Journal of Athletic Training 2022;57(4):312–318
doi: 10.4085/1062-6050-0521.20

www.natajournals.org

Management of Chronic Musculoskeletal Pain Through a Biopsychosocial Lens

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Chronic musculoskeletal pain continues to constitute a rising cost and burden on individuals and society on a global level, thus driving the demand for improved management strategies. The biopsychosocial model has long been a recommended approach to help manage chronic pain, with its consideration of the person and his or her experiences, psychosocial context, and societal considerations. However, the biomedical model continues to be the basis of athletic therapy and athletic training programs and therefore clinical practice. For more than 30 years, psychosocial factors have been identified in the literature as outcome predictors relating to chronic pain, including (but not limited to) catastrophizing, fear avoidance, and self-efficacy. Physical assessment strategies such as validated outcome measures can be used by the athletic therapist and athletic trainer to determine the presence or severity (or both) of nonbiogenic pain. Knowledge of these predictors and strategies allows the athletic therapist and athletic trainer to frame the use of exercise (eg, graded exposure), manual therapy, and therapeutic modalities in the appropriate way to improve clinical outcomes. Through changes in educational curricula content, such as those recommended by the International Association for the Study of Pain, athletic therapists and athletic trainers can develop profession-specific knowledge and skills that will enhance their clinical practice and enable them to better assist those living with chronic musculoskeletal pain conditions.

Key Words: athletic therapy, athletic therapist, athletic trainer

Key Points

- Chronic musculoskeletal pain continues to increase in prevalence, leading to significant costs for the health care system. Athletic therapists and athletic trainers are in a unique position to provide management strategies for patients with chronic pain due to their wide scope of practice, ranging from prevention to intervention for illness and injury.
- Pain is a complex, multifactorial phenomenon, which requires management beyond the scope of the traditionally taught biomedical model in which athletic therapists' and athletic trainers' education and clinical practice are based.
- Athletic therapy and athletic training programs, athletic therapists and athletic trainers, and their clients will benefit from using the recommended biopsychosocial approach for the management of chronic pain. This includes assessing psychosocial factors, emphasizing therapeutic alliances, addressing psychosocial constructs, and using pain neurophysiology to frame interventions.

The prevalence of chronic musculoskeletal pain is increasing globally and represents a significant burden to the individual and to society. In Canada, the point prevalence of chronic musculoskeletal pain lasting 6 months in the population was reported to be 18.9%, although 44% of individuals reported experiencing pain.[1] In the United States, 20.4% of the population was reported to be experiencing chronic pain (defined as "pain on most days or every day in the past 6 months"), 8% of whom considered their pain to be of high impact.[2] These findings are comparable with those of other countries over the past decades.[2]

The literature has demonstrated for decades that *chronic pain*, that is, pain lasting or recurring for >3 months,[3] is a complex phenomenon, which requires recognition of multiple factors, including biological, psychological, and social influences.[4] However, the International Association for the Study of Pain (IASP) acknowledged the difficulty in determining psychological versus pathophysiological pain and defined *pain* as "an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage."[5] To account for this complexity, in recent years, both researchers and clinicians have focused on the biopsychosocial model,[4] which includes consideration of the person, his or her experiences, and the social context.

Health care professionals have recognized the importance of psychological and social factors, which can be addressed in clinical practice using the biopsychosocial model.[6] Yet the results of a recent survey[7] indicated that athletic therapists and athletic trainers (referred to herein as *ATs* when speaking of both professions) often used a biomedical model to address pain when they could have benefited from a more integrated biopsychosocial care model.

Certified ATs work within the Canadian health care system and rely on a broad knowledge base of the

musculoskeletal system, including physiology, biomechanics, emergency care, and other areas.[8] Their scope of practice focuses on the treatment of musculoskeletal injury, including prevention, assessment, and intervention as well as practice management and a professional responsibility to public safety and welfare.[8] The assessment involves interpretation of the mechanism of injury, signs and symptoms, fitness, and identification of appropriate rehabilitation. Although the list is not exhaustive, assessment of psychosocial components is not mentioned. Similarly, in the United States, ATs' practice standards include prevention, immediate care, assessment, and therapeutic intervention for injury, illness, and long-term disability under the direction of or in collaboration with a physician (subject to the state's statutes and regulations).[9]

A review[10] of curricula for accredited Canadian athletic therapy programs did not address pain science or its psychosocial aspects but rather assessment of "athletic injury/illness." This may imply that further profession-specific knowledge of psychological or social factors in the context of chronic musculoskeletal pain conditions is warranted. In the United States, ATs receive formal education in "psychosocial strategies and referral" as part of their educational competencies before certification.[11] Despite this, a discrepancy persists between education and practice; a recent survey[7] indicated that more than one-quarter of ATs continued to use a biomedical lens for the management of patients with chronic low back pain.

The purpose of our work was to review current literature regarding the biopsychosocial approach to conservative management of chronic musculoskeletal pain and outline how we can consider this approach in assessing and managing patients with musculoskeletal disorders.

CURRENT EVIDENCE FOR THE ROLE OF BIOPSYCHOSOCIAL FACTORS IN THE EXPERIENCE OF PAIN

Biological Factors

Biological factors of pain are related to pathophysiology, including physical stress, infection, or abnormal pathology, and tissue damage that has disrupted the body's homeostasis.[12] In the traditional biomedical model of management, pain is associated with pathophysiological or neurologic (or both) causes.[13] When tissue is damaged, an initial inflammatory, chemical, thermal, or mechanical response often produces nociceptive signals that may be interpreted as pain—a natural and expected response.[14] When the lesion or disease affects the peripheral or central somatosensory nervous system, neuropathic pain may result.[5]

The biomedical model is sufficient for a pathological concern or injury when only biological factors are relevant or when a plausible explanation for their implication exists. This can be true for acute injury but is not the case when tissues have healed and yet pain persists[15] or no actual tissue damage has occurred. However, consideration of the biopsychosocial model in acute pain scenarios is still appropriate. For example, in patients with acute back pain, psychological factors have been shown to predict a transition to chronicity.[16]

Another challenge that has not been well explained by the biomedical model is the frequent discrepancy between pathoanatomical tissue damage and client-reported symptoms and chronic low back pain.[17] Changes in tissue structure found on imaging are not well correlated with reports of pain, as poor reliability in radiologic interpretation has been identified.[17] For example, low back pain is often attributed to biological factors such as structural (eg, disc degeneration) or mechanical (eg, lumbopelvic instability) dysfunction, despite supporting evidence indicating that a majority of clients with low back pain do not have a diagnosis linked to pathology.[17] This highlights the need for broader understanding of the mechanisms of pain and function beyond the biological model.

Psychological Factors

The neuromatrix theory, which is arguably the most widely accepted theory of pain to date,[6] describes the Melzack concept of the nervous system in which pain is an output produced in response to various inputs.[12] This includes sensory inputs to the body, affective and motivational aspects (immune system and limbic system), and cognitive events (memories, past experience, anxiety) such as stress. Cognitive factors, both positive and negative, have been described in the literature for over 30 years and are known predictors of outcomes relating to chronic pain. We emphasize a few factors, primarily the concepts of pain catastrophizing,[18,19] fear avoidance,[18] and self-efficacy[20]; however, many others are beyond the scope of this work.

Pain catastrophizing at intake predicted the prognosis for musculoskeletal conditions including whiplash.[21] Similar outcomes have occurred after total knee arthroplasty: pain catastrophizing was associated with higher levels of pain and dissatisfaction at 6 months postsurgery.[22] This evidence underscores the intertwining of psychological and biological factors and the need to move beyond the biomedical model.

Building from the concept of pain catastrophizing, the fear-avoidance model was founded in 1983 by Lethem et al. Fear avoidance is a normal, protective response in situations of acute injury,[23] but in cases of chronic pain, these beliefs may relate to fear of movement or reinjury.[19] Pain perception has been proposed to take 1 of 2 pathways: nonthreatening or (catastrophically) threatening.[24] When the perception is interpreted as a threat, fear-avoidance beliefs lead to deconditioning, disuse, decreased function and mood, and increased disability.[24]

Fear avoidance is often associated with low back pain, as the original framework was based on the natural history of low back pain and respondent pain.[23] However, fear of reinjury in athletes, despite a minimal to low level of pain, has also been noted in patients with a variety of sport injuries.[25] Poor outcomes in rehabilitation, such as physical impairment, reduced function, and delayed return to sport, have been identified in the presence of fear avoidance.[25] Both immediate and long-term effects on physical condition and guarded movement have resulted from fear avoidance.[26]

A person may develop fear of activity for multiple reasons. These may include direct experience from previous injury; for example, someone who experienced pain and nerve damage after lifting is likely to avoid lifting in the future. Observing another person experiencing an injury as a result of a task has also been linked to the fear of movement.[26] This psychological and emotional response of

fear further supports the insufficiency of the biomedical model alone for managing injury rehabilitation.

Positive psychological constructs are also known to be important factors in an individual's response to pain. Self-efficacy ratings were useful in predicting both pain coping and therapeutic improvements.[20] *Self-efficacy* has been described as one's belief in the ability to successfully perform a required behavior in a specific situation; an individual with stronger self-efficacy will more likely emit a stronger coping response.[27] It is through this coping response that self-efficacy acts as a protective factor that positively affects the overall functioning of people with chronic pain.[27] In a meta-analysis[27] examining the effect of self-efficacy on chronic pain outcomes, researchers found that clients who reported higher levels of self-efficacy also reported higher levels of function and less pain-related distress and severe pain.

Although pain catastrophization, fear avoidance, and self-efficacy do not constitute an exhaustive list of psychological factors relating to chronic pain, they can provide a starting point for ATs by offering insight into ways to relate to the severity and prognosis of chronic pain.

Social Factors

Social factors are recognized as playing a role in pain perception through social role satisfaction and self-perceived abilities.[28] Social support has been studied frequently, along with one's role in the family or workplace.[28] The concept of satisfaction has been suggested as differing from perceived ability and is separate from self-efficacy.[28] The operant theory of pain behavior proposes that increased pain behaviors are evident when the desired outcome is achieved: eg, encouragement to avoid an undesired activity or positive reinforcement when pain behaviors are displayed.[28] Yet the effect of social support is conflicting, as some people may display more pain in the presence of others as a way of seeking the support that they believe is not present, whereas others may display fewer pain behaviors depending on perceived support.[29]

Another social aspect that is worth noting is the effect of financial compensation on disability. Among people involved in motor vehicle accidents, factors such as intensity of neck pain, level of physical functioning, and exclusion of mental health diagnoses have been associated with shorter claim lengths.[30] Those who received disability compensation tended to report more kinesiophobic tendencies than those who did not.[31] This evidence demonstrates the consequences of social factors in pain perception, factors that are not reflected in the biomedical model.

BIOPSYCHOSOCIAL-BASED EDUCATION

Many types of clinicians have received a primarily biomedical-based education in which treatment targets physical factors.[7] The IASP, a globally recognized society for the study of pain in both health care and research, has suggested curriculum considerations, with competencies that acknowledge the importance of contextual factors, such as biological, physical, psychological, social, and cultural aspects, on the pain experience.[32] The proposed IASP curriculum is an opportunity for athletic therapy and athletic training programs to incorporate, where possible, the recommended competencies. These would facilitate knowledge acquisition by encouraging (1) understanding of the science, experience, and effect of pain at the individual and societal levels; (2) assessment, quantification, and communication of pain concerns in a valid, reliable, and empathetic manner; (3) shared decision making in selecting a treatment option based on understanding of the clinical condition; and (4) recognition of the contextual influences of client populations, the environment, and care teams on pain management. Whether these changes can be implemented in athletic therapy and athletic training programs will be influenced by the AT's scope of practice and the magnitude of changes necessary from existing curricula. Changes in curricula to align with the biopsychosocial model are arguably an important first step toward training new health professionals.

RECOMMENDATIONS FOR EVALUATION OF THE CLIENT WITH CHRONIC PAIN

Recommendations for the AT's assessment and management of an individual with chronic pain follow.

Physical Assessment

Diagnosis is perhaps the most challenging part of managing a client with chronic pain, primarily due to the multidimensional nature of pain and multitude of possible influential factors. It has been suggested that a diagnosis may not even be necessary for management.[33] Current evidence indicates that the goal of the assessment should be to establish the underlying pain mechanism and determine the psychological and social factors that influence the pain.[33] Validated outcome measures, such as the Widespread Pain Index (in which a score of $\geq$7 out of 19 suggests widespread pain being present) and the Central Sensitization Inventory (in which a score of 40 or more out of 100 points may indicate the presence of central sensitization), can help the therapist identify nociceptive pain versus neuropathic pain versus central sensitization. Nonetheless, patients often present with a mix of these mechanisms.[33] Patient-reported screening tools relating to mental health (eg, depression and anxiety) and substance abuse[34] should be completed, and the influence of psychosocial factors such as self-efficacy, pain catastrophizing, and kinesiophobia should be assessed to inform prognosis.[18,19,25,27] Other psychological and social constructs to be considered are current stressors (personal, professional), lifestyle changes related to the persisting pain, and employment status.[34] Identifying the client's social support system and attitude toward health care providers, family, employer or coworkers, and any other involved party (eg, insurance company, litigation) is necessary, as this will help determine if psychological or social factors are influential in the person's pain experience.[34]

Although the physical examination may evoke pain as a result of increased sensitivity to mechanical stimulation or changes in central nervous system modulation,[33] it is still important to examine range of motion, strength, movement patterns, and neurodynamics. This will provide confirmation of the pain mechanisms driving the symptoms and valuable information regarding fear and stress related to movement.[33] Assessment of sensory processing may help

detect the presence and severity of peripheral or central sensitization. This includes measuring pain-pressure thresholds through palpation and mechanical stimuli (such as vibration) locally and away from the nociceptive area.[34] A neurologic examination per the scope of practice is also recommended and should involve evaluation of any hypersensitivity of the peripheral nervous system tissue. Examples include pain during neurodynamic tests and bilateral responses to provocation tests (such as with the brachial plexus).

Outcome Measures

Numerous validated outcome measures may be used in ATs' clinical encounters for early recognition of psychosocial factors that may affect clinical outcomes. We identify several scales and cut scores for clinical significance, as clients who meet these criteria will likely benefit from psychological intervention.

The Pain Catastrophizing Scale was developed in 1995 to evaluate catastrophic thinking relating to pain: rumination, magnification, and helplessness.[35] With a higher score reflecting a higher level of catastrophization, a score of 30 out of 52 is clinically significant; this scale is a valid and reliable way to understand the client's association of catastrophization to pain and emotional distress.[35] Similarly, the Tampa Scale of Kinesiophobia is a valid and reliable evaluation of fear of movement related to pain and perception of activity causing physical harm, with possible scores ranging from 17 to 68[15]; a score >37 is considered a high level of perceived kinesiophobia.[31] The Fear-Avoidance Belief Questionnaire measures similar constructs as the Tampa Scale and is also valid and reliable. Subscales assess physical versus work-related activity to provide further insight.[15] Scores on this scale range from 0 to 42 and measure a person's fear of pain directly from activity. A value >39.5 predicts a high risk of failure to return to work.[36] Pain-related self-efficacy can be measured using the Pain Self-Efficacy Questionnaire, on which a lower score reflects lower self-efficacy. A score of <20 indicates a higher level of pain focus, which needs to be addressed to facilitate independent participation in exercise.[37] Identifying modifiable psychological risk factors early in care is important to identify the prognosis for disability and the need for treatment to avoid the transition to chronic pain.

THE INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY, AND HEALTH

The World Health Organization has developed the International Classification of Functioning, Disability, and Health (ICF) as a standardized way of measuring a person's ability to function based on the body or part, the individual, and society.[38] The ICF describes *function* as an output of a health condition combined with contextual factors (eg, social structures, physical environment, personal factors, coping styles, education, and past experience, among others), which aligns with the biopsychosocial model.

To classify a patient using the ICF, activity limitation or participation restriction is determined according to the constructs of body function, body structure, impairment, activity, participation, and environment. This classification provides the AT with information on health and health outcomes, filling the gap that results from relying on purely medical diagnoses.

RECOMMENDATIONS FOR MANAGEMENT OF THE CLIENT WITH CHRONIC PAIN

Athletic therapists and athletic trainers can use a biopsychosocial model of management with patients experiencing chronic musculoskeletal pain. This model is multifactorial and based on a cognitive behavioral approach in which multiple treatment strategies target symptom management, quality of life, and maintaining mobility.[13] Cognitive behavioral techniques encompass several of those that we will discuss, such as graded activity, goal setting, and education in pain neuroscience. The following management strategies are supported.

Physical Rehabilitation

Active engagement of the patient and decreased reliance on passive interventions should be prioritized. The individual should be instructed in self-management techniques such as *pacing*, which intersperses daily tasks with breaks, or modifies tasks to tolerance.[34]

Graded exposure, graded activity, and positive-movement experiences should be emphasized.[39] *Graded exposure* is the process of exposing a person slowly and methodically to feared and painful experiences (hierarchical exposure).[39] Once the fears are identified and ranked, a starting point for working with the most fearful activities is determined. This begins at an intensity that is not fear inducing. Progression is based on decreased client-reported levels of fear, positive reinforcement, and increased intensity. If the patient experiences pain, exposure is continued at the current intensity. Graded activity is based on tolerance of functional activities.[39] Initial tolerance becomes the goal; the progression is time contingent and not guided by pain. Activities are paced, meaning that breaks and quotas are integrated in the exercise prescription. Exercise starts at the initial tolerance level; when this can be achieved reliably, then frequency or intensity is increased. Throughout both graded activity and graded exposure interventions, the clinician provides positive reinforcement and addresses beliefs and negative attitudes toward pain.[39] Either approach can be used and incorporated into daily tasks, progressing to overall activity and lifestyle training and integrating the cognitive and emotional aspects of pain with the physical aspects.[40] Activity limitations and participation restrictions according to the ICF classification will have already been identified, thereby providing information to the AT on a starting point for progression.[38] Successful outcomes may also depend on whether the patient adopts a biopsychosocial belief system and the condition can be self-managed.[40]

An exercise program must be gradual and well rounded without targeting a particular pathological or anatomic aspect. For example, aiming to improve the mechanics in an impingement syndrome or increasing the extensibility of a muscle encourages biomedical beliefs.[34] Instead, exercise should be based on the client's values and preferences and may include a range of activities (walking, yoga, aquatics) as opposed to specific exercises.[13] Mild- to moderate-intensity activity and recovery periods are recommended; however, conflicting evidence has been presented regarding

the presence of pain while exercising.[41,42] In a systematic review and meta-analysis[42] of pain-free or painful exercises in the management of chronic musculoskeletal pain, the authors reported that reproducing or allowing pain during exercise can help the patient reframe the pain and address fear-avoidance behaviors. Moderate-quality evidence indicated that in the short term, exercising into pain versus avoiding it led to significant benefit. No differences were observed between pain-free and painful exercises over the medium to long term.

Therapeutic Modalities

It has been suggested that "unexplained pain" or central sensitization will respond to "desensitization techniques."[43] Transcutaneous electrical nerve stimulation may be used to stimulate afferent nerve fibers, which inhibits the descending nociceptive mechanisms and releases γ-aminobutyric acid (GABA), an antistress neurotransmitter.[43] Manual therapy's analgesic effect is short lived, and evidence is insufficient to suggest that a cumulative long-term effect is possible.[43] A recent systematic review[44] demonstrated nonsignificant differences for manipulation or mobilization therapy for chronic low back pain at 3- and 6-month follow-ups. Some evidence[41] suggests that if used incorrectly in the presence of central sensitization, manual therapy may actually provide nociceptive input to the nervous system due to decreased sensory thresholds. Manual input perceived as painful will initiate increased physical stress on the already deregulated stress-response system. Therefore, ischemic pressure or any technique beyond superficial soft tissue mobilization is not recommended.[41] Should a therapist elect to incorporate manual therapy in the treatment of chronic pain for the short-term analgesic effects, it is important that it be properly framed using appropriate language. As chronic pain often does not correlate with tissue damage, the client's biomedical beliefs need to be reconceptualized.[45]

Pain neurophysiology education (PNE) is behavior based and has shown clinical improvement when combined with other interventions.[45] Particularly for those individuals who are in a state of higher threat or sensitization due to a shift in mechanical sensitivity, PNE can be successfully incorporated with manual therapy.[46] A PNE explanation for a manual technique, such as explaining the effect of a lumbar mobilization on neuroplasticity, compared with the biomedical explanation (eg, addressing hypomobility versus hypermobility), led to an improved outcome.[47] Therefore, PNE can coexist in the biopsychosocial model with manual therapy.

Establishing a Strong Therapeutic Alliance

A patient experiencing chronic pain likely will have seen numerous medical practitioners and participated in numerous assessments and treatments or medical protocols.[34] Thus, it is of utmost importance that the AT use a client-centered approach to validate the pain, engaging in active listening while maintaining empathy and confidence. This will allow clients to perceive that their feelings and symptoms are being acknowledged. The AT should strive to build a strong therapeutic alliance and maintain it during the rehabilitation process to promote effective management. Ferreira et al[47] found that patients with chronic low back pain described greater improvements in rehabilitation outcomes in response to enhanced therapeutic alliance strategies. Increased positive interactions between the clinician and client were associated with better function and perceived treatment effects and decreased pain and disability.[47]

Providing client-centered care is important in establishing a strong therapeutic alliance. This includes discussion of treatment goals, risks, and harms between patient and AT.[48] Goals must be established to prioritize the client's needs and not those of the AT or health care team. One approach to goal setting is brief action planning.[49] This technique applies recognized principles such as motivational interviewing and behavioral change psychology with the goal of creating a self-management plan that the client can feel confident using. *Action planning* involves the client outlining a particular goal behavior in detail, including how and when he or she will use this new behavior, which builds self-efficacy. Asking an open-ended question to determine the behavior to be changed is the first step. This empowers the client to take an active role in management. An example is "Is there something you would like to see change in your level of function in the next 2 weeks?" as this leads to a discussion about change or recognition of the patient's willingness to change a behavior. The clinician can then suggest skills or tasks for the client to consider in order to invoke the change. Details can be specified, such as walking 10 minutes per day outside, starting tomorrow. The clinician should confirm that the plan is feasible and the client feels confident about pursuing the behavioral change (ideally $\geq$7/10 level of confidence). The brief action planning technique emphasizes accountability as it supports the importance of continued progress and change. This method has been shown to be successful in the literature[49] and can easily be integrated into the AT's practice and scope.

LIMITATIONS OF THE BIOPSYCHOSOCIAL APPROACH

As outlined, the biopsychosocial model has many positive influences in managing chronic pain and is acknowledged as a valuable approach.[50] However, the AT must remember that the biopsychosocial model is a trichotomy and the prominence of each component needs to be determined at each interaction and at each phase of recovery.[50] In fact, in some chronic pain situations, such as with peripheral nociception, no psychological or social influences are present. Also of note is that within each domain, no guidance or restriction on specific evaluation techniques is available. The AT needs to continue to use clinical judgement and consider individuality along with the evidence.[50] An enactive approach to pain has recently been suggested as a way to build on the biopsychosocial model.[6] This approach proposes that pain is not found in the mind, brain, or body tissues but that it is a process of sense making that would avoid the common interpretation of "pain being in the brain" in a negative way.

Resistance from clients has been identified as a barrier to the psychosocial pain-management model, as it was seen as an atypical approach for a physical therapist.[51] This method requires continuing education, increased time with the client, effective communication skills, individualized care, a

developed therapeutic alliance, and perhaps a greater number of sessions. Due to these concerns, physical therapists have reported feeling underprepared in their ability to consider and positively influence psychological and social factors.[51] Athletic therapists and athletic trainers can learn from these experiences as they move toward implementing a biopsychosocial approach in clinical practice.

CONCLUSIONS

The biopsychosocial management model of chronic pain has been a recommended approach for years, although it appears that ATs have remained grounded in the biomedical model.[7] A paradigm shift would be beneficial, as chronic pain is a complex phenomenon requiring recognition of multiple factors, including psychological and social influences. This review and analysis of the current literature regarding chronic musculoskeletal pain and the biopsychosocial approach to management should be a starting point for ATs to explore the use of the model in clinical practice while respecting their scope of practice. As noted in the evidence, ATs can use specific strategies to improve clinical outcomes for clients with chronic pain. These include (1) incorporating outcome measures for relevant psychological factors such as pain catastrophization, fear avoidance, and kinesiophobia; (2) emphasizing therapeutic alliance; (3) using PNE to frame interventions; and (4) addressing psychological constructs using techniques including cognitive behavioral strategies such as graded activity and goal setting.

The following suggestions are recommended at the education level: (1) Add biopsychosocial assessment and treatment models into existing curricula using the content recommended by the IASP. (2) Develop continuing education resources relating to biopsychosocial models of management at the provincial or state and national association levels. (3) Research the effects of specific biopsychosocial education, as the AT's perceptions of and confidence in using the biopsychosocial model will help inform ongoing development and implementation of this model into the AT's clinical practice.

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