PAIN MANAGEMENT SERIES FOR STROKE: IDENTIFYING TEACHING METHODS TO INCREASE CLINICAL SELF-EFFICACY FOR OCCUPATIONAL THERAPY DOCTORAL STUDENTS

By

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Abstract

Purpose

Post-stroke pain has been identified as a significant challenge for individuals experiencing a stroke. Occupational therapists play a crucial role in the complex treatment of post-stroke pain but often face challenges due to a lack of self-efficacy in implementing treatments for stroke-related pain. This project's purpose was to,1) to identify which teaching methods are effective for increasing clinical self-efficacy in doctoral occupational therapy students for implementing pain management treatment for individuals' post-stroke and 2) to increase reported clinical self-efficacy levels among these students following the completion of a pain management educational program for stroke pain.

Methodology

This project recruited a total of eight participants from a university in the southwest region using the quality improvement project design. The Program Feedback Questionnaire collected responses for instructional methods. The Modified Physiotherapist Self-Efficacy collected reported self-efficacy levels. The Wilcoxon Signed Rank Test and a thematic coding process was used to analyze data.

Results

The most effective teaching method for self-efficacy was manual application, often referred to as "hands-on" instruction which allows learners to apply what was taught by performing a task or activity physically. There was a statistically significant outcome in clinical self-efficacy scores for participants ($p < 0.001$), concluding the effectiveness of the program to increase clinical self-efficacy.

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Section One: Introduction

Stroke ranks as the fifth cause of death and stands as a significant contributor to the cause of disability in the United States (Donkor, 2018). This condition occurs the supply of blood flow to the brain is compromised, leading to brain damage that impacts one side of the body. As a result, individuals who have experienced a stroke face long-term deficits such as weakness, loss of motor control, and impaired cognitive function (Ezema et al., 2019). In addition to the magnitude of stroke deficits, chronic pain can become prevalent due to the changes occurring in the musculoskeletal (MSK), psychological, and peripheral nervous systems (Bonanni et al., 2022). Several noted sequelae due to the damage of these various systems include complex regional pain syndrome (CRPS), central poststroke pain (CPSP), shoulder "stiffness" commonly known as spasticity, and depression or anxiety (Treister et al., 2017). Individuals living with post-stroke chronic pain and neurological deficits are susceptible to a diminished quality of life and loss of participation in "activities of daily living," a challenge commonly treated by the field of occupational therapy (OT).

Following a stroke, individuals are commonly prescribed an extensive rehabilitation process, including OT, as a treatment to address day-to-day function from a holistic approach. As a profession, OT plays a pivotal role in enhancing the lives of an individual with a neurological condition such as stroke (Rowland et al., 2008). A fundamental tenet of OT is to enable individual health and well-being by engaging in meaningful and purposeful activities, a concept known as "occupational participation" (American Occupational Therapy Association, 2020). However, pain symptoms affect approximately 40% of individuals during stroke recovery and frequently hinder overall occupational participation or one's ability to engage in their unique occupations or activities of daily living (American Occupational Therapy Association, 2020;

Schulz et al., 2012). Occupational therapists can provide treatment to address and target the various categories of pain, such as MSK, neuropathic, and psychological pain, through various interventions (Schulz et al., 2012; Rowland et al., 2008).

MSK pain following a stroke is characterized by muscle weakness or "hemiparesis," shoulder spasticity, joint pain, or prolonged muscle tightness referred to as contractures (Civelek et al., 2016; Hao et al., 2022). Due to the functional necessity and structure of the upper limb, MSK pain in the shoulder affects from 30% to 65% of individuals poststroke (Jönsson et al., 2006). Navigating recovery from MSK pain in the shoulder poses a significant challenge to an individual's quality of life as it can impact one's occupational performance, which is defined as the ability to execute and carry out their basic ADLs such as grooming, bathing, or dressing (AOTA, 2020; Schulz et al., 2012). Recognizing that MSK pain in the shoulder is a significant barrier to achieving functional independence, occupational therapists can play an essential part in helping those who have experienced a stroke alleviate and manage their pain through a diverse range of interventions and treatments, such as the use of physical agent modalities or the use of Kinesiotape (KT) on the affected body part (Marik et al., 2017; Souza et al., 2021).

Structural changes in the PNS following a stroke can cause neuropathic pain, a type of pain characterized by constant or intermittent burning, shooting, or tingling sensations (Klit et al., 2009). Structural changes and reorganization of the nervous system, known as neuroplasticity, contribute to altered pain perception and processing, leading to a heightened sensitivity to pain signals (Liampas et al., 2020). Complex regional pain syndrome (CRPS) and chronic poststroke pain syndrome (CPSP) are among the most common neuropathic pain conditions for individuals who have experienced a stroke (Katusura et al., 2022; Treister et al., 2017). Post-stroke CRPS affects from 12% to 50% of individuals who have experienced a stroke, with symptoms of pain

and swelling persisting in the limbs or face (Katsura et al., 2022). CPSP, however, affects up to 35% of individuals and is typically developed 12 months after onset, affecting various body regions simultaneously. As the two conditions are often difficult to diagnose due to their complex pathophysiology, individuals suffering from this form of pain often experience prolonged periods without treatment, resulting in a decreased quality of life and a decline in occupational participation (Klit et al., 2009; Payton & Soundy, 2020; Storz et al., 2021).

Due to the presence of physical or cognitive deficits poststroke, psychological pain, such as anxiety or depression, can impact approximately one in three people during the first year alone (Chun et al., 2022). Factors such as perceived level of functional independence, social or familial support, and coping mechanisms can significantly contribute to the long-term emotional stress level for individuals poststroke (Gandolfi et al., 2021). Psychological pain is also associated with the impact of chronic pain after a stroke, as pain cycles often contribute to a heightened level of emotional stress or discomfort (Gandolfi et al., 2021; Payton & Soundy, 2020). As depression, anxiety, and other psychological stress play a crucial role in one's well-being, Occupational therapists can address this barrier by promoting resilience through mental health interventions (Simpson et al., 2018; Swarbrick & Noyes, 2018).

While occupational therapists possess the capability to address pain for individuals who have experienced a stroke, the current literature on pain management was focused predominantly on physical therapy (PT) treatment and interventions. This alignment may be influenced by the emphasis in PT curriculum education on exercise science and physiology, which is widely associated as a means for physical pain relief relating to MSK pain (Ambrose & Golightly, 2015; Commission on Accreditation in Physical Therapy Education, 2023). Occupational therapy doctoral (OTD) curricula include pain management courses; however, they prioritize the

conceptual teachings of occupation at the forefront of education instead of the pain relief or interventions that alleviate symptoms, often found in PT curricula (Accreditation Council for Occupational Therapy Education, 2018). A survey found that PT programs dedicated approximately 27.2 hours on average to pain intervention and management, whereas OT programs allocate about 4.91 hours. It's important to note the PT survey encompassed responses from 167 programs, whereas the OT survey included 41 programs, reflecting the variations in the hours taught (Hoegar et al., 2015; Rider et al., 2024). PT programs allocated less time for the psychological management of pain, while OT programs emphasized interventions that aligned with the biopsychosocial model of pain. These differences underscore diverse priorities and approaches within rehabilitation pain management education.

The phenomenon of pain is a subjective and unique experience for every individual; thus, treatment and intervention for pain should be approached from a holistic and all-encompassing perspective. The OT scope of practice allows the therapists to fulfill this need, as occupational therapists can treat the stroke diagnosis and the various challenges related to physical and psychological pain (Simpson et al., 2018). To implement this ability into practice, students within the field should have a strong understanding of the pain experience and treatment. However, the current literature search for this project found gaps in education among master-leveled OT students regarding the theoretical to practical understanding of pain (Rochman et al., 2013). To increase the profession's foothold in pain management for neurological conditions, a specialized educational program is needed for OT students at the doctoral level.

Several studies have noted that clinicians may be less likely to work with patients experiencing pain due to a lack of knowledge and understanding of chronic pain treatment (Hoegar et al., 2015; Reyes & Brown; 2015; Simpson et al., 2018; Wolff et al., 1991).

Insufficient knowledge on a particular topic can significantly impact one's ability to perform a given task, as it may lead to a lack of confidence in their capacity to perform it successfully. This belief is referred to as self-efficacy, which plays a crucial role in determining an individual's motivation and resilience to execute tasks effectively to achieve desired outcomes (Bandura, 1997; Domenech-Betoret et al., 2017). In the context of clinical practice, clinical self-efficacy is particularly important as it influences clinicians' abilities to effectively manage or treat patients, especially those with unique conditions such as poststroke pain. Equipping future clinicians with clinical self-efficacy may help bridge the knowledge gaps surrounding pain education and treatment (Domenech-Betoret et al., 2017). Creating a specialized educational program to address this topic is needed to advance OTD students' knowledge and confidence in pain management treatments for individuals after a stroke. To do so, it is important to understand the building blocks of how to effectively educate students in a way that fosters clinical self-efficacy. This project sought to understand "What teaching methods are effective in an educational pain management series for stroke to increase the clinical self-efficacy levels of occupational therapy doctoral students?"

This project aligns with the American Occupational Therapy Association's research agenda of instructional methods and learner characteristics and competencies to identify the various strategies used to promote learning (AOTA, 2018). The component of understanding learner self-efficacy is intended to meet the goal of learning characteristics and competencies by understanding educational program characteristics that may support student success.

Section Two: Statement of the Problem

Stroke is one of the most common conditions requiring OT treatment, primarily due to the loss of physical or cognitive function required for completing daily occupations - a significant focus of occupational therapy (Simpson et al., 2018). Over 30% to 40% of individuals who experience a stroke report feeling some form of notable physical or psychological pain. Pain management strategies are within the scope of practice for occupational therapists (Schulz et al., 2012). In recent years, the National Health Institute has included OT as a qualified profession to treat pain through nonpharmacological approaches in response to the opioid crisis (Manchikanti et al., 2020). Overreliance on pharmacological interventions may lead to potential misuse that results in negative permanent health outcomes (Manchikanti et al., 2020). The prevalent rates of pain for individuals who have experienced a stroke highlights the critical role of OT in addressing pain, aligning with the public health priorities emphasizing nonpharmacological treatment.

The current literature search for this project found knowledge gaps surrounding pain treatment exist for both practicing clinicians and students, suggesting a need to strengthen pain education as a profession (Reyes & Brown, 2015; Rider et al., 2024; Rochman, 1994; Rochman et al., 2013; Turnquist & Engel, 1994;). Early investigations of occupational therapists' and students' pain knowledge found that those within the profession felt unequipped to treat pain in specific populations, similar to post-stroke, and did not feel proficient in administering pain assessments or treatments (Strong et al., 1999; Turnquist & Engel, 1994). Similar themes were found in later studies, with therapists also reporting difficulties understanding the difference between chronic versus acute pain and knowing how to assess pain.

For OT students, gaps in pain knowledge may stem from the ability to apply theoretical teachings to practical translations of pain interventions and treatment, highlighting the difficulty of connecting knowledge from coursework and clinical experience (Rezaee et al., 2014; Rochman et al., 2013; Thomas et al., 2017). Like therapists, students similarly had difficulty understanding how to assess pain or treat pain in specific populations. Common themes reported by therapists and students are difficulty in differentiating types of pain, in addition to other concepts regarding pain behaviors, interventions, or medication (Rochman et al., 2013). Students, during a critical stage of their learning development, require a diverse range of instructional methods and teachings to foster their understanding of pain concepts or treatment to fully grasp how they can address it from an occupational lens.

A recent survey assessing 41 graduate-level OT programs' pain curricula found that 73% of these institutions include pain management content in their curriculum; however, the instructional time for pain management education was approximately 9.68 hours among the programs surveyed (Rider et al., 2024). Moreover, institutions from the study indicated that the current pain management education levels embedded in their curriculum were insufficient for doctoral OT students to address pain effectively. Respondents expressed the need for increased instruction time to provide students with a more comprehensive knowledge and skillset in pain management when they become practitioners (Rider et al., 2024). The recent data from this survey aligns with the notion that challenges found in pain management concepts among students and OT clinicians from early investigations persist in the modern context.

The discrepancies found in pain management education are not specific to only the OT profession, as students across primary health science disciplines report feeling unprepared to address pain management due to the contents, teaching methods, and duration of their general

pain education (Doorenbos et al., 2013). However, future OT practitioners play a crucial role in providing nonpharmacological pain interventions that can address a wide range of pain spectrums - encompassing physical, emotional, and social dimensions of pain management. As the trend of insufficient pain education persists, it becomes increasingly imperative to equip OTD students with the necessary skills and knowledge needed to address and treat pain in their future practice. Enhanced education for pain management, particularly concerning stroke pain, can serve as a catalyst for fostering the research initiatives set forth by AOTA focused on nonpharmacological treatments within the scope of occupational therapists. This initiative holds the potential to make a significant impact on future client outcomes.

Lacking foundational knowledge, education, or practical application skills required for a specific intervention or treatment can contribute to levels of clinical self-efficacy, which has been shown to decrease the likelihood of application for interventions among health science students (Abusubhiah et al., 2023). Considering the barriers identified in the literature search for this project, as reported by OT students regarding pain management practice, there is a need to find the most effective instructional methods and content that will enhance clinical self-efficacy levels in students and foster knowledge translation when treating a specialized or complex condition (Doorenbos et al., 2013; Rochman et al., 2013).

The current review of the literature for this project suggests that there is limited knowledge and understanding surrounding clinical self-efficacy in OTD students, as much of the research conducted is geared toward undergraduate OT students (Dalomba et al., 2021). Additionally, research on self-efficacy was found to be examined in the context of the therapeutic use of self or studying approaches rather than clinical self-efficacy (Bonaksen et al., 2018). Self-efficacy for OTD students has been examined in the context of the doctoral capstone and

fieldwork experience (Andonian, 2017). Literature on the clinical self-efficacy among OTD students regarding pain management interventions for the neurological population, such as individuals with a stroke, was limited to none in the most recent search. Because stroke is a complex neurological condition that results in various forms of pain, such as MSK, neuropathic, and psychological pain, an educational program focusing on these comorbidities is needed to improve reported clinical self-efficacy levels of students for the implementation of interventions in the clinical setting.

Educating future clinicians on this topic is necessary to address treatment from an entirely holistic approach for individuals who have experienced a stroke, as pain is a factor that affects occupational participation and overall quality of life (Schulz et al., 2012). The proposed solution intends to develop a "Pain Management Series for Stroke" that increases OTD student clinical self-efficacy levels to implement interventions and provide pain management treatment for individuals who have experienced a stroke. The hypothesis is that the Pain Management Series for Stroke will improve the clinical self-efficacy levels among OTD students. Equipping students with specialized knowledge around a common condition treated by the profession can assist in strengthening the foothold of OT in pain management.

Section Three: Literature Review

This literature review currently consists of multiple research studies surrounding the evidence on interventions for pain management of stroke within the OT scope of practice, the concepts of self-efficacy of adult learners, and the various teaching methods found to increase self-efficacy. Following the Wallace et al. (2022) Levels of Evidence Pyramid, 11 systematic reviews or metanalysis articles [Level 1], nine nonrandomized studies, one nonrandomized quasi-experimental [Level 2] article, and one cross-sectional article [Level 5] were identified. The databases used for the literature review were primarily the University of Nevada (UNLV) libraries online database, the American Occupational Therapy Association website, Google Scholar, and Pubmed. The inclusion criteria for the searches consisted of articles in English or translated into English within the past ten years. The exclusion criteria for the searches included pain management interventions outside of the OT scope of practice within the United States. This section will discuss the existing literature found regarding topics such as pain education in the OT curriculum, knowledge gaps found in OT students, self-efficacy in OT students, teaching methods within the OT curriculum, and the interventions found for the various types of pain.

Pain Management Education in the Occupational Therapy Curriculum

The call for strengthening pain management education begins in academia. The complex experience of pain requires a practical teaching approach that addresses its multidimensional nature (Reyes & Brown, 2015; Rochman et al., 2013). While the traditional biomedical model typically utilizes a pharmacological approach for pain treatment, the OT curriculum values a biopsychosocial perspective that teaches students to account for an individual's biological, psychosocial, and social dimensions using holistic and nonpharmacological interventions (Accreditation Council for Occupational

Therapy Education, 2018). In 1994, the US Department of Health and Human Services recommended that curricula for health professionals include appropriate teachings to prepare clinicians to treat pain. The International Association for the Study of Pain (IASP) was then developed by occupational and physical therapists, recommending a curriculum outline for OT programs to encompass a list of principles when teaching pain (Rochman et al., 1994). These principles include addressing the phenomenon of chronic pain, the impact of pain on occupation, and the assessment and intervention of pain (Engel, 2015). The guidelines also do not recommend specific methods of instruction or a particular structure to teach the IASP curriculum (Doorenbos et al., 2013).

However, recent findings, according to Rider et al. (2024), indicate that 76% of OTD programs were unaware of the curriculum set forth. 86% of institutions out of the 41 programs surveyed reported that they did not use a specific pain curriculum, suggesting that graduating OT students may possess inconsistent knowledge of pain management options and interventions. On average, 9.68 hours were allocated to pain content in the OT curriculum, with faculty expressing the need to increase the amount of time spent (Rider al., 2024). Further research is needed to identify students' perceptions of their pain education to understand how to advance the impact of the curriculum.

Rider et al (2024) recent data on the pain curriculum among graduate programs provides valuable insight into the current state of pain education in the OT discipline, as it is the first study in the United States to gather data on a large scale for this topic. Early investigations have suggested the need for specialized and standalone courses for pain. However, not all programs employ this recommendation, possibly due to the feasibility and demands of other courses, but incorporate it throughout other course content (Rider

et al., 2024; Doorenbos et al., 2013). It is unclear what course formats or instructional methods are most effective for pain management education. A question also remains of what topics or content should be included or removed to create a feasible yet in-depth education for students. Further research is needed on the OT student perception of pain education, as these findings can help bridge knowledge gaps in pain treatment and identify missing components in foundational pain management education.

Knowledge Gaps in Occupational Therapy Students

The earliest study found in the current literature search for this subject dates back to 1994. Rochman (1994) found that OT students lacked proficiency in addressing pain, as students believed that visible observations could verify that the pain existed. Similarly, Turnquist and Engel (1994) found that OT students also used facial expressions to assess pain in the pediatric population. However, not all pain can be detected by physical examination. In the cases of post-stroke pain, for example, neuropathic or psychological pain may not easily be observed. Mcandrew et al. (2023) suggest that pain knowledge and beliefs may stem from life experiences, so younger or healthier students who do not yet have "painful" experiences to relate to may demonstrate a decreased understanding of pain. However, Mankelow et al. (2020) suggest that the inclusion of pain education in academia can lead to improvements in knowledge and increased confidence in recommending activities for those with pain.

One master-level OT program that followed the IASP outline found that OT students had a sound understanding of the impact that the unique pain experience had on occupations; nevertheless, knowledge gaps emerged from assessing and evaluating pain in specific populations, such as CRPS - a prevalent pain condition after a stroke

(Rochman et al., 2013; Katsura et al., 2022). Students had trouble translating theoretical teachings into practical scenarios, suggesting the need to blend both types of knowledge to achieve optimal practice for future clinicians (Rochman et al., 2013). Prominent from this study was that OT students demonstrated sound knowledge of the multimodal nature and dimensions of pain, indicating that the IASP curriculum effectively educates students about the complex and subjective experience of a client living with chronic pain (International Association for the Study of Pain, 2021).

Similar knowledge gaps were found in practicing therapists, leading to a reduced ability to disseminate knowledge in pain treatment for various populations (Reyes & Brown, 2015). Clinical occupational therapists lacked knowledge about the delivery of various interventions within their scope of practice (Reyes & Brown, 2015). Simpson et al. (2018) found that a barrier to addressing psychological pain for individuals poststroke emerged from therapists feeling an imbalance of educational preparedness to address both concepts of physical and psychological pain equally, suggesting education curricula should better integrate academic components that address encompass all spectrums of well-being within stroke patients (Simpson et al., 2018).

The studies suggest that while pain education courses are effective in providing an overview of chronic pain symptoms and behavior, components of addressing specific populations are essential to addressing the unique pain experience of specific populations. Additionally, blending theoretical teachings with practical real-life scenarios can reduce barriers to implementing interventions for various populations not limited to stroke (Reyes & Brown, 2015; Rochman et al., 2013). For the stroke condition, however, pain curricula may also benefit from integrating physical and psychological health teachings more proportionately

to encourage a sufficient blend of knowledge regarding the evaluation and treatment of individuals who have experienced a stroke (Simpson et al., 2018). While clinical occupational therapists attribute a lack of preparedness from their education to perform interventions related to stroke mental health, further research is needed to identify specific components that the clinicians felt were missing.

Self-Efficacy in Occupational Therapy Students

In the literature, while the terms "self-efficacy" and "clinical self-efficacy" are occasionally used interchangeably, they refer to distinct concepts with specific applications in healthcare professions such as OT. However, both concepts can directly impact one another. Higher levels of academic self-efficacy have been shown to positively influence the clinical decision-making process (Hong et al., 2021). In the classroom setting, adopting a deeper approach to learning to create connections can positively influence academic self-efficacy as opposed to a surface learning approach (Bonaksen et al., 2018; Dalomba et al., 2021).

Smaller courses were favored when learning intervention practices, suggesting that this may be a potential method to foster clinical self-efficacy (Thomas et al., 2017). Educational preparation and academic resources contribute to the ability of students to translate their knowledge into clinical practice, thus increasing their clinical self-efficacy (Thomas et al., 2017). Additionally, case review workshops or case-based assignments were viewed as supports to increasing self-efficacy in particular topics such as implementing evidence-based practice. Fostering emotional intelligence can also contribute to the likelihood of students implementing interventions (Andonian, 2017). A prevalent factor in clinical self-efficacy is a student's professional and mentorship experience in the fieldwork or capstone process

(Andonian et al., 2017; Cook et al., 2021). These findings highlight the importance of fostering a supportive relationship between the student and educator to increase clinical self-efficacy.

Evidence surrounding self-efficacy in OT students is primarily examined at the undergraduate and master-level education (Dalomba et al., 2021). The current literature review search for this paper yielded few studies regarding potential teaching methods and their impact on OTD student clinical self-efficacy for implementing interventions. Further research is needed to understand the various factors that either support or hinder clinical self-efficacy for OTD students when implementing interventions for a specialized population.

Teaching Methods within OT Curriculum

Health professional programs often adopt a teaching style of problem-based learning (PBL), in which case studies, active learning, role-playing, and technological methods are used to challenge clinical reasoning (Coker et al., 2010; Scaffa & Wooster, 2004). PBL methods can help develop clinical reasoning by encouraging students to incorporate various perspectives and approaches when tackling clinical scenarios (Scaffa & Wooster, 2004). Experiential learning has also been shown in the literature to be effective in increasing knowledge and clinical reasoning for master-level OT students due to its components of real-world application and hands-on experience, allowing for a simulation of clinical practice and effectively bridging the knowledge gaps found between applying theory to practice (Coker et al., 2010).

Simulation-based learning in OT curricula has also been well-received. However, computerized simulations may require an adequate amount of training before students can fully utilize them effectively. Interactive simulations such as role-playing can be a more feasible way to learn, while computerized simulations require more training from the student end to be utilized effectively (Grant et al., 2021). Role-playing is an effective and feasible option to teach

mental health interventions while enhancing student self-efficacy, as it can encourage practicing communication skills without the requirement of increased resources (Ronning & Bjorkly, 2019).

Jensen (2023) found that unfolding case studies were effective in increasing clinical self-efficacy for OTD students, as this method has the potential to replicate future clinical environments that allow students to further engage in the material. Some OT curricula utilize a "boot camp" or workshop approach to teach interventions for a specialized focus area, such as pain interventions or wheelchair evaluations and interventions (Rushton & Daoust, 2018). Using an intense and condensed format may require educators to forfeit the approach of distributed practice, which is the rehearsal of skills over a spread-out amount of time (Rushton & Daoust, 2018). Thus, educators should consider course content, objectives, and resources allotted when developing a course for pain.

Rice et al. (2017) examined the impact of instructional methods of KT on student confidence. KT is a widely used intervention in OT for upper limb pain relief, requiring the implementation of hands-on techniques (Yang et al., 2018). A combination of instructional methods (hands-on, video instruction, and written instruction) was found to increase confidence levels for this clinical skill. Other methods that teach foundational knowledge of pain management were the use of didactic lectures or narrative assignments (Rochman et al., 2013). Although these methods were found to be helpful, students reported the need to combine these methods with more hands-on applications to practice what was learned, as the use of less interactive instructional methods may not be as helpful in connecting the theoretical and practice teachings (Rochman et al., 2013). These findings assisted in creating the structure and methodology to teach KT protocols in the PMSS educational program.

While traditional teaching methods such as lectures are appropriate for educating pain interventions, the introduction of active learning and manual application methods can enhance the effectiveness and quality of education (Rice et al., 2017; Rochman et al., 2013). Combinations of teaching methods that integrate both foundational knowledge and clinical application may strengthen how students' clinical reasoning when dealing with individuals who suffer from pain. Educators should also consider ways to provide students with a learning environment that best simulates anticipated clinical scenarios, as this allows students to continuously engage in the material to expand further their clinical self-efficacy (Jensen, 2023; Ronning & Bjorkly, 2019). Clinical simulations, increased lab time to allow for hands-on instruction, and further education on the unique role of occupational therapists and pain may better prepare students to address pain as clinicians (Rider et al., 2024).

Musculoskeletal and Neuropathic Pain Interventions for Stroke

Shoulder pain is commonly present in poststroke individuals with residual deficits, ranging from an astounding occurrence of 50% to 80% of cases (Souza et al., 2021). KT is an intervention commonly used to relieve shoulder pain, enhance range of motion, and reduce shoulder subluxation poststroke (Chatterjee et al., 2016; Yang et al., 2018). A systematic review by Tan et al. (2022) echoed that KT was effective for pain relief and upper limb function in stroke survivors, significantly relieving MSK pain by increasing the range of motion and stability of the joint structures affected post-stroke. Providing patient education, such as joint protection techniques, may also significantly reduce the onset of painful contractures, pressure sores, or shoulder pain (Sackley et al., 2008).

Physical agent modalities, such as transcutaneous electrical nerve stimulation (TENS) and ultrasonic therapy, were effective in reducing neuropathic pain originating in the shoulder.

Tae-sun In et al. (2021) found that a combination of TENS and KT used at the same time can further help decrease pain levels. Mirror therapy can be used to reduce neuropathic pain among clients after a stroke by increasing motor function (Thieme et al., 2012). Specifically, those with CRPS may benefit from mirror therapy by creating an illusion that distracts the brain from painful signals in the affected limb (Cacchio et al., 2009). Neuropathic pain can occur in unpredictable patterns due to its complex pathophysiology; thus, adopting adaptive or compensatory interventions such as activity pacing or energy conversation in daily activities can further help individuals alleviate potential pain (Liampas et al., 2020; Klit et al., 2009).

Psychological Pain Interventions for Stroke

For individuals who have experienced a stroke, it is widespread to experience significant declines in mental or emotional health (Wathugala et al., 2019). Compared to interventions targeted for physical pain, there is a lack of evidence supporting mental health strategies that could assist individuals in improving their overall quality of life. Mind-body interventions have been studied among various clinical populations, and robust evidence suggests mindfulness interventions improve overall emotional regulation (Kraemer et al., 2022). The effects of mental health declination or psychological stress possess the ability to influence physical pain, calling for a need to prioritize emotional well-being to maintain physiological health in addition to healthy lifestyles or routines (Sharma et al., 2021).

Mindfulness-based stress reduction (MSBR) has been widely adopted as an intervention to treat mental health or psychological pain. Gray et al. (2020) noted that mindfulness can relieve stress by supporting an emotional and calm state in stroke survivors, as it can be a feasible intervention for individuals to practice during phases of stress. Wathugala et al. (2019) found that mindfulness meditation can reduce poststroke spasticity, while Bhimani

and Anderson et al. (2014) found that it was effective in reducing anxiety and stress. A systematic review by Lawrence et al. (2013) found evidence that supports the use of mindfulness for depression. While there are various ways to educate individuals on mindfulness, it's worth noting that techniques perceived to be easier to implement, such as motor imagery or breathing techniques, were found to be well-received among individuals post-stroke.

A systematic review found that cognitive behavioral therapy (CBT) can be effective in reducing poststroke depression or anxiety, a common obstacle seen in recovery (Wang et al., 2018). Additionally, CBT, combined with upper limb rehabilitation training, can effectively target emotional and physical recovery (Choi & Kim, 2022). Mastering therapeutic communication can be a significant factor in the effectiveness of CBT; thus, adopting teaching methods such as role-playing can allow students to practice their therapeutic use of self, which is a skill needed to foster clinical self-efficacy (Andonian et al., 2013). The findings within these studies helped to create the psychological pain intervention in the PMSS program, as role-playing has been shown to encourage students to teach widely known interventions for mental health, such as CBT.

Discussion

This literature suggests various findings to inform the capstone topic. Trends that emerged in early investigations of pain education in the OT curriculum have improved after decades of advancement; however, require more research regarding its teaching methods and content for students. From the perspective of OT students, barriers to OT pain management education stem from a lack of specialized knowledge regarding the treatment of different populations, understanding how to assess pain, differentiating types of pain, and applying

theoretical foundations to real-life practice (Rochman et al., 2013). Similar gaps were found in practicing therapists, helping to inform what topics to address in the educational intervention of the Pain Management Series for Stroke (PMSS) to help foster clinical self-efficacy and shape the understanding of pain among OTD students.

OT curricula may benefit from increasing learning opportunities that include a combination of instructional methods, such as hands-on learning, simulation strategies, case studies, or other active learning opportunities to expand student clinical reasoning. Additionally, addressing resolutions to the barriers reported by clinicians for implementing pain management interventions can help students feel more equipped to tackle potential obstacles seen in the clinical setting, such as the systematic pressures in the healthcare system to value physical health over mental health (Simpson et al., 2018). Students should also be provided with opportunities to strengthen skills related to the therapeutic use of self and rapport, as this can improve levels of emotional intelligence and enhance levels of clinical self-efficacy (Andonian et al., 2013).

Section Four: Statement of Purpose

The purpose of this project is to develop a "Pain Management Series for Stroke" educational program that increases OTD student's clinical self-efficacy in pain management treatment for individuals who have experienced a stroke. The project's objective is to understand the effective teaching methods that equip students with increased levels of clinical self-efficacy when implementing pain management interventions or treatment. Additionally, the project seeks to know if the implemented educational program will increase reported levels of clinical self-efficacy. This project also hopes to inform OTD curriculum development when developing pain management education courses, as participant feedback will be analyzed to strengthen the course after the program has concluded.

Section Five: Theoretical Framework

The Adult Learning Theory, advanced by Malcolm Knowles, was chosen as the foundational framework for this capstone project due to its core values in recognizing the distinct characteristics of adult learners (Mukhlati & Taylor, 2019). In addition, the adult learning theory incorporates the concepts of student self-efficacy in the learning process. This framework is particularly relevant for OTD students, as it considers how their diverse backgrounds and lived experiences impact their attitudes and perceptions of the subject of pain. In line with Knowles' theory, the learning process for adult learners emphasizes active participation, critical thinking, and internal motivation - which are essential components for exploring the multidimensional aspects of pain. Knowle's theory has been widely adopted by professional healthcare education programs in guiding educational practices because it focuses on identifying the disparities between one's existing knowledge and the new concepts acquired during the experiential aspects of their overall education (Mukhlati & Taylor, 2019).

Another theoretical framework that will help to guide this project is the Constructivism learning theory. This framework incorporates the principles of active engagement and interaction to enhance the learning experiences of students (Alhawiti, 2023). The Constructivism theory emphasizes the idea that learners construct and build understanding from their own experiences. When learning concepts of pain education, students can learn from one another through discussions, case studies, or other problem-solving activities that help expand their clinical reasoning. Facilitating the educational course in a way that allows students to develop skills and reasoning based on real-world experiences or examples can result in the ability to create strong connections to the material at hand (Alhawiti, 2023).

Section Six: Methodology

This quality improvement (QI) capstone project employed a mixed methods approach and a pre/post design. The project was conducted on the campus of the University of Nevada, Las Vegas (UNLV). Eight participants were recruited with positive results on effective methodologies for future implementation.

Project Design

The QI project design was used to deliver an educational intervention for OTD students, with the hypothesis that clinical self-efficacy levels of OTD students will increase after completion of the educational intervention. A mixed methods approach was utilized to gather data on effective instructional teaching methods and general program feedback. A pre/post assessment was used to collect data on reported levels of OTD students' clinical self-efficacy for stroke pain management. A summative evaluation process was performed after the program was completed for both methods of data collection. Qualitative data analysis was performed by finding recorded frequencies for various keywords from participant responses and then identifying emerging themes. Quantitative data was analyzed using the Wilcoxon Signed Rank Test.

Agency

The project idea was initiated at Valley Health Specialty Hospital (VHSH), an inpatient rehabilitation facility that is a part of the Valley Health System hospital network located in Las Vegas. The organization offers acute inpatient and outpatient rehabilitative services for neurological, orthopedic, cardiovascular, and other conditions. The hospital specializes in rehabilitative services and provides skilled intensive occupational therapy, physical therapy, and speech therapy for all patients admitted. The facility has 56 beds for the

acute rehabilitation center and offers ten beds for inpatient nursing stays for recovery after post-operative procedures. VHSH has received hospital accreditation from the Joint Commission.

Participants

The target population of this project was OTD students in the southwest region. The inclusion criteria required participants to be at least 18 years or older and attending an OTD program in the southwest area of the United States. Participants were also required to be English-speaking, in addition to confirming that they had access to technology to access the content of the program. Participants were informed that they would be educated on the topic of pain management for individuals who have experienced a stroke through various teaching methods. The participants were asked to commit a total of five hours. Participants must attend the fully two-part series of the program to receive the $10 Visa gift card incentive.

Sampling and Recruitment

Participants were primarily recruited through convenient sampling methods of physical flyers and word of mouth. The recruitment processes were conducted on-site at the health sciences building at UNLV and VHSH. These methods were adopted due to the ability to gain participants who met the inclusion criteria of attending an OTD program in the southwest region, such as UNLV or Touro University. The author also assisted in a physical dysfunction lab at UNLV, where the recruitment flier was also temporarily posted in the classroom for participants to enroll. The flier contained the purpose, duration, and incentives of the program (See Appendix C). Participants were required to sign up through the flier and access a QR code that led to an interest form containing screening questions that determined eligibility (See Appendix D).

Participant recruitment was the most successful on the UNLV campus, as students who attended other programs in the southwest region declined to participate during onsite recruitment at VHSH secondary to conflicting schedules. The recruitment process was conducted over four weeks to ensure timeliness in program implementation and data collection. However, before officially starting the educational intervention, two participants withdrew due to sudden personal commitments that interfered with the program schedule, leaving a total of eight participants to begin and complete the program

Instruments and Data Collection

Two methods of data collection were utilized for two separate purposes: first, to identify which teaching methods are effective for increasing clinical self-efficacy, and second, to collect data on reported self-efficacy levels after completion of the PMSS program. The primary method of data collection was the Program Feedback Questionnaire (PFQ). The purpose of using the PFQ was to collect the most valued teaching methods of participants in addition to gaining feedback responses for program evaluation. This instrument is not valid or reliable as the author created it to collect responses that were specific to the educational series. However, the author followed the practical guidelines of developing a questionnaire found in Kishore et al. (2021). The PFQ included items that would collect both quantitative and qualitative feedback to capture in-depth responses from the participants (See Appendix A). A five-point Likert scale was utilized as a response method for all quantitative items, while free text entry responses were used for qualitative items. The PFQ would only be collected at the end of the second session.

The second method of data collection is the Modified Physiotherapy Self-Efficacy Questionnaire (MPSEQ), adapted from the Physiotherapist Self-Efficacy (PSE) questionnaire, a valid and reliable instrument used to collect subjective reporting of self-efficacy scales (See

Appendix B). The PSE questionnaire is used initially to measure self-efficacy regarding the treatment of neurological, respiratory, or cardiovascular conditions (van Lankveld et al., 2017). The MPSEQ adopted the same Likert 5-point scale; however, the questions were modified to align with the topic of stroke pain or stroke condition with a similar structure to maintain reliability and validity. Participants completed this form at the beginning of the first session before the didactic lecture officially began and once more after the program had been completed in its entirety. Both instruments collected data electronically through a Qualtrics survey. Due to the small sample size and lack of a control group for the project, the participants were not randomized. However, they drew a participant identification number from a folded card stack that was blinded to the educator to protect the anonymity of responses and reduce the potential for response bias. As the methods of data collection in the project did not ask for participant names, the assignment also allowed the educator to track pre and post-self-efficacy scores collected by the MPSEQ.

Procedures

The PMSS sessions took place at the UNLV clinical simulation building. The duration of the first session was approximately two hours, with the focus of the session educating the participants on foundational knowledge (See Figure 1). The second session lasted for three hours, with an emphasis on applying knowledge through practice (See Figure 2). Before the first session began, the educator asked participants to draw a number from a folded card stack, with numbers ranging from one to eight. They were asked not to share their identification number with the educator or other participants. The educator instructed the participants to keep their identification number for the duration of the program through a picture on their electronic device

as they will require it for the next posttest. Before continuing with the program, participants verbally confirmed that the number assigned was kept in a secure location.

The participants were emailed the materials required for participation before the educator officially began the session. Immediately after the introductory slide of the educational materials, students were given 15 minutes to complete the pretest of the MPSEQ through an anonymous link and an untraceable link. After completing the MPSEQ, the program began. When the session was completed, participants were given handouts of supplementary materials as an introduction to the contents that will be covered in the next session. The timing between the first and second sessions of the series lasted approximately one week.

Two days before the second scheduled session, participants were emailed a link to the demonstration video of the KT protocol. They were also instructed to wear appropriate clothing for the second session due to the application of the interventions that will be practiced among each other. At the beginning of the second session, participants were instructed to confirm the security of their assigned identification number. The educator asked the participants to access their numbers from their electronic devices to ensure that they entered their accurate assignments before beginning. The second session was then completed, with participants completing the posttest of the MPSEQ at the end of the program with an allotted time of 15 minutes. Then, participants immediately completed the PFQ, within the same allotted time of 15 minutes. After the program was completed in its entirety, participants were then forwarded their e-visa gift card incentive with the same email address that was used for contact purposes throughout the project.

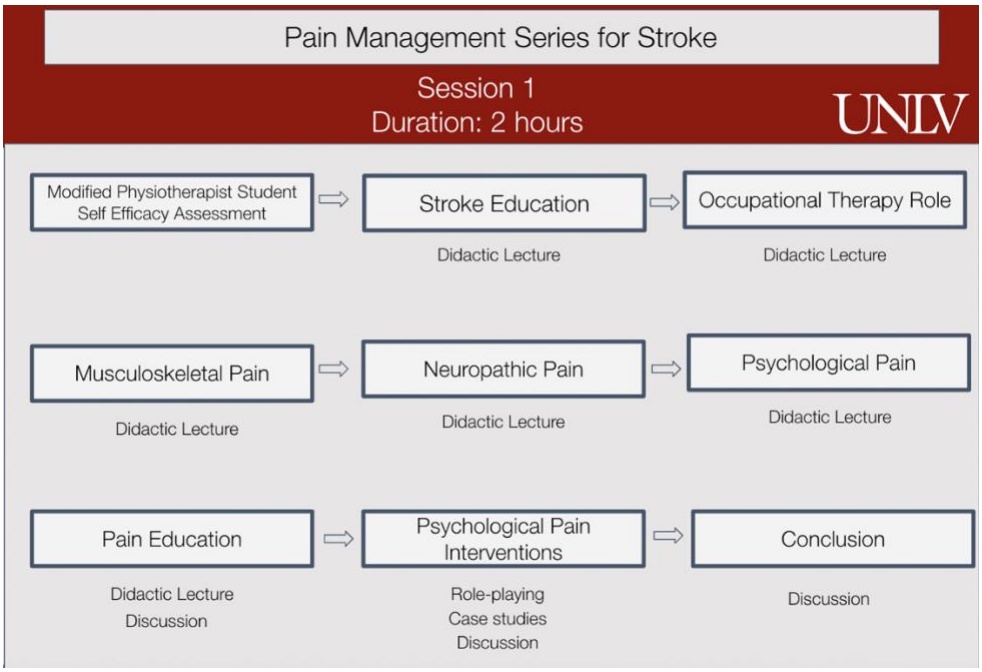
Program Flow

Session One

The first session of the series required participants to complete the program in two hours. Participants began completing the MPSEQ. Foundational topics such as stroke education, occupational therapy's role, and categories of pain education were discussed through didactic lectures. Psychological pain interventions were then taught through role-playing methods, case studies, and discussion. Finally, the topic concluded with a group discussion of what was learned. See Figure 1 for the flow of the first session. Participants were then given supplementary materials at the end of the session to give them a brief introduction to the next series (See Appendix F, Appendix G, Appendix H).

Figure 1

Program Flow Session One

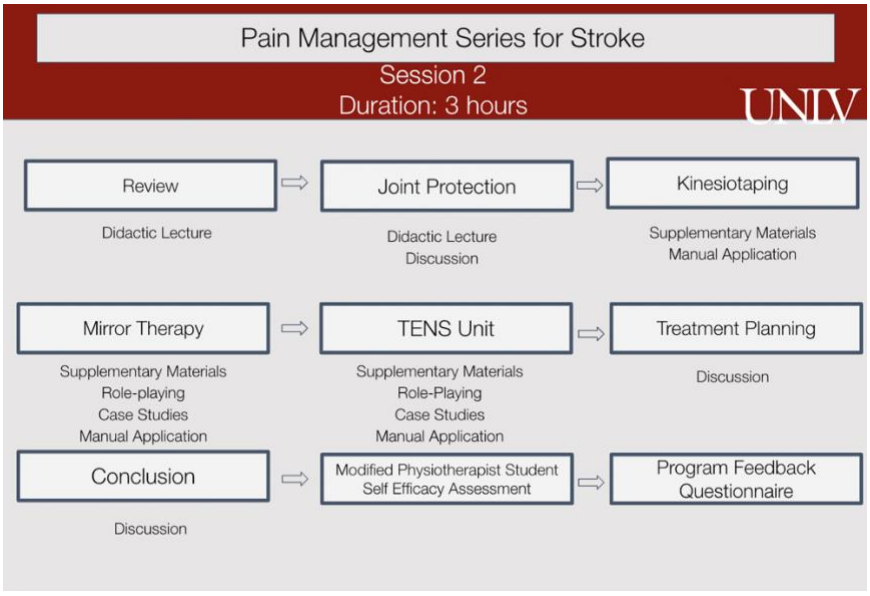


Session Two

The second session began with a brief review of the concepts learned in the week prior. Joint protection interventions were discussed for MSK pain using didactic lecture and group discussions. Participants were then given step-by-step instructions on how to perform two KT methods found in the literature on shoulder pain. The participants used the method of manual application on each other after a demonstration from the instructor. However, the methods were also demonstrated in the supplementary materials given to participants before the session. The session continued onto neuropathic pain interventions and a discussion of treatment planning. Finally, participants completed the MPSEQ.

Figure 2

Program Flow Session Two



Data Analysis

Quantitative and qualitative responses were collected to gain an understanding of participants' perspectives on preferred teaching methods and general program feedback. For the PFQ, quantitative data was analyzed using descriptive statistics. Quantitative responses in the questionnaire regarding program feedback were recorded using a Likert scale, with responses ranging from "strongly disagree" to "strongly agree". The responses were then coded into numeric figures from one through five with "1" being strongly disagree and "5" being strongly agree. A summative evaluation process was used to analyze qualitative data. Due to the small sample size, a word frequency analysis was used to conducted to identify common themes that emerged from participants' responses using the "search" function on Microsoft Word. The frequencies of responses were recorded. A second researcher assisted in the process of identifying emerging themes from participant responses.

The MPSEQ consisted of quantitative scores, utilizing a Likert scale to gauge the subjective reporting of levels of self-efficacy. Given the non-parametric nature of the data, the Wilcoxon Signed Rank test was adopted as a means of analysis for the MPSE. The Wilcoxon Signed rank test was able to assess the statistical significance of differences in self-efficacy scores before and after the program. The differences between the scores are calculated and ranked in absolute terms to allow for comparisons and examine the change. The information gathered from the PFQ and the MPSEQ was saved on a secure drive on Qualtrics and then converted into an Excel sheet for data entry and organization. To ensure further confidentiality of the results, the Excel sheets were uploaded into a secure Google drive managed by UNLV, requiring a two-factor authorization method for access. Finally, the results from the methods of data collection were uploaded into IBS SPSS 28 for analysis.

Section Eight: Ethical and Legal Considerations

This project was approved by the University Institutional Review Board (UNLV-2023-493). The content of the self-efficacy questionnaire may invoke sensitive emotions from the participants, as the concept of self-efficacy relies on internal reflection of participant knowledge and ability. In addition, the content of this program was solely educational and not intended to sell course materials utilized in the sessions. Demographic characteristics were connected anonymously through an untraceable link to maintain confidentiality.

Section Nine: Results

This section will describe the participant characteristics and the results from the PFQ and the MPSEQ after the completion of the PMSS.

Participant Sample Characteristics

A total of eight participants completed the program. Participants were assigned an identification number during the first series and asked to keep a record of the number to track the before and after self-efficacy questionnaires. The number was drawn out of folded slips of paper to protect the participant's identity. Of the participants, 50% were second-year students, 37.5% were first-year students, and 12.5% were third-year students. Table 1 displays the demographic characteristics of the participants, such as the years of experience and fieldwork setting for each participant.

Table 1

Demographic Characteristics of the Sample

Characteristics	n=8 (% of participants)
Years of Experience	
1	37.5%
2	50%
3	12.5%
Level 1 Fieldwork Setting	
Inpatient rehabilitation	25%
Acute care	37.5%
Community-based	37.5%
Have not yet completed	12.5%
Level 2 Fieldwork Setting	
Skilled nursing facility	12.5%
Inpatient rehabilitation	37.5%
Acute care	12.5%
Have not yet completed	37.5%

Note. The order of level I and level II completion may be different for each participant. This table displays the overall percentages of participants in each type of setting.

Teaching Methods

Most Valued Teaching Methods

The first three items of the questionnaire asked the participants to multi-select, rank, and then describe the reasoning for teaching methods they found to be the most valuable for their self-efficacy. Statistics of the most and least valued teaching methods of participants, along with the frequency, themes, and reasonings that emerged from the open-ended questions can be found in Table 2. Of the methods presented participants (50%) found manual application to be the most valuable, followed by role-playing (25%), case studies (12.5%), and didactic lectures (12.5%).

For the most valued method of manual application (25%), three themes emerged. The theme of “enhance practical skills” recorded one frequency of the keyword “hands-on” with a participant stating they learned more with this method due to the ability to *“practice”* their skills. The theme of “increased understanding” had two recorded frequencies of keywords such as “easy to understand”, with participants citing that manual application was *“less overwhelming”* than simply intaking the information without performing. Finally, “information retention” was the last theme that was identified with one recorded frequency of the keywords “retain information better”.

The qualitative results of role-playing (25%) found that the method helped them practice their future clinical skills, with themes emerging such as “simulation of clinical skills” and “quick decision making”, with one participant reporting that role-playing allowed them to “*think on their feet”.* Participants who favored case studies (12.5%) reported that the method was able to help “present the learning material” in a way that lets them practice and apply their skills, while those choosing didactic lecture (12.5%) responded that it helped them understand topics more in-depth.

Table 2

Results of the Valued Teaching Methods from the PFQ

Teaching Methods	n = 8 (% of total)	Frequency	Themes	Reasoning
Most Valued				
Practical Application	50%	1	Enhance Practical Skills	"…learn more when I'm able to be hands-on and practice the skills…"
		2	Increased Understanding	"…easier to understand and less overwhelming than just hearing what and how..."
		1	Information Retention	"…helps retain the information better…"
Role Playing	25%	1	Simulation of Clinical Skills	"…helped me practice my skills as a therapist"
		1	Quick Decision Making	"…nice thinking on my feet"
Case Studies	12.5%	1	Application of Learning	"…presents learning material to help practice and apply"
Didactic Lecture	12.5%	1	Detailed Learning	"…allowed us to revisit current knowledge…dive deeper into concepts that were learned superficially..."
Least Valued				
Supplementary Materials	25%	2	Non-interactive	"…not effective in improving ability to perform a skill…"
				"…learn better with other people to interact with…"

Case Studies	25%	1	Variation of Clinical Reasoning	"…no definite right or wrong answer…"
		1	Time Demand	"need more time dedicated…best combined with manual application…"
Didactic Lecture	25%	1	Non-interactive	"…does not stay in long-term memory if nothing is done to interact with material…"
		1	Inability to Practice Skills	"…unable to gain knowledge compared to physically doing…"
Role-playing	12.5%	1	Informality	"…students may take it less seriously…"
Discussion	12.5%	1	Prefer Hands-on	"…interesting to hear opinions…however preferred doing things…"

Note. Frequencies represent the number of times various keywords were populated in responses. Not all participant quotes for each theme are displayed in the table.

Least Valued Teaching Methods

The results found that the lowest-ranked methods among 6 participants equally were supplementary materials (25%), case studies (25%), and didactic lecture (25%). The category of non-interactive emerged for both supplementary materials and didactic lecture methods. For the remaining two participants, role-playing (12.5%) and discussion (12.5) were selected to be of the least value. The manual application teaching method was not selected as "least valued" for any participant (n = 8).

For supplementary materials, two frequencies were recorded for the theme of "non-interactive". For case studies (25%), the themes of "variation of clinical reasoning" and "time demands" were identified. One participant reported that case studies were *"best when combined with manual application methods".* Didactic lectures (25%) also had a similar identified theme of "non-interactive" such as supplementary materials. Role-playing (12.5%) had one recorded frequency of the keyword *"less serious"*, with the theme emerging as "informality". Finally, the discussion method (12.5%) had an identified theme of "prefer hands-on", with one recorded frequency of the words *"preferred doing things".*

Valued Program Content

Table 3 represents the most valued content in the program based on rank. The most selected content was the categories of pain, with 50% of participants choosing it as the number one rank. Knowledge and application for interventions were selected by 25% of participants. There was an equal number of participants who each selected stroke education and pain communication to be the most valued. For this item, open-ended questions describing reasoning were not evaluated, due to the primary focus of gathering qualitative data first to understand effective instructional methods.

Table 3

Results of the Valued Content from the PFQ

Most Valued Content	**n = 8 (% of total)**
Categories of Pain	50%
Knowledge and Application of Intervention	25%
Stroke Education	12.5%
Pain Communication	12.5%
Least Valued Content	
Clinical Assessments	62.5%
Treatment Planning	25%
Stroke Education	12.5%

Note. Percentages represent the proportion of respondents who identified the most and least valued content according to rank. Ranks were populated after a multi-select question of chosen topics for valued content.

Pain Management Program Evaluation Results

Quantitative items in the PFQ asked questions regarding general feedback of the PMSFS, such as program structure and overall organization, using a Likert scale. The average score was consistent throughout items regarding the quality of the program's teaching methods, organization, enhancement of knowledge, and instructor knowledge (*M = 4.75)*. The item with

the lowest average related to the duration of the course *(M = 4.87)*. However, the results suggest that the general program feedback was perceived as positive.

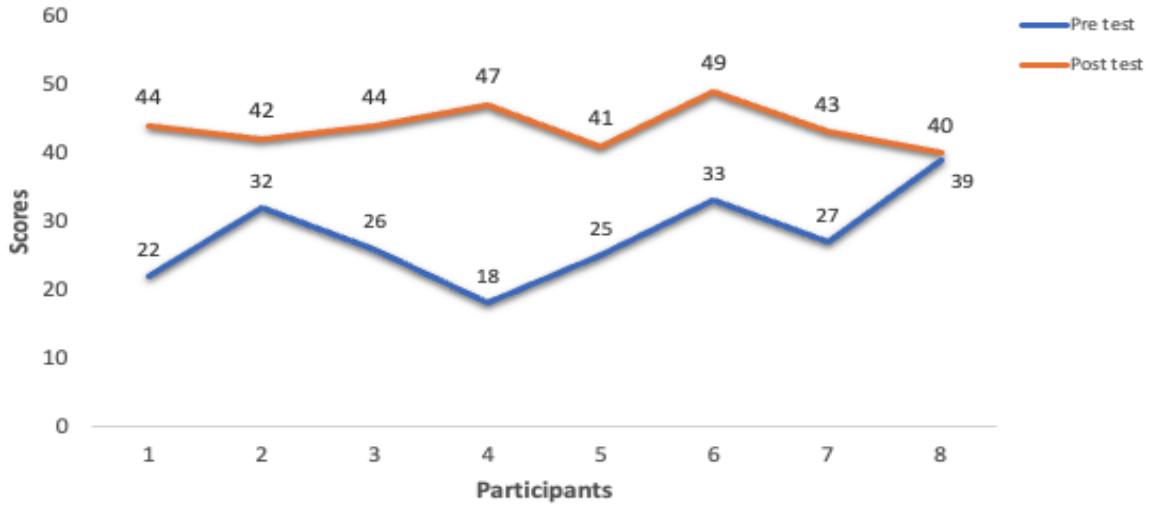
Overall, the program was well-received by participants. Strengths were highlighted in the emerging themes of "quality of content", "organization and structure", "opportunities for interactive engagement", and the ability of the program to "enhance self-efficacy". Participants noted that the program allowed them to *"feel more confident in addressing pain",* and that the program included a *"variety of topics, manual application, and education on pain management".* All participants addressed the program strengths, while only 50% of participants completed the PFQ item regarding areas of improvement. The identified theme for areas of improvement was "increased learning activities", as participants suggested that having formal knowledge checks or activities about a discussion of the literature would help enhance the program.

Modified Physiotherapist Self-Efficacy Questionnaire

The MPSEQ consisted of closed-ended questions related to the participant's perceived ability to implement interventions for the three categories of stroke pain. Overall, there was a positive increase in scores among all participants (See Figure 3). A 2-tailed Wilcoxon Signed Rank Test was used to determine the statistical significance of the scores. The chosen significance level for the analysis was (α=0.05). The analysis yielded a p-value of $p < 0.001$, indicating that there is sufficient evidence to reject the null hypothesis. No ties were found during the ranking process. The test statistic (Z) was -2.5533, signifying that the sum of the ranks for the negative differences is lower than the sum of the ranks for positive differences, thus suggesting an overall improvement in clinical self-efficacy to implement pain management interventions for stroke following the program. The results conclude a statistically significant result for self-efficacy scores before and after program completion.

Figure 3

Results from the Modified Physiotherapist Self-Efficacy Scale



Note. Scores were calculated based on a Likert scale 1 = strongly disagree, 2 = somewhat disagree, 3 = neither agree nor disagree, 4 = somewhat agree, 5 = strongly agree

Section Ten: Discussion

The purpose of this project was to identify the efficacy of teaching methods that should be included in a pain series program for occupational therapy doctoral students treating adult individuals who have experienced a stroke. The identification of valued teaching methods in this capstone project contributes to the instructional methods and learner characteristics and competencies category of the AOTA education research agenda. The development of the pain series attempted to include various methods and content that may bridge the knowledge gaps found in this project's literature review for pain management treatment and education in the field of occupational therapy. The results from this project can help to inform the OTD curriculum and assist educators in understanding how to increase awareness of the unique pain experience that individuals live with after experiencing a stroke. Increasing doctoral students' self-efficacy, knowledge, and ability in this topic area can pave the way for the development of further research related to stroke pain or stroke rehabilitation.

Teaching Methods

The results from each questionnaire provided, the PFQ and the MPSEQ, saw generally positive results after completion of the series. The results of the data collected from the PFQ conclude that manual application instructional methods were the most effective in enhancing student's clinical self-efficacy. Students described that the preference for manual application helped to improve practical skills, increase understanding, and the retaining of information. This finding supports the notion that manual application or other hands-on instructional techniques can be one of the potential solutions that may help translate theoretical teachings into practical application, a knowledge gap found in Rochman et al. (2013) and Thieme et al. (2018).

The most valued content was the pain categories in addition to knowledge and application of interventions. This finding may help answer the faculty's concerns in Rider et al. (2024) regarding how to effectively prioritize and select topics when educating on pain management. Understanding types of pain in-depth (onset, acute vs. chronic, and variations of pain in different populations) may help students create clinical judgments on which treatment plans are appropriate for a population, rather than having a broader knowledge that an intervention can reduce pain as pain can be presented differently among every individual.

One participant reported that the PMSS was *"very valuable for those who'd like to specialize in neurological conditions".* The incorporation of manual application or other forms of practical application techniques may be an effective way to teach how to differentiate pain or treat pain in various populations, which were reported difficulties by OTD students in the studies found in this project's literature review (Rochman et al., 2013; Strong et al., 1999; Turnquest & Engel, 1994). Finally, one participant noted that they "enjoyed how mental health was incorporated". Providing a balance of mental and physical pain management education can resolve the barriers found in practice, as therapists reported that they felt unprepared to address mental health due to receiving an education focused on physical recovery (Simpson et al., 2018).

Role-playing was found to be an effective teaching method by 25% of the participants, specifically when used for identifying psychological pain interventions. This method may allow students to practice essential communication skills that are crucial for addressing sensitive issues, making it an impactful approach to teaching mental health interventions such as CBT (Wang et al., 2018). However, one participant noted that, although this method was valuable, the formality in role-plays can be decreased when practicing with other students. This finding reflects the results of Rider et al. (2024), as OT programs expressed that using standardized

patients with lived experiences can better prepare students, perhaps in a way that enhances realism in the academic setting.

The remaining participants chose case studies (12.5%) and didactic lectures (12.5%) to be the most valued. Case studies were valuable in improving clinical self-efficacy because the method "*enhanced the ability to practically apply what was learned by first presenting the problem or conflict and then finding a solution"*, as stated by a participant. In contrast, one participant expressed that case studies were not as effective due to the infinite possibilities of "right" or "wrong" approaches. This perspective was an unexpected finding that was not discussed in the literature review for this project regarding case studies. However, the finding gives insight into the complexities of the adult learning experience and the challenges that can arise when implementing these methods. Some learners may value a more systematic way of thinking to seek the best approach for all clinical scenarios; however, instructors should emphasize that the clinical reasoning process may involve trial and error due to the unique pain experience – and embracing this process of learning can in return strengthen judgment rather than seeking out a definite approach for every client.

Increased Clinical Self-Efficacy

The findings from the MPSEQ scores before the program implementation helped to provide insights regarding student knowledge for pain education and treatment for individuals who have experienced a stroke. Participants who had completed a Fieldwork IIb in settings commonly providing OT for individuals poststroke, such as acute care, inpatient rehabilitation, or outpatient neuro, had generally low clinical self-efficacy scores for implementing pain management interventions for this population (Burris, 2017). In addition, participants in this category reported having at least two years of experience in their graduate program, but

following the MPSEQ, their clinical self-efficacy scores for these increased by at least 30%. Further research should be conducted to identify if the topics of stroke pain were addressed in the clinical setting, as some stroke survivors have noted being unaware that occupational therapists were able to address the concerns of psychosocial needs (Wenzel et al., 2021).

One participant reported that an ultimate strength of learning activities and methods in the program was that it encouraged students to practice their delivery and communication when addressing pain, particularly noting that *"sounding confident is a frequent problem students experience during their fieldwork experience".* This finding reflects the importance of fostering skills of emotional intelligence, a concept in the literature closely related to self-efficacy. Andonian et al. (2013) found that emotional intelligence in OT students was related to implementing client-centered interventions, further supporting the results from the project that educational programs should incorporate structures and methods that allow students to practice emotional regulation skills that can help enhance overall clinical self-efficacy.

In the context of enhancing clinical self-efficacy among doctoral-level OT students, the results found that the sample had a dominant preference for active learning methods. Additionally, increased emphasis on discussing current literature was seen as beneficial for improving educational effectiveness. While this aspect was verbally integrated into the program, one participant suggested that incorporating dedicated learning activities focused on discussing specific case studies related to stroke pain found in the literature may help enhance the learning experience. This recommendation aligns with the chosen theoretical frameworks for this project, as the Adult Learning Theory and Constructivism theory suggest that learners may have an advanced level of desire to develop knowledge by making connections through what is known. As the participants have not experienced the stroke pain conditions themselves, they aimed to

establish a stronger connection with the concepts by understanding the contextual factors that surround an individual beyond their condition.

Section Eleven: Limitations

Despite the insights gained from this capstone project, it is essential to acknowledge the limitations that exist. The educator of the pain series and the author of this topic were also an attendant of the same program, which may potentially increase the participant bias when providing feedback. However, steps to reduce bias and ensure anonymity were taken by assigning participant identification numbers in the first session. Some students may have recent experience regarding the content of the program and interventions learned based on their current years of experience in the program. For example, first-year students may have recently learned about stroke or stroke interventions due to the timing of their curriculum, while second-year students in the program are currently in their pediatric courses. Additionally, static case studies, such as the ones used in the pain series, may have limited potential to combine multiple learning methods and increase the variation of clinical reasoning among students. Although the educator chose not to implement this due to the short duration of the program, utilizing unfolding case studies with a longer course may be more effective in enhancing learning and student clinical self-efficacy.

Another limitation of this project was the lack of randomization and a control group. The project was also not intended to gather research data to make inferences on the general population but rather to collect feedback responses, thus further limiting the generalizability of the results. Additionally, the primary method of feedback collection in this program, the PFQ, lacked validity and reliability as it was created by the author of this project with the intent to gather unique responses based on specific program feedback. However, the study followed established methods found in the literature for protocol on creating feedback questionnaires to best capture participant responses.

The methods of data collection also mainly relied on subjective responses to measure program effectiveness and clinical self-efficacy. As there were no assessments to measure the level of knowledge gained from the program, such as a knowledge check in the form of a quiz or test, the concept of clinical self-efficacy highly relies on the participant's perception rather than objective scoring. Participants who naturally feel confident in themselves as students, for example, may have higher scores in self-efficacy than students who lack confidence. This may increase the inability to capture clinical self-efficacy based on actual skill or performance but rather on internal self-esteem or perceived self-confidence.

Section Twelve: Conclusion

The results from this found that the primary use of manual application and role-playing blended with methods such as case studies, and didactic lectures should be included in an education program that teaches pain management for OTD students to increase clinical self-efficacy for a specialized population or condition. While these teaching methods have been widely adopted in academia, the literature review of this project suggests that there is limited knowledge on how the methods can bridge the knowledge gaps identified in OTD program pain management education. Incorporating a variety of topics into pain management education for a specific condition with the uses of manual application, role-playing, case studies, and didactic lecture can help students feel more confident in applying their education in the clinical setting. Condensed courses, such as the pain series in this project, may be feasible to implement for students who have an interest in specializing in various populations. These results provide insight into how to enhance the learning experience in a way that increases clinical self-efficacy for OTD students. Due to the limited generalizability of this project, further research at a larger scale should be conducted to increase generalizability and inform future occupational therapy doctorate curricula.

Implications for Research

The findings from the results can help inform future curricula, instructional methods, and pain education in several ways for OTD programs. First, students prefer primarily practical or manual application methods in combination with other methods, such as case studies or role-playing, to achieve a level of enhanced clinical self-efficacy when implementing interventions. Further studies that intend to understand the OTD student learning process should explore ways to replicate experiential learning, such as the environment of fieldwork or other clinical

opportunities, within the classroom. Although this project used static case studies due to their shorter structure, pain courses may benefit from using unfolding case studies embedded into their curriculum to mimic the multi-dimensional and evolving nature of realistic painful conditions. Second, students prefer a variety of content that helps expand their knowledge base for a specific condition or population while incorporating the occupational therapy processes. Because the scope of OT allows clinicians to treat all spectrums of pain, a well-balanced structure is divided among the various dimensions. However, educators must build the content in a way that is not too broad but rather descriptive to provide students with sound knowledge of the material, giving them more chances to stimulate and develop their clinical reasoning. Finally, addressing special conditions when teaching pain in the OTD curriculum may be effective for enhancing self-efficacy. Although addressing general chronic pain is helpful for knowledge, students may benefit from an in-depth understanding of the condition that causes specific pain to generate more individualized treatment plans, thus enhancing their clinical reasoning and optimizing client outcomes.

Implications for Practice

A foundation of educational programs is to help teach knowledge and foster an increase in self-efficacy when applying skills. Advancing initiatives for pain education may help students feel more prepared for future fieldwork rotations and continuously evolve their skills as new clinicians. Increased clinical self-efficacy can advance specialization and knowledge in the clinical setting, thus increasing awareness and advocacy for the profession as a whole and making occupational therapists a crucial component of pain management interdisciplinary teams.

Appendix A: Program Feedback Questionnaire

IRB #UNLV-2023-493

Thank you for your participation in the Pain Series for Stroke educational program. This educational series is a quality improvement project intended to educate doctoral occupational therapy students about stroke pain and pain management interventions. The purpose of the questionnaires taken by participants is to gather feedback on the appropriate program methods, content, or structure needed to increase student self-efficacy when implementing interventions related to stroke pain. Your identity will remain anonymous after completing the questionnaires. Your participation is voluntary and you may choose to withdraw at any time.

The principal investigator of this quality improvement project is Dr. Donnamarie Krause who will oversee the procedures of this project. Please forward any questions to donnamariekrause@unlv.edu or to jittpa1@unlv.nevada.edu.

Please proceed to the questionnaire if you have read the statements above and consent to move forward with your participation.

Please verify and enter your participant identification number below.

_____

Q1. Please select the teaching methods you found valuable to your self-efficacy for implementing stroke pain interventions.

- Didactic lecture
- Discussion
- Case studies
- Manual application
- Role-playing
- Supplementary Materials

Q2. Please rank the selected teaching methods chosen from most valuable to least valuable in descending order (ex. ranking #1 is the most valuable).

_____ didactic lecture
_____ discussion
_____ case studies
_____ manual application
_____ role playing
_____ supplementary materials

Q3. Please describe your reasoning for selecting the most valuable teaching method.

Q4. Please describe your reasoning for selecting the least valuable teaching method.

Q5. The teaching methods were appropriately paired with the content being educated.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q6. Please describe how the teaching methods can better align with the content being educated to improve the quality of this program.

Q7. Please select the following content that you found valuable to your self-efficacy for implementing stroke pain interventions.

- Pain communication
- Musculoskeletal pain, neuropathic pain, and psychological pain
- Stroke education
- Knowledge and application of interventions
- Clinical assessments and examination for stroke pain
- Treatment planning

Q8. Please rank the following content from most valuable to least valuable in descending order (ex. #1 ranking is most valuable).

_____ pain communication

_____ musculoskeletal pain, neuropathic pain, and psychological pain
_____ stroke education
_____ knowledge and application of interventions
_____ clinical assessments and examination for stroke pain
_____ treatment planning

Q9. The information presented for this session was structured in an organized manner.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q10. The content being educated in this session enhanced my knowledge for the program topic

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q11. The instructor demonstrated adequate knowledge and understanding of the topics being taught.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q12. The duration of each session was appropriate for the content being taught.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q13. Please identify the overall strengths of the program.

Q14 Please identify further areas of improvement for the program.

Q15. Please share other additional feedback or comments you may have regarding the program.

Appendix B: **Modified Physiotherapist Self-Efficacy Questionnaire**

IRB #UNLV-2023-493

Thank you for your participation in the Pain Series for Stroke educational program. This educational series is a quality improvement project intended to educate doctoral occupational therapy students about stroke pain and pain management interventions. The purpose of the questionnaires taken by participants is to gather feedback on the appropriate program methods, content, or structure needed to increase student self-efficacy when implementing interventions related to stroke pain. Your identity will remain anonymous after completing the questionnaires. Your participation is voluntary and you may choose to withdraw at any time.

The principal investigator of this quality improvement project is Dr. Donnamarie Krause who will oversee the procedures of this project. Please forward any questions to donnamariekrause@unlv.edu or to jittpa1@unlv.nevada.edu.

Please proceed to the questionnaire if you have read the statements above and consent to move forward with your participation.

Please verify and enter your participant identification number below.

_____

Please select the fieldwork settings (level I) that you have completed with the adult population during your time in your doctoral program.

- Acute care
- Inpatient rehabilitation
- Outpatient hands
- Outpatient neuro
- Skilled nursing facility
- Emerging areas of practice
- Home health
- Community-based
- Other
- Have not yet completed a FW experience with the adult population

Please select the fieldwork settings (level II) that you have completed with the adult population during your time in your doctoral program.

- Acute care
- Inpatient rehabilitation
- Outpatient hands
- Outpatient neuro
- Skilled nursing facility
- Emerging areas of practice
- Home health
- Community-based
- Other
- Have not yet completed a FW experience with the adult population

Q1. I feel educated in occupational therapy's role in pain management for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q2. I feel adequately prepared to address pain for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q3 I feel that I am able to educate clients about pain-related conditions that can occur after a stroke.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q4 I feel that I am able to educate clients about pain management after a stroke.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q5 I feel that I am able to verbally communicate effectively and appropriately for a stroke client experiencing pain.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q6. I feel that I am able to perform assessments or examinations related to pain for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q7. I feel that I am able appropriately perform pain interventions for neuropathic pain for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q8 I feel that I am able appropriately perform pain interventions for musculoskeletal pain for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q9. I feel that I am able appropriately perform pain interventions for psychological pain (depression, anxiety, or other mental health concerns) for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Q10 I feel that I am able to create a treatment plan that addresses pain for a stroke caseload.

- Strongly disagree
- Somewhat disagree
- Neither agree nor disagree
- Somewhat agree
- Strongly agree

Appendix C: Recruitment Flier

UNLV

DOCTORATE OF OCCUPATIONAL THERAPY

PAIN SERIES FOR STROKE

EDUCATIONAL PROGRAM FOR OTD STUDENTS

Sign up to learn about pain management education and interventions for the stroke population

Participants must...

- be 18 years and older
- attending an OTD program in Southern NV
- be English speaking
- have technology access for participation

Participants will...

- attend 1 session of 2 hours followed by a 2nd session of 3 hours
- learn various topics related to stroke pain
- receive a $10 visa gift card for completion

IRB #UNLV-2023-493

For more information, contact:

Donnamarie Krause, PhD, OTR/L
donnamarie.krause@unlv.edu
and
Apasara Jittprasert, OTD/S
jittpa1@unlv.nevada.edu

INTERESTED IN JOINING?
SCAN HERE

Appendix D: Interest Form

Pain Series for Stroke Interest Form
IRB #-2023-493

Thank you for your interest in participation for the Pain Series for Stroke program!

This education program asks for a total commitment of 5 hours, requiring participants to attend 2 separate sessions. The first session of the program will last for 2 hours, while the second session of the program will last for 3 hours.

This form will be used to identify interested and qualified participants. If you are selected as a participant, a follow-up email will be sent to confirm further scheduling details.

1. **Are you interested in becoming a participant in the Pain Series Program?**

o Yes

o No

2. **Are you a current OTD student?**

o Yes

o No

3. **Are you enrolled in an OTD program in the Southwest Region?**

o Yes

o No

4. **If you are selected to participate, will you have access to technology (laptop, tablet, etc.) required for program participation?**

o Yes

o No

5. **If you are selected to participate, will you have access to technology (laptop, tablet, etc.) required for program participation?**

o Yes

o No

6. **Please select your preferred availability to participate in the program.**

Appendix E: Definitions

Occupational Therapy

Conceptual definition: “Therapy based on engagement in meaningful activities of daily life (such as self-care skills, education, work, or social interaction) especially to enable or encourage participation in such activities despite impairments or limitations in physical or mental functioning” (American Occupational Therapy Association, 2020)

Operational definition: “A profession eligible to treat pain within stroke patients through various types of interventions targeted towards physical and emotional health”

Musculoskeletal Pain

Conceptual definition: “Pain originating or relating from the musculature and skeletal system” (Civelek et al., 2016)

Operational definition: “Pain relating to the muscles, bones, ligaments, tendons, joints, or other elements of the musculoskeletal system caused by a stroke”

Neuropathic Pain

Conceptual definition: “Damage, disease, or dysfunction of one or more nerves, especially of the peripheral nervous system, that is typically marked by burning or shooting pain, numbness, tingling, or muscle weakness or atrophy, is often degenerative, and is usually caused by injury, infection, disease, drugs, toxins, or vitamin deficiency (Klit et al., 2009)

Operational definition: “Pain characterized by symptoms of burning, shooting, tingling pain, or peripheral pain that is at times an unexplainable feeling or phenomenon”

Pain

Conceptual definition: “A localized or generalized unpleasant bodily sensation or complex of sensations that causes mild to severe physical discomfort and emotional distress and typically results from bodily disorder (such as injury or disease)” (Merriam-Webster, n.d.)

Operational definition**:** “A physical or psychological feeling of an uncomfortable sensation that may cause disturbances to daily routine, occupational performance, or occupational participation”

Pain Management

Conceptual definition: “Regulation of pain through medications, procedures, or other forms of therapy” (Merriam-Webster, n.d.)

Operational definition: “Regulation of pain through various strategies developed by an assessment of an individual’s functional habits”

Pain Intervention

Conceptual definition: “Treatment for individuals suffering from symptoms of pain-related factors” (Reyes & Brown et al., 2015)

Operational definition: “A nonpharmacological intervention given to those who experience musculoskeletal, neuropathic, or psychological pain in order to assist in alleviating feelings of discomfort or stress”

Physical Agent Modalities

Conceptual definition: “Passive treatments used for various types of pain (Honda et al. 2018)

Operational definition: **“**Method of treatment including nerve stimulation or thermal agents used to address neuropathic or musculoskeletal pain”

Psychological pain

Conceptual definition: “Perception of negative changes in the self and its functions that are accompanied by negative feelings (Orbach et al., 2003)

Operational definition: “Emotional or mental feelings of stress, anxiety, or depression caused by the damage from a stroke”

Self-Efficacy

Conceptual definition: “Individual’s belief in their ability to organize and implement action to produce desired outcomes (Domenech-Betoret et al., 2017)

Operational definition**:** “A student’s belief that they have all the necessary skills and education needed to perform a pain management intervention as measured by the Modified Physiotherapist Student Self-Efficacy Scale”

Stroke

Conceptual definition: “Neurological medical condition that occurs when the blood supply to a part of the brain is disrupted” (Donkor, 2018)

Operational definition: “A condition that leaves individuals with chronic deficits in function, in addition to acute or long-term experiences of physical and emotional pain that affects well-being and quality of life”

Teaching Method

Conceptual definition: “Strategy of educational method used to convey learning and knowledge” (Scaffa & Wooster, 2004)

Operational definition: “Effective strategies of educational methods used in curriculum to educate OT students on pain management education and foster self-efficacy

Appendix F: Supplementary Materials I

Mirror Therapy

Overview

Mirror therapy is used to improve motor function and reduce pain for individuals with neurological conditions. The technique utilizes a mirror to create a visual illusion that the affected limb is moving in a typical and painless manner while watching the reflection of the unaffected limb.

How does it work?

Visual Feedback

Mirror neurons are activated when the brain observes movements of the sound limb through reflection, contributing to the brain's perception of movement in the affected limb

Neuroplasticity

Providing positive feedback through mirror reflections stimulates neural plasticity or "rewiring" of the sensorimotor cortex of the affected limb

Pain Modulation

Feedback generated can disrupt the pain cycle and provide pain relief in the affected limb, in addition to restoring motor function

Benefits to Clinical Practice

Functional Approach

Can be used to replicate patterns and movements involved activities of daily living in order to promote independence

Easy Administration

Can be taught to clients with ease in order to encourage independent practice in the home-based setting or used as a preparatory method

Accessible

Considered an inexpensive and non-invasive approach for a wide range of client populations

References: Pervane Vural et al., (2016) "Effects of Mirror Therapy in Stroke Patients With Complex Regional Pain Syndrome Type 1: A Randomized Controlled Study"
Jaafar et al., (2016) "Mirror Therapy Rehabilitation in Stroke: A Scoping Review of Upper Limb Recovery and Brain Activities"

Appendix G: Supplementary Materials II

ELECTRICAL STIMULATION FOR PAIN

Transcutaneous Electrical Nerve Stimulation (TENS)

The TENS unit is a type of physical agent modality that provides temporary pain relief through electrical stimulation. Based on the gate control theory, the application of electrical currents is theorized to modulate the brain's perception o pain and interfere with the transmission of pain signals to the brain.

Electrodes are placed on the surface area of the skin to surround a region of pain and send pulses into the body to initiate the pain modulation process. The intensity of the signals can be adjusted to the right parameters to ensure safe and adequate pain relief.

TENS Use

- Manage musculoskeletal or neuropathic pain
- Use as a preparatory method or in conjunction with other functional techniques
- Acute or chronic pain

Contraindications

- Seizures or epilepsy
- Pregnancy
- Pacemaker
- Cancer
- Open wounds or infection of the skin

References

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Appendix H: Supplementary Materials III

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Curriculum Vitae

Apasara Jittprasert
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Education

University of Nevada, Las Vegas

Occupational Therapy Doctorate (OTD) *(May 2021 - Present)*

Bachelor of Science in Healthcare Administration *(Aug 2016 - 2020)*

Teaching & Mentoring Experience

University of Nevada, Las Vegas

SAMHSA Mental Health Grant - *Suicide Prevention Trainer* *(May 2023 – Sept 2023)*

- Conduct "Question, Persuade, Refer" suicide prevention trainings for university population
- Deliver educational lectures for mental health coping strategies and substance abuse awareness
- Educate campus community on at-risk populations and community resources through lecture and marketing strategies

University of Nevada, Las Vegas

Occupational Therapy Doctoral Program - *Student* *(August 2021 - present)*

OCT 764: Teaching and Learning

- Created and implemented mock curriculum syllabus, lectures, and learning activities
- Developed an academic teaching portfolio composed of personal and professional development plans

University of Nevada, Las Vegas

Center of Academic Enrichment & Outreach - *Program Specialist* *(Jan 2022 - May 2023)*

- Mentored a caseload of 80 students per semester to provide academic counseling and career planning guidance
- Provide scholarly feedback for scholarship essays and graduate school applications
- Develop and facilitate educational workshops to promote professional development skills and career exploration

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Research Experience

University of Nevada, Las Vegas
Occupational Therapy Doctoral Program - *Student* *(August 2021 - present)*

Capstone Project
- Developed quality improvement project and created an educational program designed to teach pain management approaches for stroke population to adult learners

Capstone Experience
- Developed inservice projects relating to occupational therapy pain management for organizational use at Valley Health Specialty Hospital

University of Nevada, Las Vegas

School of Public Health - *Graduate Research Assistant* *(August 2021 - January 2022)*

- Constructed survey questions to pilot for quantitative study on COVID-19 Vaccine Hesitancy within university population
  - Contribute to literature review and drafting portions of manuscripts
- Collaborate with university faculty, graduate students, and Southern Nevada Health District to gather input and data on related COVID-19 vaccination and contact tracing efforts

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Honors & Awards

University of Nevada, Las Vegas

Recipient of the Guinan & Gerstenberger Endowed Internship Scholarship ● Qualified through exceptional healthcare administration internship experience

Recipient of the Roland Sottero Endowed Scholarship
- Qualified through scholarship essay on ethnic health disparities and outstanding academic performance

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Affiliations

Student Occupational Therapy Association - *Social Activities Representative*
American Occupational Therapy Association - *Member*

References available upon request