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## **Best Interventions for Working Adults Experiencing Chronic Musculoskeletal Pain**

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## Focus Question

How can working adults holistically alleviate their chronic musculoskeletal pain by engaging in health management through various physical activities to improve their overall quality of life?

## Clinical Scenario

Chronic musculoskeletal pain is defined as ongoing pain felt in the bones, joints, and tissue of the body that persists for longer than three months (Booth et al., 2017; Joelsson et al., 2017). Worldwide, 30% of the population has experienced some form of chronic pain in their lifetime (Guy et al., 2020). When living with chronic pain, it can become difficult for working adults to engage in their everyday occupations such as activities of daily living (ADL), instrumental activities of daily living (IADL), health management, social participation, and leisure (American Occupational Therapy Association [AOTA], 2020). These troubles can affect an individual's performance range by minimizing the number of activities they are able to comfortably participate in. The study by Stubbs et al. (2013) confirmed that older working adults with chronic pain are significantly less active than older working adults without chronic pain. The population of working adults with chronic pain and less physical activity is at risk for experiencing secondary consequences such as fear of movement, fear of falling, pain catastrophizing, anxiety, and nervous system sensitization (Booth et al., 2017; Stubbs et al., 2013).

Health management consists of, “activities related to developing, managing, and maintaining health and wellness routines, including self-management, with the goal of improving or maintaining health to support participation in other occupations” (AOTA, 2020, p. 45). It is then broken down into seven specific activities: social and emotional health promotion and maintenance, symptom and condition management, communication with the health care system, medication management, physical activity, nutrition management, and personal care device management (AOTA, 2020). For the working adult population, physical activity can be a long-term solution to consider as an alternative holistic pain management technique instead of a short-term solution such as medications (Bruckenthal et al., 2009). Physical activity is important to occupational performance because it creates an overall better quality of physical, mental, and emotional health for individuals who experience chronic pain. Examples of physical activity that have been found to help alleviate chronic musculoskeletal pain are yoga, pilates, and water aerobics, all of which can be graded exercises and support a healthy range of motion (Hara et al., 2017; Monson et al., 2017; Shnayder et al., 2018; Tul et al., 2010; Williams et al., 2009).

The type of cultural aspects to consider within the working adult population are individuals' current job positions, their values and beliefs regarding their occupational performance, and their view on holistic care techniques. Other factors to consider include the number of hours the individual works whether it is part-time or full-time, how long the individual has experienced pain within their workplace, and the physical demand the job has on their body. For example, a construction worker and teacher may experience a similar type of pain even though they work in very different environments. Both individuals may work for the same amount of time, but the physical demands on their bodies differ with job positions, and their availability to engage in health management may be limited by outside factors.



## ***Ecology of Human Performance Model***

By looking at the clinical scenario through the lens of the Ecology of Human Performance (EHP), it suggests how occupational therapy intervention can positively impact one's performance range. The EHP model focuses on the performance range of the individual and how their contexts influence it (Dunn, 2017). The factors of this model include the person, task, and context which provides a template of the person's performance range that may be limited due to chronic musculoskeletal pain. There are five intervention approaches including establish/restore, prevent, create, adapt/modify, and alter within the EHP model (Dunn, 2017). The establish/restore intervention approach would be the most effective by attempting to restore an individual's ability to participate in health management through physical activity. An increase in physical activity can then lead to an increase in performance range for other everyday tasks as well. The EHP model was chosen to analyze the before and after-effects of a physical activity-related intervention to increase performance range and ultimately provide a better quality of life for an individual with chronic pain.

### **Purpose statement**

For the purpose of this Critically Appraised Topic (CAT), the occupation of health management will be discussed in-depth in regards to holistically improving the lives of working adults with chronic musculoskeletal pain through physical activity. The evidence found from the articles reviewed will provide ideas and intervention strategies for practicing occupational therapists (OT) to implement with their clients experiencing chronic musculoskeletal pain.

### **Literature Synthesis**

#### ***Search Terms and Limitations***

Several different databases were utilized in order to obtain the appropriate existing literature for this particular topic. Databases included the American Journal of Occupational Therapy (AJOT), Cumulative Index of Nursing and Allied Health Literature (CINAHL), PubMed, Australian Occupational Therapy Journal (AOTJ), Arthritis Care and Research, and Pain Management. CINAHL and PubMed were used because they contained articles for allied health professionals including occupational therapy. The Journal of Hand Therapy was also used to find evidence related to wrist chronic pain. AJOT and AOTJ were both used because they primarily focused on research articles for occupational therapy intervention. From these databases, 17 articles were reviewed that fit the criteria to support the topic of chronic musculoskeletal pain in adults. From the 17 reviewed articles, five of the articles were level I designs including systematic reviews and randomized controlled trials (Bruckenthal et al., 2009; Iverson et al., 2017; Roll & Hardison, 2016; Stubbs et al., 2013; Westby, 2001), one article was level II (Kirsch Michelletti et al., 2019), three of the articles were level III (Koele et al., 2014; McGeary et al., 2006; Shnayder et al., 2018), and nine of the articles were level N/A qualitative designs (Andrews et al., 2018; Gardner-Harbeck & Fisher, 2011; Hara et al., 2017; Iversen et al., 2017; Lötters, F. J et al., 2020; Monson et al., 2017; Tul et al., 2011; Wilcox et al., 2006; Williams et al., 2009).

The articles that were considered for further review had inclusion criteria of publication in English, participants who experienced any kind of chronic musculoskeletal pain, and the main focus of physical activity as intervention. Exclusion criteria included articles that were about



children, cognitive behavioral-focused therapies, and articles that were published over 10 years ago unless they provided relevant information. Articles were excluded that involved any population, not within the typical working age of 18-70 years old. The search terms used to search for relevant literature included “musculoskeletal pain”, “occupational therapy”, and “adults”.

### *Causes of Chronic Musculoskeletal Pain*

**Work-Related.** A key reason for choosing to focus on the working adult population was because of the high prevalence; about 30% of chronic musculoskeletal pain occurrences are related to work injuries (Andrews, 2018; Gardener-Harbeck et al., 2011). Kirsch Micheletti et al. (2019) and Shnayder et al. (2018) expressed that individuals who acquired chronic musculoskeletal pain from their jobs experienced lower life satisfaction, decreased physical activity outside of work, and overall lower productivity in their jobs. Employment in areas that require neck bending, neck twisting, repetitive motion, vibration, static reach/grip, confined spaces, heavy lifting, and demanding physical activity pose a threat to one’s physical health and creates a higher possibility for one to experience chronic musculoskeletal pain (Monson et al., 2017; Shnaydar et al., 2018). Working adults who experienced chronic musculoskeletal pain reported that they considered reducing the number of hours they worked, changing careers and even leaving their area of the profession altogether as a result of their pain (Monson et al., 2017).

Five research studies focused their sample population strictly on working adults, ages 18-70 years old, and how chronic musculoskeletal pain impacts their lives (Gardner-Harbeck & Fisher, 2011; Hara et al., 2017; Kirsch Micheletti et al., 2019; Monson et al., 2017; Shnayder et al., 2018). Inclusion criteria for all five studies included participants being currently employed or participating in educational activities that led to employment and experiencing some form of chronic musculoskeletal pain from work contexts.

Gardener-Harbeck & Fisher (2011) had seven participants in their qualitative study and researchers gathered data through semi-structured interviews. Six of the seven participants disclosed their chronic musculoskeletal pain during the interviews and were given ergonomic recommendations from an occupational therapist for their workstations. Participants reported being more comfortable and productive after receiving ergonomic changes to their work areas (Gardener-Harbeck & Fisher, 2011). A study by Hara et al. (2017,) 222 individuals participated in focus groups to discuss overlapping conditions related to chronic musculoskeletal pain as a result of working environments. Of the participants, 75% reported experienced chronic pain, 79% experienced chronic fatigue and 62% experienced mental distress (Hara et al., 2017). Both qualitative studies concluded that participants who had chronic musculoskeletal pain from work experienced negative impacts on their health and also a decreased productivity in life activities (Gardener-Harbeck & Fisher, 2011; Hara et al., 2017).

Kirsch Micheletti et al. (2019), Monson et al. (2017), and Shnaydar et al. (2018) used more quantitative data gathering approaches. Kirsch Micheletti et al. (2019) conducted a cross-sectional study by sending out a survey to the general working population in Denmark asking about work environments and health. There were 10,427 respondents to this survey, and those who were self-employed or not part of the labor market were excluded. Results from the survey showed that respondents who participated in physical activity, ate fruits and vegetables regularly, and didn’t engage in smoking experienced less chronic musculoskeletal pain (Kirsch Micheletti, 2019). Shnaydar et al. (2018) also conducted a survey that was aimed at understanding the relationship between musculoskeletal pain and life satisfaction for Home Health Aide (HHA)



workers. The HHA participants were also asked about their interest levels in participating in pain-alleviating exercises. The survey was completed by 285 respondents and 46.6% reported experiencing chronic musculoskeletal pain in the last 3 months. The majority of the respondents who experienced chronic pain showed interest in learning more about pain alleviating physical activities (Shnaydar et al., 2018). Monson et al. (2017) conducted a pretest-posttest study where 77 dental hygiene students self-selected if they wanted to be in the experimental group where bi-weekly yoga classes would be implemented or a control group where there would be no yoga classes. Participants in the experimental group reported having a significant decrease in musculoskeletal pain when participating in yoga classes whereas the control group reported having the same amount of musculoskeletal pain as from the beginning of the study (Monson et al., 2017). These three quantitative studies all yield similar results by providing evidence that work-related chronic musculoskeletal pain has negative impacts on one's life and that there are holistic practices available to treat chronic musculoskeletal pain such as physical activity (Kirsch Michelletti et al., 2019; Monson et al., 2017; Shnaydar et al., 2018).

**Arthritis.** Although work-related factors make up an alarming amount of the chronic musculoskeletal pain occurrences, rheumatoid arthritis was also very prevalent in articles discussing musculoskeletal pain. Three of the studies that were analyzed addressed how arthritis can be thought of as both a cause of chronic musculoskeletal pain and a result of damaging work-related contexts (Iverson et al., 2016; Westby, 2001; Wilcox et al., 2006). Similar to a broad diagnosis of chronic musculoskeletal pain, studies show that physical activity such as aerobics and resistance training improves one's pain symptoms of rheumatoid arthritis (Wilcox et al., 2006). Having a condition like rheumatoid arthritis can limit an individual's performance range of favorable activities. These limitations can decrease an individual's overall quality of life and wellbeing.

### ***Interventions***

**Yoga.** A commonly researched and effective intervention for chronic musculoskeletal pain is physical activity, specifically yoga. "Yoga is described as a combination of breathing exercises, physical postures, and meditation used to calm the nervous system and balance the body, mind, and spirit" (Monson et al., 2017, p. 16). Yoga is also considered good for not only an individual's physical health but also their mental health because it is a method where there is a strong interaction between one's mind and body (Shnayder et al., 2018).

Of the articles reviewed, four addressed yoga as an intervention for chronic musculoskeletal pain. Tul et al., (2011), Monson et al., (2017), Williams et al., (2009), Shnayder et al., (2018) all included a population of adults 18-70 years old. Tul et al., (2011) had seven participants, Monson et al., (2017) had 77 participants, Williams et al., (2009) had 90 participants, and Shnayder et al., (2018) had 285. Common inclusion criteria within these studies were: being referred by a physician, having chronic musculoskeletal pain, English and/or Spanish speaking, and over the age of 18. Some differences were Monson et al., (2017) required that the participants were dental hygienist students who had chronic back and neck pain. Shnayder et al., (2018) required that the participants were Home Health Aides.

The intervention programs lasted from 8 to 24 weeks. The participants in Monson et al., (2017), Shnayder et al., (2018), Williams et al., (2009) met twice a week for an hour each time while participants in Tul et al., (2011) only met once a week. There were three specific types of yoga that the researchers used for their intervention programs. Tul et al., (2011) used Hatha



yoga, “which emphasizes controlled breathing awareness to gentle body movements and postures” (p. 436). Monson et al., (2017) used vinyasa flow yoga, “which is strength-building, flexibility-improving, stamina-increasing, mind-calming cardiovascular exercise” (p. 16). Williams et al., (2009) used Iyengar yoga, “emphasis on detail, precision, and alignment in the performance of yoga postures” (p. 2067). To rate/interpret the participants' pain before and after the interventions the researchers used a Visual Analog Scale, the Comparative Pain Scale, a 55-item questionnaire, and a medical questionnaire addressing their pain.

Results in the Monson et al., (2017) study were, “individuals who practiced yoga reported higher body awareness, felt more relaxed, reduced their pain medications, and felt their lives had improved due to reduction in pain” (p. 20). Similar positive results were also found in all the other research articles pertaining to yoga. Tul et al., (2011) found three common themes in their data: renewed awareness of the body, transformational relationship with the body in pain, and acceptance. William et al., (2009) found that there was a “significantly greater reduction in functional disability and pain intensity,” and “a reduction in pain medication” (p. 2066). Overall, each study showed a significant increase in function and quality of life in participants who engaged in yoga intervention programs. The participants’ performance range of desired occupations seemed to increase after using this establish/restore method of intervention as well. This further shows how physical activity is an important factor in an individual's overall health and wellbeing.

**Pilates.** Although yoga and pilates are both a type of exercise to get one’s body moving, they are very different in terms of how the activity can improve chronic pain. Yoga is a type of exercise to improve one’s flexibility and help to connect the body with the mind by sitting in one pose for a few seconds at a time (Tul et al., 2011). Pilates is a type of exercise used to help relax muscles that are tense and to strengthen muscles (Schroeder & March, 2021). Gaskell and Williams (2018) completed a qualitative study to determine if a pilates exercise program reduced musculoskeletal pain in adults. The program lasted for 12 weeks, and the participants explored factors such as work and leisure hobbies that can induce musculoskeletal pain that affects their daily lives. Based on their findings, “pilates promotes an active lifestyle: improved performance at work and hobbies; psychosocial benefits and improved confidence; increased autonomy in managing their own condition; and motivation to continue with exercise” (Gaskell & Williams, 2018, p. 56).

**Water Aerobics.** Water aerobics is a type of aquatic exercise that promotes pain-free movement during physical activity for those who experience chronic musculoskeletal pain (Westby, 2001). Not only does water aerobics alleviate pain during exercise but it also prepares the individual to better tolerate similar movements made in water to perform those same movements on land (Booth et al., 2017). This is one way that physical activity for an individual with chronic musculoskeletal pain can be graded. Two studies that addressed the effects of water aerobics on individuals with chronic pain were Westby (2001) and Booth et al. (2017). Both are level 1 systematic reviews and the authors reviewed a combined total of eight articles specifically addressing water aerobics and how it has proven benefits for individuals’ health and wellbeing.

Westby (2001) reviewed two randomized control trials and one non-randomized control trial that provided evidence that water aerobics was an effective intervention for working adults who experienced chronic musculoskeletal pain. Based on the review, overarching positive takeaways from participating in water aerobics when experiencing chronic musculoskeletal pain



is improved flexibility, muscle strength, and function (Fork & Douglas, 1989, as cited in Westby, 2001).

Booth et al. (2017) reviewed five articles that addressed how aquatic exercise can lead to an easier transition into land-based physical activities. Water aerobics is a great resource for an individual who is experiencing severe chronic musculoskeletal pain or has limited motor functional mobility (Booth et al., 2017). Although it is good for an individual to exercise in an environment that provides pain-free movement, it is imperative that land-based exercises are also implemented to increase muscle function and strength in order to perform everyday activities (Bidonde et al., 2014, as cited in Booth et al., 2017). Of course, the choice of exercise is completely dependent on each individuals' preference.

### ***Summary***

The key findings found in the existing literature suggest that the most effective physical activity-related interventions were yoga, pilates, and water aerobics. The evidence indicates these interventions would be effective for improving the lives of the working adult population that has experienced chronic musculoskeletal pain. The goal of implementing the establish/restore intervention from the EHP model is to establish new physical activity habits and restore previous skills that were lost due to chronic musculoskeletal pain in adults who have had a decrease in their performance range (Dunn, 2017).

### **Clinical Bottom Line**

The focus of this CAT is to answer the question of how working adults can holistically alleviate their chronic musculoskeletal pain by engaging in health management through various physical activities to improve their overall quality of life. Information from the articles reviewed for this CAT included evidence of a high prevalence of chronic musculoskeletal pain found in working adults, how chronic pain decreases one's ability to participate in various occupations, and the importance of engaging in physical activity to improve both chronic musculoskeletal pain and quality of life. The study designs that were found in the articles reviewed included randomized control trial, systematic review, meta-analysis, focus group, cross-sectional study, survey/questionnaire, pretest-posttest, and qualitative studies including narratives. There were strong findings in the existing literature that yoga, pilates, and water aerobics were shown to decrease chronic musculoskeletal pain through physical activity training which in turn increases the individual's quality of life. Within the studies, not much was discussed about the participants' ability to afford and access facilities that offer yoga, pilates, and water aerobic classes outside of the study. If an occupational therapist (OT) were to recommend attending an exercise class to a client, they should keep in mind the client's ability to access to those classes.

### ***Best Model***

The occupation-based model that was used to illustrate the clinical scenario was the Ecology of Human Performance (EHP) model (Dunn, 2017). Utilizing the EHP model in clinical practice gives OTs an idea of what tasks a client is unable to do due to their condition. This will allow OTs to create interventions for individuals to establish holistic pain management skills based on their current performance range and work towards increasing it by creating a new context of physical activity implementation. It is also a way to assess the changes in the performance range of a client after the intervention to determine if an improvement has been





made. The process of EHP begins with the evaluation of the person, context, and task following up with the best intervention approach based on the individual (Dunn, 2017). This displays the ethical consideration of beneficence by doing what is right no matter the individual's cultural background or by referring them to another health professional if necessary to improve their chronic pain (AOTA, 2020).

### ***Usefulness In Practice***

For individuals with chronic musculoskeletal pain, “the occupational therapy practitioner’s primary role in rehabilitation is to evaluate and intervene to improve client’s ability to independently perform functional tasks” (Roll & Hardison, 2017, p. 1). Negative impacts on one’s daily function and participation in occupations occur when an individual is experiencing chronic musculoskeletal pain. Without help from an OT, it may lead to more permanent and irreversible issues that are more damaging to their overall quality of life. Individuals with chronic pain may choose to use more short-term approaches to helping with their pain such as medications, ice, or heat. It is the OT’s responsibility to introduce interventions that can pose as a more long-term solution and improve one’s physical and mental abilities. An OT would be included in the evaluation and intervention programming alongside the individual’s general physician, orthopedic specialist, physical therapists, and any other relevant healthcare professionals.

Based on the evidence reviewed, interventions that were found to alleviate pain and increase the performance range for working adults with chronic musculoskeletal pain were yoga, pilates, and water aerobics. Yoga was found to alleviate neck pain, back pain and improve mental health (Shnayder et al., 2018; Williams et al., 2009). Pilates creates a similar outcome to yoga for it relaxes and strengthens muscles (Schroeder & March, 2021). Water aerobics allows for a pain-free environment and allows for resistance training to improve range of motion (Booth et al., 2017; Westby, 2001). Although all three interventions have been shown to improve working adults’ musculoskeletal pain, yoga and pilates tend to be more accessible activities than water aerobics. Water aerobics requires a pool and may only be available by attending classes while yoga and pilates can be completed at home and require fewer materials and resources. Financial situations were not addressed in the literature which can affect the accessibility of the interventions since many yoga, pilates, and water aerobic classes require payments to participate. Depending on the individual’s physical, cultural and social context, water aerobics may be harder to participate in compared to yoga and pilates.

### ***Limitations***

The findings of this Critically Appraised Topic should be interpreted considering the present limitations. The limited intervention strategies, sample sizes, and short-term studies do not allow for generalizations, or long-term viability to be inferred. A specific limitation was the inclusion of participants who had close access to the program (Gaskell & Williams, 2018). Further research should be done involving younger and/or older populations, along with individuals outside of the workforce. Exploring further research to study the viable long-term effects will have implications for the usefulness of holistic therapies such as physical activity. Possible biases that would affect the outcome of the studies could be the participants’ and researchers' perceptions of yoga, pilates, and water aerobics and whether or not they find them helpful. More relevant information about working adults with chronic musculoskeletal pain can



be found on the AOTA website and by also visiting one's local physical wellness center for information on class accessibility.



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