EVIDENCE-BASED PRACTICE & TRAUMATIC BRAIN INJURY: A SURVEY OF OT PRACTITIONERS

A Thesis submitted to the faculty at Stanbridge University in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy

by

Miranda Dichairo, Christopher Plague, Hilary Ramos, and Nicole Sialaris

Thesis Advisor: Eileen Wang, MA, OTR/L

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Certification of Approval

I certify that I have read Evidence-based practice: Traumatic brain injury by Miranda Dichairo, Christopher Plague, Hilary Ramos, and Nicole Sialaris and in my opinion, this work meets the criteria for approving a thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Occupational Therapy at Stanbridge University.

Eileen Wang, MA, OTR/L

Instructor of Occupational Therapy

ACCEPTED

Vikas Sharma, OTD, OTR/L

Program Director, Master of Science in Occupational Therapy

Abstract

Occupational therapy practitioners have a responsibility to maintain service competency and increase professional knowledge through the implementation of evidence-based research in clinical practice. The research conducted in this project investigates the use of evidence-based practice (EBP) by occupational therapy practitioners treating adult clients with traumatic brain injury (TBI). An online survey was created and distributed to collect data about how these practitioners utilize EBP to enhance occupational performance in adults with a traumatic brain injury. Survey questions were created by utilizing information, data, and research from the *Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury* (American Occupational Therapy Association [AOTA], 2016).

In efforts to support practitioners, AOTA created the *Occupational Therapy Practice Guideline for Adults with Traumatic Brain Injury* to specify which interventions have significant evidence for enhancing occupational performance in multiple impairment categories. The areas of impairment identified include alertness and arousal, motor, cognitive, visual and visual-perceptual, psychosocial, behavioral, or emotional, and everyday areas of occupation and social participation (AOTA, 2016). For this research, occupational therapy practitioners were surveyed to determine the use of evidence-based interventions in their treatment of adult clients with traumatic brain injury. Our data depicted that the majority of occupational therapy practitioners who were surveyed are utilizing evidence-based interventions from AOTA's *Practice Guidelines.* This indicates that occupational therapist practitioners are adhering to the vision and

goals for the field of OT and are actively pushing for the growth of occupational therapy as an evidence-based profession.

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Evidence-Based Practice: Traumatic Brain Injury

Traumatic brain injury (TBI) is one of the leading causes of death and disability in the United States. In 2013, there were a reported 2.8 million emergency room visits, hospitalizations, and deaths due to TBI (Centers for Disease Control and Prevention [CDC], 2017). It is estimated that nearly 50,000 of the 2.8 million deaths were directly related to TBI (CDC, 2017). Additionally, TBI related emergency department visits have increased by 47% from 2006 to 2013 (CDC, 2017). Many factors contribute to these rising numbers, but most notable may be the increase in mild TBI diagnoses in soldiers and athletes (Hoge, McGurk, Thomas, & Cox, 2008).

Many military personnel from the wars in Iraq and Afghanistan have survived brain injuries that once would have been fatal due to improved technology and protective equipment. Consequently, TBIs have been deemed the hallmark injury of these wars (Hoge, McGurk, Thomas, & Cox, 2008). In sports, the incidence of concussions is also on the rise, with an estimated 1.6 million to 3.8 million cases of sports-related concussions per year (Doolan, Day, Maerlender, Goforth, & Gunnar Brolinson, 2011). While the care of athletes with concussions has improved over the years, it is still a pressing issue, as athletes are experiencing more powerful concussions due to increased strength, increased athletic participation of both sexes, and changes in NCAA rules and policies (Kamins & Giz, 2016). More frequently, we are seeing young athletes reach adulthood with post-concussion symptoms and functional deficits at a higher rate than previous generations (Kamins & Giz, 2016).

Fortunately, following a brain injury, an individual with a TBI can receive a variety of rehabilitation services. A study by Levant, Chari, & DeFrances (2016) found

that physical therapy was the most common therapeutic service provided for individuals with a TBI within inpatient and outpatient settings. However, occupational and speech therapy trail close behind, signifying their importance in the treatment of those with a TBI (Levant, Chari, & DeFrances, 2016). As the prevalence of TBIs continues to rise, it is vital for occupational therapy practitioners to be adequately prepared to provide effective interventions and education. More specifically, occupational therapy practitioners should be engaging in evidence-based practice (EBP) to ensure they are providing high-quality interventions for their clients.

EBP is essential to the growth of occupational therapy as a profession by validating the need for occupational therapy, justifying reimbursement, and ensuring that practitioners are providing the highest quality care to their clients (Leung, 2002; Arbesman, Lieberman, & Metzler, 2014; Cullen & Hanrahan, 2018). In efforts to guide clinical decision making for occupational therapy practitioners, the AOTA created a series of practice guidelines to be used in treatment settings. AOTA, the national organization that represents occupational therapists, occupational therapy assistants, and occupational therapy students, supports a mission statement geared towards "[advancing] the quality, availability, use, and support of occupational therapy through standard-setting, advocacy, education, and research" (AOTA, 2016). The *Practice Guidelines* provide therapists with succinct summaries of the current evidence and provide clinical examples of how to utilize this evidence while in practice (Arbesman, Lieberman, & Metzler, 2014). Each of the AOTA *Practice Guideline* series is either accepted or in the process of being reviewed by the Agency for Healthcare Research and Quality (AHRQ) National Guideline Clearinghouse, which is an online database of evidence-based clinical

practice guidelines that adhere to the Institute of Medicine (IOM) standards for trustworthiness (AOTA, 2016). For our research, we referred to *The Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury,* which is meant to enhance the quality of occupational therapy services provided for clients with TBI (AOTA, 2016).

Our research aimed to determine if occupational therapists and occupational therapy assistants around the country are implementing interventions specified by the *Practice Guidelines*, and, if so, which interventions. If practitioners are not using interventions from the AOTA *Practice Guidelines*, we sought to explore other potential interventions that practitioners are implementing with their clients. Our survey was distributed through several occupational therapy state organizations, CommunOT, Facebook groups for occupational therapy and TBI support, and hospitals and clinics around the United States that treat adults with TBI.

Determining the use of EBP for clients with a TBI is not only beneficial to ensuring quality care for a diagnosis that is on the rise, but also to support and reinforce occupational therapy's emphasis on being a science-driven profession. Evidence found in systematic reviews of the *Practice Guidelines*, continue to display the importance of implementing occupational therapy interventions to improve client outcomes (AOTA, 2016). The use of evidence-based interventions is part of a broad multidisciplinary approach in healthcare that considers the client's performance patterns (i.e., habits, roles, routines, rituals), performance skills (i.e., motor skills, process skills, social interaction skills), and the context and environments in which clients function (American Occupational Therapy Association [AOTA], 2014). The intent of our research in

occupational therapy practice is to determine the extent to which EBP is utilized, specifically regarding interventions for clients with TBI. Although there is a significant amount of research surrounding TBI and evidence-based interventions to better aid the TBI community, there is no definitive answer as to how much of this research is being implemented by current practicing therapists.

Today's clinical environment pressures occupational therapy practitioners to demonstrate the effectiveness and efficiency of their interventions and treatments through documentation reviewed by insurance companies (Cameron, Ballantyne, Kulbitsky, Margolis-Gal, Daugherty, & Ludwig, 2005). Occupational therapy practitioners have a responsibility to maintain competency and increase professional knowledge through the implementation of evidence-based research into their actual practice. A study conducted by Cameron et al. (2005) investigated the use of EBP by registered occupational therapists in the United States. Researchers found that although 98% of occupational therapists agree that research is the foundation of occupational therapy practice, a significant number of clinicians chose not to seek out related research in their clinical practice area or pursue evidence validating their interventions. These results also suggested that as the degree level (e.g., bachelors, masters, doctorate) of the clinician increases, or the years of experience in the field increases, practitioners are less likely to use research for decision-making in their clinical practice (Cameron et al., 2005). This study provides an insightful overview of the use of EBP amongst occupational therapists in the United States. In our research, we further narrowed the scope in order to focus specifically on occupational therapy practitioners treating adult clients with TBI.

We were hopeful that practitioners are now more motivated and better equipped at finding, analyzing, and using research into their clinical practice than they were in 2005. With the increased focus on research during educational programs for occupational therapists and occupational therapy assistants, as well as the expansion of the internet as a clinical resource, we speculate that practitioners should have the tools necessary to access and scrutinize current research for implementation in their practice. More specifically, we hoped to discover the extent to which EBP is being used across the United States with the vulnerable and complex population of adults diagnosed with a TBI.

Literature Review

Impact of TBI and Goal of OT Services

TBIs are a non-congenital, non-degenerative injury caused by an external force to the head, consequently leading to brain trauma. Resulting brain trauma is classified as mild, moderate, or severe, depending on the extent of damage to the brain and level of dysfunction following the injury. Despite the severity, all levels of a TBI produce an altered or diminished state of consciousness, resulting in short-term or long-term impairments of typical human function (Blyth & Bazaruah, 2010).

Additionally, the heterogeneity of symptoms of a TBI convey that this injury should not be considered an acute disorder; instead, TBI needs to be regarded as a multifaceted and chronic neurodegenerative condition (Tabish & Syed, 2015). Of the 2.8 million individuals who sustain a TBI each year, 2.5 million, or almost 90% of cases, are treated with medical attention (Tabish & Syed, 2015). Though advancements in technology have decreased the rates of death due to a TBI, the disabilities and dysfunction that result often decrease an individual's quality of life (Tabish & Syed,

2015). Common impairments related to TBI include chronic physical, mental, and emotional challenges. Although the degree and severity of disability vary from person to person, and the signs and symptoms can be addressed and treated via surgeries and health care services, some deficits are lifelong and require intense, prolonged rehabilitative interventions. Further highlighting the importance of ensuring that research into effective treatment methods is utilized in occupational therapy practice.

Cost of Services

In addition to physical and emotional distress, the increase in TBI incidence also comes with an enormous societal and economic toll. For example, "the cost of TBIs in the United States is estimated at more than $48.3 billion annually [and] over $31.7 billion in hospitalization costs" (Tabish & Syed, 2015, p. 5). However, this number does not reflect those who are uninsured or who live in rural communities. The financial burden faced by a survivor of a severe TBI can range from $600,000 to $1,875,000 over their lifetime (Tabish & Syed, 2015). In hopes to reduce the overall costs of TBI, rehabilitation services such as occupational therapy can be a cost-effective solution. Research conducted by Humphreys, Wood, Phillips, and Macey (2013) found that receiving rehabilitation services two years post-injury often prevented hospital readmission. This demonstrates the cost-effectiveness of rehabilitation programs by increasing total lifetime savings. While the prevalence of TBIs are increasing, the long term financial burden can be reduced. Effective occupational therapy intervention can provide clients with meaningful and long term functional gains. The improvements that a person with a TBI receiving occupational therapy services can make include increased motor function to

complete dressing and eating, or improved attention to return to school or work to name a few.

EBP Trends

Rehabilitation therapists are frequently judged by the functional outcomes that their clients achieve when discharged from therapy services. This constant judgment and pressure by third-party payers and insurance companies if occupational therapy services are effective for reaching functional outcomes reflects the current clinical environment. Integrating current research, clinical expertise, and clients' values can result in optimal care and better functional outcomes (Institute of Medicine, 2001). Through the use of EBP, interventions are documented and rationalized, allowing for other practitioners to replicate the interventions and achieve similar outcomes with comparable clients (Holm, 2000). In conjunction with the dynamic and rapidly growing healthcare field, occupational therapy practitioners are forced to confront major changes in the way their therapeutic services are delivered. In turn, the structure and organization of practice settings are expected to change and grow, primarily as new research is published. For these new healthcare services to appropriately function, detailed information is required on whether services are clinically effective.

In addition to the effectiveness of treatment, the use of EBP is also widely advocated as one way to meet reimbursement demands (Arbesman, Lieberman, & Metzler, 2014) Similar to other healthcare professions, occupational therapy is rooted in science and EBP is used to legitimize the profession further. In a study conducted by the research division of AOTA, findings indicate that not enough therapists are routinely integrating current research into their interventions despite the growing status of EBP

(Cameron et al., 2005). 500 surveys were sent to occupational therapy practitioners and occupational therapy assistants at random. The survey was distributed among all practice areas, and the researchers received 122 responses. The questions sought to clarify whether or not practitioners seek, utilize, and find EBP essential for appropriate occupational therapy practice. Despite the availability and accessibility of evidence-based resources, this research discovered that a majority (75%) of therapists seek out EBP related to their area of practice less than half of the time. However, nearly all therapists (99%) believe that EBP is necessary and beneficial for appropriate occupational therapy practice. When reviewing this article, we had to consider that the survey was generalized across practice areas and did not indicate which practice areas were utilizing EBP more or less frequently.

Barriers to EBP

In a systematic review conducted by Law and Thomas in 2013, a total of 69 articles were reviewed which sought out the attitudes and perceptions of EBP in healthcare, as well as the processes and skills of acquiring EBP. The compilation of research reviewed depicted that health care practitioners find current EBP to be a critical piece of clinical practice. However, practitioners see clinical expertise and client factors as equally essential. Evidence, expertise, and client centered care were perceived as critical to the therapeutic process. Overall, clinicians' attitudes toward EBP were positive and have increasingly evolved since the start of the 21st century. The emphasis on the utilization of EBP over the past decades have consequently increased EBP use in various environments, such as academia, clinical settings, and even in government (AOTA, 2016). For legislators and third-party payers, EBP can be used as a means to measure

effectiveness of interventions, as well as help people outside of the profession of occupational therapy understand its scope. Ultimately, EBP legitimizes the occupational therapy profession to other professionals with measurable outcomes of occupational therapy services.

Further investigating allied healthcare professionals' attitudes, knowledge, and behavior about EBP, Heiwe et al. (2011) surveyed all dieticians, occupational therapists, and physical therapists at a Swedish university hospital. Results demonstrated an overall positive attitude regarding EBP and the usage of evidence to bolster clinical decision making. Additionally, the participants indicated having the necessary skill set to depict and comprehend the evidence, as well as the fact that clinical practice guidelines were available and readily used (Heiwe et al., 2011). Although the overall perception surrounding EBP is positive in this study, Heiwe et al. (2011) also addressed that EBP accessibility requires improvement, as many barriers still stand in the way for practitioners.

Various barriers prevent the translation of EBP into clinical practice, in turn affecting access and utilization of EBP by occupational therapy practitioners. Some of these barriers include lack of time to research upcoming EBP in their given settings, feeling of inadequacy and incompetence of skills to access EBP resources, and lack of funding of their facility for the new technologies that some EBP requires (Stube & Jedlicka, 2007). Another perceived barrier to EBP is the lack of a standardized definition of "effective intervention" (Biesta, 2007). In order for an intervention to be effective, it must have a clear cause and effect (Biesta, 2007). Lastly, research has shown that practitioners expressed a lack of support within the workplace to actively seek out EBP

(Heiwe et al., 2011). The lack of EBP culture within the workplace not only hinders practitioners' accessibility, but it fosters an environment where practitioners may be discouraged to use EBP at all.

To target the perceived barriers to effective EBP use, the focus must be on changing attitudes, both at a systemic and behavioral level (Bennett et al., 2016). Additional research shows that passive methods of EBP training are less effective than an interactive approach, such as workshops, educational session led by clinical experts, and practice-based learning groups (Lin, Murphy, & Robinson, 2010). For successful translation of EBP into clinical practice, there should be active learning methods available for practitioners. At an organizational level, practitioners need an environment where there is leadership promoting an EBP-driven culture, a foundational base of knowledge that allows practitioners to engage in a practice that is informed by evidence, and an infrastructure in the workplace that can support and maintain a culture of EBP (Bennett et al., 2016). Once these boundaries are addressed, EBP can be used to solidify further occupational therapy as a profession that is rooted in science. Research has shown that practitioners in this field believe EBP enables occupational therapy to grow as a profession and is an integral part of all specialty settings. Further, EBP holds promise to support the future of occupational therapy (Stube & Jedlicka, 2007). Our research is relevant to AOTA's survey results, as we narrowed down the scope of this survey to therapists who work specifically with clients with a TBI. We hoped to receive results indicating that a high percentage of practitioners are using EBP in the treatment of those with a TBI.

Using a Survey

Through an examination of the various strengths, weaknesses, and generalizability of the numerous survey methods, we concluded that conducting our research through the use of an online survey was the best fit for our research. Conducting an online survey allowed us to evaluate the usefulness of evidenced-based research, as well as to distinguish common interventions occupational therapy practitioners are implementing in practice to treat clients with a TBI. We considered several advantages and strengths to using an online survey for conducting research, as supported by its widely used and preferred method of data collection by researchers. The benefits of sending an online survey include ease of development, cost and time effectiveness, reaching a broad population, and receiving a higher response rate compared to other modes of sending surveys, such as written surveys or telephone surveys (Wright, 2017).

Despite the many benefits of utilizing an online survey as a means of data collection, we must consider the limitations as well, including unpublished contact information, a lengthy consent form, a vague statement of purpose, and the possibility of the survey not relating to the therapist's practice area (Wright, 2017). In order to address the legitimacy of our online survey, we chose to send the survey through a legitimate organization(s), such as the Occupational Therapy Association of California (OTAC). Additionally, we ensured to clearly and concisely state the target population, convey the purpose, and specify how the results would be used, thus strengthening the validity of our survey to the population we hoped to reach (Dillman, Smyth, & Christian, 2014).

Statement of the Problem

Stanbridge University's MSOT program values certain curricular threads that we found relevant to our topic, such as an occupation-based focus, and healthcare communication, both of which are vital to provide clients with both occupation-based and evidence-based interventions. This ensures that treatments and interventions are meaningful to the client and supported by research, establishing their effectiveness in practice. Additionally, it is crucial to understand the importance of healthcare communication in clients with a TBI. Facilitating strong communication between the therapist and client—as well as other healthcare practitioners, insurance companies, and families—is vital to providing the best care possible. This also guarantees that clients understand the need for specific interventions and treatment, providing them the opportunity to ask questions, accept or deny treatment, and be autonomous in their care. Psychosocial aspects are also considered necessary when treating these clients, as many of the deficits from a TBI can affect psychosocial, behavioral, and emotional aspects of life. These deficits can interfere with a client's relationships, job status, and overall well-being. TBIs can be seen in any practice area and within any population, despite age, gender, and socioeconomic status; therefore, therapists should be culturally competent and accepting of diversity when interacting with all clients they face.

The current clinical environment encourages the use of EBP in occupational therapists' treatments and interventions, yet there is a gap between available EBP and its utilization in practice (Cameron et al., 2005). While reviewing our country's current goals for the field of occupational therapy, questions emerged relating to healthcare quality, patient satisfaction, availability of appropriate services, and reduction of costs of

services. AOTA's centennial vision and vision 2025, as well as the American Occupational Therapy Foundation's (AOTF) vision, each stress the importance of providing research that supports occupational therapy as a science-driven, holistic, and effective field of healthcare practice (AOTA, 2007; AOTA, 2017; AOTF, 2016). Having this research to support the field of occupational therapy can help practitioners address issues with the quality of healthcare that clients receive, the availability of resources for those in need, and the affordability of services for all. The ever-changing and fragmented healthcare system in the U.S. has made this difficult for occupational therapy practitioners, but with continuous research and the utilization of EBP, occupational therapy can be an effective field of healthcare that improves the quality of life for all individuals and families involved in care.

For our research, we referenced the *Occupational Therapy Practice Framework: Domain and Process, 3rd ed.* (OTPF), a document that outlines the domain of occupational therapy practitioners, describes the therapeutic process, and focuses on occupations, client-centered care, and the dynamic nature of therapy (AOTA, 2014). When reviewing the OTPF, we recognized elements that apply to our research, as they relate to aspects of AOTA's *Practice Guidelines* for adults with TBIs. Referencing both the AOTA *Practice Guidelines* and the OTPF allows us to connect our research to specific components that address meaningful occupations affected by deficits from a TBI. Therefore, the purpose of this research was to survey occupational therapy practitioners about their use of evidence-based interventions during their treatment of adults with a TBI. According to AOTA's *Practice Guidelines for Adults with Traumatic Brain Injuries*, clients can experience deficits in alertness and arousal, motor activity, cognition,

vision and visual-perceptual abilities, psychosocial aspects, behavior, emotion, and everyday areas of occupation and social participation (AOTA, 2016).

The need for our research emerged from the discrepancy between the lack of EBP use in the clinical environment as depicted by our literature review and the perceived use of EBP by occupational therapy practitioners. As stated by Thomas and Law (2013), there is a lack of EBP literature in the field of occupational therapy, and our research hopes to address this gap in the literature. We assessed the use of EBP among OT practitioners in the treatment of adults with TBI. Our target population was occupational therapists and occupational therapy assistants in the United States. The outcome of our preliminary research was a survey that determined the use of EBP among OT practitioners in their treatment of clients with a TBI. After conducting our literature review, our research question asked if occupational therapy practitioners using evidence-based interventions in their treatment of adults with TBI to improve occupational performance. We hypothesized that the majority of practitioners are using evidence-based interventions with their treatment of TBI clients.

Theoretical Framework

We chose to utilize the Person-Environment-Occupation Performance Model (PEOP) to guide our research. This model proposes that performance and occupation are closely intertwined by the level of ability to perform an activity and the act of participating in those activities (Christiansen & Baum, 2005). Additionally, this model holds the belief that performing an occupation successfully and adequately leads to meaningful participation, as well as a sense of accomplishment and identity (Christiansen & Baum, 2005). Therefore, a functional individual can engage in meaningful

participation and thus improve their overall quality of life. On the contrary, dysfunction is viewed as an occupational performance disability or disease; in this case, the disability that leads to dysfunction is a TBI. Despite dysfunction, change and motivation can occur through the activation of human agency and motivation, as facilitated by an occupational therapy practitioner.

According to the literature, the PEOP model is used to guide the research and development of interventions that improve health outcomes and reduce health disparities (Smith & Hudson, 2013). Therapists using this model focus on identifying enablers and barriers between the person and their environmental factors in order to optimize occupational participation (Christiansen & Baum, 2005). By referencing TBI interventions supported by AOTA, we wanted to know if the guidelines are congruent with AOTA's vision and if they ensure that performance leads to meaningful participation in occupations. This research aimed to understand the reasons therapists may or may not be referencing these guidelines in practice and if they are utilizing other interventions that improve client performance in meaningful occupations.

Using this model benefits this research due to the type and level of dysfunction encountered by clients with TBI. The PEOP model encourages the use of remediation, compensation, and environmental modification to improve occupational performance (Christiansen & Baum, 2005). In clients with a TBI, these strategies can be utilized as an aspect of the intervention plan. When considering the person—our clients—a therapist would use methods of assessment that acknowledge the client's preferences in their occupational tasks, ensuring a client-centered approach. When addressing the environment, therapists would consider adaptations and social supports that would

facilitate a client's ability to interact with the world around them. When looking at the client's occupations, a therapist would examine the client's ability to adapt in order to fulfill wants and needs, such as activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Lastly, when assessing performance, the therapist would attempt to maximize the client's potential by providing resources, support, adaptive equipment, and more. If the therapist encounters barriers, such as environmental obstacles, the PEOP model suggests that the environment must change to improve occupational performance, rather than the person and their desired occupations. This is a top-down approach, which takes a global perspective of a client and their valued occupations and is linked to the activities and participation levels of a client (Christiansen & Baum, 2005). Interventions that address both the person and occupation, rather than their underlying levels of dysfunction, increase occupational performance by valuing the client's roles and desired occupations.

Overall, the PEOP model places a significant emphasis on quality of life and participation in occupations. Providing therapeutic interventions that follow this theoretical framework supports a client-centered approach, addresses a client's ability to adapt and engage in their desired occupations, and encourages environmental adaptations to enhance participation. Due to the physical, cognitive, or psychosocial deficits that may result from their diagnosis, we felt that clients with a TBI could benefit significantly from these strategies. Therefore, choosing the PEOP model was an appropriate and valuable framework when addressing the effectiveness of interventions for adults with a TBI.

Methodology

A survey is a powerful tool that provides researchers with a way to collect quantitative and qualitative data. When executed appropriately and correctly, survey results can provide researchers with reliable information. Conducting an online survey allowed us to evaluate the usefulness of evidenced-based research as well as distinguish the common interventions occupational therapy practitioners are implementing in practice to treat clients with a TBI. The development of our survey was based on the recommendations from the Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury (AOTA, 2016). After reviewing the literature, we summarized the information to create a concise, eleven-question survey using Qualtrics online software (see Figure 1). The six areas of impairment explained in the Practice Guidelines are alertness and arousal, motor, cognitive, visual and visual-perceptual, psychosocial, behavioral, or emotional, and everyday areas of occupation and social participation. However, our survey reflected five of these impairment areas; for our research, we required active participation in occupations in order to observe occupational performance, leading us to exclude alertness and arousal. The interventions that are listed under each area of impairment in our survey have either an A (strong) or B (moderate) rating for their level of evidence.

We first conducted a pilot survey with a convenience sample to test the appropriateness of questions, the correctness of instructions, feedback regarding the survey, and ultimately, if our survey was useful in fulfilling our research purpose. Our pilot survey consisted of twelve total questions. There were five demographic questions, five EBP intervention questions, one question to confirm the participant worked with TBI

patients, and one question for open-ended feedback about the pilot survey. The five EBP intervention questions each had a part A and part B. Part A listed the interventions from the AOTA practice guideline and part B provided an opportunity to input an "other" response. The survey was shared with 15 occupational therapy practitioners; seven occupational therapists and one occupational therapy assistant completed the survey. The recipients had a period of two weeks to complete and submit the survey. All participants selected multiple EBP interventions in each area of impairment. Several "other" responses were submitted, which contributed to our investigation of the possibility of other widely used interventions being used that were not listed. Themes from the open-ended feedback were that the survey was easy to complete and navigate through, and the questions were clear and well thought out.

From the feedback and success of the pilot survey, we did not make changes before the final distribution of our survey except to remove the final open-ended question asking for feedback about the survey. To deliver the survey to occupational therapists and occupational therapy assistants around the country, several occupational therapy state organizations (such as OTAC), CommunOT message board, Facebook groups for occupational therapy and TBI support, as well as hospitals and clinics around the country that treat adults with TBI were contacted. Consent was obtained through a digital form attached to the survey. The data obtained from our survey was intended to determine how many practitioners (% of respondents) are using evidence-based practice and which evidence-based interventions are most popular in each area of impairment. Using our demographic questions, we hoped to learn if OTs or OTAs are using EBP more, which practice settings are using EBP the most, if owning or having read the AOTA Practice

Guidelines result in higher EBP use, and if certain states or areas of the country are using EBP more or less than others. By allowing survey participants to write in interventions they use that are not listed in the "other" box, we were able to discover other widespread interventions that are not listed in the AOTA Practice Guidelines.

Participants and Ethical Considerations

For this project, participants included occupational therapists and occupational therapy assistants across the United States. They were recruited via state and national occupational therapy associations, such as AOTA and OTAC. Also, participants were recruited through online forums such as AOTA Listserv, CommunOT, and Facebook groups relating to occupational therapy. An email was sent to participants with a brief introduction to the survey, and a link was attached to allow participation in the survey. Once the participant clicked on the link, consent was obtained through a digital form attached to the survey before starting the survey. The consent form explained the purpose and design of the survey, a description of risks, voluntary participation, and confidentiality of personal information.

There were no known risks for participating in the survey. The participants' identities remained confidential due to the anonymity of the responses. Participants had the opportunity to withdraw from the survey at any point in time without penalty, and they could refuse to answer any specific questions. Participation in the survey was expected to take 10-15 minutes and required minimal effort. There were no other costs to the participants, and there was no reimbursement or compensation to the participants. Responses collected did not include any identifying information. Therefore, the data is anonymous. The only identifiers included indicating if the participant was an OT or

OTA, the setting they work in, and the state they practice in. The demographic identifiers were vague enough to be still considered anonymous, and results were kept anonymous and private through the Qualtrics software.

Results

Demographics

Our survey had five demographic questions; question 1 asked whether the participant was an occupational therapist or occupational therapy assistant. Of the 99 who completed the survey, 92 were occupational therapists, and 7 were occupational therapy assistants. Question 3 asked about years of experience. Almost half of all participants, 41, said they had more than 10 years of experience. The next largest group was 20 participants, who had 1-3 years of experience, 17 who had 7-10 years, 15 who had 4-6 years, and 6 who had less than 1 year of experience. Question 4 asked what setting the practitioner works in. Of the 99 completed surveys, 56 participants said they worked in inpatient, 25 in outpatient, 9 in home health, and 9 in community settings. The next demographic inquiry was question 10, asking participants about their familiarity with the AOTA's Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury. Forty participants said they had heard of it but never read it, 31 said they had access to the guideline but rarely use it, 17 said they had never heard of it, and just 11 said they have access to it and use it frequently. The last demographic question, and last of the survey, was question 11. It asked participants to identify the state they work in. Close to half of all participants, 47 were from California. The next largest groups were 17 from Michigan, 7 from Massachusetts, 5 from Arizona, 4 from both Alaska and Nevada, 3 from Colorado, and 2 from both New Mexico and New York. Lastly, there was 1

participant from each of the following states: Connecticut, Georgia, Louisiana, New Jersey, Pennsylvania, South Carolina, Texas, and Washington.

Motor Impairments

The first question about evidence-based practice was question 5A. It asked practitioners to select the interventions they used to improve motor function impairments in their patients with TBI. There were two interventions of high or moderate evidence listed, exercise programs and computer-based interventions, as well as one choice for "other." The results demonstrated that 8/99 selected only "other," indicating that they do not use any of the EBP interventions listed. A total of 64/99 selected only one intervention or 1 intervention in conjunction with "other"; 27/99 selected 2/2 interventions or 2/2 and "other" (see Figure 2). Results showed that exercise programs were the most popular intervention listed for motor impairments, selected by 88/99 participants.

There were several trends identified among the "other" responses in question 5B. Seventeen participants said that they used interventions relating to activities of daily living (ADL), instrumental activities of daily living (IADL), and basic activities of daily living (BADL). There were 13 responses relating to neuro-reeducation, neurodevelopmental treatment (NDT), and proprioceptive neuromuscular facilitation (PNF). Nine participants entered functional activity, occupation-based, and meaningful activity related responses. There were 6 "other" responses associated with modalities, electrical stimulation, and functional electrical stimulation. Another 6 participants entered interventions correlated to cognitive, executive functioning, and attention tasks. The last 4 "other" responses related to vision and visual-perceptual interventions.

Cognitive Impairments

Question 6A asked participants to select the interventions that they used to improve the occupational performance of patients with cognitive impairments. Eight interventions of high or moderate evidence were listed, as well as one choice for "other." The choices were general memory interventions, attention regulation interventions, executive strategy training, training in encoding techniques to improve recall, training in the use of cognitive assistive technology, various memory-specific compensatory approaches, use of compensatory interventions to improve multiple cognitive domains, and cognitive interventions to improve self-awareness. Of the 99 participants, 73 selected 4 or more of the 8 choices listed and 46/99 selected 6 or more (Figure 3). The three most popular interventions were each selected by 78/99 participants. They were general memory interventions, executive function strategy training, and cognitive interventions to improve self-awareness. No trends were identified among the "other" responses received for question 6B.

Visual and Visual-Perceptual Impairments

Question 7A asked participants to select the interventions that they used to improve the occupational performance of patients with visual and visual perceptual impairments. The survey listed three high or moderated evidence-based interventions for visual and visual perceptual impairments, scanning training to improve search skills, cognitive rehabilitation, and scanning training accompanied by visual and/or auditory stimulus, as well as one choice for "other." Seventy-nine of the 99 participants selected 2/3 or more of the listed interventions. 45 out of 99 selected all 3 choices (see Figure 4).

Results showed that scanning training to improve search skills was most popular, with 87/99 practitioners selecting this option.

There were three trends identified in the "other" responses from question 7B. Responses relating to ADL or functional activity, compensatory strategies, and a neuro-optometry referral were each entered 3 times.

Psychosocial, Behavioral, and Emotional Impairments

Question 8A asked participants to select interventions used for patients with psychosocial, behavioral, or emotional impairments. We listed five high or moderate evidence interventions for this question as well as one choice for "other." The five options were CBT interventions, goal-directed outpatient rehabilitation, goal-directed outpatient rehabilitation in group settings, aquatic exercise, and functional skills training. Of the 99 participants, 77 selected 2 or less of the 5 interventions, and 44/99 selected 1 or less (see Figure 5). The most popular intervention for this area of impairment was functional skills training, selected by 87/99 practitioners.

In the "other" responses for Question 8B one trend was identified. Three responses had a multi-disciplinary approach (i.e., psychology, neuro-psych, rehab psychologist) theme.

Impairments in Everyday Activities and Areas of Occupation

Question 9A asked participants to select the interventions they use to address impairments in everyday activities and areas of occupation. There were six high or moderate evidence interventions were listed, as well as one choice for "other." Activity-based interventions focused on client-centered goals, multidisciplinary rehabilitation approaches, training in social behaviors, peer mentoring programs, social peer mentoring

programs focused on accessing the community, and virtual reality driving programs made up the six choices. Out of 99 participants, 73 selected 3 or fewer interventions and 56/99 selected 2 or less out of 6 (see Figure 6). The most popular intervention was "activity-based interventions focused on client-centered goals," selected by 96/99 practitioners.

In the "other" responses for question 9B, community re-entry / reintegration was the 1 trend identified by 4 responses.

Cross-Analysis

There were three cross-analyses between our quantification of EBP use and demographic questions. We chose to explore if the practice setting a clinician worked in impacted EBP use, if years of experience impacted EBP use, and if increased familiarity with the AOTA practice guideline led to greater EBP use. For practice setting, inpatient and outpatient were the two biggest groups, so we compared their individual EBP use. We found that therapists who worked in outpatient settings used more EBP interventions than those who worked in inpatient settings. In the comparison of experience and EBP use, we looked practitioners with 1-3 years of experience verse those with 10 or more years. Therapists with 1-3 years of experience used more EBP interventions than therapists with 10 or more years of experience. Lastly, after comparing each of the 4 answer choices for familiarity with the AOTA practice guideline, no particular answer showed a noticeable difference in EBP use.

Discussion

Occupational therapists have a professional, ethical, and moral obligation to provide safe and reliable services for their clients. Referring to evidence-based interventions and engaging in EBP ensures that therapists are adhering to the visions of

AOTA and AOTF, as well as ensuring that clients are receiving the best care possible. Our research gathered information about the current use of EBP in occupational therapy services for those with a traumatic brain injury.

There were some limitations of our research that we were unable to foresee when we created the survey. The *Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury* was designed to determine the effectiveness of interventions for adults with TBI in six areas including (1) motor function; (2) cognitive impairments and occupational performance; (2) visual and visual–perceptual impairment; (4) psychosocial, behavioral, and emotional impairments and skills; and (5) everyday activities, areas of occupation, and social participation; and one that we did not include in our survey (6) arousal and alertness for patients in a coma or persistent vegetative state. We did not include arousal and alertness because we were specifically interested in obtaining results that depicted the interventions occupational therapists utilize in treating clients who are alert enough to participate in some level of ADL activity. Within the five domains of treatment for adults with TBI that we included in our survey, we only utilized grade A (strong) and grade B (moderate) evidence ratings from the *Practice Guidelines*. Thus, nearly all OTs and OTAs completing the survey indicate that they do use EBP unless they solely selected "other" as a response in the survey. In the future, results may present with better accuracy if we included grade C (low evidence) and grade I (insufficient evidence) EBP ratings.

We also recognize the potential for overlap of interventions described in T*he Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury*. Occupational therapists frequently address multiple areas of practice (i.e., the motor

activity also used to address cognition). The rigid categorizations used in our review may be limited from the perspective of the survey recipient, but they were created to help readers better understand the interventions' characteristics within each domain.

Future research should focus on designing a survey with anticipated questions in mind. For example, the research question is "To what extent are practitioners using EBP?". However, our survey addressed whether or not practitioners are utilizing EBP, not the extent to which they are using it. This is something that can be investigated in the future, but may need to be addressed in a qualitative manner as opposed to quantitative. The question of "to what extent are practitioners using EBP" may only be measured by practitioners' perceptions of their own use. This would allow for a more concise, effective survey tailored to the research question. Additionally, from the data we have collected, we would want to further analyze if those who use EBP have read the *Practice Guidelines*. More specifically, we want to know how exposure to the *Practice Guidelines* impacts the use of EBP. This could indicate that the *Practice Guidelines* provided by AOTA are effective in improving the use of EBP in clinical settings.

Our intent is that this data shows that the majority of OTs and OTAs surveyed are utilizing evidence-based interventions from AOTA's *Practice Guidelines*. This would indicate that occupational therapists are adhering to the goals for the field of OT and are actively pushing for the growth of occupational therapy as a profession.

References

American Occupational Therapy Association (2007). AOTA'S centennial vision and executive summary. *The American Journal of Occupational Therapy*, *61*(6). Retrieved from https://ajot.aota.org/article.aspx?articleid=1866999

American Occupational Therapy Association. (2014). Occupational therapy practice framework: Domain and process. *American Journal of Occupational Therapy, 68*(Suppl. 1), S1–S48. https://doi.org/10.5014/ajot.2014.682006

American Occupational Therapy Association (2016). Occupational therapy practice guidelines for adults with traumatic brain injury. Bethesda, MD: American Occupational Therapy Association.

American Occupational Therapy Association. (2017). Vision 2025. *American Journal of Occupational Therapy*, 71. https://doi.org/10.5014/ajot.2017.713002

American Occupational Therapy Foundation (2016). Vision, mission, and strategic plan. Retrieved from http://www.aotf.org/aboutaotf/visionmissionstrategicplan

Arbesman, M., Lieberman, D., & Metzler, C.A. (2014). Using evidence to promote the distinct value of occupational therapy. *American Journal of Occupational Therapy, 68*(4), 381-385. Doi:10.5014/ajot.2014.684002.

Bennett, S., Allen, S., Caldwell, E., Whitehead, M., Turpin, M., Fleming, J., & Cox, R. (2016). Organizational support for evidence-based practice: occupational therapist's perceptions. *Australian Occupational Journal, 63*, pp. 9-18. doi: 10.1111/1440-1630.12260

Biesta, G. (2007). Why "what works" won't work: evidence-based practice and the democratic deficit in educational research. *Education Theory, 57*(1). doi:10.1111/j.17415446. 2006.00241.x

Blyth, B. J., & Bazarian, J. J. (2010). Traumatic alterations in consciousness: Traumatic brain injury. *Emergency medicine clinics of North America, 28*(3), 571-94.

Cameron, K.A., Ballantyne, S., Kulbitsky, A., Margolis-Gal, M., Daugherty, T. & Ludwig, F. (2005). Utilization of evidence-based practice by registered occupational therapists. *Occupational Therapy International, 12*(3). 123-126. doi: 10.1002/oti.1

Centers for Disease Control and Prevention (2017). TBI: get the facts. Retrieved from https://www.cdc.gov/traumaticbraininjury/get_the_facts.html

Christiansen, C.H. & Baum, C.M. (2005). Person-environment-occupation-performance: An occupation based framework for practice. In C.H. Christiansen, C.M. Baum, & J. Bass-Haugen (Eds.), Occupational therapy: Performance, participation, and well-being (3rd ed.). Thorofare, NJ: SLACK Incorporated.

Cullen, L. & Hanrahan., K. (2018). *Evidence-based practice and the bottom line: An issue of cost.* Retrieved from https://www.hfma.org/Content.aspx?id=58754

Dillman, D. A., Smyth, J. D., & Christian, L. M. (2014). Internet, phone, mail, and mixed-mode surveys: The tailored design method (4th ed.). Hoboken, NJ: John Wiley & Sons Inc.

Doolan, A., Day, D., Maerlender, A., Goforth, M. & Gunnar Brolinson, P. (2011). A review of return to play issues and sports-related concussion. *Annals of Biomedical Engineering, 40*(1), pp.106-113.

Forsyth, K. & Kviz, F.J. (2017). Survey research. In Taylor, R.R. (Ed.), Kielhofner's research in occupational therapy, 2nd edition (pp. 375-394). Philadelphia, PA: F.A. Davis Company

Heiwe S., Kajermo, K. N., Tyni--Lenné, R., Guidetti, S., Samuelsson, M., Andersson, I., & Wengström, Y. (2011). Evidence-based practice: Attitudes, knowledge, and behavior among allied health care professionals. *International Journal for Quality in Health Care, 23*(2). 198-209. doi: 10.1093/intqhc/mzq083

Hoge, C.W., McGurk, D., Thomas, J.L., & Cox, A.L. (2008). Mild traumatic brain injury in U.S. soldiers returning from Iraq. *The New England Journal of Medicine,* 358: 453-463. doi: 10.1056/NEJMoa072972

Holm, M. B. (2000). Our mandate for the new millennium: Evidence-based practice, 2000 Eleanor Clarke Slagle lecture. *American Journal of Occupational Therapy, 54*, 575–585.

Humphreys, I., Wood, R.L., Phillips, C.J. & Macey, S. (2013). The costs of traumatic brain injury: a literature review. *ClinicoEconomics and Outcomes Research, 20*(5), 281-287. doi: 10.2147/CEOR.S44625

Institute of Medicine. (2001). *Crossing the quality chasm. A new health system for the 21st Century*. Washington, DC: The National Academies Press; 2001.

Kamins, J. & Giza, C. C. (2016). Concussion-Mild traumatic brain injury: Recoverable injury with potential for serious sequelae. *Neurosurgery clinics of North America*, *27*(4), 441–452. doi:10.1016/j.nec.2016.05.005

Law, M. & Thomas, A. (2013). Research utilization and evidence-based practice in occupational therapy: A scoping study. *American Journal of Occupational Therapy, 67*(4), doi: 10.5014/ajot.2013.006395.

Leung, E. K. H. (2002). Evidence-based practice in occupational therapy. *Hong Kong Journal of Occupational Therapy, 12.* 21-32. Retrieved from https://doi.org/10.1016/S1569-1861(09)70014-2

Levant, S., Chari, K., & DeFrances, C. (2016). National hospital care survey demonstration projects: traumatic brain injury. National Health Statistics Report, *97*. 1-15.

Lin, S.H., Murphy, S.L., & Robinson, J.C. (2010). Facilitating evidence-based practice: Process, strategies, and resources. *American Journal of Occupational Therapy, 64*, 164–171.

Smith, D., & Hudson, S. (2013). Using the person-environment-occupational performance conceptual model as an analyzing framework for health literacy. *Journal of Communication in Healthcare, 5*(1).

Stube, J. E. & Jedlicka, J. S. (2007). The acquisition and integration of evidence-based practice concepts by occupational therapy students. *American Journal of Occupational Therapy, 61*, 53–61. Retrieved from https://cpb-us-w2.wpmucdn.com/u.osu.edu/dist/8/43838/files/2017/05/acquistion_of_EBP_by_students_-_week_1-268wsbv.pdf

Tabish, S. A. & Syed, N. (2015). Recent advances and future trends in traumatic brain injury. *OMICS International, 5*(229). doi: 10.4172/2165-7548.1000229

Titler, M. (2008). The evidence for evidence-based practice implementation. *Patient safety and quality: An evidence-based handbook for nurses*. Rockville, MD: Agency for Healthcare Research and Quality.

Wright, K. (2017). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication, 10*(3). doi: 10.1111/j.1083-6101.2005.tb00259.x

Figures

Figure 1. Evidence-Based Practice & TBI Survey

1. What type of occupational therapy practitioner are you?

o Occupational therapist

o Occupational therapy assistant

2. This survey is meant to determine the use of evidence-based practice in the treatment of adults with traumatic brain injury. If you do not work with this population, please do not complete the survey.

o Yes, I do work with patients who have traumatic brain injuries.

o No, I do not work with patients who have traumatic brain injuries.

3. How many years of experience do you have as an occupational therapy practitioner?

o Less than 1 year

o 1-3 years

o 4-6 years

o 7-10 years

o More than 10 years

4. Which of the following best describes the setting you work in?

- o Outpatient
- o Inpatient
- o Home health
- o Community Setting

*For questions 5-9, please hover over each option to see examples of interventions. Descriptions may take about two seconds to show up.

5A. Please select all of the following interventions that you use with patients to improve motor function:

- o Exercise programs
- o Computer-based interventions
- o Other

5B. If you selected “Other” please specify.

- o Text box to input other responses

6A. Please select all of the following interventions that you use to improve the occupational performance of patients with cognitive impairments:

- o General memory interventions

o Attention regulation interventions

o Executive function strategy training

o Training in encoding techniques to improve recall

o Training in the use of cognitive assistive technology

o Various memory-specific compensatory approaches

o Use of compensatory interventions to improve multiple cognitive domains

o Cognitive interventions to improve self-awareness

o Other

6B. If you selected “Other” please specify.

o Text box to input other responses

7A. Please select all of the following interventions that you use to improve the occupational performance of patients with visual and visual-perceptual impairments:

o Scanning training to improve search skills

o Cognitive rehabilitation

o Scanning training accompanied by visual and/or auditory stimulus

o Other

7B. If you selected “Other” please specify.

o Text box to input other responses

8A. Please select all of the following interventions that you use to improve the occupational performance of patients with psychosocial, behavioral, or emotional impairments:

o CBT interventions

o Goal-directed outpatient rehabilitation

o Goal-directed outpatient rehabilitation in group settings

o Aquatic exercise

o Functional skills training

o Other

8B. If you selected “Other” please specify.

o Text box to input other responses

9A. Please select all of the following interventions that you use to improve the occupational performance of patients in everyday activities and areas of occupation and social participation:

o Activity-based interventions focused on client-centered goals

o Multidisciplinary rehabilitation approaches

o Training in social behaviors

o Peer mentoring programs

o Social peer mentoring programs focused on accessing the community

o Virtual reality driving programs

o Other

9B. If you selected “Other” please specify.

o Text box to input other responses

10. Are you familiar with the AOTA's Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury?

o Yes, I have access to a copy and refer to it frequently.

o Yes, I have access to a copy but rarely use it.

o I’ve heard of it, but never read it.

o No

11. What state do you practice in?

o Drop down list to select one of the 50 states

Figure 2. Question 5A: Motor Impairments

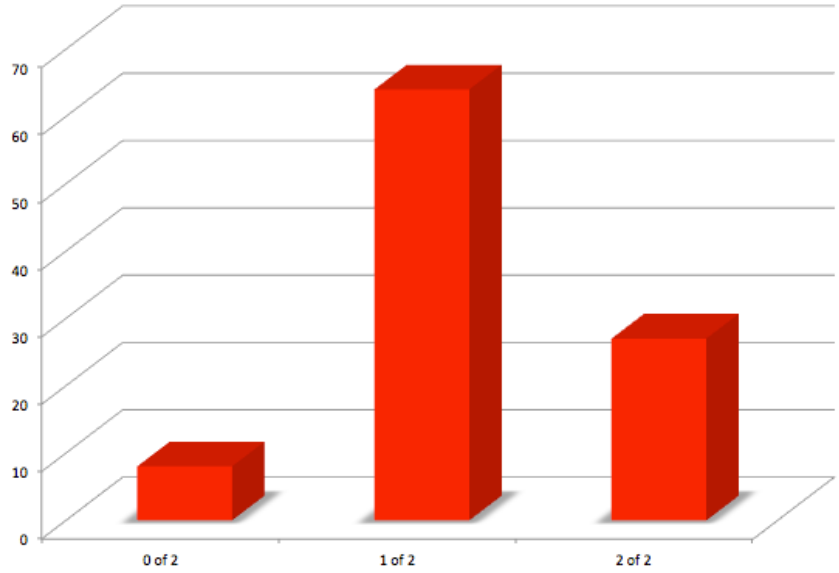

Figure 2. The bars in the graph represent the number of interventions each participant selected that were listed in question 5A.

Figure 3. Question 6A: Cognitive Impairments

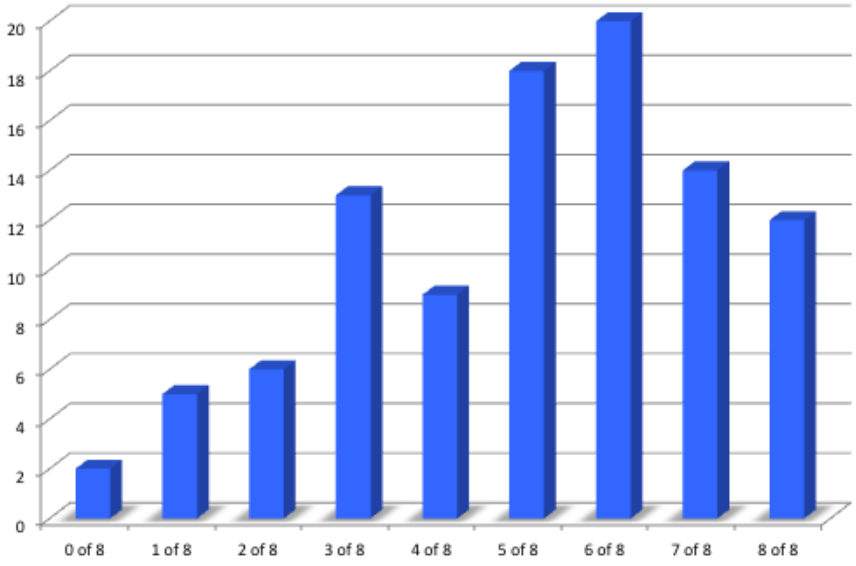

Figure 3. The bars in the graph represent the number of interventions each participant selected that were listed in question 6A.

Figure 4. Question 7A: Visual & Visual-perceptual Impairments

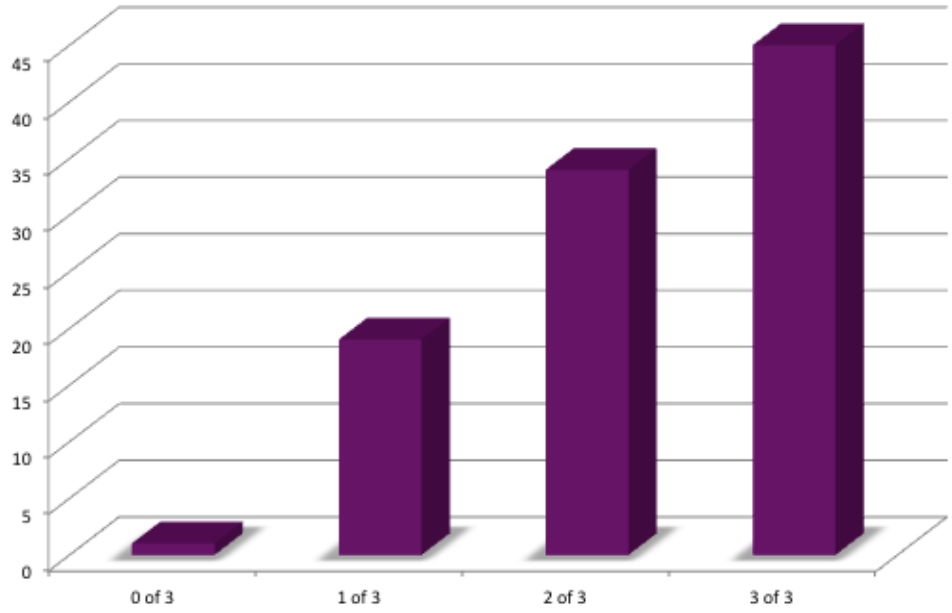

Figure 4. The bars in the graph represent the number of interventions each participant selected that were listed in question 7A.

Figure 5. Question 8A: Psychosocial, Behavioral, and Emotional Impairments

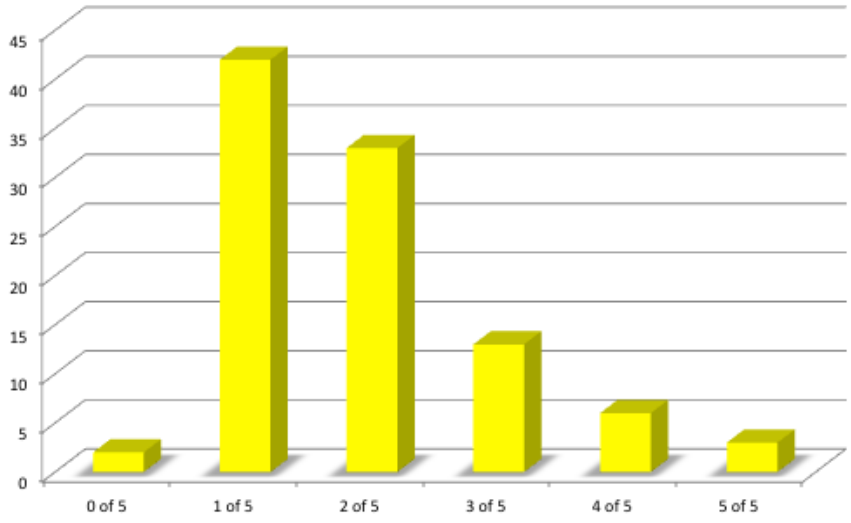

Figure 5. The bars in the graph represent the number of interventions each participant selected that were listed in question 8A.

Figure 6. Question 9A: Impairments in Everyday Activities and Areas of Occupation

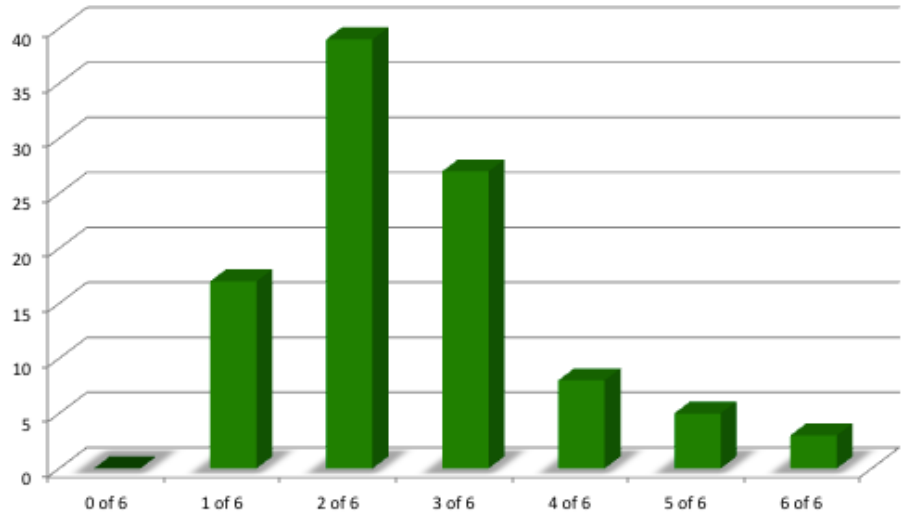

Figure 6. The bars in the graph represent the number of interventions each participant selected that were listed in question 9A.

Institutional Review Board Approval

STANBRIDGE UNIVERSITY

IRB Reviewer Feedback

Reviewer Name:	Ingrid Leu
Student Name(s):	Hillary Ramos, Nicole Sialaris, Miranda Dichario, Christopher Plague
Advisor Name(s):	Eileen Wang
Study Title:	Use of Evidence Based Interventions for Improving Occupational Performance in Adult Clients with Traumatic Brain Injury.
Study ID:	
Decision:	x Approve □ Minor Revisions □ Major Revisions

Reviewer Comments:

Concerns addressed. Now includes more information about methodology and variables.

Approved!

Ingrid Leu

_____

Please type your name as electronic signature