Addressing Impaired Awareness in Clients with Cognitive and Perceptual Deficits Resulting from CVA

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Abstract

It is common for stroke survivors to have cognitive and/or perceptual deficits that negatively impact their participation in meaningful occupations (Bowen, Knapp, Gillespie, Nicolson, & Vail, 2011). In addition, many people are unable to recognize these deficits, which decreases the likelihood that they will use strategies needed to overcome deficits and improve occupational performance. In order to successfully teach compensatory and remedial strategies to improve functional performance, occupational therapists must help their clients gain a more realistic understanding of their deficits, also known as awareness (Ekstam, Uppgard, Kottorp, & Tham, 2007). A manual was created to educate occupational therapy students about impaired awareness following a stroke and to provide students with assessments, intervention strategies, and home program ideas to improve self-awareness in clients receiving services at the on-site clinic at University of Puget Sound. A pilot study was conducted to determine the effectiveness of the manual; 100 percent of students who piloted the manual demonstrated increased knowledge of awareness deficits and indicated that the manual was helpful to use during intervention sessions.

Introduction

Cerebral vascular accident (CVA), more commonly known as stroke, is a leading cause of death and lifelong disability in the United States (Centers for Disease Control and Prevention [CDC], 2013). Trends with CVA demographics have recently shifted, with the age of onset decreasing and milder strokes becoming more common (Wolf, Baum, & Connor, 2009). Prevailing rehabilitation practice tends to focus on needs of the older clients and those with more severe deficits, thereby neglecting the growing number of younger stroke survivors with milder deficits (Ownsworth & Shum, 2008; Wolf et al., 2009). Clients' own understanding of their physical, cognitive, and perceptual limitations as a result of stroke is a critical component in the successful return to meaningful activities. If stroke survivors do not believe there is an impairment, they are less likely to employ compensatory strategies to adjust to the loss in ability or skill (Ownsworth et al., 2007). In light of the changing demographics and new research regarding impact of the awareness of deficits on function, occupational therapists must adapt to the changing needs of their clients.

Occupational therapy (OT) students provide services to individuals with CVA at the University of Puget Sound's adult on-site clinic, some of whom lack awareness of the extent of their deficits. The purpose of this project was to create an educational manual for OT students to improve their understanding of the impact of self-awareness on rehabilitation and function in order to meet the needs of the changing population of stroke survivors, including clients at the on-site clinic. The manual was designed to help bridge the gap between new research and clinical practice by providing students with background information and assessments to identify clients with poor self-awareness of deficits. The manual also included treatment activities with

strategies to increase clients' self-awareness, thereby improving clients' function to help them return to their meaningful roles, improve quality of life, and decrease caregiver dependence.

Background Information/Literature Review

Acquired Brain Injury: Cerebral Vascular Accident

Cerebral vascular accident (CVA) is the result of the brain's blood supply being cut off, resulting in brain tissue death (Woodson, 2008); and occurs in more than 795,000 people annually, causing 130,000 deaths each year in the United States (CDC, 2013). CVA falls under the umbrella of acquired brain injury (ABI), along with traumatic brain injury (TBI) and other brain pathologies that occur after birth, which have similar resulting symptoms (Woodson, 2008). Advancements of modern medicine, safety equipment and procedures, increased public education, and awareness of early warning signs have improved the survival rate of people with CVA (Department of Social and Health Services, 2009). Although more people are surviving CVAs, the annual healthcare costs (medical care, medication, and days off work) in the United States is about $38.6 billion (CDC, 2013). The incidence, increasingly common risk factors, prognosis, and cost to the individual and society indicate a need for more evidence-based intervention to increase independence of people with CVA.

Common resulting deficits. Possible impairments following a CVA include: hemiparesis, difficulty with speech, somatosensory deficits, and cognitive and perceptual deficits (Knesek, 2009). These common impairments do not provide a full picture of clients' resulting level of function because factors like "support systems, premorbid history, severity of injury, education level, substance abuse history, level of awareness, and social skills contribute to functional outcomes" (Dirette, 2002b, p. 8). The location and size of the infarction can indicate a pattern

of loss but cannot necessarily predict the outcome; therefore, occupational therapists must treat each case individually.

Changing demographics. There is a misconception that stroke only impacts the elderly. In actuality, a CVA can occur at any point in the life span, but the risk increases with age (CDC, 2013). In the past, stroke was uncommon among middle-aged adults; however, widespread risk factors such as poor diet, obesity, and sedentary lifestyle have contributed to the growing number of middle-aged adults with CVA (CDC, 2013). In 2009, 34 percent of people hospitalized for stroke were less than 65 years old (CDC, 2013). Wolf et al. (2009) studied 7,740 patients who were treated for a CVA at Barnes-Jewish Hospital in St. Louis. The researchers found that almost half of the participants were less than 65 years old and almost a third were less than 55 when their first stroke was experienced. Since CVA has historically impacted older adults with more severe deficits, most rehabilitation interventions focus on this age group and on activities of daily living (ADL) such as self-care, personal hygiene, feeding, and dressing (American Occupational Therapy Association [AOTA], 2008; Ownsworth & Shum, 2008; Wolf et al., 2009). This emphasis fails to meet the complex needs of increasingly younger adults who experience a CVA, especially those with milder resulting deficits.

Although mild strokes may appear inconsequential, recent research has found that individuals who have had a mild stroke do not necessarily remain free of disability (Wolf et al., 2009). In fact, even a slight mismatch between clients' cognition and perception following a stroke and their daily roles can significantly interrupt their lives (Gillen, 2009). This is due to the complex nature of their responsibilities, especially with instrumental activities of daily living (IADL) such as shopping, care of others, meal preparation, home, health and financial

management, and community mobility (AOTA 2008). The best illustration of this mismatch between ability and role expectation is found in research regarding return to work. An evidence-based review was conducted by Salter, Allen, Richardson, Teasell, and Foley (2013) on community reintegration. Based on the articles reviewed, these authors concluded that "a substantial proportion of stroke survivors who were employed prior to the stroke event do not return to work" (p. 105) due to internal factors that limited their function (cognitive and physical deficits), their age, and their work responsibilities. Occupational therapists can help minimize functional deficits by training clients to use cognitive strategies and modifying work tasks or the environment. If more people are better able to meet job requirements, more could return to employment, thereby lessening the financial impact stroke has on the individual and society.

Productive lifestyles, which include occupations like work, social participation and community involvement, leisure, and IADL, contribute to the quality of life and self-worth of younger clients (Banks & Pearson, 2003; Koch, Egbert, Coeling, & Ayers, 2005; Stuart, 2004; Vestling, Tufvesson, & Iwarsson, 2003; Wolf et al., 2009). However, for those with a mild CVA, returning to these social roles and activities can be challenging because of the high cognitive demand required to participate in these occupations. Being aware of one's own capabilities and deficits plays a critical role in being able to compensate for deficits in the complex cognitive processes such as planning, problem solving, and cognitive flexibility, which are required in many daily occupations and tasks (Mateer & Sira, 2006). For this reason, occupational therapists need to incorporate the development of self-awareness in treatment.

Cognitive and Perceptual Deficits

Among clients with CVA, 65 percent present with cognitive deficits, which can include difficulty with attention, sequencing, memory, and/or problem solving (Hoffmann, Bennett, Koh, & McKenna, 2010). To complete complex job tasks and meet productivity requirements in the workplace, higher level cognitive abilities are critical but are often lacking in those who live with the effects of milder CVAs (Ownsworth & Shum, 2008). Similarly, 54 percent of clients with CVA present with visual perceptual deficits, which affect how the brain processes visual stimuli (Bowen et al., 2011). These deficits can greatly impact people's ability to function independently and often require occupational therapy intervention.

Impact of deficits. Occupational performance is composed of three interacting factors: client, environment, and task (AOTA, 2008). Abreu (1987), Hanson (1997), and Poole (1991) found a correlation between cognitive deficits and participation in ADL and IADL; with cognitive deficits resulting in clients requiring increased assistance from caregivers and the community (as cited in Hoffmann et al., 2010). Cognitive and/or perceptual deficits can greatly affect clients' ability to participate in these activities, ultimately leading to caregiver dependence (Bowen et al., 2011). In order to increase independence by compensating or adapting for cognitive and/or perceptual impairment, a person must first be aware of these deficits that impact participation.

Awareness of Deficits

Awareness is defined as the "ability to recognize the problems caused by impaired brain function" (Dirette, 2002a, p. 861). In order to understand the complexity of self-awareness, Crosson et al. (1989) developed a model to explain it by separating it into three parts:

intellectual awareness is the understanding that there is an impairment, emergent awareness is the ability to recognize difficulty at the moment it is occurring, and anticipatory awareness is the skill of expecting a difficulty before it happens. All three types of awareness can be compromised after a CVA (Bruce & Borg, 2002).

Limited awareness of deficits, especially cognitive and perceptual deficits, is a common impairment after CVA (Ekstam et al., 2007). Toglia (1991) found that 72 percent of clients with CVA had limited awareness of cognitive deficits. People with poor awareness have difficulty assessing risks and can under- or overestimate their ability to complete a task. This can be dangerous as they can hurt themselves or others when attempting to complete tasks outside their ability. Limited awareness can also prevent clients from reaching their full potential in terms of independence with occupations and consequently require more caregiver support (Ekstam et al., 2007). Additionally, research has found a link between poor self-awareness and a lack of motivation during rehabilitation, which results in poorer outcomes (Fleming, Strong, & Ashton, 1998). In other words, clients who are unaware of their deficits are less likely to fully engage in therapy or utilize compensatory strategies.

Developing awareness. The development of awareness can be an arduous journey heavily influenced by the environment (O'Callaghan, Powell, & Oyebode, 2006). During the acute stages of CVA, clients in a hospital or skilled nursing facility often require assistance with ADL and IADL. In these settings, clients may attribute their difficulties with a task to being in a foreign environment. Once clients return to more familiar contexts, such as their home, they have more opportunities to engage in occupations independently and uncover deficits. These experiences in the natural environment can help clients understand the reality of their new

situation and the resulting deficits from the CVA (Dirette, 2002a). Gaining more self-awareness can also be facilitated by reactions and feedback from other people (O'Callaghan et al., 2006; Toglia & Kirk, 2000). For these reasons, it is often more practical to emphasize awareness development near the end of the continuum of care, during outpatient or community rehabilitation.

Gaining awareness can take time, with clients describing it as "a slow process with occasional 'aha' moments" (Dirette, 2002a, p. 865). During this process, therapists must consider the psychological implications of becoming aware of one's own deficits. A qualitative study by O'Callaghan et al. (2006) showed that the common reactions to understanding deficits were "fear and loss" (p. 579). Researchers have compared the development of awareness of deficits to the five stages of grief (O'Callaghan et al., 2006), which according to the Kübler-Ross model, are: denial and isolation, anger, bargaining, depression, and acceptance (Kübler-Ross, 1969). O'Callaghan et al. (2006) found that a majority of clients go through a phase of denial when they begin to notice changes in their level of function. However, it is important to note the difference between denial and limited awareness. Toglia and Kirk (2000) explained that these two concepts can occur simultaneously, and even though the difference is subtle, denial is often a psychological coping mechanism, whereas limited awareness is a neurologically-based impairment (Toglia & Kirk, 2000). The next stage of grief is anger; as clients begin to recognize their change in function, they may become angry about the loss of who they were, which leads to the next stage, bargaining (Kübler-Ross, 1969). It has also been found that increasing awareness can lead to lower self-esteem and increased incidence of depression, which is the fourth stage (Carroll & Coetzer, 2011). The final stage of the grief process is acceptance (Kübler-

Ross, 1969). When clients understand their deficits and have become aware of how their level of function is affected, they will be able to remediate and compensate for impairments in order to improve their participation in meaningful activities. It is important to be sensitive to the common psychological implications of gaining awareness and the process of grieving these changes. The researchers stated that "it was only after acknowledging their deficits that [clients] were able to describe a new outlook on life and a different sense of self" (O'Callaghan et al., 2006, p. 583).

The process of gaining awareness can also be illustrated by Prochaska, Norcross, and Diclemente's theory about motivation to change (1992), which was originally designed to understand the process of attempting to cease addictive behaviors. Individuals with CVA who are unaware of their deficits would fall in the precontemplation stage. When applied to rehabilitation, clients in this first stage are unable to progress because they do not recognize a need to change, being unaware of their deficits, and are therefore unwilling to learn new skills (Prochaska et al., 1992). In order to progress clients through this process of change, therapists must provide opportunities for them to see and understand that there is a problem; before they recognize this, they will not make an effort to improve. Clients in the second stage, contemplation (Prochaska et al., 1992), are aware they have impairments and are more conscious of inconsistencies in performance, but have not fully applied strategies to improve their level of function with those impairments. They know there is a problem, but they have not attempted to ameliorate it yet; this is when therapists need to continue educating clients about their impairments and how strategies would improve their level of performance.

Moving along the continuum, preparation is the third stage in which clients still have not

fully committed to changing or adapting to their impairments, but they are preparing to make changes (Prochaska et al., 1992). The fourth stage, action (Prochaska et al., 1992), is when clients take charge of their rehabilitation to accept adaptations to the person, task, or environment. At this stage, clients are aware of their deficits and are working to increase their functional performance using remedial and/or compensatory strategies. Finally, the fifth stage of change is maintenance (Prochaska et al., 1992), in which clients work to maintain the gains they have made and generalize the adaptations and strategies across all environmental contexts (therapy, home, work, etc.) (Toglia, 1991). To improve therapy outcomes, it is important that therapists consider clients' stage of change and utilize the appropriate strategies to progress them forward to the next stage and develop increased self-awareness.

OT interventions to improve awareness. Occupational therapists use remedial and compensatory interventions to address cognitive and perceptual deficits following a CVA (Lucas & Fleming, 2005). Remedial approaches assume clients can make improvements to their cognitive processes. For example, clients are often taught the remedial strategy of self-evaluating performance during and after a task (Lucas & Fleming, 2005). If clients are not responding to remedial intervention, compensatory strategies are used in conjunction with remedial strategies to increase clients' independence (Lucas & Fleming, 2005). If clients consistently forget to self-evaluate, the occupational therapist may utilize a compensatory strategy such as posting a list of safety precautions next to the stove in order to increase independence with kitchen tasks. If clients can effectively implement these remedial and compensatory strategies, they can minimize the impact of their deficits on their occupational performance.

When learning a new strategy, many clients find implementation challenging, especially if there are changes to the task or environment (Lucas & Fleming, 2005). This is because many people do not recognize that two different tasks can actually require similar underlying skills, and they can therefore use the same strategy (Gillen, 2009; Toglia, Johnston, Goverover, & Dain, 2010). In addition, they may not fully understand the versatility of the strategies across multiple occupations and environments (Gillen, 2009; Lucas & Fleming, 2005). Dr. Joan Toglia is a prominent occupational therapist and figure in cognitive rehabilitation who developed the Multicontext Approach and Dynamic Interactional Approach (DIA) to remediate and/or compensate for cognitive impairments and to improve the transfer of skills across different tasks and environments, also known as generalization (Toglia et al., 2010; Toglia & Kirk, 2000; Toglia, 1991).

According to the Multicontext Approach, therapists can improve learning and generalization if they facilitate opportunities for clients to practice strategies on similar tasks or in similar environments and then slowly progress them to using the same strategies on dissimilar tasks or environments (Gillen, 2009; Toglia et al., 2010; Toglia, 1991). For example, an occupational therapist may introduce the use of a checklist to make pancakes from a mix. If the occupational therapist had the client use a checklist to make the same pancakes but with blueberries, this would be considered a near transfer. If the client used a checklist and that same pancake mix to make waffles with a waffle iron, this would be considered an intermediate transfer. If the client used a checklist to make fresh lemonade, with the same number of steps as the pancake mix, it would be a far transfer. If a checklist was then used to help the client do laundry, that would be considered a very far transfer (Toglia, 1991). Using the deliberate and

methodical sequence the Multicontext Approach outlines, individuals can learn how to generalize strategies across multiple tasks in multiple environments (Dirette, 2002b; Toglia et al., 2010; Toglia, 1991). In fact, case studies and small sample studies have found that interventions completed in multiple contexts or centered on a familiar activity in a familiar environment improved self-awareness (Lucas & Fleming, 2005).

According to the DIA, cognition is a constantly shifting interaction between internal and external factors (Gillen, 2009; Bruce & Borg, 2002). Under normal circumstances, people assess activity demands, environmental barriers, and personal strengths and limitations, and then adjust their approach accordingly to be successful with task performance (Bruce & Borg, 2002; Lucas & Fleming, 2005). Using the DIA, occupational therapists can increase clients' ability to evaluate the activity, environment, and themselves to improve their performance (Bruce & Borg, 2002; Lucas & Fleming, 2005) by training them to adapt their way of thinking through graded cueing (Gillen, 2009). Depending on clients' needs, occupational therapists provide general cues, progressing to more specific and then explicit cues as necessary. Activities can be altered to meet clients' levels of function by grading up or grading down the difficulty, making the activity challenging while ensuring successes at the just-right challenge (Toglia et al., 2010). Practitioners facilitate the development of awareness using prediction and reflection to help clients gain both knowledge of their performance during activity process and knowledge of results (Gillen, 2009; Toglia & Kirk, 2000). Using the appropriate cognitive strategies to balance the interactions between person, environment, and task, therapists can assist clients in improving their occupational performance and increasing their awareness of deficits.

OT interventions that aim to improve occupational performance but do not explicitly

work towards developing clients' self-awareness can be insufficient. Goverover, Johnston, Toglia, and Deluca (2007) conducted a blind randomized clinical trial with 20 participants with ABI living in the community. Half of the participants received an experimental intervention focused on improving self-awareness by predicting performance before an IADL, then assessing performance and brainstorming what could be improved after completing the task. Participants in the control group were asked to do the same IADL but received corrective therapist feedback with no self-awareness training. The study found those who received self-awareness training were able to self-regulate and meet the cognitive demands of functional tasks better than the control group who did not receive any specific self-awareness training. Based on this research, occupational therapists need to specifically incorporate self-awareness training in their interventions, rather than assuming their clients will develop it on their own, in order to improve self-regulation and cognition during functional tasks.

Implications for Occupational Therapy

Awareness of deficits is an important component in the successful participation of ADL, IADL, and other meaningful occupations. Ekstam et al. (2007) found a strong positive correlation between awareness of disability and ADL process ability, which included logical task sequencing and the ability to adapt accordingly based on performance. Considering its potential to improve occupational performance, increasing clients' self-awareness of deficits needs to be deliberately targeted in occupational therapy rehabilitation.

Based on current research demonstrating that development of awareness is crucial for improving occupational performance, it was determined that an educational manual for occupational therapists, specifically student therapists at the University of Puget Sound, would

be beneficial. The manual was designed to facilitate implementation of these intervention strategies for adults with CVA in order to improve their self-awareness and level of functioning.

Purpose Statement

The purpose of this project was to create a resource manual to educate occupational therapy students participating in the University of Puget Sound adult on-site clinic about awareness deficits in people with CVA and to provide tools for assessment and intervention of these deficits.

Procedure for Project

This project began by interviewing a person with CVA and impaired awareness of deficits to understand what common deficits look like and how awareness affects functioning. Next, a discussion with key players (clinical instructors and clinic coordinator) of the University of Puget Sound adult on-site clinic indicated the need for additional resources for student therapists treating clients with CVA. Following these discussions, research was conducted to gain general information on CVA, implications of changing demographics, common deficits and the impact on function, cognitive and perceptual deficits following CVA, awareness of deficits and how it affects function, how people develop awareness, and strategies to improve awareness in order to have background knowledge to accurately present the information in the educational manual. Assessments to measure level of awareness and intervention strategies to improve self-awareness were researched and included in the manual. Permission to use assessments for educational and clinic purposes was requested. Treatment activities were researched and analyzed to grade the demands up and down for the specific needs of individual clients. This information was compiled into an educational manual for the University of Puget

Sound adult on-site clinic to help students understand and treat self-awareness through assessments, remedial and compensatory intervention strategies, and treatment activities. When implemented, this manual may help to improve awareness of deficits in clients post-CVA at the adult on-site clinic. Home program ideas were also compiled to help student therapists encourage transfer of skills learned in clinic to the home environment, as is consistent with the Multicontext Approach (Toglia et al., 2010; Toglia, 1991). A pilot manual was tested April 2014 by volunteer second year OT students participating in the adult on-site clinic; pre- and post-tests and surveys were administered to determine the effectiveness and usability of the manual. This feedback was used to make the manual more intuitive and useful for future students.

A myriad of skills and knowledge were needed to complete this project. Some of the skills required include: writing, computer use (using Google Drive), computer design (using Apple Pages 2009), interview and active listening, communication, problem-solving, reading, research, writing, leadership, teaching, creativity, organization, and the ability to work and collaborate in a group. To bridge the gap between research and practice, dense research articles had to be translated into a manageable, easy to use, and accessible format for OT students. Knowledge required to complete this project included: background information on CVA, current trends of CVA, impact of CVA on life (especially common deficits, including cognitive and perceptual), how awareness affects function, strategies to develop awareness, current OT interventions for clients with CVA, APA citations, activity analysis, OT Practice Framework, DIA, Multicontext Approach, awareness assessments, and needs of student therapists, caregivers, and clients receiving services at the University of Puget Sound adult on-

site clinic.

Description of Final Product

The final product of this project was an educational manual for OT students and clinicians at the University of Puget Sound adult on-site clinic. The manual consisted of ten sections, including: disclaimer, introduction, background information, how to use the manual, general considerations, assessments, activities with remedial and compensatory intervention strategies to increase awareness of deficits, home program ideas, glossary, references, and appendices (see Appendix for sample pages from the manual). Background information included material on CVA, cognitive and perceptual deficits as common deficits after CVA, awareness, importance of addressing deficit awareness and how it affects occupational performance, stages of change to improve self-awareness, implications for OT, and psychological considerations of developing awareness. This section also included material on the theory behind interventions presented in the manual (DIA and Multicontext Approach), which allows student therapists to facilitate the development of awareness and generalize the skills across multiple contexts, improving occupational performance (Bruce & Borg, 2002). Assessment tools available and the benefits for use when assessing clients' awareness of cognitive and/or perceptual deficits were described. Treatment activities comprised the bulk of the manual, which included: activity instructions, materials needed, performance skills addressed, grading techniques to meet the needs of individual clients, and strategies to increase awareness. Twelve different remedial and compensatory intervention strategies to improve clients' awareness were defined in the glossary, as well as other relevant terms. These strategies included: anchor scanning strategy, audio signals, external checklist, cognitive

(internal) checklist, environmental visual cue, lighthouse scanning strategy, prediction and reflection, role reversal, self-talk, stimuli reduction, video feedback, and visualization. Finally, the home program section provided examples of activities that could be done at home and in the community utilizing remedial and compensatory strategies. These home program ideas facilitated transfer of skills learned to new contexts when clients were discharged from therapy services, as was consistent with the Multicontext Approach.

The University of Puget Sound adult on-site clinic provides valuable learning opportunities to students as well as beneficial therapy services to the community. By developing and implementing the educational manual, the OT students learned and implemented valuable intervention strategies that improved their knowledge and skillset as therapists with regards to awareness of deficits. Clients from the community also may have benefited by increasing their awareness of deficits and therefore improving occupational performance. Home programs were designed to inform clients and caregivers of the importance increasing self-awareness and provide ideas of activities to do at home in order to facilitate more growth outside the clinic.

Outcome of Project

Goal 1: After reading the educational manual, occupational therapy students will improve knowledge about awareness deficits in clients with CVA.

Objective 1: After reading the educational manual, occupational therapy students will be able to independently define three types of awareness of deficits in clients with CVA.

Objective 2: After reading the educational manual, occupational therapy students will be able to independently identify three reasons why awareness is important to the

occupational performance of clients.

Goal 2: After reading the educational manual, occupational therapy students will improve knowledge about assessments used to measure the level of awareness in clients with CVA.

Objective 1: After reading the educational manual, occupational therapy students will be able to independently identify three assessments used to measure clients' awareness of deficit.

Objective 2: After reading the educational manual, occupational therapy students will be able to independently administer at least two assessments to measure awareness.

Goal 3: After reading the educational manual, occupational therapy students will be knowledgeable about intervention strategies to improve awareness in clients with CVA.

Objective 1: After reading the educational manual, occupational therapy students will be able to independently identify three intervention strategies to improve clients' awareness of deficit.

Objective 2: After reading the educational manual, occupational therapy students will be able to independently utilize at least three intervention strategies to improve awareness of deficits in clients.

Goal 4: After participating in occupational therapy awareness intervention, facilitated by the educational manual, clients will demonstrate an increased awareness of deficits to increase safety and independence.

Objective 1: After participating in occupational therapy awareness intervention facilitated by the educational manual, clients will be able to independently identify at least one cognitive or perceptual deficit that affects their occupational performance,

showing improved self-awareness.

Objective 2: After participating in occupational therapy awareness intervention facilitated by the educational manual, clients will be able to complete three activities demonstrating use of strategies to compensate for cognitive and perceptual deficits with supervision.

Goal 5: After student therapist trains client and caregiver on the use of the home program as it is described in the educational manual, client and caregiver will understand the importance of development of awareness and will support the development by assisting in implementation of home program.

Objective 1: After student therapist trains client and caregiver on the use of the home program as it is described in the educational manual, client and caregiver will independently describe two reasons why awareness of deficits is important for the client's occupational performance.

Objective 2: After student therapist trains client and caregiver on the use of the home program as it is described in the educational manual, client and caregiver will independently demonstrate implementation of home program.

Measurement of goals and objectives: In order to establish the effectiveness of the educational manual, pre- and post-tests of occupational therapy students were administered to determine before and after knowledge of assessment tools, intervention strategies, and identification of awareness deficits in clients; post-intervention surveys were also conducted to gain feedback on the utility, effectiveness, and thoroughness of the manual. Based on information gathered from the pre- and post-tests, goal 1 and goal 3 were met. Scores for the post-tests were one to

two points greater than scores for the pre-tests for 100 percent of the students who piloted the manual, indicating increased knowledge on the subject material. Goal 2 and goal 5 were not addressed with the pilot manual because it did not contain the sections for assessments or home programs. Because the pilot took place during one intervention session, goal 4 was not addressed; prolonged use of the strategies would be necessary to demonstrate clients' improved occupational performance.

Limitations of Project

One limitation to this project was a limited amount of time to pilot the manual. In order to get more feedback on the utility of the manual from students, clinical instructors, clients, and caregivers, it would have been beneficial to pilot for multiple weeks of intervention. A longer length of time for piloting would also demonstrate whether or not clients made gains with their level of self-awareness, showing the effectiveness of the intervention strategies and activities. Another limitation is that because each client is unique, activity grading options and intervention strategies presented in the manual do not always meet each client's individual needs. In order to be client-centered, if an activity does not match a client's level of function, student therapists can use the manual as an example to understand how to implement strategies to increase awareness during intervention and adapt activities for their client as needed. The manual could not accommodate for each client's individuality. The final project limitation is a consideration for future implementation of the project. Student therapists are scheduled to work with clients for two 45-minute sessions per week for 10 weeks. For some clients, 20 sessions is not adequate time to build self-awareness that translates into measurable functional outcomes. In order to address this limitation, it is important to encourage the use of

the home program ideas to generalize the strategies in the home environment.

Recommendations for Future

The completed educational manual will be stored with equipment required for the activities in the adult clinic space in Weyerhaeuser Hall at University of Puget Sound. If materials need to be replenished or if extra materials are needed, students must inform the clinic director (currently Sue Doyle) of the needed items. Future students could expand on the project by adding activities to the manual and adjusting the content with the most up-to-date and evidence-based information; because this is a relatively new topic that researchers are addressing, new information and effectiveness of strategies will continue to become available. Because our Centennial Vision, for 2017, is to be evidence-based practitioners (AOTA, 2014), it is important that this project remains current; future students could facilitate this product expansion with the most up-to-date information. In order to make the explanation of activities in the manual more clear, a future project could be to make videos to demonstrate the steps of the activities and how to implement the strategies. Another possible future project would be to conduct research on the effectiveness of the activities and strategies presented in the manual. Either more in-depth qualitative and quantitative surveys could be completed of student therapists and clients, or outcome data could be collected to show whether or not progress was made using the techniques presented in the manual.

Conclusion

The changing demographics of people who experience a CVA have resulted in an increase of stroke survivors with mild cognitive and/or perceptual deficits (Wolf et al., 2009). A common concern with this population is a limited awareness of what their deficits are, resulting

in little understanding about how their impairments affect participation in activities (Ekstam et al., 2007). It is crucial that occupational therapists address awareness of deficits during rehabilitation in order to ensure clients reach their full rehabilitation potential. If clients do not believe they have a deficit, they will not work to remediate or compensate for the deficit (Goverover et al., 2007). This type of intervention is not always addressed in rehabilitation (Ownsworth & Shum, 2008; Wolf et al., 2009), therefore a manual was developed for occupational therapy students at University of Puget Sound with information, assessments, activities, and strategies to address clients' awareness of their deficits, which may help address this unmet need. A limited pilot of the background information and activities resulted in increased understanding of the material for the students who piloted the manual, which demonstrates promise to improve student therapists' ability to implement intervention strategies that address impaired awareness in clinic.

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Appendix

Sample Manual Pages

ACTIVITIES

SET: THE GAME OF VISUAL PERCEPTION

Objective and Performance Skills

15 min

To participate in a card game that can also address cognitive flexibility, grouping, and memory.

Materials

- Set the game of visual perception
- Table
- Timer (to measure progress based on speed and number of sets matched)

Instructions

In the intro deck, there are 3 features: *color, shape, and number.* In the full deck, there are 4 features: *shading, color, shape, and number.*

1. Deal 12 cards, face up (3x4) on table.
2. Find and group sets of 3 based on *same or different shape, number, color, and shading patterns* (see instructions in box for examples and more details).
3. Dealer replenishes cards (12 are always on the table).

Activity Specific Considerations

Start with **general/non-specific feedback** ("you are looking for patterns of 3") and progress as needed to **specific feedback** ("do you seen any similar shapes/numbers/colors/patterns?") and **explicit instruction** ("these 3 are a pattern").

Check GENERAL CONSIDERATIONS for more strategies

ACTIVITIES

Cognitive Flexibility

Strategies

- **List or environmental visual cue**: written list (see Appendix A) or prepare examples ahead of time to illustrate the qualities of a correct "set" pattern nearby for reference. Use physical or verbal cues to help clients remember to reference the examples.
- **Self-talk**: Have clients narrate their thinking process out loud. OTS may need to demonstrate self-talk for clients.

Strategy-specific grading	
Grade Down	**Grade Up**
• Client and OTS work together to find pairs. • Client and OTS take turns, playing against each other (whoever has the most cards at the end wins).	• Client and OTS play against each other; player turns occur simultaneously (whoever has the most cards at the end wins).

Memory

Alternative instructions with memory components

Set up: Place 12 cards face up on the table.

1. Call out 2 features (e.g. "red twos").
2. Have clients find sets that match the set that was called out (e.g. clients find cards with two red symbols of any shape).

Strategy-specific grading	
Grade Down	**Grade Up**
Play with *intro deck* (without shading feature cards). Fewer cards decreases cognitive demand.	Play with *full deck* (with shading feature cards). More cards increases cognitive demand.

Strategies

- **Self-talk**: Have clients narrate their thinking process out loud. OTS may need to demonstrate self-talk for clients.
- Have clients **visualize** the cards and **group** similar features if possible.
- If client can't remember what they are searching for, write down the 2 features called out; this **environmental visual cue** may help them remember as they search. After the game, discuss about how the environmental visual cue helped them remember and how that strategy can be applied in other daily activities.