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## Abstract

*Background:* Chronic pain and resultant disability can persist long after tissue healing. Past research suggests educating individuals about chronic pain is efficacious in changing knowledge, health beliefs, and healthcare utilization. This study piloted an educational intervention to teach participants about the nature of chronic, nociplastic pain.

*Design:* Pre-post study using three groups: occupational therapy (OT) practitioners, OT students, and lay people.

*Methods:* Participants rated their agreement with four statements pre-intervention regarding the relationship between chronic pain, tissue damage, and activity performance to ascertain accurate knowledge. Participants were presented with studies comparing acute and chronic pain and acknowledging that some people have chronic pain after tissues heal. The intervention lasted approximately fifteen minutes.

*Results:* Eleven OT practitioners, 11 OT students and 18 lay people participated. The entire cohort demonstrated improvements with each statement post-intervention. Lay people demonstrated statistically significant improvements in three statements, OT students in two statements, and none for OT practitioners. OT practitioners demonstrated significantly higher pre-intervention knowledge than students in two statements and lay people in one statement. Lay people had the lowest accurate knowledge pre-intervention, demonstrated by a composite score, but made the greatest improvements post-intervention.

*Conclusion:* This educational program shows promise as an intervention to educate individuals including potential patients, current students, and practicing clinicians about the nature of chronic, nociplastic pain and to address potential incorrect health beliefs regarding pain. The program was brief, included multiple stakeholders, and included easy-to-understand language all key components of successful knowledge translation.



## Keywords

Chronic pain; nociplastic pain; education program

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## ABSTRACT

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## Pilot Study Evaluating a Brief Chronic Pain Education Program in Occupational Therapy Practitioners, Occupational Therapy Students, and Lay People

Pain is a primary reason adults seek medical care (Cohen et al., 2021). Acute pain, which arises as a response to tissue damage or bodily inflammation, plays an evolutionary role for survival. Nociception occurs when the nervous system is activated by noxious stimuli, alerting us to pay attention to the damage or potential damage and allow for rest and healing (Cohen et al., 2021). However, many individuals experience pain long after the tissues have healed and inflammation has subsided, turning an acute pain sensation into a chronic disease state (Cohen et al., 2021; Fitzcharles et al., 2021). Chronic pain is defined as "pain that persists past normal healing time and hence lacks the acute warning function of physiological nociception, lasting more than 3-6 months" (Treede et al., 2015, p. 1003) and has multiple diagnostic categories in the International Classification of Disease, 11$^{th}$ edition (ICD-11) (Treede et al., 2015). Estimates of chronic pain note a prevalence of 20% of the population in the United States (Zelaya et al., 2020) to 30% worldwide affecting millions of people with billions of dollars in healthcare expenditures (Cohen et al., 2021). Of the estimated 20% of Americans living with chronic pain, 7.4% of them have pain that is disabling (Zelaya et al., 2020).

People living with chronic pain experience limitations and disability in work performance, social roles, community participation, leisure activities, self-care, and sexual activities (Robinson et al., 2011). Moreover, the prevalence of people living with chronic pain is apparently increasing (Zelaya et al., 2020). Traditional management of chronic pain often included opioids due to the prevailing thought among clinicians that any treatment that does not fully eradicate pain is inadequate (Santiago, 2022). Researchers recently estimated 15% of people living with chronic pain in the United States use opioids (Groenewald et al., 2022). However, an overreliance on pharmaceutical management or using pharmaceuticals as the primary intervention has led to a worldwide opioid misuse of upwards of 30% of users (Cohen et al., 2021), with strong clinical opinion and regulatory backlash as a result (The Lancet, 2021). Opioids are warranted for a few chronic pain conditions, such as cancer, but for many others, it is no longer considered best practice (Cohen et al., 2021).

Anecdotally, clinicians note a weak association between objective tissue damage and chronic pain complaints. For example, there is a poor correlation between the degree of radiographic evidence of degenerative osteoarthritis and degree of subjective pain (Tucker, 2011). Contemporary understanding of chronic pain moves away from the thought that it arises from ongoing structural damage and towards an appreciation of chronic pain as a product of abnormal nerve signaling (The Lancet, 2021) and/or individual differences in pain sensitivity (Tucker, 2011). Chronic pain arises from unique alterations to the sensory pathways in either the central nervous system (CNS), peripheral nervous system (PNS), or both (Cohen et al., 2021; Fitzcharles et al., 2021). The International Association for the Study of Pain (IASP) distinguishes three types of pain: nociceptive, neuropathic, and nociplastic pain, with many, but not all, chronic pain conditions falling into this third category (Ayedede, 2018; Fitzcharles, et al., 2021). Nociplastic pain is "pain that arises from altered nociception despite no clear evidence of actual or threatened tissue damage causing the activation of peripheral nociceptors or evidence for disease or lesion of the somatosensory system causing the pain" (IASP website, n.d.), or more simply, "pain that arises from altered nociceptive function" (Ayedede, 2018, p. 1176). It is important to note that these pain categories are not mutually exclusive, and nociplastic pain is possible in the presence of clinical signs or biomarkers for either nociceptive or neuropathic pain (IASP website, n.d.) and should be considered as part of a chronic pain continuum (Fitzcharles et al., 2021).

Given both the documented overreliance on opioids to eradicate pain and the new understanding of chronic pain sensation mechanisms in the body, patients and clinicians alike need

revised approaches to manage and treat chronic pain (Cohen et al., 2021; Groenewald et al., 2022). Patients who experience pain desire to learn more about their pain and how to return to normal (Bhana et al., 2015) but not necessarily the technicalities involved with anatomy and physiology (Louw, et al., 2016a). Furthermore, using language that emphasizes pathology, such as medical test results, may cause fear and anxiety in patients (Louw, et al., 2016a). Educating patients on the nature of chronic pain in an easy-to-understand manner is an efficacious approach, often referred to as Pain Neuroscience Education (PNE) (Cooper et al., 2022; Louw, et al., 2016a; J.A. Watson et al., 2019; S. Watson et al., 2022) or Explaining Pain (Moseley & Butler, 2015). Previous research also demonstrates participants' willingness to engage in pain education, noting that pain education is believable, helpful, and the participants would recommend to another person in pain (Rufa et al., 2019). In this study, we elected to use lay people as compared to current chronic pain patients to explore whether simple education materials are effective in individuals without a healthcare background. Studies also show that teaching a lay audience, irrespective of their complaints of chronic pain, about pain science increases knowledge (Cooper et al., 2022).

Interestingly, despite noting weak relationship between objective tissue damage and their patients' subjective pain ratings, clinicians rely on interventions intended to heal body structures to treat chronic pain. This focus on remediation of tissue damage may be due to ongoing belief in what causes a patient's pain (Stern et al., 2021) or cemented beliefs in current practice patterns with minimal regard to evidence (Grajo et al., 2020). Therapists may be aware of their lack of expertise but unsure how to fill this knowledge gap (Najem et al., 2023). Allied health students continue to be trained to treat chronic pain as a dysfunction of body tissues with biomechanical interventions as the gold standard (Nijs et al., 2013; Najem et al., 2023) and most have never been introduced to pain neuroscience education (Louw et al., 2017). In turn, patients adopt knowledge that chronic pain is related to tissue damage and should be solely treated by interventions to remediate and heal (Nijs et al., 2013). Given their demonstrated need for improved knowledge and evidence-informed chronic pain interventions, both practicing clinicians and future clinicians may benefit from similar education techniques that have been used successfully to introduce pain neuroscience to patients.

The purpose of this study was to 1) pilot a brief program to educate lay people, registered occupational therapists, and occupational therapy (OT) students about chronic, nociplastic pain; 2) to evaluate participants' chronic pain knowledge before and after program; and 3) investigate whether the education program mitigated potential differences in knowledge among these groups.

## Method

This pilot study used a pre-post intervention design with three groups. The Institutional Review Board approved this research project under the 2018 Common Rule Exempt Category of Benign Behavioral Interventions, protocol #202010059.

### Participants

English speaking adults were recruited from a convenience sample of individuals affiliated with the research institution or acquainted with a research team member: registered occupational therapists, OT graduate students, and lay people. The entire first year student body and all registered occupational therapists employed by the institution were sent a recruitment email explaining the study. To recruit lay people, members of the research team reached out to their acquaintances, who they knew did not have a professional chronic pain management background or training in OT. Interested students, therapists, and lay people contacted a study team member, study procedures and consent were discussed in detail per approved exempt study information sheet, and the intervention session was scheduled. All sessions

were held via Zoom (Zoom Video Communication, Inc., San Jose, CA) as this research occurred during the COVID-19 pandemic.

**Procedures**

Similar procedures and outcome measures were previously developed and refined through feedback as a teaching method in coursework by the senior author. The intervention session began by assessing the participant's beliefs about pain by rating their level of agreement (strongly disagree, disagree, slightly disagree, slightly agree, agree, and strongly agree), with the following statements.

1. A more intense pain correlates to more tissue damage in your body. (abbreviated pain-damage)
2. It is safe to perform everyday tasks when you are experiencing pain. (abbreviated tasks-pain)
3. It is possible to have significant pain without evidence of tissue damage on medical tests. (abbreviated pain-tests)
4. After an injury, you should adjust your activity level based on the amount of damage found on medical test. (abbreviated activity-tests)

To help the participants form a picture of what life with chronic pain may look like, the researcher read a scripted case study describing an individual slipping on the ice, falling onto their back, and experiencing severe back pain that prevents work, leisure, or household activities eight months after injury despite unremarkable medical tests (Figure 1). Then the researcher presented the more common experience of the acute pain after of a broken arm. They explained the difference between acute and chronic pain using visuals demonstrating how the levels of pain, tissue damage, and disability correlate with acute pain, but not chronic pain (Figure 1). The researcher provided brief education on the neurological system and the disconnected nature of pain, tissue damage, and disability with chronic pain. The researcher did not engage in extraneous conversation during the intervention. Immediately after the intervention participants re-rated their agreement with the four statements asked pre-intervention. This method was chosen to avoid burdening the respondents with another call, email, or written survey during the COVID-19 pandemic.

**Figure 1**

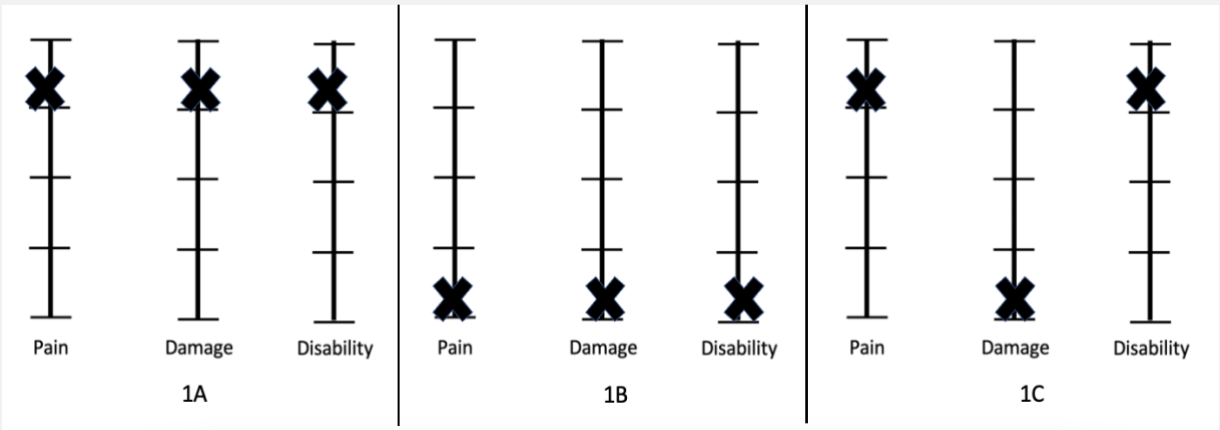
*Scripted Intervention and Diagrams Shown to Participants*

Imagine you are in the following scenario. After a long day at working as a waiter at a restaurant, you receive a phone call from your roommate saying they tested positive for COVID-19. Thinking you've likely been exposed, you head home stressed out. As you get out of your car, you slip on an ice patch and lose your footing, falling hard on your back. After heading inside to talk to your roommate, you work that week. After a visit to the doctor's office, your doctor indicates that everything looks normal in the exam and the X-rays, and that nothing seems wrong, despite your terrible back pain. Days turn to weeks, and weeks turn to months, as your back pain hasn't seemed to improve much. You've been let off from your job as a waiter, cleaning your house has become nearly impossible, you cannot play in your local basketball recreation league anymore, and even driving has become a massive burden, as the only thing you feel like you can do is lay down. You now realize your life has been turned upside down by the pain that arose from just tweaking your back. It's been 8 months now, and you've moved back in with your parents and are not working.

When someone experiences pain, it's usually because a specific part of their body has been injured. For example, if you break your arm, you'll feel a spike of pain, which will last for a good amount of time. During that same time frame, there will be some physical damage to your arm that can be seen in an x-ray. You also wouldn't be able to participate in a lot of activities. (Figure 1A is shown to participant.) So right after you broke your arm, your pain is likely really high because there is a lot of damage done to the bone and other structures. Because of the pain and the damage in your arm, you probably have to wear a cast, and limit certain activities. For example, you wouldn't be able to play basketball or cook meals without trouble. So, your disability level is also high. But over time, you get out of the cast, the bone heals up, and your doctor says you can get back to doing the things you want to do. Your experience of pain, the physical damage, and your disability level have all gone back down to a more normal level. I'm sure you've had this experience of pain in your life, is that true? (Figure 1B is shown to participant.) This is typically people's experience of pain. They get hurt, they can't do as much, they heal after some time, and get back to doing what they do. You probably have experienced this pain before, right?

The problem is that it's not always like this. Sometimes, the system in the body that processes pain goes haywire. Something small that causes little to no physical damage, still causes your pain to spike up as if you just broke your arm. Despite your doctor telling you there's nothing physically wrong, you're still in a load of pain, and can't do your normal activities. So, your disability level on the chart goes up, even though there isn't much physical damage. (Figure 1C is shown to participant.) Think back to the scenario earlier with the back pain that went on for a long time. The pain was so debilitating, but the doctors didn't find anything wrong. While you may not have experienced this odd pain situation before, it can be extremely difficult for people who experience it. Their whole lives can get completely turned upside down, like in the scenario from earlier. Often people begin to think that all this pain is just all going on inside their head, and that it's not real pain. But that isn't true, its real pain happening in the body. It's just in a system in the body that we don't have a good way of measuring. It's called the neurological system, or the pain system. This system carries messages about pain throughout your body up to your brain. In these weird instances, where someone experiences pain without any real damage, it's this system that gets impacted. Do you think this would be tough to handle and work through?

This is where occupational therapy can step in and help someone live their life with this pain system out of whack. We can help someone begin to resume some of the things they used to do. This can look different with each person, but OT ultimately helps to reintroduce activity back into someone's life. We can't guarantee you'll never experience pain again, but we can help you feel like you can start to live your life again.




**Statistical Management and Analysis**

Data were entered into a Research Electronic Data Capture (REDCap) Database (Vanderbilt University, Nashville, TN) on a secure university server. Ratings were assigned points from 1-6 as follows: strongly disagree-1 point, disagree-2 points, slightly disagree-3 points, slightly agree-4 points, agree-5 points, and strongly agree-6 points. The mean score was computed for each statement for the entire sample and each of the three study groups. Pre-post changes were analyzed using Wilcoxon Signed Rank Test. Group scores for each statement were compared using Kruskal-Wallis test with Bonferroni correction with $p \leq 0.05$ with *post-hoc analysis.* Composite scores were computed by summing the scores for the four statements, with statements one and four reverse-scored so higher scores represented more accurate answers for all statements. Wilcoxon Signed Rank Test compared pre-post composite scores. All analyses were performed with SPSS Statistics for Windows, version 27 (SPSS Inc., Chicago, Ill., USA).

**Results**

Forty individuals participated in this study (30 females and 10 males), including 11 licensed occupational therapists, 11 first year OT graduate students, and 18 lay people. The overall mean age of the entire sample was 40. The OT student group's mean age was 24, much lower than the other groups. The Zoom session lasted approximately 15 minutes.

When examining the entire cohort's results, the highest accurate knowledge at baseline was present for statement three, pain-tests (Table 1). The largest improvement after the intervention was noted for statement one, pain-damage. Statistically significant improvements occurred for each of the four statements with p-values ranging from $p < .001$ to $p=.004$.

**Table 1**

*Pre- and Post-Intervention Mean Scores for the Entire Sample and Wilcoxon Signed Rank Test Results, n = 40.*

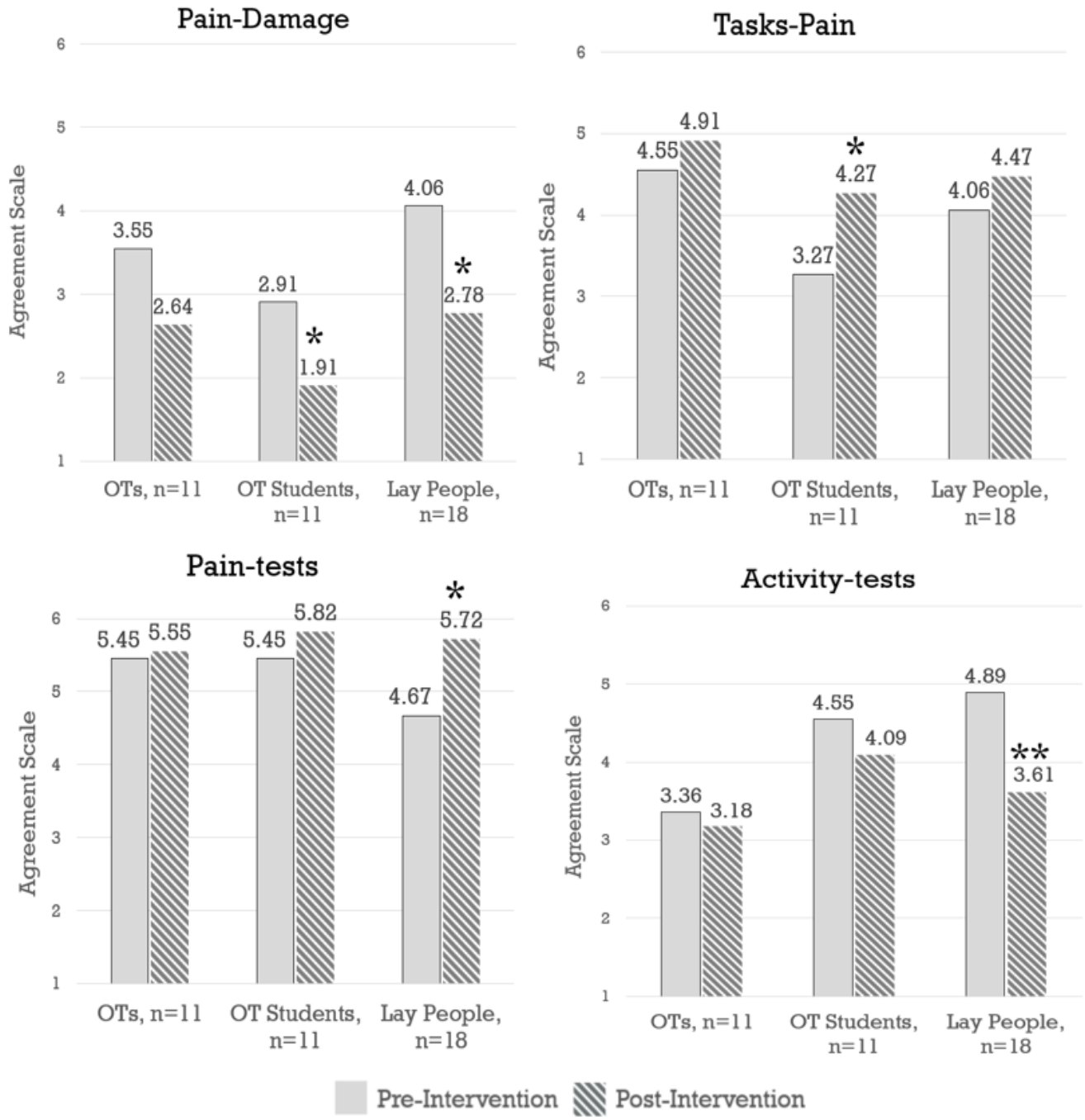
| Statement | Pre | Post | Change | Z score | *p*-value |
|---|---|---|---|---|---|
| 1. A more intense pain correlates to more tissue damage in your body (pain-damage).* | 3.60 | 2.50 | -1.1 | -3.78 | <.001 |
| 2. It is safe to perform everyday tasks when you are experiencing pain (tasks-pain).* | 3.98 | 4.53 | .55 | -2.87 | .004 |
| 3. It's possible to have significant pain without evidence of tissue damage on medical tests (pain-tests).* | 5.10 | 5.70 | .60 | -3.33 | <.001 |
| 4. After an injury, you should adjust your activity level based on the amount of damage found on medical test (activity-tests).* | 4.37 | 3.62 | -.75 | -3.17 | .002 |

*Note: Strongly disagree = 1, disagree = 2, slightly disagree = 3, slightly agree = 4, agree = 5, and strongly agree = 6. *Higher scores on statements 2 and 3 demonstrate more accurate chronic pain knowledge, whereas lower scores on statements 1 and 4 demonstrate more accurate chronic pain knowledge.*

Mean ratings for the three groups for each statement before and after the intervention are demonstrated in Figure 2. Knowledge improved pre- to post-intervention for all statements, with the greatest improvements for the lay people group. Improvements were statistically significant for pain-damage, pain-tests, and activity-tests in the lay people group, pain-damage and tasks-pain in the OT students, and none in the OTs. Prior to the intervention, statistically significant differences among the three groups were noted for the tasks-pain statement, $c^2$ (2, N = 40) = 6.96, $p$ = 0.031 and the activity-tests statement, $c^2$ (2, N = 40) = 9.66, $p$ = 0.008. *Post hoc* analysis indicated that OT practitioners demonstrated more accurate knowledge on the tasks-pain statement than OT students ($p$ = 0.027) as well as more accurate knowledge on the activity-tests statement than both lay people ($p$ = 0.007) and OT students ($p$ = 0.087). No statistically significant differences among the groups' scores were noted post-intervention.

**Figure 2**

*Mean Pre- and Post-Intervention Score for Each Statement by Group and Statistical Significance, n=40.*



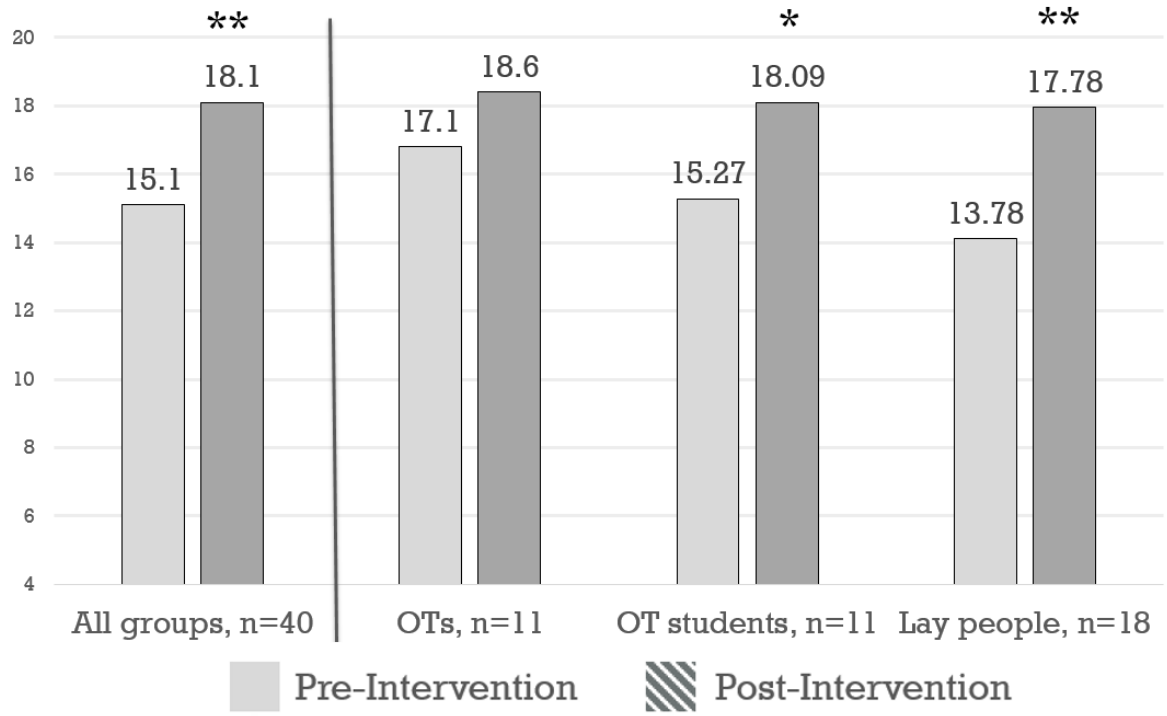

*Note: * p-value ≤ 0.05, **p-value ≤ 0.001, Wilcoxon Signed Rank Test. Strongly disagree = 1, disagree = 2, slightly disagree = 3, slightly agree = 4, agree = 5, and strongly agree = 6. Higher scores on statements 2*

*and 3 demonstrate more accurate chronic pain knowledge, whereas lower scores on statements 1 and 4 demonstrate more accurate chronic pain knowledge.*

Composite scores computed for the four statements are shown in Figure 3, with higher composite scores demonstrating more accurate chronic pain knowledge. The lay people group had the lowest understanding of chronic pain prior to the intervention, yet they made the greatest improvement after the intervention (change score of 4.0) compared to a change of 2.92 for OT students a change of 1.5 for OT practitioners. The entire sample's composite mean score demonstrated statistically significant improvements at $p \leq 0.001$. Statistically significant improvements were noted for the lay people ($p \leq 0.001$) and OT student groups ($p = 0.005$).

**Figure 3**

*Pre- and Post-Intervention Composite Score and Statistical Significance for Entire Cohort and Each Group*




*Note: *p-value = 0.005, **p-value ≤ 0.001, Kruskal-Wallis test with Bonferroni correction with p < 0.05 for multiple tests. Higher composite scores demonstrate more accurate chronic pain knowledge as two items were reverse-scored prior to computing composite score.*

## Discussion

In this study, we successfully piloted a brief education program to three distinct groups of stakeholders: lay people, registered occupational therapists and OT students. We also were able to evaluate participants' chronic pain knowledge before and after education program and explore differences among groups pre and post education. This present study adds to the growing body of literature about knowledge surrounding chronic, nociplastic pain by helping lay people understand it, as

well as educating the clinicians and future clinicians who treat these potential clients. Lay people benefited the most from this study's brief educational intervention, as evidenced by the statistically significant increases in accuracy with three of the four statements after instruction. These positive findings are comparable to past research exploring the effects of educating patients on the nature of chronic pain (Louw et al., 2016b; Rufa et al., 2019; Tegner, et al., 2018). The systematic review performed by Louw and colleagues (2016b) noted that patients receiving education in pain neurophysiology education improved their pain knowledge and decreased disability. In their systematic review of patients with chronic low back pain, Tegner and colleagues (2018) noted pain science education had a small to moderate effect on disability at three months follow-up. An important distinction of this present study is that having ongoing chronic pain (or lack thereof) was not an inclusion/exclusion criterion for participation for lay people. In one systematic review, researchers found that engaging patients with chronic pain in pain education led to decreased healthcare utilization (Louw et al., 2016b). Further research exploring effects of education on chronic pain on future healthcare utilization with individuals with chronic pain is needed.

This study also illustrates limited knowledge regarding chronic pain. Before intervention lay people demonstrated statistically significant lower knowledge for the statement regarding changing activity participation relative to damage noted on a medical test (activity-tests) than licensed practitioners. Health beliefs regarding pain in the general population come from personal experience or experience of close family and friends (Caneiro et al., 2021; Higgins et al., 2015). These health beliefs are often negative and do not promote health (Christe et al., 2021) and may increase long-term disability (Morton et al., 2019), or even increase probability of future pain in other body parts (Elfering et al., 2015). A brief an easy-to-understand chronic pain education program, such as the one presented in our study, may help mitigate the effect of negative health beliefs through increasing knowledge.

OT students demonstrated statistically significant changes in two out of the four statements. Interestingly, students scored the lowest of the three groups pre-intervention on statement two, regarding the safety of performing everyday tasks while experiencing pain. This may speak to the age of the participants in this group; their average age was around 20 years younger than the average age of both lay people and OT clinicians. Like lay people, students' health beliefs are shaped by life experiences (Caneiro et al., 2021). Likely, they have not experienced as much chronic pain in their life as the other two groups, who either drew on personal experience of living life with some pain or in the case of OT practitioners, treated individuals with pain, to rate this statement prior to the intervention. Studies show that educating healthcare students on the nature of pain leads to immediate improvements in knowledge (Mankelow, J. et al., 2020; Talmage et al., 2020; Wassinger, 2021), longer-term increased patient empathy (Mankelow et al., 2020), and increased confidence recommending activity with chronic pain (Mankelow et al., 2020). Literature on the impact of pain science education specifically for OT students remains limited. In one longitudinal study using only OT students, participants demonstrated statistically significant improvements in their pain knowledge following a course addressing pain and pain science, with over 90% of students meeting standards of pain knowledge post-test (Rochman et al., 2013). In our study, we showed an increase in chronic pain knowledge using a brief education program as compared to a full course. Expanded studies using this brief program on OT students in increasing pain knowledge as well as the long-term increased empathy and confidence in recommending activities is warranted.

Lastly, the registered occupational therapists did not demonstrate any statistically significant changes in pain knowledge but were the most accurate pre-intervention for three out of the four statements. OT clinicians draw on clinical experience as well as evidence-based practice to make

recommendations regarding participating in daily tasks and activities for their patients. The OT clinicians in this study were recruited from a convenience sample from our clinical practice division at our university, creating a homogenous group who may or may not have had specific instruction and education on chronic pain sponsored by the institution. Intriguingly, OT clinicians scored worse than OT students with pre-test statement 1, "*a more intense pain correlates to more tissue damage,"* and scored the same on this statement at post-test as lay people and worse than OT students. Researchers have discovered limitations with licensed OT clinicians' knowledge regarding pain and pain science, specifically with differentiation between nociception and subjective pain (Stern & Howe, 2021), directly relating their higher agreement with statement one in our study. In their scoping review, Lagueux and colleagues (2018) reported that OT practitioners trend toward using inappropriate or outdated evidence in working with individuals with chronic pain. In 2016, Reyes and Brown noted that OT clinicians' deficiencies in pain knowledge were relatively unchanged in 20 years. Nijs and colleagues (2013) purport having an accurate belief regarding chronic pain is necessary for effective treatment of patients. These findings continue to suggest that the OT field needs improved education in pain science starting with OT students, and appropriate dissemination of evidence to practitioners to translate this evidence to practice. Similar guidelines may be appropriate for other healthcare disciplines.

A unique feature of this intervention is that it was brief, only lasting 15 minutes, while demonstrating effectiveness, as evidenced by the statistically significant changes recorded for lay people and students. Including our brief intervention in clinical practice or classroom is likely shorter than other studies where the intervention for patients ranged from a single session of 30 minutes (Louw et al., 2019) to multiple sessions of 30-60 minutes (Rufa et al., 2019) or even longer (Louw et al., 2016b, Mosley & Butler, 2015) The single study using OT students employed two, two-hour sessions for their pain science intervention (Rochman et al., 2013). Research exploring the effects of chronic pain education on clinicians' beliefs is more limited, but one study used a 15-hour intensive program for physical therapists (Louw et al., 2017). Because of the shorter nature of our program, it may be easier to implement within a patient treatment session, student classroom or continuing education environment. Additionally, we used visual aids in our intervention, an evidence-based approach to improve health literacy (Mbanda et al., 2021) and promote occupational justice (Grajo & Gutman, 2019).

## Study Limitations

An *a priori* power analysis was not completed due to the pilot nature of this study, likely underpowering to find statistical significance; however, half of the items for the OT students and lay people demonstrated statistical significance at $p \leq 0.05$. This study used a self-designed outcome measure due to no available validated questionnaire at the time of the study that explored participation in the presence of pain. The commonly used and validated revised neurophysiology of pain questionnaire (rNPQ) uses a statement like ours: *"pain only occurs when you are injured or at risk of being injured*" (Catley et al., 2013). Additionally, the recently developed and validated Concept of Pain Inventory (COPI) for Adults includes the similar statement, "*you can feel a lot of pain even when an injury is small"* (Pate et al., 2022). These similarities indicate face validity to our statements regarding tissue damage and level of pain (statements 1 and 3). However, the rNPQ does not include statements regarding return to activity and everyday tasks (Catley et al., 2013). Future studies would benefit from using our outcome measure along with standardized measures for triangulation of data. Lastly, due to the pilot nature of this program, the registered occupational therapists were drawn from a convenience sample from the same institution, limiting generalizability.

## Knowledge Translation Take-away

Knowledge translation is a shared process among many knowledge users (McWilliam, 2007; Perkins, et al., 2020). McWilliam (2007) theorized that successful knowledge translation requires an opportunity for practitioners to integrate their personal knowledge. In this study, the presented scenario included a common experience and reflective questions (e.g., *You probably have experienced this pain before, right?)* to help participants draw from their own knowledge, increasing their engagement. This study was designed by a licensed occupational therapist with extensive clinical practice experience as well as an OT student, where each was able to bring their personal experiences to create an intervention that could be meaningful for these respective participant groups. Clients themselves are a valid and integral part of successful knowledge translation (Banner et al., 2019). While we did not use clients in creating the intervention, we refrained from using jargon or medical terms, a common thread among PNE strategies (Louw, et al., 2017) to improve understanding and buy-in from lay participants.

Moreover, a strong therapeutic alliance, where the client trusts their clinician with their care, is known to improve client outcomes (Leach, 2005). We know that clients will adopt health beliefs of the clinicians (Nijs, 2013), even when the beliefs of the clinician are unhelpful or uninformed (Caneiro, et al., 2021). Considering the documented lack of knowledge in chronic, nociplastic pain in both clients and therapists, it is easy to comprehend why both groups could benefit from the same educational intervention to improve knowledge. Case studies and stories are a common means to deliver pain neuroscience education to patients (Louw et al., 2016b). In this study we elected to create case studies that were brief to overcome some of the previously noted barriers to implementation of evidence-based treatment, such as lack of time or insufficient training by practicing therapists (Bennett et al., 2016; Grajo, et al., 2020). Although completed over Zoom, this was a synchronous intervention, a mode that supports the translation of evidence to practice in OT (Perkins et al., 2020).

In a recent scoping review, researchers identified themes in essential competencies of OT education including engaging in active participation with the client and providing quality service with a focus on evidence-based practices (Chun et al., 2020). The educational intervention outlined in this study provides an opportunity to address both competencies. A scripted dialogue asks questions of the client (e.g., *Do you think this would be tough to handle and work through?)* allowing their input throughout. The scenarios introduce students to the evidence that contrasts chronic pain with the acute pain interventions that address tissue damage that they may be more familiar with (Najem, et al., 2023). Additionally, the use of case studies is a recommended method to overcome the documented lack of opportunities to link evidence to the clinical reasoning process in OT students (Grajo et al, 2020). The American Occupational Therapy Association (AOTA) acknowledged that OT practitioners are distinctly prepared to work independently in the treatment of chronic pain in its recently position paper, which specifically states education in pain science as an evidence-based approach for clients (AOTA, 2021).

Successful knowledge translation needs to include outcomes of the participants (Perkins et al., 2020). In our study, we examined knowledge change through a pre-post design. Future work needs to examine longer-term implementation of chronic pain education of clients in both licensed therapists and students exposed to this intervention.

## Conclusion

The purpose of this study was to pilot a brief chronic, nociplastic pain education program using three groups. It demonstrated effectiveness in increasing knowledge regarding chronic pain, especially in the two groups without ostensible experience treating individuals with chronic pain-OT students and lay people. It also highlighted knowledge regarding chronic pain among the individual study groups, with

own life experience, experience of those around the participants, and personal experience with treating patients with chronic pain playing a role in shaping these beliefs. These findings indicate that expanding this pilot study to larger study groups and beyond a virtual environment is warranted to explore the efficacy of this education program.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