion and how it impacts school and sports (Hunt et al., 2018; Weerdenburg et al., 2016). In one study, only 22% of parents correctly identified how long concussion symptoms could last (Hunt et al., 2018). While parents were aware that concussions could impact their child's ability to participate in their sport for weeks to months, they were significantly less aware that their child's participation in school may be impacted as well (Weerdenburg et al., 2016). Majority of parents were unable to recognize the progressive return to school and play nature of concussion management which can have a significant impact on their child's recovery and quality of life (Hecimovich et al., 2016).

Based on current literature, parents of youth athletes hold significantly less knowledge of concussions than coaches (Feiss et al., 2020). This may be attributed to the mandated educational course provided to coaches (Coxe et al., 2018). There is a lack of guidelines for parents'

education, and this has resulted in parents of youth athletes still demonstrating their belief and misconceptions regarding concussions and their significant gaps in knowledge (Coxe et al., 2018). Evidence-based concussion education for parents can improve concussion knowledge for not only the parents but the children as well (Beidler et al., 2022). It is imperative for healthcare providers including occupational therapists to educate parents in this topic to help protect youth athletes from the significant long-term effects of concussion and improve concussion outcomes in youth athletes (Beidler et al., 2022).

It is evident that parents of youth athletes should be provided with specific concussion knowledge to protect their children (Beidler et al., 2022). While there are clear gaps in knowledge that were discovered in literature regarding concussion knowledge, there is no complete set of data on all comprehensive knowledge. Due to this research, my clinical reasoning skills, and expertise from my site mentor, I have determined the need for the creation of an educational program to address the comprehensive knowledge of parents and caregivers. It is a combination of my knowledge gained from literature and expert advice from individuals in the athletic departments of Cherokee County Schools and Parks and Recreation that led me to discover the need for a comprehensive education course for parents and caregivers with children in the Cherokee County Parks and Recreation department. My site mentor, the Cherokee County Athletic Director, and Cherokee County Athletic trainers provided the necessary input to create an effective course. After discussion, we decided that a video-based education presentation with the incorporation of knowledge checks would be most effective for parents and caregivers.

CHAPTER 3

Capstone Process

Overall Proposed Intervention

Following the analysis of findings from the completion of a needs assessment, the planning of the intervention methods and the process of implementation began. Based on the findings from the needs assessment, it was determined that two separate educational programs were needed. The first program being a video-based educational presentation for parents and caregivers of young athletes in the Cherokee County parks and recreation department and the second being a module for the Brain Injury Elective Course at Georgia State University. Both educational program materials were developed using pre-existing literature and expertise from mentors and stakeholders. I used my clinical reasoning skills and the guidance from my mentors to decide which components of the research should be included in the educational program. Both programs aimed to increase concussion knowledge as well as advocate for occupational therapy services for individuals with concussion.

Parent and Caregiver Education Program

The first program was developed based on a need discovered by my site mentor. It aimed to increase concussion knowledge in parents and caregivers of young athletes. After discussion and analysis of the needs assessment, it was decided that the course would be implemented using a video-based presentation. It was created on Canva and then video recorded. The video recording of the program was disseminated through email where participants received an informed consent form, detailed instructions, and a link to watch the presentation at their leisure.

Based on the needs of Cherokee County, it was determined that a sustainable program was needed to reach parents and caregivers of young athletes in all sports. To create a more sustainable program, a pre-test, post-test, and satisfaction survey that is embedded in the video-based presentation for parents and caregivers of young athletes using a QR code was developed. Qualtrics was used to create the surveys and analyze the findings. All three surveys were anonymous and no identifying information was collected from the participants. The pre-test and post-test will be used to test the efficacy of the program in increasing knowledge levels of concussion in parents and caregivers of young athletes.

The satisfaction survey will give insight into the quality of the program and assist in creating a more sustainable program for the Cherokee County Parks and Recreation Department to use in the future. The feedback from the survey will be used to adapt the program for future use.

Following the implementation and improvement of the program, a sustainability plan was created. The sustainability plan, including the improved education course and a protocol for dissemination, were provided to the Cherokee County Parks and Recreation department.

Brain Injury Elective Module

The second program was developed based on the need for an increase in knowledge for occupational therapy students. Following discussion with current Georgia State University occupational therapy faculty, it was decided that a module on concussion management would be incorporated into the brain injury elective class. It was developed to be implemented in the next offering of the course for occupational therapy students. It includes lecture materials and an interactive knowledge check. The lecture materials were created using a PowerPoint presentation. To maintain a similar format to the other elective modules, the PowerPoint

presentation includes a voice-over. Following the completion of the lecture, students will be asked to participate in a knowledge check. Based on discussions during the needs assessment process, it was decided that an interactive knowledge check would be more relevant than a typical quiz. Once finalized, all materials were provided to the Georgia State University faculty member responsible for teaching the brain injury elective course. The lecture materials and knowledge check will be disseminated by the faculty member to all occupational therapy students who elect to take the course.

Based on the need to increase knowledge of concussion management, two educational programs were created. The first program targeted parents and caregivers and was developed with Cherokee County School District personnel. A video presentation was successfully created and implemented. This presentation, along with accompanying surveys, was then adapted into a sustainable program to be used for future parents and caregivers. The second program targeted occupational therapy students and was developed for future use. Lecture materials and a knowledge check were created and provided to the occupational therapy faculty member teaching the brain injury elective course at Georgia State University. Both programs not only aimed to increase concussion knowledge but advocate for occupational therapy services in concussion management as well.

CHAPTER 4

Output & Results

The outputs and results from this experience were developed and organized through the creation of learning objectives. There were four learning objectives developed and adapted throughout the experience to ensure progress was being made towards the project. Learning objectives one, two, and three pertained to the development, implementation, and sustainability of the educational program for parents and caregivers. The final learning objective regarded the development of the educational program for occupational therapy students. Each learning objective had specific goals and short-term objectives that resulted in significant outputs and results.

Learning Objective #1 Output: Concussion Education Program for Parents and Caregivers of Young Athletes

The first learning objective involved the creation of an educational program for parents and caregivers. The associated output is the video-based concussion education program. This program included presentation slides with video-presentation. Information included in the concussion education course provided to parents and caregivers can be found below in *Figure 1*.

Concussion Education for Parents and caregivers of Young Athletes

What is a Concussion?

A concussion is a mild traumatic brain injury (Concussion statistics and facts: UPMC: Pittsburgh, 2023). They impact approximately 4 million individuals per year making it one of the most common brain injuries (Concussion statistics and facts: UPMC: Pittsburgh, 2023). Approximately half of these concussions result from sports or recreation (Concussion statistics and facts: UPMC: Pittsburgh, 2023). This number may be even greater due to underreporting and difficulty in detection (Concussion statistics and facts: UPMC: Pittsburgh, 2023). The most common sport concussions are seen in is football followed by female soccer and female basketball (Concussion statistics and facts: UPMC: Pittsburgh, 2023).

Concussions occur after a sudden bump, blow, jolt, or any other force that causes the brain to move in the skull (Centers for Disease Control and Prevention, 2019). There is no physical injury to the brain and therefore is no structural damage seen during neuroimaging which makes diagnosing a concussion difficult (Choe M.C, 2016).

The actual mechanism is a stretching or shearing of the white and gray matter due to acceleration/deceleration differences (Choe M.C, 2016). Their make up causes them to move at different speeds and when there is a rapid acceleration or deceleration, they shear against each other causing tearing of biological structures (Choe M.C, 2016). This causes cellular imbalances, changes in cerebral blood flow, axonal injuries, and neuroinflammation which causes the symptoms of concussion (Choe M.C, 2016).

Signs & Symptoms

Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications (Marar et al., 2012). Symptoms of concussion can vary between individuals and vary based on the severity of the concussion (Marar et al., 2012). Symptoms may show up immediately following the injury or may not show up for days or weeks later (Marar et al., 2012).

An individual who has sustained a concussion may experience a variety of physical, cognitive, and emotional symptoms that could impact their everyday functioning if not properly treated (Marar et al., 2012). Common symptoms include headache, nausea, confusion, loss of consciousness, blurry vision, difficultly concentrating or problem solving, balance problems, sensitivity to light and noise, and inability to recall events (Concussion: Causes, symptoms, diagnosis, treatments, prevention 2020). Some fewer common symptoms include emotional distress, anxiety, depression, and changes in personality (Concussion: Causes, symptoms, diagnosis, treatments, prevention 2020).

Although rare, it is important to look for any danger signs (Centers for Disease Control and Prevention, 2019). Any of these could indicate that a brain bleed has developed, and it is imperitive to seek emergency medical attention (Centers for Disease Control and Prevention, 2019). These signs are different size pupils, severe drowsiness, weakness, or numbness, worsening coordination, repeated vomiting, slurred speech, loss of consciousness, seizures, and inability to recognize familiar places or people (Centers for Disease Control and Prevention, 2019).

Recovery

Following the injury, the most important step to recovery is rest (Centers for Disease Control and Prevention, 2019). Adequate sleep, daily naps, and breaks from activity are necessary to let the brain recover heal (Centers for Disease Control and Prevention, 2019). The first 24-48 following the injury should be characterized by rest (Centers for Disease Control and Prevention, 2019). You are allowed to sleep following a concussion (Centers for Disease Control and Prevention, 2019). It has been recently found that there is no need to keep a child awake through the night following a concussion (Centers for Disease Control and Prevention, 2019). The reason for keeping a child awake was to monitor for severe symptoms that may appear (Centers for Disease Control and Prevention, 2019). This will most likely happen within the first couple of hours so after a 2–3-hour wake period following a concussion, it is recommended to let your child sleep and to check on them every hour or so to monitor symptoms (Centers for Disease Control and Prevention, 2019). The exception is if you are seeing worsening symptoms like dilated pupils or severe vomiting which you should then take them to a medical professional (Centers for Disease Control and Prevention, 2019).

There are 2 protocols in place to help with proper recovery (McCrory et al., 2017). The first protocol is Return to School. The stages can be found in the table below (McCrory et al., 2017).

Stage	Activities
1 – Daily Activities at Home	Gradually returning to any daily activities that your child typically does throughout their day as long as they do not give your child any symptoms. Examples may include reading, texting, and other screen time. It is recommended to start with 5–15-minute intervals and build up tolerance.
2 – School Activities at Home	Begin to increase their cognitive tolerance by incorporating schoolwork such as homework assignments, reading, etc. outside of the classroom in the home setting.
3 – Partial Return to School	Increase academic tolerance through the gradual reintroduction of school. It may be necessary to start with one class per day or half days. Breaks and compensatory strategies may also be necessary to participate in school during this stage.
4 – Full Return to School	Child should be able to return to school full time and catch up on any missed work.

Following the return to school protocol, the return to play protocol begins (McCrory et al., 2017). The return to play protocol stages can be found in the table below (McCrory et al., 2017).

Stage	Activities
1 – Symptom limited activities	This stage includes incorporating all daily activities including school and schoolwork. This is equivalent to the final stage of the return to school protocol.
2 –Light aerobic exercise	The child should be able to increase their heartrate through walking, cycling, etc. at a slow to moderate pace. This does not include resistance training or sport-specific exercises.
3 – Sport-specific exercise	At this stage, the child may begin to incorporate sport-specific movements such as running. There should be no impact activities included in this training
4 – non-contact training drills	Child can progress to resistance training including drills and other activities that incorporate higher level of coordination and thinking. There should still be no opportunity for contact with other athletes at this stage.
5 – Full-contact practice	Child may now participate fully in practices. This stage is characterized by restoring the athlete's confidence and assessing current skill level.
6 – Return to Sport	Child may participate in normal game play.

It is imperative to follow the protocols to prevent long term effects and repeat concussions (Ryan, L. M., & Warden, D. L., 2003). When a child sustains a concussion, they will be at a greater risk of sustaining another and at a greater risk of developing long term effects and post-concussion syndrome (Ryan, L. M., & Warden, D. L., 2003).

When following proper recovery protocol, approximately 80%-90% of individuals will spontaneously recover from concussion within 10 to 14 days (McCrory et al., 2017).

In some cases, or if symptoms are not properly treated, an individual may develop post-concussion syndrome which impacts physical, cognitive, and emotional/behavioral functioning in the long-term (Ryan, L. M., & Warden, D. L., 2003). Some commonly experienced symptoms of Post-Concussion Syndrome are dizziness, emotional irritability, sleep disturbances, intense sensitivity to light and noise, visual disturbances like blurry vision, fatigue, anxiety, and balance or coordination issues (Ryan, L. M., & Warden, D. L., 2003). These symptoms can persist for years and cause permanent issues if not addressed (Ryan, L. M., & Warden, D. L., 2003).

Final Takeaway

While concussions are not 100% preventable, there are many things that you can do as a parent or caregiver that can better your child's health outcome. Educate yourself and other parents/caregivers. Educate your child. Advocate for your child.

Figure 1 – Information in the Concussion Education Program for Parents and Caregivers of Young Athletes

This information was then organized into a slide presentation which can be found in the appendix and then video recorded. The video-presentation was uploaded to YouTube for easy dissemination. The link to view the YouTube video is https://youtu.be/wzYKIId2xig .

Learning Objective #2 Output: Implementation of the Concussion Education Program for Parents and Caregivers of Young Athletes

After the development of the presentation, the implementation process began. IRB approval was required based on the pre-test, post-test, and satisfaction survey that was included in the presentation for sustainability purposes. After receiving IRB approval, the dissemination occurred. Discussion with Cherokee County personnel led to the decision to implement and disseminate this presentation through email. The program was emailed to parents and caregivers in Cherokee County from my site mentor. Participants received an email with the presentation and an informed consent form. This form was approved by the IRB. It included instructions on completion and can be found in the appendix.

Learning Objective #3 Output: Development of a Sustainable Program for parents and caregivers

Sustainability protocol began during the development of the educational course. Based on needs expressed by my site mentor, it was decided that outcome measures should be taken during the educational course to develop a more sustainable program. A pre-test, post-test, and satisfaction survey were developed to address this need. During the educational course,

participants were given the choice to participate in the pre-test, post-test, and satisfaction survey. The pre-test and post-test were used to determine the efficacy of the educational program in increasing concussion knowledge. The pre-test and posttest had 10 questions that can be found in the table below. The correct answers are shown in bold.

Table 2 – Pre-test and Post-test Questions in the Video-Based Education Course Given to Parents and Caregivers of Young Athletes.

Question	**Answer Choices**
Q1 - An individual must receive a "blow" to the head to sustain a concussion.	True **False**
Q2 - When can symptoms of a concussion appear?	Immediately following the injury 24 following the injury One week following the injury **All of the above**
Q3 - Which of the following is not a symptom of a concussion?	Nausea Emotional Irritability Dizziness Loss of Consciousness **Muscle Soreness**
Q4 - Your child receives a blow to the head during football practice and experiences loss of consciousness for a few seconds. You observe that he seems disoriented and go check on him. When you get down to him, you realize that one pupil is larger than the other. What should you do next?	Tell them to sit on the bench for the remainder of the game Take them home and let them rest **Seek emergency medical attention**
Q5 - You may allow your child to sleep following a suspected concussion injury as long as you monitor them.	**True** False
Q6 - Your child sustained a concussion 8 days ago. He is currently fully participating in school with no reported symptoms. He has been attending soccer practice the past 2 days but has only participated in non-contact drills. He has an important soccer tournament starting tomorrow that he is asking to play	Yes **No**

in. He said he feels fine and has not reported any symptoms within the last 2 days. You also have not observed any abnormal behaviors. Should you allow him to participate in the tournament?	
Q7 - Which of the following are ways to increase participation in school following a concussion injury?	Let teachers and counselors know the state of your child's concussion Allow your child to take rest breaks throughout the school day Provide you child with a quiet room and extra time to complete assignments **All of the above**
Q8 - Your child is currently in the stage of recovery where she can attend sports practices but is not able to participate in any contact drills. How long must your child be symptom free in this stage before progressing to the next stage of recovery including full contact practices?	If she is not experiencing any symptoms during practice, she can start participating in contact practice that day She can participate in full contact practice if she is symptom free for two hours She can participate in full contact practice if she is symptom free for 12 hours **She can participate in full contact practice if she is symptom free for 24-48 hours**
Q9 - When following proper concussion protocol, 80-90% of individuals should make a full recovery within how many days?	2-4 days 1 week **10-14 days** 3-4 weeks
Q10 - Post-Concussion Syndrome only occurs when you do not follow the proper recovery protocol.	True **False**

At the end of the educational program, participants were asked to complete a satisfaction survey. This survey was used to improve the program's accessibility and quality for future use. The following table has the questions that were asked during the satisfaction survey.

Table 3 – Satisfaction Survey Questions Given to Parents and Caregivers of Young Athletes at the End of the Video-Based Educational Course.

Question	Answer Choices
Q1- How easy or difficult was it to access the course materials?	Extremely easy Moderately easy Slightly easy Neither easy nor difficult Slightly difficult Moderately difficult Extremely difficult
Q2- How would you rate your level of engagement throughout the course?	Extremely engaged Moderately engaged Slightly engaged Neither engaged nor unengaged Slightly unengaged Moderately unengaged Extremely unengaged
Q3- How satisfied or dissatisfied were you with the quality of the presentation materials?	Extremely satisfied Moderately satisfied Slightly satisfied Neither satisfied nor dissatisfied Slightly dissatisfied Moderately dissatisfied Extremely dissatisfied
Q4- Overall, how satisfied or dissatisfied were you with this educational course?	Extremely satisfied Moderately satisfied Slightly satisfied Neither satisfied nor dissatisfied Slightly dissatisfied Moderately dissatisfied Extremely dissatisfied
Q5- Please share any additional comments or feedback regarding this education course.	

After implementation, results from the pre-test, post-test, and satisfaction were analyzed on Qualtrics. Overall, there were 14 individuals who participated in the educational course and completed the pre-test, post-test, and satisfaction survey. It is assumed that more individuals

participated in the course but chose to not complete the surveys based on them being voluntary. *Table 4* demonstrates the results of the pre-test and post-test as change in correct answers chosen for each question.

Table 4 – Results from Pre-test and Post-test in Concussion Education Program for Parents and Caregivers of Young Athletes

Question	**Percentage of participants that correctly answered this question on the Pre-Test**	**Percentage of participants that correctly answered this question on the Post-Test**
Q1 - An individual must receive a "blow" to the head to sustain a concussion.	36%	71%
Q2 - When can symptoms of a concussion appear?	86%	93%
Q3 - Which of the following is not a symptom of a concussion?	79%	100%
Q4 - Your child receives a blow to the head during football practice and experiences loss of consciousness for a few seconds. You observe that he seems disoriented and go check on him. When you get down to him, you realize that one pupil is larger than the other. What should you do next?	100%	100%
Q5 - You may allow your child to sleep following a suspected concussion injury as long as you monitor them.	50%	100%
Q6 - Your child sustained a concussion 8 days ago. He is currently fully participating in school with no reported symptoms. He has been attending soccer practice the past 2 days but has only participated in non-contact drills. He has an important soccer tournament starting	29%	93%

tomorrow that he is asking to play in. He said he feels fine and has not reported any symptoms within the last 2 days. You also have not observed any abnormal behaviors. Should you allow him to participate in the tournament?		
Q7 - Which of the following are ways to increase participation in school following a concussion injury?	79%	93%
Q8 - Your child is currently in the stage of recovery where she can attend sports practices but is not able to participate in any contact drills. How long must your child be symptom free in this stage before progressing to the next stage of recovery including full contact practices?	79%	93%
Q9 - When following proper concussion protocol, 80-90% of individuals should make a full recovery within how many days?	64%	93%
Q10 - Post-Concussion Syndrome only occurs when you do not follow the proper recovery protocol.	71%	86%

According to the results, we see that every question showed an increase in the percentage of individuals who answered it correctly. The biggest increase in percentage we see is in question six. It went from only 29% of parents and caregivers answering it correctly to 93%. This is especially important to note because question six provides parents with a real-life scenario as a case study. This knowledge can translate directly to future situations.

A total of 14 participants completed the satisfaction survey at the end of the educational program. *Table 5* displays the findings from the satisfaction survey. It displays the percentage of each answer choice chosen by participants.

Table 5 – Findings from Satisfaction Survey in Concussion Education Program for Parents and Caregivers of Young Athletes

Question	Answer choices	Percentage of participants that chose each answer choice
Q1- How easy or difficult was it to access the course materials?	Extremely easy	57%
	Moderately easy	29%
	Slightly easy	14%
	Neither easy nor difficult	0%
	Slightly difficult	0%
	Moderately difficult	0%
	Extremely difficult	0%
Q2- How would you rate your level of engagement throughout the course?	Extremely engaged	86%
	Moderately engaged	14%
	Slightly engaged	0%
	Neither engaged or unengaged	0%
	Slightly unengaged	0%
	Moderately unengaged	0%
	Extremely unengaged	0%

Q3- How satisfied or dissatisfied were you with the quality of the presentation materials?	Extremely satisfied	100%
	Moderately satisfied	0%
	Slightly satisfied	0%
	Neither satisfied nor dissatisfied	0%
	Slightly dissatisfied	0%
	Moderately dissatisfied	0%
	Extremely dissatisfied	0%
Q4- Overall, how satisfied or dissatisfied were you with this educational course?	Extremely satisfied	100%
	Moderately satisfied	0%
	Slightly satisfied	0%
	Neither satisfied nor dissatisfied	0%
	Slightly dissatisfied	0%
	Moderately dissatisfied	0%
	Extremely dissatisfied	0%
Q5- Please share any additional comments or feedback regarding this education course.	"This was great! I learned a lot about the recovery process." "Very professional!" "Pleasant presentation style."	

Overall, all participants were satisfied with the program. Feedback provided was all positive. One participant noted that the presentation was "pleasant" and another said, "I learned a lot about the recovery process." The only concern coming from the satisfaction survey results

was the accessibility. While all answers fell in the easily accessed category, some participants noted that it was only “slightly easy”. The results provided valuable feedback that was used to modify the program for sustainability.

The findings of the satisfaction survey were used to adapt the program for future use in the Cherokee County Parks and Recreation Department. Based on results, there were minor concerns with accessing the presentation. For this reason, the presentation was downloaded and saved as an mp4 video file. Cherokee County personnel were given this file to disseminate to future parents and caregivers of young athletes. Additional updates to the presentation included the removal of the Qualtrics surveys due to Cherokee County personnel seeing no need to include them.

An in-depth sustainability protocol was requested by Cherokee County as an outcome of this capstone experience. The sustainability protocol ensures that the educational program can be implemented for future parents and caregivers of young athletes in fall sports. The sustainability protocol was created based on the needs of the Cherokee County Parks and Recreation Department and adapted based on findings from surveys. It includes an updated presentation, an educational handout, and in-depth instructions for the future dissemination of the program. The educational handout was requested by Cherokee County personnel as an additional piece of information to provide to parents and caregivers to increase concussion knowledge. The handout was developed at the request of my site mentor by adapting the presentation into a pamphlet. The handout is seen in *Figure 2* below.

Concussion in Young Athletes

What is a concussion?

A concussion is a mild traumatic brain injury. They impact approximately 4 million individuals per year making it one of the most common brain injuries. Approximately half of these concussions result from sports or recreation. This number may be even greater due to underreporting and difficulty in detection. The most common sport concussions are seen in is football followed by female soccer and female basketball.

Concussions occur after a sudden bump, blow, jolt, or any other force that causes the brain to move in the skull. There is actually no physical injury to the brain and therefore is no structural damage seen during neuroimaging which makes diagnosing a concussion fairly difficult. It is a cellular imbalance and neuroinflammation which causes the symptoms of concussion.

Signs & Symptoms

Headache or "Pressure" in Head
Nausea
Confusion
Loss of Consciousness
Blurry Vision
Difficulty Concentrating or Problem Solving
Balance Problem/Clumsiness
Changes in Sleep
Sensitivity to Light or Noise
Emotional Distress
Anxiety/Depression
Changes in Typical Behavior or Personality

Different size pupils
Severe drowsiness
Weakness or numbness
Repeated vomiting
Slurred speech
Seizures
Inability to recognize familiar people
Increasingly confused and agitated
Loss of consciousnes

Danger signs

(seek emergency medical attention)

Recovery

Rest is Key

Following the injury, the most important step to recovery is rest. The first 24-48 following the injury should be characterized by rest! Adequate sleep, daily naps, and breaks from activity are necessary to let the brain recover heal. You are allowed to let your child sleep following a concussion. It has been recently found that there is no need to keep your child awake through the night following a concussion. It is recommended to let your child sleep and to check on them every hour or so to monitor symptoms.

Following 24-48 hours of rest, you can begin the stages of recovery.

Stages of Returning to School

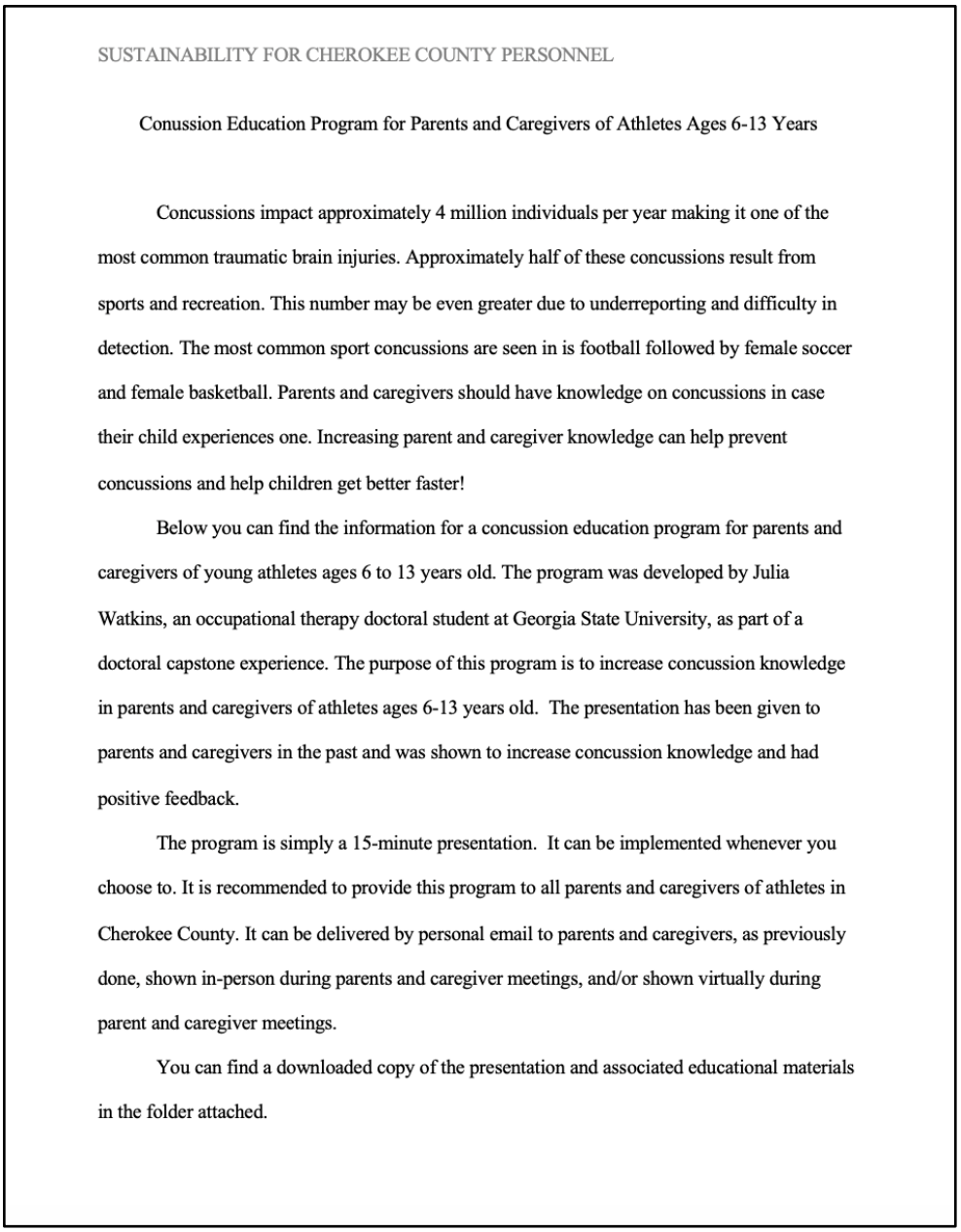
Stage	Activities
1 – Daily Activities at Home	Gradually returning to any daily activities that your child typically does throughout their day as long as they do not give your child any symptoms. Examples may include reading, texting, and other screen time. It is recommended to start with 5–15-minute intervals and build up tolerance.
2 – School Activities at Home	Begin to increase their cognitive tolerance by incorporating schoolwork such as homework assignments, reading, etc. outside of the classroom in the home setting.
3 – Partial Return to School	Increase academic tolerance through the gradual reintroduction of school. It may be necessary to start with one class per day or half days. Breaks and compensatory strategies may also be necessary to participate in school during this stage.
4 – Full Return to School	Child should be able to return to school full time and catch up on any missed work.

Stages of Returning to Sport

Stage	Activities
1 – Symptom limited activities	This stage includes incorporating all daily activities including school and schoolwork. This is equivalent to the final stage of the return to school protocol.
2 –Light aerobic exercise	The child should be able to increase their heartrate through walking, cycling, etc. at a slow to moderate pace. This does not include resistance training or sport-specific exercises.
3 – Sport-specific exercise	At this stage, the child may begin to incorporate sport-specific movements such as running. There should be no impact activities included in this training
4 – non-contact training drills	Child can progress to resistance training including drills and other activities that incorporate higher level of coordination and thinking. There should still be no opportunity for contact with other athletes at this stage.
5 – Full-contact practice	Child may now participate fully in practices. This stage is characterized by restoring the athlete's confidence and assessing current skill level.
6 – Return to Sport	Child may participate in normal game play.

Figure 2 – Education Handout included in Sustainability Protocol for Cherokee County Parks and Recreation Department

Instructions for future dissemination were written and delivered to the Cherokee County parks and recreation department with the presentation and educational handout. This document can be found below in *Figure 3*.



SUSTAINABILITY FOR CHEROKEE COUNTY PERSONNEL

Conussion Education Program for Parents and Caregivers of Athletes Ages 6-13 Years

Concussions impact approximately 4 million individuals per year making it one of the most common traumatic brain injuries. Approximately half of these concussions result from sports and recreation. This number may be even greater due to underreporting and difficulty in detection. The most common sport concussions are seen in is football followed by female soccer and female basketball. Parents and caregivers should have knowledge on concussions in case their child experiences one. Increasing parent and caregiver knowledge can help prevent concussions and help children get better faster!

Below you can find the information for a concussion education program for parents and caregivers of young athletes ages 6 to 13 years old. The program was developed by Julia Watkins, an occupational therapy doctoral student at Georgia State University, as part of a doctoral capstone experience. The purpose of this program is to increase concussion knowledge in parents and caregivers of athletes ages 6-13 years old. The presentation has been given to parents and caregivers in the past and was shown to increase concussion knowledge and had positive feedback.

The program is simply a 15-minute presentation. It can be implemented whenever you choose to. It is recommended to provide this program to all parents and caregivers of athletes in Cherokee County. It can be delivered by personal email to parents and caregivers, as previously done, shown in-person during parents and caregiver meetings, and/or shown virtually during parent and caregiver meetings.

You can find a downloaded copy of the presentation and associated educational materials in the folder attached.

Figure 3 – Sustainability Protocol Provided to Cherokee County Parks and Recreation Department

Learning Objective #4 Output: Concussion Module for Occupational Therapy Students participating in the Brain injury Elective

The final output of my capstone project was the brain injury elective module regarding the scope of occupational therapy practice in concussion care. This module was developed based on current research and findings from the needs assessment. The module includes lecture slides with a voice over presentation, an interactive knowledge check, and a quiz. The lecture slides were created using Microsoft PowerPoint and then voice recorded. The slides can be found in the appendix. The knowledge check was created on Kahoot! for students to test their knowledge in a fun and interactive way. The quiz questions were developed and given to the faculty member for use on iCollege. The entire module was developed to be disseminated to future occupational therapy students enrolled in the brain injury elective course. Following the development, the module was provided to the professor responsible for teaching the brain injury elective course at Georgia State University for feedback. Feedback was then incorporated into the module. The information included in the module can be found below in *Figure 4*.

The Role of Occupational Therapy in Concussion (mTBI) Care in Pediatrics

What is a Concussion?

A concussion is a mild traumatic brain injury (Concussion statistics and facts: UPMC: Pittsburgh, 2023). They impact approximately 4 million individuals per year making it one of the most common brain injuries (Concussion statistics and facts: UPMC: Pittsburgh, 2023). Approximately half of these concussions result from sports or recreation (Concussion statistics and facts: UPMC: Pittsburgh, 2023). This number may be even greater due to underreporting and difficulty in detection (Concussion statistics and facts: UPMC: Pittsburgh, 2023). The most common sport concussions are seen in is football followed by female soccer and female basketball (Concussion statistics and facts: UPMC: Pittsburgh, 2023).

Concussions occur after a sudden bump, blow, jolt, or any other force that causes the brain to move in the skull (Centers for Disease Control and Prevention, 2019). There is no physical injury to the brain and therefore is no structural damage seen during neuroimaging which makes diagnosing a concussion difficult (Choe M.C, 2016).

The actual mechanism is a stretching or shearing of the white and gray matter due to acceleration/deceleration differences (Choe M.C, 2016). Their make up causes them to move at different speeds and when there is a rapid acceleration or deceleration, they shear against each other causing tearing of biological structures (Choe M.C, 2016). This causes cellular imbalances, changes in cerebral blood flow, axonal injuries, and neuroinflammation which causes the symptoms of concussion (Choe M.C, 2016).

Signs & Symptoms

Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications (Marar et al., 2012). Symptoms of concussion can vary between individuals and vary based on the severity of the concussion (Marar et al., 2012). Symptoms may show up immediately following the injury or may not show up for days or weeks later (Marar et al., 2012).

An individual who has sustained a concussion may experience a variety of physical, cognitive, and emotional symptoms that could impact their everyday functioning if not properly treated (Marar et al., 2012). Common symptoms include headache, nausea, confusion, loss of consciousness, blurry vision, difficultly concentrating or problem solving, balance problems, sensitivity to light and noise, and inability to recall events (Concussion: Causes, symptoms, diagnosis, treatments, prevention 2020). Some fewer common symptoms include emotional distress, anxiety, depression, and changes in personality (Concussion: Causes, symptoms, diagnosis, treatments, prevention 2020).

Although rare, it is important to look for any danger signs (Centers for Disease Control and Prevention, 2019). Any of these could indicate that a brain bleed has developed, and it is imperitive to seek emergency medical attention (Centers for Disease Control and Prevention, 2019). These signs are different size pupils, severe drowsiness, weakness, or numbness, worsening coordination, repeated vomiting, slurred speech, loss of consciousness, seizures, and inability to recognize familiar places or people (Centers for Disease Control and Prevention, 2019).

Recovery

Following the injury, the most important step to recovery is rest (Centers for Disease Control and Prevention, 2019). Adequate sleep, daily naps, and breaks from activity are necessary to let the brain recover heal (Centers for Disease Control and Prevention, 2019). The first 24-48 following the injury should be characterized by rest (Centers for Disease Control and Prevention, 2019). You are allowed to sleep following a concussion (Centers for Disease Control and Prevention, 2019). It has been recently found that there is no need to keep a child awake through the night following a concussion (Centers for Disease Control and Prevention, 2019). The reason for keeping a child awake was to monitor for severe symptoms that may appear (Centers for Disease Control and Prevention, 2019). This will most likely happen within the first couple of hours so after a 2–3-hour wake period following a concussion, it is recommended to let your child sleep and to check on them every hour or so to monitor symptoms (Centers for Disease Control and Prevention, 2019). The exception is if you are seeing worsening symptoms like dilated pupils or severe vomiting which you should then take them to a medical professional (Centers for Disease Control and Prevention, 2019).

There are 2 protocols in place to help with proper recovery (McCrory et al., 2017). The first protocol is Return to School. The stages can be found in the table below (McCrory et al., 2017).

Stage	Activities
1 – Daily Activities at Home	Gradually returning to any daily activities that your child typically does throughout their day as long as they do not give your child any symptoms. Examples may include reading, texting, and other screen time. It is recommended to start with 5–15-minute intervals and build up tolerance.
2 – School Activities at Home	Begin to increase their cognitive tolerance by incorporating schoolwork such as homework assignments, reading, etc. outside of the classroom in the home setting.
3 – Partial Return to School	Increase academic tolerance through the gradual reintroduction of school. It may be necessary to start with one class per day or half days. Breaks and compensatory strategies may also be necessary to participate in school during this stage.
4 – Full Return to School	Child should be able to return to school full time and catch up on any missed work.

Following the return to school protocol, the return to play protocol begins (McCrory et al., 2017). The return to play protocol stages can be found in the table below (McCrory et al., 2017).

Stage	Activities
1 – Symptom limited activities	This stage includes incorporating all daily activities including school and schoolwork. This is equivalent to the final stage of the return to school protocol.
2 –Light aerobic exercise	The child should be able to increase their heartrate through walking, cycling, etc. at a slow to moderate pace. This does not include resistance training or sport-specific exercises.
3 – Sport-specific exercise	At this stage, the child may begin to incorporate sport-specific movements such as running. There should be no impact activities included in this training
4 – non-contact training drills	Child can progress to resistance training including drills and other activities that incorporate higher level of coordination and thinking. There should still be no opportunity for contact with other athletes at this stage.
5 – Full-contact practice	Child may now participate fully in practices. This stage is characterized by restoring the athlete's confidence and assessing current skill level.
6 – Return to Sport	Child may participate in normal game play.

It is imperative to follow the protocols to prevent long term effects and repeat concussions (Ryan, L. M., & Warden, D. L., 2003). When a child sustains a concussion, they will be at a greater risk of sustaining another and at a greater risk of developing long term effects and post-concussion syndrome (Ryan, L. M., & Warden, D. L., 2003).

When following proper recovery protocol, approximately 80%-90% of individuals will spontaneously recover from concussion within 10 to 14 days (McCrory et al., 2017).

In some cases, or if symptoms are not properly treated, an individual may develop post-concussion syndrome which impacts physical, cognitive, and emotional/behavioral functioning in the long-term (Ryan, L. M., & Warden, D. L., 2003). Some commonly experienced symptoms of Post-Concussion Syndrome are dizziness, emotional irritability, sleep disturbances, intense sensitivity to light and noise, visual disturbances like blurry vision, fatigue, anxiety, and balance or coordination issues (Ryan, L. M., & Warden, D. L., 2003). These symptoms can persist for years and cause permanent issues if not addressed (Ryan, L. M., & Warden, D. L., 2003).

Current Scope of Practice for Occupational Therapy

Because the current protocol focuses on a gradual return to daily occupations, occupational therapy can serve as a valuable rehabilitation method for individuals who are experiencing concussions (Finn, 2019). Occupational therapy scope of practice revolves around the idea that all aspects of life are intertwined and impact each other's functioning (Wheeler et. al., 2017). Occupational therapy services in concussion management have the capacity to address every area in an individual's life that may be impacted by their injury and assist in recovery (Wheeler et. al., 2017). The American Occupational Therapy Association recognizes that occupational therapists may help individuals with concussion through remediation of new skills and education on compensatory strategies in the academic environment (Wheeler et. al., 2017). Typical impairments seen in individuals experiencing concussion that may be addressed through occupational therapy services may include lower level of alertness, visual impairments, vestibular system and balance issues, difficulty with sleep, and psychosocial disorders including depression, irritability, and lack of motivation (Wheeler & Acord-Vira, 2023).

Assessment & Intervention

Regardless of severity of concussion, some individuals will experience persistent symptoms that require a more specialized care to prevent them becoming something that alters everyday functioning (Silverberg et al., 2020). Treatment should be symptom specific and referral to specialty clinics may be necessary for recovery (Silverberg et al., 2020). Treatment and interventions are typically done by a neurologist, physical therapist, occupational therapist (Silverberg et al., 2020).

Because every individual experiences differing concussion symptoms, care must be individualized, and client centered (Finn, 2019). The first step of treatment of an individual with concussion is evaluation and assessment (Finn, 2019). Possible categories of occupational therapy assessments may include perceived performance assessments, symptom reports, quality of life assessments, assessments of occupations, and sleep assessments (Finn, 2019). Specific assessments include but are not limited to the Canadian Occupational Performance Measure, the National Institutes of Healthy Activity Record, the Sports Concussion Assessment Tool 5, the Developmental Eye Movements Test, the Rivermead Post Concussion Symptoms Questionnaire, the Concussion Symptom Inventory, the 36-Item Short Form Survey Instrument, the Assessment of Motor and Process Skills, the Fatigue Severity Scale, and the Pittsburgh Sleep Quality Index (Finn, 2019; Van Lew & Waskiewicz, 2020). The occupational therapists should use clinical judgment to determine the specific assessments necessary to treat the individual (Finn, 2019).

Following the comprehensive evaluation, the therapist should determine the intervention plan (Van Lew & Waskiewicz, 2020). Interventions must be client-centered and individualized because no two individuals have the same set of concussion symptoms (Van Lew & Waskiewicz, 2020). Occupational therapists should use the protocols as a guide and build upon the improvement and expansion of client skills to address self-care, sleep, education, work, play, and leisure (Van Lew & Waskiewicz, 2020). Interventions may take a compensatory or remedial approach and may include a variety of accommodations and adaptations (Finn, 2019). Based on the symptoms experienced and assessment results, interventions may target visual-vestibular system rehabilitation, sensory processing re-integration, cognitive remediation, and symptom management education (Van Lew & Waskiewicz, 2020). The following table regarding specific interventions will also be inserted in the presentation.

Symptom	Intervention
Emotional Reactivity	Interventions to decrease emotional reactivity may include making the client aware of the triggers and the teaching of relaxation techniques (Van Lew & Waskiewicz, 2020).
Fatigue	Fatigue is one of the most common symptoms (Van Lew & Waskiewicz, 2020). It is important to address fatigue because it impacts the participation level in other occupations (Van Lew & Waskiewicz, 2020). The first step is to determine the causes of the fatigue and address them (Van Lew & Waskiewicz, 2020). Interventions may include providing the client with strategies to reduce fatigue like recruiting assistance, taking rest breaks, or creating a schedule for a gradual return to occupations (Van Lew & Waskiewicz, 2020).
Sleep Disturbances	Interventions may include education of sleep hygiene, recommendation for adaptive equipment, and compensatory strategies (Van Lew & Waskiewicz, 2020). Some strategies may include completing an environmental evaluation of the client's bedroom and recommending a more conducive environment for sleep with a darker room, no screen time, or a noise machine (Van Lew & Waskiewicz, 2020).
Visual Functioning Deficits	Interventions to remediate visual pursuits, eye range of motion, and saccades for daily function and occupations (Van Lew & Waskiewicz, 2020).
Sensory Processing Deficits	Interventions to compensate for over-responsiveness to visual stimulus, auditory stimulus, movement, and the environment. Including but not limited to proprioceptive input and assistive technology (Van Lew & Waskiewicz, 2020).
Cognitive Functioning Deficits	Interventions to remediate and compensate for deficits in executive functioning including self-awareness, problem solving, and memory (Van Lew & Waskiewicz, 2020). Compensatory strategies may include extra cueing and activity analysis (Van Lew & Waskiewicz, 2020). Remedial strategies may include tasks and activities that address planning, attention, and memory that can then be generalized to daily occupations (Van Lew & Waskiewicz, 2020).

Final Takeaway

There is a lack of occupational therapists working in the field of concussion Occupational therapists have the skillset to improve health outcomes after concussion and especially in individuals experiencing Post-Concussion Syndrome. With the drastic increase in concussions being reported and an increase of concussions being in the public eye, this puts occupational therapists in the unique spot to educate individuals on what occupational therapy is and advocate for this profession.

Figure 4 – Information in the Concussion Module for the Brain Injury Elective

The quiz and knowledge check questions are identical and were created based on lecture materials. The questions were then adapted into a game format using the Kahoot! website. On this website students can complete challenges as a solo player or compete against classmates. The questions and answers used to assess the knowledge level of students after listening to the module can be found below in *Table 6*. The correct answer is in bold lettering.

Table 6 – Questions included in the Interactive Knowledge Check for Occupational Therapy Students

Question	Answer Choices
Which of the following is the mechanism of injury of a concussion?	Loss of blood flow **Acceleration/deceleration differences in the brain** Skull Fractures None of the above
Which of the following is not a symptom of a concussion?	Nausea Emotional Irritability Loss of Consciousness **Rash**
When can symptoms of a concussion appear?	Immediately following the injury 24 hours following the injury 7+ days following the injury **All the above**
Which of the following is a danger sign that may indicate a brain bleed after a concussion?	Sensitivity to light **Repeated vomiting** Difficulty problem solving Balance problems
What is the main goal of the Return to School Protocol?	To increase participation in sport To monitor symptoms **To facilitate a gradual return to academic activities** To restrict participation in social activities

A child sustained a concussion 8 days ago. He is currently fully participating in school with no reported symptoms. He has been attending soccer practice the past 2 days but has only participated in non-contact drills. He has an important soccer tournament starting tomorrow that his coach is asking him to play in. He said he feels fine and has not reported any symptoms within the last 2 days after practice. Do you recommend that his parents and coaches allow him to participate in the tournament?	Yes, he hasn't experienced symptoms in 48 hours and can begin to participate in full contact sport play. **No, He should not participate in full contact play without first participating in full contact practice and experiencing no symptoms in doing so.**
When following proper concussion protocol, 80-90% of individuals should make a full recovery within how many days?	2-4 days 1 week **10-14 days** 3-4 weeks
Which of the following is a commonly experienced symptom of Post-Concussion Syndrome that can be treated through occupational therapy intervention?	Joint pain Fever **Fatigue** Shortness of breath
Which of the following are ways to increase participation in school following a concussion injury?	Recommend the parents or caregiver tells teachers and counselors Recommend the child takes rest breaks throughout the school day Recommend the child have a quiet room and extra time to complete assignments **All the above**
Helping a client create a daily schedule for rest breaks is an appropriate intervention to decrease fatigue?	**True** False
How can occupational therapists help individuals with post-concussion syndrome who are having difficulty with problem solving?	Provide client with extra cueing strategies Have client practice activities that require planning Perform a task analysis with the client **All of the above**
It is not possible to remediate any symptoms of concussion so occupational therapists	True

should focus on teaching the client compensatory strategies.	**False**

Due to timing purposes, there are not yet outcome results to come from the module. This module will be implemented in the future brain injury elective course for occupational therapy students at Georgia State University. The projected output is an increase in concussion knowledge in occupational therapy students as well as an increase in interest in pursuing a career in the concussion care setting as a future occupational therapist. This cannot be determined as the course has not yet been implemented.

The overall outcome of this capstone experience was an increase in concussion knowledge. The materials developed including the video presentation, sustainability plan, and learning module contributed to the increase in knowledge. Evidence of this is seen in the pre-test and post-test results observed during the parent and caregiver education program. Following the completion of the 14-week capstone experience, it is projected that the educational programs for parents, caregivers, and students will continue to increase knowledge in concussions.

CHAPTER 5

Discussion and Impact

The overall goal was to increase concussion knowledge in individuals while also raising awareness of occupational therapy services in the field of concussions. This was done through the completion of four objectives.

The goal of learning objective #1 was to develop an interactive educational course for parents and caregivers of young athletes. Current literature describes the gap in knowledge of concussions that parents and caregivers have. Parents and caregivers were unable to identify the mechanism of injury of concussions, signs and symptoms, or the detailed recovery process (Hunt et al., 2018; Mannings et al., 2014; Kay et al., 2017; Weerdenburg et al., 2016). Based on the findings from research and personal clinical judgment, the interactive educational course was developed. It was developed to address the gaps in knowledge for parents and caregivers. A presentation was created and adapted into a video-based program. It was determined through the needs assessment process that the video-based program would be most effective in reaching more individuals and it was shown to be successful in doing so. The interactive course was successfully created and learning objective #1 was met.

The goal of learning objective #2 was to successfully implement the interactive educational course. This process included determining an appropriate time for dissemination, receiving approval from the review board to disseminate the program and associated materials, and finally disseminating the program to parents and caregivers. Dissemination successfully occurred through email and this learning objective was met.

The goal of learning objective #3 was to develop a sustainable education program for parents and caregivers of young athletes. After discussion with Cherokee County personnel and

my site mentor about disseminating this course for future sports such as fall football, it was determined that a sustainability plan was necessary. The educational program disseminated during the 14-week capstone process was adapted into a sustainable program which can be disseminated by Cherokee County personnel after the 14-week capstone experience ends. In order to create a sustainable and effective program, outcome measures were put in place during the original dissemination. Participants completed a pre-test and post-test to determine the efficacy of the program in increasing knowledge. It was determined that it was effective. The participants were also given a satisfaction survey to complete. All participants were satisfied and provided feedback for future dissemination of the program. Using the feedback, a sustainability protocol was created and included an adapted version of the program, an educational handout, and instructions for Cherokee County personnel to use during future dissemination. After being reviewed by my site mentor, the sustainability protocol was approved and delivered to the Cherokee County Parks and Recreation Department. This learning objective was met.

The goal of learning objective #4 was to create a learning module on concussion management for the brain injury elective course offered to Georgia State University occupational therapy students. Current literature states that the protocol for concussion management focuses on a gradual return to daily occupations (Finn, 2019). While occupational therapy can serve as a valuable rehabilitation method for individuals who are experiencing concussions, there is a lack of occupational therapy professionals working in the field (Finn, 2019). Using current literature, current guidelines for practice, and my personal clinical judgment, lecture materials and an interactive knowledge check were created. Because the elective course is being offered to future students, implementation of the module was not feasible. With the assistance from Georgia State University faculty, this module will be implemented. The projected outcome of this module will

be an increase in concussion knowledge and a growing interest in working in the setting of concussion for occupational therapy students.

Clinical Impressions

There is currently a lack of comprehensive guidelines for occupational therapy services in concussion management. Occupational therapists base their practice on providing services for specific impairments using broad assessment tools. There is room for growth in the field of occupational therapy when treating patients with a concussion. The field of occupational therapy must create practice guidelines for concussion management and publish evidence supporting the success of incorporating occupational therapy services in concussion management. In conjunction with practice guidelines, occupational therapy practitioners must advocate for the profession by defining the unique set of skills that can be used to improve health outcomes of individuals experiencing lasting concussion symptoms. It is important to discuss this with all individuals involved in the rehabilitation process, including parents and caregivers, to ensure they have the knowledge necessary to promote an environment conducive to a favorable recovery for the individual experiencing a concussion (Van Lew & Waskiewicz, 2020). This comes in the form of education and advocacy, both of which need more attention.

Limitations

The major limitation of this capstone project was the lack of time. Due to the experience only being 14-weeks, the concussion learning module for Georgia State University occupational therapy students was not able to be implemented. The module was ultimately developed for future use. To ensure the future implementation of the course, the professor was provided with full access to the educational materials.

There were also limitations seen in the development and implementation of the educational program for parents and caregivers of young athletes. Time constraints and limited access due to county regulations resulted in only a small number of individuals being exposed to the educational presentations that were created.

Due to time constraints of the 14-week capstone experience, parents and caregivers were only given a couple of weeks to complete the program. If given more time, I believe that more individuals could have participated in the full educational program including the pre-test, post-test, and satisfaction survey. Another limitation resulting from time constraints of the 14-week experience was the need to target a specific population. Only parents and caregivers of young athletes were asked to participate in the educational program, but we know that concussions can also be caused by other traumatic events such as car accidents. If there were no time constraints, the program could be adapted to target all parents and caregivers of young children and not only athletes.

County regulations also played a factor in limiting the population of individuals able to participate. Due to Cherokee County School District athletic department rules and regulations, there were limits as to what parents and caregivers could be included. Cherokee County School

District contracts outside medical professionals for high school sports. This educational program was not able to receive approval from outside medical professionals to be delivered to parents and caregivers of high school athletes. This limitation resulted in the dissemination of the educational program being limited to parents and caregivers of young athletes in the Cherokee County Parks and Recreation Department, being that it was able to receive approval in time. The educational program was able to reach a significant number of parents and caregivers and increase their concussion knowledge. Cherokee County personnel were provided with a sustainability protocol, the video presentation, and other educational materials to reach more individuals in the future as well.

Regardless of the limitations experienced throughout this project, it was successful in increasing knowledge of concussions in the participants and will continue to reach more individuals in the future due to the sustainability plans in place.

Sustainability Plan

Sustainability for this capstone consists of a two-part plan. The first part of the sustainability plan for this capstone experience coincides with the learning module created for future Georgia State University occupational therapy students who elect to take the brain injury elective course. During this capstone experience, a module including lecture materials and an interactive knowledge check was developed. Due to limitations of when the elective course is offered, the module was not implemented. The learning module was provided to occupational therapy faculty members at Georgia State University for future implementation in the brain injury elective course.

The second part coincides with the educational program created for parents and caregivers of young athletes in Cherokee County. Per request of Cherokee County personnel, an in-depth sustainability plan was created for the implementation of the course for parents and caregivers of young athletes in fall sports such as football and cheerleading. Cherokee County personnel were provided with the educational program including an updated presentation, an educational handout, and a dissemination protocol. This in-depth sustainability plan was developed as an outcome measure and can be found in Chapter 4 of this document. Cherokee County was also notified that future occupational therapy students completing their capstone experience may show interest in continuing this capstone project in the future years.

The following table displays the sustainability plan for the continuation of the advocacy for occupational therapy services in the field of concussion management through increase in knowledge in multidisciplinary team members such as athletic trainers, parents, and future occupational therapists.

Table 7 – Overall Sustainability Goals and Plans

Goal	Plan
I will provide the Cherokee County School District with all necessary materials to continue to increase knowledge and awareness of occupational therapy-based concussion management in sports coaches and parents of athletes.	Following the development and implementation of education materials, the materials will be provided to the athletic department for future use. During creation of materials and programs, the protocol will be recorded for future use. The materials should then be disseminated as frequently as needed by Cherokee County. The implementation of the lecture will be observed by the faculty member for future dissemination by the faculty member.
I will provide Georgia State University's occupational therapy program with all necessary materials to continue to educate students on concussion management including occupational therapy-based assessment and intervention.	A concussion module was developed for the brain injury elective course. Materials included lecture slides with a voice-over and an interactive knowledge check. Following the development of the module, the materials were provided to the Georgia State University faculty members. The lecture materials were reviewed by the faculty member who teaches the course on brain injury. Final materials were agreed upon by the capstone student and faculty member as acceptable before implementation of the course. The lecture should then be disseminated annually during the semester of the brain injury elective course to the Georgia State occupational therapy students participating in the elective course. The implementation of the lecture will be observed by the faculty member for future dissemination by the faculty member. *Adaptations may be made to the provided lecture materials at the discretion of the professor teaching the course on brain injury.

Conclusion

In conclusion, my capstone project explored the role of occupational therapy in concussion management with a focus on educational interventions. This project included the development of educational pieces for parents, caregivers, and occupational therapy students. These pieces aimed to increase concussion knowledge and advocate for occupational therapy services when treating patients with a concussion. The outcome of the educational program for parents and caregivers was an increase in knowledge regarding concussions in young athletes. The projected outcome of the developed learning module for occupational therapy students is an increase in knowledge and a growth in interest in working in the field of concussions. This project was developed to be sustainable and implemented in future years. It is my hope that this project continues to increase knowledge and advocate for the profession of occupational therapy. Occupational therapists have a unique set of skills that can be used to improve health outcomes of individuals experiencing concussion and it is imperative for occupational therapy practitioners to consider entering the field.

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Appendix

Appendix 1: Learning Objectives

Long Term DCE Learning objectives	Short Term DCE Learning objectives	Learning tasks/activities to meet objectives	Outcome measure
1. Over the 14-week capstone experience, I will develop an interactive educational course for parents and caregivers of young athletes to enhance knowledge and raise awareness on concussion management in young athletes from an occupational therapy perspective.	1a. Develop educational materials based on concussion education guidelines created with current literature findings and needs assessment results. 1b. Develop an interactive program based on concussion education guidelines created with current literature findings and needs assessment results.	1a. Gather all information discovered through research and compile it into an educational presentation slide show. 1b. Prepare an educational presentation with video recording for dissemination.	1a. Complete educational course with associated materials and have it reviewed by site and faculty mentor by February 23rd, 2024. 1b. Complete full write up of the protocol of the educational program and have it reviewed by site and faculty mentor by April 12th, 2024.
2. Over the 14-week capstone experience, I will implement an education course for parents and caregivers of young athletes to enhance knowledge and raise awareness on concussion management in athletes from an occupational therapy perspective.	2a. Disseminate the education course for parents and caregivers of young athletes.	2a. Attend meetings with Cherokee County personnel to choose the most appropriate time to implement the program. 2b. Effectively disseminate an educational program to parents and caregivers of young athletes.	2a. Complete dissemination of the educational course and update site mentor with progress by February 23, 2024. 2b. Complete full write up of the protocol of the educational program and have it reviewed by site and faculty mentor by April 12th, 2024.

	3. Over the 14-week capstone experience, I will develop a sustainability protocol for the Cherokee County Parks and Recreation Department for the continuation of my education course in the future.	3a. Develop a satisfaction survey to be completed by participants after the educational program to determine the satisfaction level of my course. 3b. Develop a pre and post knowledge test to be completed by participants to determine the effectiveness of my program. 3c. Use findings of the survey and test to adapt my program according to the feedback received. 3d. Provide Cherokee County Parks and Recreation Department with finalized program and dissemination protocol.	3a. Create satisfaction survey questions and upload them to Qualtrics. 3b. Develop a Pre and Post knowledge test and upload them to Qualtrics. 3c. Analyze the data collected from the survey and pre-posttest. 3d. Make changes to my program that reflect the findings of the data. 3e. Complete written protocol of the dissemination process and deliver it to the department.	3a. Complete survey and pre-posttest on Qualtrics and have it reviewed by site and faculty mentor by February 23rd, 2024. 3b. Complete any changes to educational program following the analysis of data and have reviewed by site and faculty mentor by March 29th, 2024. 3c. Complete full write up of the protocol of the educational program and have it reviewed by site and faculty mentor by April 12th, 2024.

	4. Over the 14-week capstone experience, I will develop a module on concussion management for Georgia State occupational Therapy students in the Brain Injury Elective course to enhance knowledge on the occupational therapy scope of practice in concussions.	4a. Create a learning module based on research and guidelines created on the role of occupational therapy services in concussion management.	4a. Gather all information discovered through research and compile into educational presentation. 4b. Develop an interactive knowledge check based on educational materials. 4c. Deliver the educational module to the professor to incorporate in the brain injury elective course at Georgia State University.	4a. Complete educational course with associated materials and have it reviewed by faculty mentor by March 31st, 2024. 3b. Complete full write up of the protocol of the educational program and have it reviewed by site and faculty mentor by April 12th, 2024.

Appendix 2: Supervision Plan

Scheduled meetings

- Check-in meetings will occur between August 2023 and December 2023 as needed to discuss progress and updates to the capstone project as needed.
- Meetings between the site mentor and student will take place at minimum one time per week from January 8th, 2024, through April 12th, 2024. Meetings will primarily be held virtually. There will be scheduled weekly meetings on Webex at a time most convenient for the site mentor and student.
- There will be opportunities for in-person meetings as needed. In person meeting time will be used to review progress, share deliverables, and receive feedback. These will occur prior to dissemination of the educational materials to ensure the deliverables are acceptable.

Method of Communication

- Communication between the site mentor and student will be through email, text message, phone call, and Webex calls as needed.
- Communication will be clear and consistent.

Specific requirements of the project

- All student objectives and requirements of this project are outlined in the learning objectives and the MOU. Included in the objective is the creation of a literature review, educational materials for parents, coaches, and students, and protocol for sustainability.
- Objectives include an estimated time of completion for each outcome.

Types of expertise desired from site mentor

- Provide expertise on organization of the school district administration and athletic department
- Provide expertise and education on effective communication skills and professional behavior.
- Serve as a liaison between myself and departments in the Cherokee County School District

Roles and responsibility of each person

Role and responsibilities of the student include but are not limited to the following:

- Completion of learning objective in accordance with the MOU
- Consistent and clear communication with the site and faculty mentor.
- Effective communication of research findings and materials with site and faculty mentor
- Demonstration of professional behavior.
- Demonstration of objective listening to professionals and peers throughout the process.
- Establishment of new relationships and connections through a network provided by the site mentor.

Roles and responsibilities of the site mentor include but are not limited to the following:

- Serve as a professional role model for the student
- Orient student to the site, other personnel at the site, procedures of the site, and all expectations of the site.
- Assist student in the development of relationships with stakeholders in the school district
- Support student engagement in leadership level communication
- Maintain consistent communication with the student
- Review all deliverables and provide timely feedback.

Appendix 3: Evaluation Plan

An evaluation plan was set in place by the capstone coordinator, faculty mentor, site mentor, and me to ensure the successful completion of the doctoral capstone experience. Informal evaluations occurred between myself, my site mentor, and my faculty mentor. Progress checks took place as needed. During progress checks, ideas were exchanged, and program materials were reviewed. Formal evaluations were also put in place. They occurred in week 4, week 7, week 11, and week 14. The week 4 and week 11 evaluations included a review by myself and my site mentor on professionalism, communication skills, current strengths and weaknesses, and the progress being made towards my project. The week 7 review, or midterm review, included the discussion of progress on all short term and long-term learning objectives. The week 14, or final evaluation, discussed the outcomes on all short term and long-term learning objectives. These evaluations and associated meetings with my site mentor and faculty mentor ensured that progress was being made and contributed to my success in this experience.

Appendix 4: Consent & Instructions Form Given to the Parents and Caregivers of Young Athletes for the Education Program.

Georgia State University
Informed Consent

Title: Concussion Education for Parents and Caregivers of Young Athletes
Principal Investigator: Veronica Rowe, OTD
Student Principal Investigator: Julia Watkins, OTS

We invite you to take part in an educational program created by Julia Watkins. This program is part of a Doctoral Capstone project.

Purpose

The purpose of the study is to increase your concussion knowledge by watching a video presentation. We invite you to take part in this research study because you are a parent of a young athlete. We will invite a total of 100 people to be in this study.

Procedures

If you decide to take part in this study, you will watch one video presentation online at any time you choose to watch it. You may watch it wherever you choose to watch it. If you choose to do the pre-test, you will do so at the beginning of the presentation. You will scan a QR code that will take you to a website where you will take the pre-test. It is 10 questions. After the pre-test you will continue to watch the 15-minute presentation. After the presentation ends, you will scan another QR code that will take you to a website where you will take the post-test. This will be 10 questions. On the final slide, after taking the post-test, there will be a third QR code that will take you to a website where you will do the satisfaction survey. It is 5 questions. The pre-test, post-test, and survey will not ask for your name or anything about you. After the survey, the presentation will be over, and you will be done with the study. The tests, survey, and video will take no longer than one hour total. You may stop the study at any time if you choose that you no longer want to do it.

Voluntary Participation and Withdrawal

You do not have to be in this study. If you decide to be in the study and change your mind, you can drop out at any time. You may choose to watch only part of the video. You may choose to watch the video without doing the tests. You can skip questions during the tests. You may still receive the benefit of increasing your concussion knowledge if you only watch part of the presentation or skip the tests and survey.

Contact Information

You can contact Julia Watkins at 770-853-2686 or jwatkins51@student.gsu.edu

- If you have questions about the study or your part in it
- If you have questions, concerns, or complaints about the study

The IRB at Georgia State University reviews all research that involves human participants. You can contact the IRB if you would like to speak to someone who is not involved directly with the study. You can contact the IRB for questions, concerns, problems, information, input, or questions about your rights as a research participant. Contact the IRB at 404-413-3500 or irb@gsu.edu.

Consent

You have the choice to watch this program. You have the choice to watch the program without completing the surveys as well. You may stop watching at any time. If you agree to participate in this program, please click the link below to watch the presentation.

https://www.canva.com/design/DAF96J1Yu7E/1wfXpE3kK4zDu4ismjuY7g/view?utm_content=DAF96J1Yu7E&utm_campaign=designshare&utm_medium=link&utm_source=editor

Pre-test Link: https://gsu.qualtrics.com/jfe/form/SV_cx66ivAHVDAHfGC

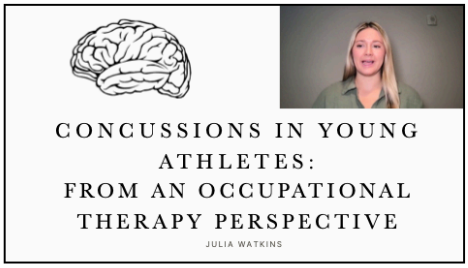
Post-test Link: https://gsu.qualtrics.com/jfe/form/SV_d5va5Y4Vu8WQULk

Satisfaction Survey Link: https://gsu.qualtrics.com/jfe/form/SV_dm0D1sqyoecZB2K

If you do not wish to take part in this study, you can simply ignore this message.

Thank you in advance for your time,
Julia Watkins

Appendix 5 – Presentation Slides in the Concussion Education Program for Parent and Caregivers of Young Athletes



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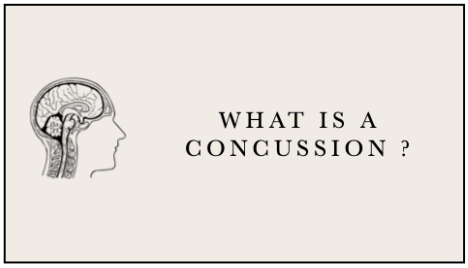

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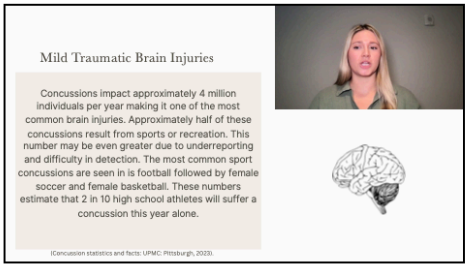

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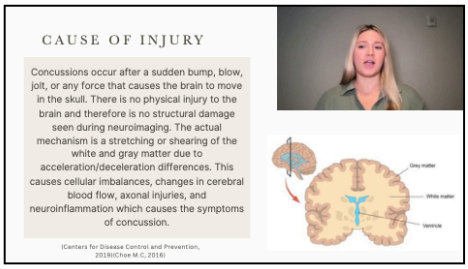

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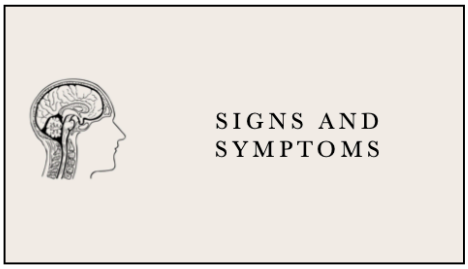
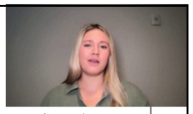


6

LARGE VARIETY OF SIGNS AND SYMPTOMS



Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications.

An individual who has sustained a concussion may experience physical, cognitive, and/or emotional symptoms that could impact their everyday functioning if not properly treated.

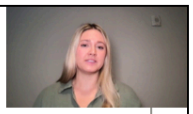
Symptoms of concussion can vary between individuals and vary based on the severity of the concussion. Symptoms may show up immediately following the injury or may not show up for days or weeks later.

(Marar et al., 2012)

7

Common Symptoms

- Headache or "Pressure" in Head
- Nausea
- Confusion
- Appearing Dazed or Stunned
- Loss of Consciouness
- Blurry Vision
- Difficulty Concentrating or Problem Solving
- Balance Problem/Clumsiness
- Changes in Sleep
- Sensitivity to Light or Noise
- Inability to recall events prior to or after injury
- Not "feeling right"



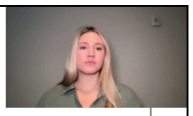
Less Common Symptoms

- Emotional Distress
- Anxiety
- Depression
- Changes in Typical Behavior
- Changes in Personality

(Concussion: Causes, symptoms, diagnosis, treatments, prevention 2020)
(Marar et al., 2012)

8

Danger signs to look for that require emergency medical attention.

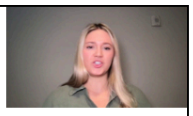


- Different size pupils
- Severe drowsiness or inability to be awaken
- Worsening headache
- Weakness or numbness
- Worsening coordination
- Repeated vomiting
- Slurred speech
- Seizures
- Inability to recognize familiar people or places
- Increasingly confused and agitated
- Loss of consciousness

(Centers for Disease Control and Prevention, 2019)

9

KNOWLEDGE CHECK!

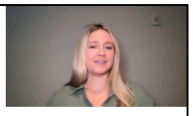


Which of the following is not a symptom of a concussion?

a. Changes in sleep patterns
b. Personality changes
c. Dizziness
d. Loss of consciousness
e. Muscle soreness

10

KNOWLEDGE CHECK!



Which of the following is not a symptom of a concussion?

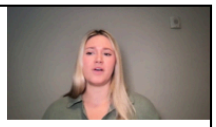
a. Changes in sleep patterns
b. Personality changes
c. Dizziness
d. Loss of consciousness
e. **Muscle soreness**

11

RECOVERY

12

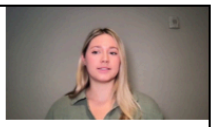
CONCUSSIONS IMPACT EVERYDAY FUNCTIONING



As demonstrated by the previously mentioned symptoms, we can see that concussions can impact a multitude of occupations and possibly all aspects of an individual's life. Concussions can impact not only your child's ability to participate in sports and play but can impact their learning, social play and recreation, and participation in academics as well. The recovery guide and return protocols in place to ensure your child is recovering properly and able to participate in their occupations of school and sports.

13

RECOVERY



The first 24-48 hours is characterized by rest!

Adequate sleep, daily naps, and breaks from activity are necessary to let the brain recover heal.

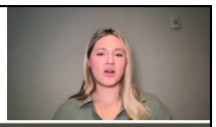
Continue to monitor symptoms and prepare for the recovery process and the return to school protocol.

(Centers for Disease Control and Prevention, 2019)

14

RETURN-TO-SCHOOL PROTOCOL

(McCrory et al., 2017)

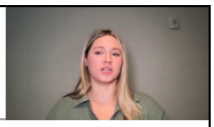


Stage	Activities
1 – Daily Activities at Home	Gradually returning to any daily activities that your child typically does throughout their day as long as they do not give your child any symptoms. Examples may include reading, texting, and other screen time. It is recommended to start with 5-15-minute intervals and build up tolerance.
2 – School Activities at Home	Begin to increase their cognitive tolerance by incorporating schoolwork such as homework assignments, reading, etc. outside of the classroom in the home setting.
3 – Partial Return to School	Increase academic tolerance through the gradual reintroduction of school. It may be necessary to start with one class per day or half days. Breaks and compensatory strategies may also be necessary to participate in school during this stage.
4 – Full Return to School	Child should be able to return to school full time and catch up on any missed work.

15

RETURN-TO-PLAY PROTOCOL

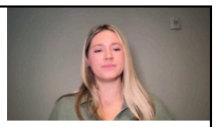
(McCrory et al., 2017)



1 – Symptom limited activities	This stage includes incorporating all daily activities including school and schoolwork. This is equivalent to the final stage of the return to school protocol.
2 –Light aerobic exercise	The child should be able to increase their heartrate through walking, cycling, etc. at a slow to moderate pace. This does not include resistance training or sport-specific exercises.
3 – Sport-specific exercise	At this stage, the child may begin to incorporate sport-specific movements such as running. There should be no impact activities included in this training.
4 – non-contact training drills	Child can progress to resistance training including drills and other activities that incorporate higher level of coordination and thinking. There should still be no opportunity for contact with other athletes at this stage.
5 – Full-contact practice	Child may now participate fully in practices. This stage is characterized by restoring the athlete's confidence and assessing current skill level.
6 – Return to Sport	Child may participate in normal game play.

16

KNOWLEDGE CHECK!

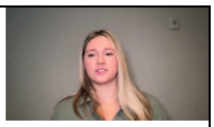


Your child sustained a concussion 6 days ago. He is currently participating in school but only for half of the day. He has not attended any practice this week but has a basketball tournament starting tomorrow that he is asking to play in. He said he feels fine and has not reported any symptoms within the last 2 days. You also have not observed any abnormal behaviors. Should you allow him to participate in the tournament?

YES NO

17

KNOWLEDGE CHECK!



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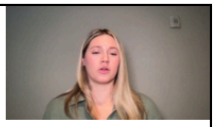
YES **NO**

18

LONG TERM EFFECTS

19

POST-CONCUSSION SYNDROME



When following proper recovery protocol, approximately 80%-90% of individuals will spontaneously recover from concussion within 10 to 14 days.
In some cases or if symptoms are not properly treated, an individual may develop post-concussion syndrome which impacts physical, cognitive, and emotional/behavioral functioning in the long-term.

- Dizziness
- Irritability
- Sleep disturbances
- Intense sensitivity to light and noise
- Visual disturbances
- Fatigue
- Anxiety
- Balance and Coordination issues

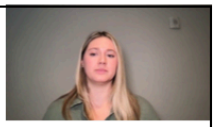
(Ryan, L. M., & Warden, D. L., 2003)
(McCrory et al., 2017)

20

WHEN & WHY YOUR CHILD MAY NEED SPECIALTY SERVICES

21

TREATMENT FOR CHRONIC SYMPTOMS



Treatment should be symptom specific and referral to specialty clinics, such as those with occupational therapy services available, may be necessary. Treatment interventions can include compensatory strategies, adaptations, and remediation and may be done by a combination of occupational therapists, physical therapists, and neurologists.

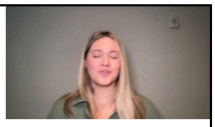
(Silverberg et al., 2020)

22

FINAL TAKEAWAY

23

WHAT CAN YOU DO?



- Educate yourself!
  - Use this course as an overview
  - Do your own research
  - Talk to coaches and medical professionals
- Educate your child!
  - Explain what a concussion is
  - Talk through the symptoms and signs
  - Explain the importance of reporting a head injury even if they do not feel symptoms
  - Demonstrate the need for and use of proper protective equipment
- Advocate for your child!
  - Speak up

24

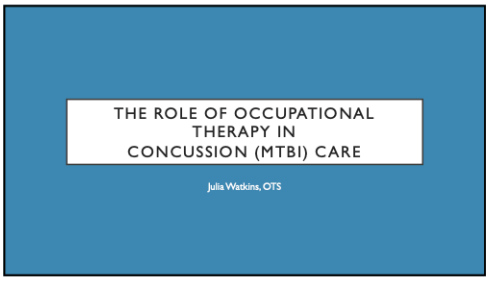

POST-TEST

25


THANK YOU FOR YOUR TIME!
IF YOU HAVE ANY QUESTIONS PLEASE REACH OUT TO ME AT THE EMAIL BELOW:
JULIA.WATKINS98@GMAIL.COM
SATISFACTION SURVEY:

26

Appendix 6 – Presentation Slides in the Concussion Education Module for Occupational Therapy Students



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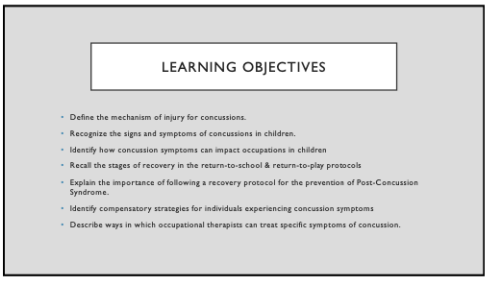

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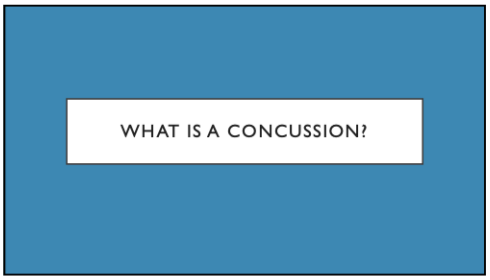

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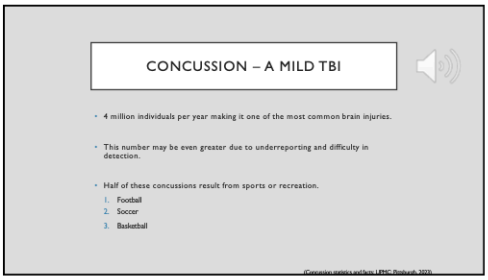

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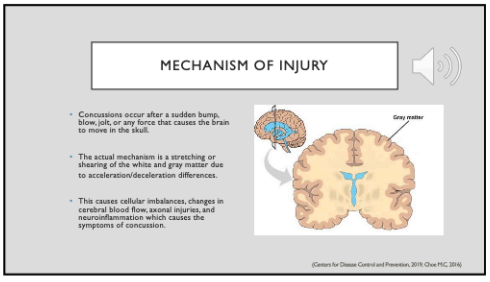

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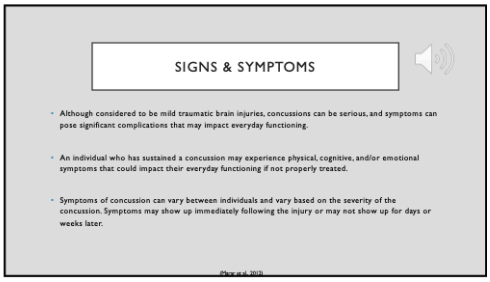
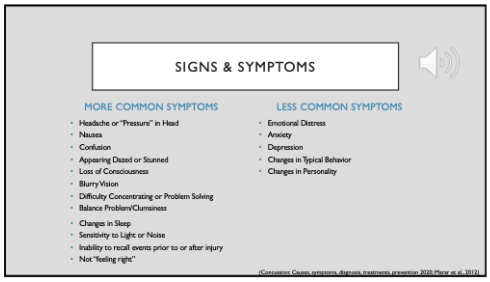
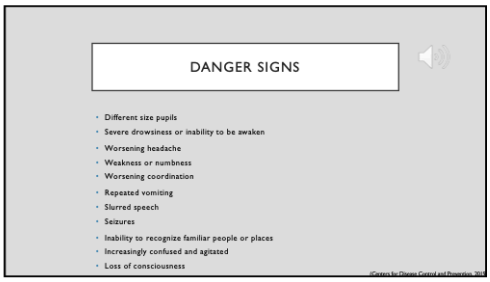

SIGNS & SYMPTOMS
Although considered to be mild traumatic brain injuries, concussions can be serious, and symptoms can pose significant complications that may impact everyday functioning.
An individual who has sustained a concussion may experience physical, cognitive, and/or emotional symptoms that could impact their everyday functioning if not properly treated.
Symptoms of concussion can vary between individuals and vary based on the severity of the concussion. Symptoms may show up immediately following the injury or may not show up for days or weeks later.
(Meyer et al., 2012)

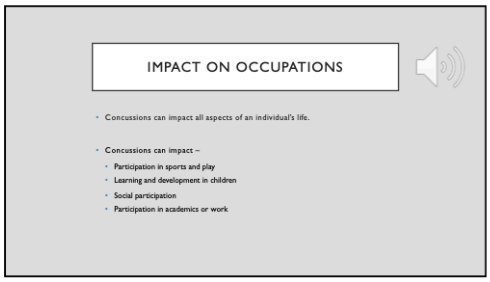
7


SIGNS & SYMPTOMS
MORE COMMON SYMPTOMS
Headache or "Pressure" in Head
Nausea
Confusion
Appearing Dazed or Stunned
Loss of Consciousness
Blurry Vision
Difficulty Concentrating or Problem Solving
Balance Problem/Clumsiness
Changes in Sleep
Sensitivity to Light or Noise
Inability to recall events prior to or after injury
Not "feeling right"
LESS COMMON SYMPTOMS
Emotional Distress
Anxiety
Depression
Changes in Typical Behavior
Changes in Personality
(Concussion: Causes, symptoms, diagnosis, treatments, prevention 2020; Meyer et al., 2012)

8


DANGER SIGNS
Different size pupils
Severe drowsiness or inability to be awaken
Worsening headache
Weakness or numbness
Worsening coordination
Repeated vomiting
Slurred speech
Seizures
Inability to recognize familiar people or places
Increasingly confused and agitated
Loss of consciousness
(Centers for Disease Control and Prevention, 2019)

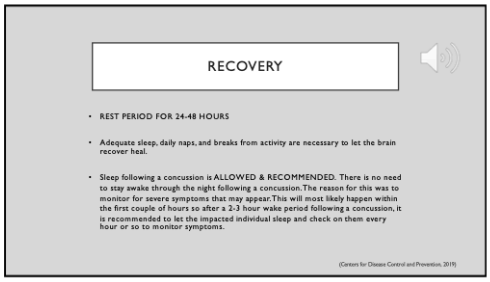
9


IMPACT ON OCCUPATIONS
Concussions can impact all aspects of an individual's life.
Concussions can impact –
Participation in sports and play
Learning and development in children
Social participation
Participation in academics or work

10


RECOVERY PROCESS

11


RECOVERY
REST PERIOD FOR 24-48 HOURS
Adequate sleep, daily naps, and breaks from activity are necessary to let the brain recover heal.
Sleep following a concussion is ALLOWED & RECOMMENDED. There is no need to stay awake through the night following a concussion. The reason for this was to monitor for severe symptoms that may appear. This will most likely happen within the first couple of hours so after a 2-3 hour wake period following a concussion, it is recommended to let the impacted individual sleep and check on them every hour or so to monitor symptoms.
(Centers for Disease Control and Prevention, 2019)

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RECOVERY

GRADUAL RETURN TO OCCUPATIONS!!!

(Centers for Disease Control and Prevention, 2019)

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RETURN-TO-SCHOOL PROTOCOL

(McCrory et al., 2017)

Stage	Activities
1 – Daily Activities at Home	Gradually returning to any daily activities that your child typically does throughout their day as long as they do not give your child any symptoms. Examples may include reading, texting, and other screen time. It is recommended to start with 5–15-minute intervals and build up tolerance.
2 – School Activities at Home	Begin to increase their cognitive tolerance by incorporating schoolwork such as homework assignments, reading, etc. outside of the classroom in the home setting.
3 – Partial Return to School	Increase academic tolerance through the gradual reintroduction of school. It may be necessary to start with one class per day or half days. Breaks and compensatory strategies may also be necessary to participate in school during this stage.
4 – Full Return to School	Child should be able to return to school full time and catch up on any missed work.

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RETURN-TO-PLAY PROTOCOL

(McCrory et al., 2017)

Stage	Activities
1 – Symptom limited activities	This stage includes incorporating all daily activities including school and schoolwork. This is equivalent to the final stage of the return to school protocol.
2 –Light aerobic exercise	The child should be able to increase their heartrate through walking, cycling, etc. at a slow to moderate pace. This does not include resistance training or sport-specific exercises.
3 – Sport-specific exercise	At this stage, the child may begin to incorporate sport-specific movements such as running. There should be no impact activities included in this training
4 – non-contact training drills	Child can progress to resistance training including drills and other activities that incorporate higher level of coordination and thinking. There should still be no opportunity for contact with other athletes at this stage.
5 – Full-contact practice	Child may now participate fully in practices. This stage is characterized by restoring the athlete's confidence and assessing current skill level.
6 – Return to Sport	Child may participate in normal game play.

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RETURN-TO-WORK PROTOCOL

- No strict protocol stages set by the CDC yet.
- Return to work should still include the restriction of cognitive and physical exertion at first and then a gradual return to a full workday dependent on symptoms.

(Centers for Disease Control and Prevention, 2019)

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POST – CONCUSSION SYNDROME

- When following proper recovery protocol, approximately 80%-90% of individuals will spontaneously recover from concussion within 10 to 14 days.
- In some cases or if symptoms are not properly treated, an individual may develop post-concussion syndrome which impacts physical, cognitive, and emotional/behavioral functioning in the long-term.
  - Dizziness
  - Irritability
  - Sleep disturbances
  - Intense sensitivity to light and noise
  - Visual disturbances
  - Fatigue
  - Anxiety
  - Balance and Coordination issues

(Ryan, L. M., & Warden, D. L. 2003; McCrory et al., 2017)

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CURRENT SCOPE OF PRACTICE

- Due to the current protocol being focused on a gradual to daily occupations, occupational therapy can serve as a valuable rehabilitation method for individuals who are experiencing concussions.
- Occupational therapy services in concussion management have the capacity to address every area in an individual's life that may be impacted by their injury and assist in recovery
- The American Occupational Therapy Association recognizes that occupational therapists may help individuals with concussion through remediation of new skills and education on compensatory strategies in the academic environment

(Flaro, 2019; Wheeler et al., 2017)

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ASSESSMENT & INTERVENTION

19

TREATMENT

- Regardless of severity of concussion, some individuals will experience persistent symptoms that require a more specialized care to prevent them becoming something that alters everyday functioning.
- Treatment should be symptom specific and referral to specialty clinics may be necessary for recovery. Treatment and interventions are typically done by a neurologist, physical therapist, occupational therapist.
- Early intervention and management is the most effective means of reducing post-concussion syndrome and future disability.

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POSSIBLE ASSESSMENTS

- Occupational Profile
- Canadian Occupational Performance Measure
- National Institutes of Healthy Activity Record
- Sports Concussion Assessment Tool 5
- Developmental Eye Movements Test
- Rivermead Post Concussion Symptoms Questionnaire
- Concussion Symptom Inventory
- 36-Item Short Form Survey Instrument
- Assessment of Motor and Process Skills
- Fatigue Severity Scale
- Pittsburgh Sleep Quality Index

(Finn, 2019; Van Low & Wasilewicz, 2020)

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INTERVENTION

- Interventions must be client-centered and individualized because no two individuals have the same set of concussion symptoms. Occupational therapists should use the protocols as a guide and build upon the improvement and expansion of client skills to address self-care, sleep, education, work, play, and leisure.
- Interventions may take a compensatory or remedial approach and may include a variety of accommodations and adaptations.
- Based on the symptoms experienced and assessment results, interventions may target visual-vestibular system rehabilitation, sensory processing re-integration, cognitive remediation, symptom management, and education.

(Finn, 2019; Van Low & Wasilewicz, 2020)

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INTERVENTION - EDUCATION

- According to the American Congress of rehabilitation Medicine, the first form of treatment for concussion should be education for the individual experiencing the concussion as well as family and caregivers.
- Education should include but is not limited to an understanding of what a concussion is, advice on how to manage symptoms, and what favorable recovery looks like.

(Silverberg et al., 2020)

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SYMPTOM-SPECIFIC INTERVENTIONS

Symptom	Possible Interventions
Visual Functioning Deficits	Interventions to remediate visual pursuits, eye range of motion, and saccades for daily function and occupations.
Sensory Processing Deficits	Interventions to compensate for over-responsiveness to visual stimulus, auditory stimulus, movement, and the environment. Including but not limited to proprioceptive input and assistive technology.
Cognitive Functioning Deficits	Interventions to remediate and compensate for deficits in executive functioning including self-awareness, inhibition, emotional regulation, problem solving, and memory. Compensatory strategies may include extra cueing and activity analysis. Remedial strategies may include tasks and activities that address planning, attention, and memory that can then be generalized to daily occupations.

(Van Low & Wasilewicz, 2020)

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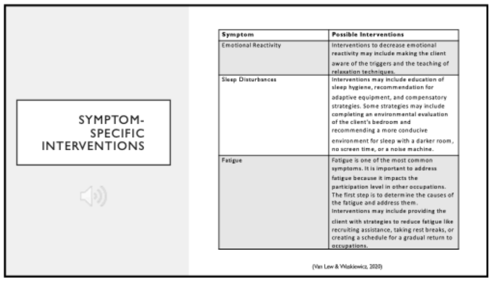
SYMPTOM-SPECIFIC INTERVENTIONS
Symptom
Possible Interventions
Emotional Reactivity
Interventions to decrease emotional reactivity may include making the client aware of the triggers and the teaching of relaxation techniques.
Sleep Disturbances
Interventions may include education of sleep hygiene, recommendation for adaptive equipment, and compensatory strategies. Some strategies may include completing an environmental evaluation of the client's bedroom and recommending a more conducive environment for sleep with a darker room, no screen time, or a noise machine.
Fatigue
Fatigue is one of the most common symptoms. It is important to address fatigue because it impacts the participation level in other occupations. The first step is to determine the causes of the fatigue and address them. Interventions may include providing the client with strategies to reduce fatigue like recruiting assistance, taking rest breaks, or creating a schedule for a gradual return to occupations.
(Van Lew & Waskiewicz, 2020)

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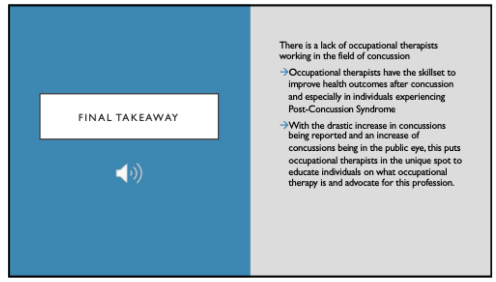
FINAL TAKEAWAY
There is a lack of occupational therapists working in the field of concussion
→Occupational therapists have the skillset to improve health outcomes after concussion and especially in individuals experiencing Post-Concussion Syndrome
→With the drastic increase in concussions being reported and an increase of concussions being in the public eye, this puts occupational therapists in the unique spot to educate individuals on what occupational therapy is and advocate for this profession.

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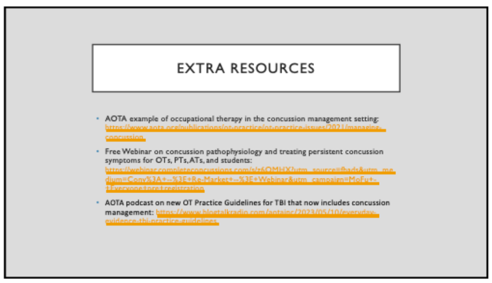
EXTRA RESOURCES
AOTA example of occupational therapy in the concussion management setting: https://www.aota.org/publications/ot-practice/ot-practice-issues/2021/managing-concussion
Free Webinar on concussion pathophysiology and treating persistent concussion symptoms for OTs, PTs, ATs, and students:
AOTA podcast on new OT Practice Guidelines for TBI that now includes concussion management: https://www.blogtalkradio.com/aotainc/2023/05/10/everyday-evidence-tbi-practice-guidelines

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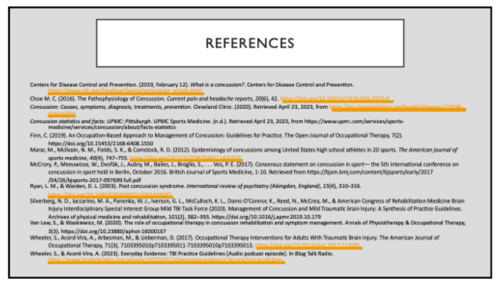
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