

Individual Expectation: An Overlooked, but Pertinent, Factor in the Treatment of Individuals Experiencing Musculoskeletal Pain

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Physical therapists consider many factors in the treatment of patients with musculoskeletal pain. The current literature suggests expectation is an influential component of clinical outcomes related to musculoskeletal pain for which physical therapists frequently do not account. The purpose of this clinical perspective is to highlight the potential role of expectation in the clinical outcomes associated with the rehabilitation of individuals experiencing musculoskeletal pain. The discussion focuses on the definition and measurement of expectation, the relationship between expectation and outcomes related to musculoskeletal pain conditions, the mechanisms through which expectation may alter musculoskeletal pain conditions, and suggested ways in which clinicians may integrate the current literature regarding expectation into clinical practice.

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Physical therapy interventions for musculoskeletal pain conditions often address impairments with the implication that pain and function will improve in response to stretching a tight muscle or strengthening a weak muscle. Realistically, the mechanisms through which physical therapy interventions alter musculoskeletal pain are likely multifaceted and dependent upon a variety of factors related to the therapist, the patient, and the environment.¹ The current literature indicates factors other than the correction of physical impairments influence clinical outcomes in the conservative management of patients experiencing musculoskeletal pain. For example, psychological factors such as fear are useful in directing treatment.^{2,3} Similarly, factors related to patient expectations are associated with both clinical outcomes,^{4,5} satisfaction with treatment,^{6,7} and influence of behavior.^{8,9}

The purpose of this perspective article is to review the influence of expectation in current physical therapist practice for the treatment of individuals experiencing musculoskeletal pain. First, we will define expectation as related to health outcomes and discuss the measurement of expectation. Second, we will summarize the literature regarding expectation as a mediator of outcomes related to patients with musculoskeletal pain conditions and the mechanisms through which expectation may alter musculoskeletal pain.

Third, we will discuss ways in which physical therapists may consider expectation in current practice, including how best to measure expectation and how to maximize treatment effects with expectation.

Definition of Expectation

Health care expectations may be positive or negative and for the purpose of this article are defined as the general belief a clinical outcome will occur.^{10,11} For example, a person experiencing work-related low back pain may have negative expectations of recovery under the care of a health care provider mandated by their worker's compensation claim while having positive expectations for recovery under the care of a health care provider recommended by a friend. The construct of expectation currently is poorly defined. Thompson and Sunol¹² have developed a model of expectation. Although intended to conceptualize expectation as related to patient satisfaction, this model is frequently cited and provides a framework from which to view expectation. The model consists of 4 categories of expectation: (1) predicted expectations or what the individual believes will occur, (2) ideal expectations or what the individual wants to occur, (3) normative expectations or what the individual believes should occur, and (4) unformed expectation or the lack of a preconceived notion regarding a situation or intervention.

Predicted Expectations

Predicted expectations are what the individual believes will occur and are measured in most studies identifying a link between expectation and clinical outcomes for individuals experiencing musculoskeletal pain.^{4,13-19} Subsequently, the literature to date has focused on and supports a relationship between measures of predicted expectation and clinical outcomes related to musculoskeletal pain.

Ideal Expectations

Ideal expectations correspond to the constructs of desire and hope from which predicted expectations are frequently not well delineated.^{11,20,21} Ideal expectations are what an individual wants to occur,^{10,11,21} whereas predicted expectations are what the individual thinks will occur.

Normative Expectations

Normative expectations, or what the individual believes should occur, to our knowledge, have not been studied extensively for their influence upon clinical outcomes related to musculoskeletal pain conditions. Patient satisfaction with a given intervention is related to normative expectation^{6,7,22,23} and unmet normative expectations may lead to dissatisfaction.⁶ Patient satisfaction with treatment for musculoskeletal pain is influenced by factors other than relief of pain or improved function.^{22,24} For example, George and Hirsh²² found satisfaction for treatment delivery to differ from that of treatment effect, and Breen and Breen²⁴ observed "overall improvement" to explain only 57% of the variance for satisfaction in individuals seeking chiropractic care due to low back pain. Subsequently, normative expectations may provide a better indicator of satisfaction for individuals experiencing musculoskeletal pain than as a prognostic indicator for outcomes related to pain and disability.

Unformed Expectations

Unformed expectations are those of which an individual is unaware or is unwilling or unable to express.¹² For example, an individual may have no prior experience with a situation upon which to form an expectation for a corresponding outcome. Additionally, some actions may be habitual and not require conscious thought or subsequent expectation.¹² Unformed expectations, to



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our knowledge, have not been studied extensively for a relationship to musculoskeletal pain conditions.

Thompson and Sunol's¹² model of expectation provides a useful framework to illustrate the multifaceted construct of expectation. A universally accepted definition of expectation is not available. Consequently, the literature regarding expectation and pain includes great heterogeneity in the use of the term. The current article will focus upon expectation as a mediator of clinical outcomes related to conservative interventions in the treatment of individuals experiencing musculoskeletal pain. We will use Thompson and Sunol's¹² model as a framework to categorize measures of expectation when possible; however, the reader must be aware that expectation will frequently refer to a general concept.

Measurement of Expectation

Measurement tools for expectation may generally quantify expectation for overall improvement in a condition, such as requesting participants to indicate the amount of improvement expected in low back pain.^{16,18,25-27} Measures of expectation also may be specific to a given intervention. For example, Kalauokalani et al¹⁶ asked participants to indicate how helpful they believed both acupuncture and massage would be for their low back problem. Furthermore, assessment of expectations may be specific to a given outcome.^{17,20,27} For example, Robinson et al²⁰ asked individuals experiencing chronic pain to indicate their expectations for changes in pain, fatigue, emotional distress, and interference with daily activities, and Kapoor et al²⁸ asked for participant expectations regarding their likelihood of returning to work within 4 weeks. The methods used to quantify expectation include numeric rating scales,^{16,18} Likert scales,^{16,17,25,26} categorical measures,²⁸ and multi-item

instruments.^{27,29} Predicted expectation for the benefit of care, regardless of the method of measurement, is consistently high, resulting in positively skewed results and necessitating dichotomization of data for analysis.^{16,17,28,30,31} Despite the variability in measurement methods, predicted expectations are associated with outcomes related to musculoskeletal pain conditions.^{5,32,33} Certain qualities of measurement tools do appear to lead to a greater association. Iles et al³² performed a systematic review and reported recovery expectations in individuals experiencing low back pain were the strongest predictors of outcomes when they were based upon specific time frames and outcomes.

Expectation is a broad construct with implications relative to the ease and validity of measurement. For instance, Peck et al³⁴ recorded 65 separate expectations for medical care in 253 patients attending a Veterans Administration primary care clinic. Furthermore, individual measures of expectation may not be highly correlated, as Venkataramanan et al³⁵ observed low internal consistency (Cronbach alpha = .63) of 5 measures of expectation in individuals undergoing total knee replacement revision surgery. Additionally, Robinson et al²⁰ reported on a sample of chronic pain patients in whom predicted expectations for pain, fatigue, and emotional distress surpassed their definition of a successful treatment, whereas predicted expectation for interference with daily activities did not. Collectively, these studies suggest that expectation is a multidimensional construct for which simple measurement tools may not adequately account.

Expectation may be influenced by a number of individual factors such as sex,^{31,36,37} education level,^{36,37} age,^{31,37} race,^{31,38-40} psychological factors (eg, fear,⁴¹ coping,⁴¹ depres-

sion,³⁶ emotional distress²⁸), acuity of pain,³¹ and marital status.²⁸ The direction of the association between expectation and individual factors is variable. For example, expectations were lower in women undergoing decompression surgery to the lumbar spine³⁷ and in men seeking conservative care for low back pain³¹ and whiplash-associated disorder.³⁶ Additionally, expectations were lower for African Americans considering joint replacement surgery or seeking primary care consultation³⁸⁻⁴⁰ but higher for African Americans seeking conservative care for low back pain.³¹

In summary, the current definition of expectation is highly variable. Furthermore, expectation appears to be influenced by a number of individual factors; however, the influence of these factors may be specific to the situation and individual. Currently, the measurement of expectation is not standardized, and failure to fully clarify expectation may lead to confusion regarding measurement methods and numerous measurement approaches. Variability in the measurement of expectation has implications for the generalization of results among studies and from research to clinical practice, as self-report of expectation differs by the measurement tool used.^{42,43} Despite these inconsistencies, an association exists between predicted expectations and outcomes related to musculoskeletal pain regardless of the method of measurement.

The Relationship Between Expectation and Musculoskeletal Pain

Clinical studies have demonstrated an association between predicted expectation and outcomes related to the management of musculoskeletal pain conditions, including work-related injury,^{9,15,19,30,44-47} total joint arthroplasty^{13,17} chronic pain,⁴¹ neck pain,¹⁴ shoulder pain,⁴ whiplash-

associated disorder,^{36,48} and low back pain.^{16,18,25,27,28,31} As an example, Myers et al¹⁸ performed a secondary analysis of individuals with acute low back pain who were randomly assigned to receive usual care alone or in combination with chiropractic, acupuncture, or massage. Participants were asked to indicate predicted expectation for improvement over 6 weeks on an 11-point numeric rating scale, with 0 indicating no improvement and 10 indicating complete recovery. General expectation for improvement was associated with improved functional status. Specifically, a 1-point increase in expectation corresponded to a 0.96-point improvement in the Roland-Morris Disability Questionnaire. Mahomed et al¹⁷ studied the influence of predicted expectations on clinical outcomes related to total joint arthroplasty. Expectation was quantified using a 4-point Likert scale with anchors of “no pain or limitation” and “very painful/limited” and a 101-point visual analog scale with anchors of 0 (“no success/no complications”) and 100 (“certainty of success/certainty of no complications”). Expectations for pain relief and for low risk of complications following surgery were associated with improved pain, function, and satisfaction following joint arthroplasty.

Expectation also is associated with negative outcomes. For example, Du Bois and Donceel³⁰ reported on the development of a screening questionnaire to predict individuals with work-related low back pain at risk for not returning to work within 3 months. Participants were asked to indicate their expected ability to return to work within 6 months using a numeric rating scale, with 0 indicating no chance and 10 indicating a very large chance. The odds ratio for participants indicating ≤ 9 on this scale for failure to return to work within 3 months was 4.6 (95% confidence interval=2.1-10.3). Further-

more, Hill et al¹⁴ studied predictors of poor physical therapy outcomes in individuals experiencing neck pain. Expectation was quantified with a 5-point ordinal scale anchored with “completely cure it” and “definitely won’t improve it.” The odds ratio for a poor outcome when measured at 6 weeks was 3.24 for low expectation for physical therapy in comparison with a high expectation. The odds ratio increased to 4.66 when measured at 6 months. Collectively, these studies suggest an association between predicted expectations for the results of treatment and clinical outcomes related to musculoskeletal pain conditions.

Predicted expectation may be a potential confounder in clinical trials. For example, Linde et al²⁶ pooled 4 studies of the efficacy of acupuncture in comparison to placebo acupuncture for musculoskeletal pain. Expectation was quantified categorically as participants were questioned regarding their perception of the effectiveness of acupuncture (“very effective,” “effective,” “slightly effective,” “not effective,” and “don’t know”) and regarding their expectation of the intervention (“cure,” “clear improvement,” “slight improvement,” “no improvement,” and “don’t know”). Outcomes were dependent not upon which intervention participants received (acupuncture versus sham acupuncture), but upon their expectations for acupuncture. Similarly, Bausell et al⁴⁹ compared acupuncture with sham acupuncture for the treatment of post-procedural dental pain and observed outcomes were dependent not upon the intervention the participant actually received, but upon the intervention the participant thought he or she had received. Participants receiving the acupuncture who believed they received the sham acupuncture did not do as well as those who received the sham acupuncture

and who believed they had received actual acupuncture.

Expectation is a pertinent factor in placebo analgesia⁵⁰⁻⁵³ and the placebo literature supports expectation as a causative factor in patient outcomes related to musculoskeletal pain conditions. The magnitude of the placebo effect is greater in studies of the mechanisms of the placebo effect rather than studies in which the placebo intervention serves as a control.^{54,55} Specifically, the usual instructional set in a placebo-controlled study is “You will be randomly assigned to receive either the studied intervention or the placebo.” Subsequently, participants are aware they have a 50% chance of receiving either the studied intervention or the placebo. Conversely, individuals in a study specifically of the mechanisms of the placebo effect may be told “the agent you have just been given is known to significantly reduce pain in some patients,”⁵¹ with the intention of raising expectation of an analgesic effect. For example, Verne et al⁵⁶ induced pain through rectal distension in participants diagnosed with irritable bowel syndrome. When coupled with a usual placebo instructional set, lidocaine produced significantly greater analgesia than placebo, and both placebo and lidocaine produced significantly greater analgesia than no treatment. When the study was repeated using the enhanced instructional set, the magnitude of the placebo analgesia increased to that of lidocaine.⁵¹

Conversely, expectation of a pain-intensifying effect (negative predicted expectation) has been found to worsen experimental pain sensitivity.^{51,57} Some researchers have observed an inverse effect of the same placebo dependent upon the instructions provided to a participant. For example, Benedetti et al⁵⁷ observed a significant increase in tolerance to ischemic arm pain in participants

who were healthy following the application of a placebo with an instructional set to expect a decrease in pain. Conversely, application of the same placebo with an instructional set to expect a resultant increase in pain was associated with a significant decrease in pain tolerance.

In summary, these studies suggest an association between predicted expectation and outcomes related to musculoskeletal pain conditions. Furthermore, these studies suggest a prognostic value for expectation in the treatment of individuals experiencing musculoskeletal pain that may surpass the type of treatment provided. Specifically, the exact intervention may not be as important as the individual expectation for the intervention.^{16,26,49} Outcomes, therefore, may not depend wholly upon the type of treatment provided, but also are influenced by individual attitudes or beliefs regarding the treatment. Manipulation of expectation, as is common in the placebo literature, suggests a causative effect of expectation on pain-related outcomes that may translate to the clinical management of musculoskeletal pain conditions.

Mechanisms of Expectation

Flood et al⁵⁸ suggested that expectation alters musculoskeletal pain in 5 ways: (1) promoting a physiological response, (2) increasing motivation to participate in a designated program, (3) conditioning an individual to focus on specific aspects of a disorder while ignoring others, (4) changing a patient's understanding of the disorder, and (5) mediating anxiety to decrease or alleviate pain.

Physiological Response

Studies of physiological responses that accompany expectation have been reported primarily in the placebo literature. Specifically, studies

of expectation-related analgesia have demonstrated associated responses, including activation of the opioid system,⁵⁹⁻⁶² changes in spinal reflexes,⁶³ and specific activation of the brain⁶⁴⁻⁶⁷ and spinal cord.⁶⁸ Price et al⁶⁹ observed a significant decrease in brain activity, as measured by functional magnetic resonance imaging, associated with expectation-related analgesia in brain regions related to pain (thalamus, somatosensory cortices, insula, and anterior cingulate cortex).

Additionally, Craggs et al⁷⁰ studied brain activity associated with expectation-related analgesia using functional magnetic resonance imaging and observed sustained activation of regions involved in pain modulation, such as the medial prefrontal cortex, posterior cingulate cortex, bilateral aspects of the temporal lobes, amygdala, and parahippocampal cortices. Furthermore, transient activation was observed in areas of the brain associated with emotion and information processing, such as the posterior cingulate cortex, precuneus, rostral anterior cingulate cortex, parahippocampal gyrus, and the temporal lobes. Finally, Goffaux et al⁶³ observed a significantly diminished withdrawal reflex, as measured by the R-III reflex, corresponding to expectation-related analgesia. Together, these studies suggest very specific neurophysiological mechanisms related to expectation at the level of both the spinal cord and the supraspinal structures.

Increased Motivation

Health-related outcomes for musculoskeletal pain may benefit from predicted expectation of reward related to a lessening of pain or improvement in function. Physiological responses related to the dopaminergic system^{61,71} and the opioid system^{52,53} consistently accompany expectation, and the resulting analgesia is linked to the reward system.^{61,72-74}

Subsequently, the potential for reward or physiological activation of the reward system may promote participation and improved adherence in rehabilitation programs⁷³ in individuals experiencing musculoskeletal pain, leading to better clinical outcomes.

Focus on a Specific Aspect of the Disorder

Expectation also may condition an individual to focus on specific aspects of a musculoskeletal pain condition while ignoring others. For example, Flood et al⁵⁸ studied the influence of preoperative expectations on postoperative outcomes following prostatectomy for benign prostate hypertrophy. Higher preoperative expectations corresponded to a greater likelihood of reporting "feeling better" following surgery, even when controlling for symptoms. Interestingly, preoperative expectations were not predictive of postoperative symptoms or overall health. The authors concluded that expectation may not directly change outcomes, but rather result in a more optimistic view of the outcomes that do occur.⁵⁸ Consequently, expectation may not directly alter outcomes related to a disorder, but instead change individual perception of the outcomes, with a more positive focus.

Change in the Understanding of the Disorder

Expectation may influence outcomes related to musculoskeletal pain conditions through the interpretation of education regarding a disorder. This process may influence musculoskeletal pain regardless of whether the information is correct or the patient's interpretation is accurate.⁵⁸ For example, the fear-avoidance model of low back pain suggests that individuals who confront their low back pain through activity will have better outcomes than individuals who avoid activity due to fear of injury or move-

ment.⁷⁵ Interventions directed at minimizing fear of pain or maladaptive coping strategies to pain have shown promise in the treatment of individuals experiencing musculoskeletal pain.^{75,76} Subsequently, an individual experiencing low back pain with high pain-related fear may expect worsening of pain in response to prescribed physical therapy exercises. As a result, the patient may have negative predicted expectations for the effectiveness of physical therapy, with a corresponding poor clinical outcome. Interventions directed at reducing pain-related fear and maladaptive coping may lead to the predicted expectation of improvement, with the potential for improved clinical outcomes and participation due to enhanced expectation and confrontational pain behavior.

Mediation of Anxiety

Anxiety is associated with outcomes related to musculoskeletal pain.^{14,77-79} Furthermore, anxiety is related to analgesia corresponding to expectation.⁸⁰⁻⁸³ Subsequently, expectation may alter clinical outcomes related to musculoskeletal pain, generally through the mediation of anxiety. Conversely, the placebo literature indicates a site-specific analgesic effect of expectation.^{50,52} For example, expectation of a pain-relieving effect for a placebo agent applied to the hand results in an analgesic response localized to that hand without change in pain perception in the other hand or either foot.⁵² These findings suggest additional mechanisms of expectation-related analgesia, as reduction in anxiety alone would be expected to result in a more general analgesic effect.⁵⁰

Implications for Clinical Practice

Expectation is a mediator of outcomes related to musculoskeletal complaints for which physical therapists frequently do not account in clinical practice. Expectation may be measured easily and quickly in the

clinical setting, and subtle attention to expectation may maximize treatment effects. We offer recommendations based on the current literature as to how physical therapists may best account for and maximize the treatment effect of this potentially powerful construct.

Measuring Expectation in the Clinical Setting

The literature does not currently support a standardized measure of expectation. Subsequently, we are unable to recommend a specific measurement tool. Expectation is associated with outcomes related to musculoskeletal pain conditions,^{16,32,45,48} despite the variability in measurement methods and lack of a standard definition. Considering the current lack of a validated measure of expectation, we suggest that clinicians include a simple but consistent method of measurement. Additionally, clinicians should consider that negative expectations may influence outcomes related to pain,^{82,84,85} so a scale encompassing no change to complete improvement may not reflect the beliefs of a patient expecting his or her pain to worsen. Consequently, clinicians may want to ask their patients to categorically indicate whether they expect their pain to worsen, stay the same, or improve. A 3-item scale may be sufficient in cases where general predicted expectation is preferred. When comparing expectations for 2 or more interventions, more options may be desired, and this question could be followed up with an appropriately anchored numeric rating scale, with 0 indicating no change and 10 indicating complete improvement or worsening, or a Likert scale with greater options. However, further investigation is necessary to identify reliable and valid methods of measuring expectation.

Although the literature does not support a specific measurement scale, certain features of a measurement scale may be more useful in predict-

ing clinical outcomes related to musculoskeletal pain. Predicted expectations (what the patient believes will happen) currently appear more reflective of clinical outcomes related to musculoskeletal pain and should be included as prognostic indicators. Clear instructions should be provided in order to differentiate predicted expectations from ideal expectations (what the patient wants to happen). For example, the patient should be told, "We would like you to indicate what you *think* will occur and not what you *want* to occur." The request to the patient should be specific to an outcome and a time frame, as a greater relationship between expectation and outcomes related to musculoskeletal pain has been associated with these traits of a measurement tool.⁵ For example, rather than just asking patients to indicate their expectations for their low back pain, a more responsive question may be, "At the end of 4 weeks of physical therapy, what do you expect will be the pain associated with your low back condition?"

The question also could be specific to identified functional deficits pertinent to the individual patient. For example, "At the end of 4 weeks of physical therapy, what do you expect will be your ability to play golf?" The response to each of these questions could be quantified with a numeric rating scale, with 0 indicating no worse/no better and 10 indicating completely worse/completely better. Despite the variability in measurement, a fairly consistent relationship exists between expectation and clinical outcomes related to musculoskeletal pain. We present general guidelines for the clinical measurement of expectation; however, additional studies are necessary to identify valid and more responsive constructs and measures of expectation.

Expectation in the Clinical Decision-Making Process

The literature suggests outcomes related to interventions for musculoskeletal pain may be dependent upon expectation for a given intervention rather than the specific intervention itself.^{16,26,31,49} Subsequently, baseline expectation may assist in directing interventions for musculoskeletal pain. For instance, Kalauokalani et al¹⁶ observed better outcomes in individuals experiencing low back pain who were randomly assigned to receive either massage or acupuncture if they were assigned to the intervention for which they had greater expectation of benefit. Consequently, physical therapists may want to include individual patient expectation for a given intervention in the clinical decision-making process when considering appropriate interventions for individuals experiencing musculoskeletal pain. For example, both joint mobilization and manipulation of the cervical spine are suggested as effective in the treatment of individuals experiencing neck pain.⁸⁶

Furthermore, manipulation of the thoracic spine is suggested as effective in some individuals experiencing neck pain.² A physical therapist treating a patient with neck pain could present the patient with each potential intervention option (mobilization of the neck, manipulation of the neck, and manipulation of the thoracic spine) and base the decision about which intervention to use upon the intervention for which the patient reported the highest expectation for treatment effectiveness. Certainly, other factors, such as whether the patient had a loss of bone density that may contraindicate manipulation or whether the therapist was concerned about vertebrobasilar insufficiency and preferred a technique directed at the thoracic spine, would influence this decision. Regardless, when faced with com-

peting interventions supported by the literature as effective, the individual's expectation of benefit for a given intervention should be considered in the clinical decision-making process. Furthermore, interventions without strong evidence-based support also may be justified. Traction generally is considered ineffective in the management of low back pain.⁸⁷ However, a brief trial of traction may be appropriate in a patient who reports very high recovery expectations for traction as a result of attributing prior resolution of an episode of low back pain to treatment with traction. Such an approach may be particularly justified if other "more effective" interventions have not been helpful during an episode of care. The trend in current physical therapist practice is the identification of subgroups of individuals likely to respond to a given intervention.^{2,88-90} Individual expectation for a given intervention for the conservative management of musculoskeletal pain conditions may provide a pertinent variable to assist clinicians in the identification of individuals likely to respond to a given intervention.

Predicted expectations appear capable of change rather than a trait characteristic. For example, preoperative educational programs may alter patients' expectation for postoperative recovery,⁹¹ and consultation with a physician may alter health-related expectations in patients with cardiac conditions.⁹² Subsequently, in addition to a prognostic value, clinicians may be able to improve outcomes related to musculoskeletal pain through the manipulation of expectation, and the placebo literature supports this contention.^{50,51,54,83} Expectation-related analgesia may be enhanced with higher expectation for a given intervention. For example, Pollo et al⁹³ treated individuals following a thoracotomy with a basal intravenous infusion of saline solu-

tion. A 3-group design was used, with one group provided with no instructions regarding the basal intravenous infusion of saline solution. A second group was provided with the typical placebo control instructional set that the patients may receive a placebo or a studied medication. The third group was provided with an enhanced instructional set that the basal intravenous infusion of saline solution was a potent painkiller. The magnitude of the expectation-related analgesia differed by the instructional set, with individuals who received the enhanced instructional set demonstrating the least need for additional analgesia. Studies such as this suggest expectation as a mechanism through which conservative interventions may alter musculoskeletal pain and in which the effect may be heightened by instructional sets promoting enhanced expectation of treatment effectiveness. Clinicians treating patients may have the potential to strengthen their treatment responses when, in the face of appropriate evidence of the effectiveness of an intervention, they enhance expectation through the suggestion of the likelihood of a positive response to treatment.

We must be clear that we are not advocating deception, as significant ethical issues could be raised to such an approach. We believe 3 specific factors must be considered, which support promoting positive expectations: (1) the intention of maximizing expectation is to help the patient, (2) the literature suggests analgesia related to expectation may be enhanced with a positive instructional set, and (3) the statement should not be deceptive. Specific to point 3, the addition of an instructional set to enhance expectation should accompany an intervention supported by the evidence. Additionally, the instructional set must be truthful (eg, "The agent you have just

been given is known to significantly reduce pain in *some* patients.”).⁵¹

Clinicians also should be aware when a patient has unrealistic recovery expectations, as fulfillment of expectations is predictive of outcomes related to musculoskeletal pain.⁹⁴ Subsequently, physical therapists should establish baseline expectations for recovery and provide direction should the expectations appear unrealistic. For example, a patient with a 10-year history of low back pain and reported expectation of being pain-free following 4 weeks of physical therapy may be better directed toward expectation for reasonable functional improvements and better management of the present pain. We would suggest physical therapists first determine the appropriateness of a patient's baseline recovery expectations, educate the individual as to realistic expectations, and then provide instructional sets in conjunction with treatment suggestive of a very high likelihood of achieving these revised expected outcomes.

Finally, physical therapists may want to distinguish ideal expectations from predicted expectations. These constructs could be differentiated quickly and easily using the same measurement scale, with the request to answer based upon what the individual thought would occur (predicted expectation) and what he or she wanted to occur (ideal expectations). Differentiating predicted from ideal expectations has potential value for directing educational interventions with patients regarding the most likely outcomes resulting from an intervention.¹¹ Consider a 40-year-old man with a diagnosis of severe degenerative joint disease of the knee whom the physician refers to physical therapy with the hopes of prolonging time prior to an inevitable joint replacement surgery. The patient may desire to be pain-free and to continue to run for exercise; however,

he realistically may expect that physical therapy will provide a 50% reduction in his knee pain and allow him to bicycle for exercise. Differentiating between ideal expectations and predicted expectation may allow the physical therapist to appropriately direct the patient to achieve goals that are medically feasible. The discrepancy between predicted expectations related to outcomes of treatment and ideal expectations related to outcomes may factor into continued health care use by patients with chronic pain and subsequent increased health care costs.²⁰

Limitations and Future Directions

We believe several problems exist regarding the current understanding of expectation. First, a standardized measure of expectation does not exist, resulting in a variety of measurement tools, with many lacking validation. Additionally, the construct of expectation has not been fully defined, and measurement tools assess varying components of expectation that may or may not be valid or comparable. Subsequently, methodological variability exists in current studies of expectation, and comparison of the findings of different studies is limited.

The literature to date has focused primarily upon predicted expectations without consideration for how other potential categories of expectation (ideal, normative, unformed) may influence outcomes related to musculoskeletal pain. A consensus must be reached on both a specified definition of expectation and how best to measure the identified construct in order to lessen the heterogeneity in current studies. Despite the variability in measurement and the studied construct, expectation is consistently a significant factor in outcomes related to musculoskeletal pain conditions.^{4,17,18,32,33,48} Thus, we believe consideration of expecta-

tion in the treatment of individuals experiencing musculoskeletal pain is currently warranted, and future studies should work toward standardizing the definition of expectation, the measurement of expectation, and how best to incorporate the findings into patient treatment. A consensus regarding terminology and measurement will allow valid comparison of the findings of different studies, and we expect homogeneity in methodology will indicate an even stronger relationship between expectation and outcomes related to musculoskeletal pain conditions than is currently observed.

Second, expectation is associated with musculoskeletal pain outcomes; however, studies demonstrating changes in response to experimental manipulation of expectation are necessary to more strongly indicate causation. The placebo literature suggests experimental manipulation of expectation may alter pain.^{50,51,93} These studies, however, were of short duration and not specific to musculoskeletal pain conditions or physical therapy interventions. Further longitudinal studies specific to the experimental manipulation of expectation are needed in clinical samples similar to what practicing physical therapists would encounter.

Finally, psychological factors such as fear, catastrophizing, and depression may influence clinical outcomes related to musculoskeletal pain conditions.^{75,95-97} Furthermore, psychological factors may interact with expectation to influence outcomes. For example, a lessening of emotional distress is related to greater expectation-related analgesia.⁸³ Future studies should consider the interaction between expectation and other psychological constructs and whether the influence of expectation on outcomes related to musculoskeletal pain conditions provides unique information separate from these constructs or is influenced by these constructs.

Conclusions

Expectation is associated with outcomes related to musculoskeletal pain and is a factor for which physical therapists may not adequately account. Neither a standardized definition nor a generally accepted measurement tool exists for expectation; however, despite the heterogeneity, an association is consistently observed in relation to outcomes for musculoskeletal pain conditions. Expectation may serve as a significant prognostic indicator for individuals with musculoskeletal pain conditions, and the literature suggests practitioners may take steps to maximize the benefit of expectation in their daily practice.

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