Treatment of memory for patients with traumatic brain injury

Memory is an important aspect of our daily life. When memory is disrupted by a life-changing event such as traumatic brain injury (TBI), it can have residual effects. Memory impairment is common in individuals with TBI. Brookshire and McNeil (2014) stated TBI is a head injury resulting from complications that include brain lesions and concussions. Some of the symptoms that are seen in patients with memory loss secondary to TBI include forgetting important events, forgetting important details, and forgetting important occasions (Brookshire & McNeil, 2014). Patients with TBI show signs of impaired cognitive functioning and spoken communication, which includes (a) processing and sequencing information, (b) word retrieval, (c) expressing thoughts, and (d) developing clear narratives (Dinnes, Hux, Holmen, Martens, & Smith, 2018). Due to TBI being associated with speech and language deficits, treatment is an important aspect for recovery and teaching compensatory techniques. The purpose of treatment for patients with TBI is to effectively train them to function independently and carry what was learned over into daily life routines by focusing on strengths and targeting weaknesses (American Speech-Language-Hearing Association [ASHA], n. d.). Goverover, Chiaravalloti, and DeLuca (2010) stated treatment should focus on improving acquisition of information in patients with TBI who have memory impairments. The purpose of this paper is to evaluate memory treatment through the research for patients with TBI.

Research Studies

Sumowski, Coyne, Cohen, and DeLuca (2014) conducted a within-subject design study to investigate the effects of retrieval practice for patients with severe TBI. The goals of the study were to evaluate if retrieval practice

enhanced delayed recall after long- and short-term delays and to demonstrate if retrieval practice will improve memory in patients with severe TBI. Ten participants with severe TBI and patients with mild TBI and memory impairments ranging from 21 to 57 years old were evaluated based on memory strategies and divided across three learning conditions: retrieval practice, spaced restudy, and massed restudy (also known as cramming). During the retrieval practice study, the participants were asked by researchers to recall information that was presented to them previously. The participants in the massed restudy and spaced restudy groups were evaluated on cramming memory and distributed learning strategies. Each participant's session included assessment of memory performances and delayed recall practice. Based on the study, the researchers found that retrieval practices were beneficial for patients with severe TBI who have memory impairments. The researchers concluded that retrieval practice was the most effective treatment for the participants with severe TBI and had better results than the spaced restudy strategy; however, participants with mild TBI found massed restudy a more beneficial method for memory strategies. Additional practice and training are needed to evaluate the impact of retrieval practice for patients with TBI (Sumowski et al., 2014).

Fish, Manly, Emslie, Evans and Wilson (2008) conducted a randomized control crossover study to examine the results of paging systems as a compensatory strategy for patients with acquired memory and planning disorders. The goal of this study was to examine if using the paging system as a compensatory strategy would maximize cognitive rehabilitation for patients with TBI. Participants who exhibited planning and memory

impairments were chosen for this study. For this seven-week study, the participants were divided into two groups, and both groups had three phases. For group A, the treatment included baseline, introduction to pager, and return to baseline. For group B, the treatment included baseline and then the introduction of the pager. The participants did memory diaries and used the paging system as a compensatory strategy to help remember the errands or activity they needed to do during the day. Based on the study, the participants with TBI showed great benefits and demonstrated maintenance by using the paging system as a compensatory strategy. The researchers concluded the paging system had long-term improvements in most of the participants even after the discontinuation of the pager. Further studies about the use of a paging system need to be conducted; however, the researchers believe patients with memory impairment will benefit from short-term use of a paging system (Fish et al., 2008).

Coleman, Frymark, Franceschini, and Theodoros (2015) conducted a systematic literature review comparing telepractice treatment versus in-person treatment for patients with acquired brain injury. The goal of this research study was to examine whether the telepractice service delivery method was an impactful method for speech language pathologists (SLP) to use as a communication and cognitive intervention. Also, the researchers examined the impact of an in-person delivery model versus the telepractice delivery method for cognitive improvements in participants. The researchers evaluated 218 research articles between April and August 2013 from databases (PsycInfo, PubMed, and Rehabdata); however, 10 articles were chosen based on the inclusion criteria (Coleman et al., 2015). Based on the

results, similar outcomes were found for both telepractice and in-person treatment methods, resulting in inconclusive findings. (Coleman et al., 2015).

Vik, Skeie, Vikane, and Specht (2018) examined the effects of music production on patients with mild TBI. The goal of this between group and longitudinal within-subject design was to examine how music plays a role in restoring cognitive impairments after a mild TBI. The researchers believed that music therapy helps with cognitive rehabilitation by recognizing familiar tones and melodies. Participants ranging from 19 to 42 years old with mild TBI were recruited for this study. The treatment consisted of three groups: group one consisted of patients with mild TBI that were receiving music therapy, group two was the control group with healthy participants receiving music therapy, and group three consisted of healthy participants that did not have music therapy. Groups one and two's cognitive functioning were assessed pre and post music therapy. The researchers concluded music production therapy has a significant impact on cognitive functioning; there is causal relationship between the two (Vik et al., 2018).

Burgeois, Lunius, Turkstra, and Camp (2007) examined the impact of errorless training on patients with memory loss caused by TBI. The purpose of this experimental design study was to examine whether spaced retrieval approach helped patients with TBI maintain and generalize everyday memory strategies to enhance their quality of life. Also, the researchers questioned if therapy by phone would be an effective approach for treating patients with memory impairments secondary to TBI. Thirty-eight participants with chronic brain injury who exhibited memory impairments were recruited for the study and were assigned to a treatment and control

group. The participants and their caregivers were asked to write down items they had difficulties remembering, which included forgetting appointments and planners, losing items, and forgetting to take medications. Each participant’s training session was 30 minutes for four to five days per week. The researchers began the session by asking the spaced retrieval training group prompt questions and asking the participants to respond. The participants were asked to answer the questions the same way for each question on each trial. If the participants gave the researchers a correct response after the initial prompt, the next prompt was given. During the session if the participants answered the questions incorrectly, the researcher modeled the correct response. The participants were asked to respond immediately to each prompt without struggling to retrieve the answer. The participants in the control group received the same therapy as the spaced retrieval group; however, the content for each session included memory strategy discussions with the researchers that helped each participant. The researchers concluded that errorless training that implemented spaced retrieval treatment had a positive impact on the treatment and control groups to help with memory impairments. However, there was not enough evidence that spaced retrieval training by phone would generalize and have a positive effect the participant’s quality of life. According to the researchers, continued research is needed to evaluate treatment strategies that will improve situations, behaviors, and environments of patients with acquired TBI (Burgeois et al., 2007).

Analysis of Research

Each one of the studies evaluated treatment strategies of memory for patients with TBI. The retrieval training approach helped the participants with severe TBI to restore their memory by using a recall training technique to regain cognitive processing. The researchers focused on teaching the partcipants how to retrieve information from memory and encouraged the participants to let the information come out of their mouth (Sumowski et al., 2014). The compensatory strategies treatment focused on altering the participant's environment by including a paging system in their daily activities to help with cognitive communication impairments to remember important events, such as picking up their children from school, taking medication, and looking in their planner daily (Fish et al., 2008). Music therapy treatment focused on the role music plays in restoring cognitive function for patients with mild TBI (Vik et al., 2018). The errorless training was an approach that was used to help the participants eliminate errors. The treatment consisted of the researchers asking the participants to avoid guessing and to instantly correct errors before fading prompts (Burgeois et al., 2007).

Conclusion

Memory impairment due to TBI can affect an individual emotionally and socially. Memory impairment due to brain injury can persist for years despite treatment. As a result, clinicians have investigated through evidence-based practice the best approach to use to restore memory (Brookshire & McNeil, 2014). There are many different treatment approaches SLPs use to help with memory for mild to severe TBI, which include repetitive practice, errorless teaching, retrieval training, compensatory strategies, and the use of AAC

devices. Treatments that are evidence based should focus on compensating or strengthening cognitive communication impairments (ASHA, n. d.). There is continuous study concerning treatment approaches for memory. Sumowski et al. (2014) stated research should focus on strategies that are challenging for patients with TBI who have memory impairments, to improve long-term knowledge. The researchers whose studies were reviewed in this paper examined the effects of different treatment strategies on cognitive plasticity and memory. Continued research is needed to consider what method is more beneficial for generalization of skills learned in therapy for patients with memory impairments in daily life.

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