

# East Meets West in Therapeutic Approaches to the Management of Chronic Pain

## Abstract

Yoga as a holistic principle, not only practice of asanas or poses, integrates all aspects of the self, with biological, mental, intellectual, and spiritual elements. Yoga encompasses the biopsychosocial medical perspective, which regards pain as a dynamic interaction between physiological, psychological, and social factors. The purpose of this perspective article is to compare and contrast psychological practices such as mindfulness meditation, relaxation response (RR), and cognitive behavioral therapy (CBT) with Yoga in their management of chronic pain. The use of these practices is explored through history, literature, and research studies. Results from scientific studies on Yoga show changes in health-related pain outcomes for patients with chronic pain. The key aspects of Yoga, notably relaxation, positive thinking, and mindfulness, are discussed in relation to mindfulness meditation, RR, and CBT.

**Keywords:** Chronic pain, cognitive behavioral therapy, mindfulness meditation, mindfulness, pain acceptance, relaxation response, yoga

## Introduction

The purpose of this article is to compare and contrast psychological practices such as mindfulness meditation, relaxation response (RR), and cognitive behavioral therapy (CBT) with Yoga in their management of chronic pain. Ancient Eastern practices will be compared with modern Western practices with the management of chronic pain as the interface between the two.

The modern conceptualization of chronic pain subscribes to the biopsychosocial model in both etiology and treatment.<sup>[1]</sup> In this model, biological, psychological and social factors, and their complex interactions, are systematically considered in understanding pain and disability.<sup>[2]</sup> Yoga is an ancient technique practiced for thousands of years in India.<sup>[3]</sup> Since the 1960s, Yoga has also been practiced in the West.<sup>[2]</sup> Yoga integrates a variety of techniques: Postures, body awareness and mindfulness, breathing exercises, and the application of Yoga philosophy to the way of life. As a science and practice, Yoga encompasses physical, psychological, social, and spiritual aspects and as such, would seem to fit the biopsychosocial model.<sup>[4]</sup>

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In 2020, the International Association for the Study of Pain updated their pain definition to “an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage.”<sup>[5]</sup> Chronic pain is “persistent or recurrent pain lasting longer than 3 months.”<sup>[6]</sup> In Canada, chronic pain is a pertinent health concern, affecting 18.9% of the Canadian population over 18 years of age, with 1/3 of those with chronic pain rating their pain intensity in the very severe range.<sup>[7]</sup>

The biomedical approach to chronic pain involves utilizing analgesics, opioids, injections, and surgery to treat patients.<sup>[8]</sup> These methods can lack long-term benefits and potentially predispose patients to unnecessary risks.<sup>[8]</sup> Gatchel *et al.* explored interdisciplinary chronic pain management through the biopsychosocial approach to pain, as an alternative to the biomedical approach.<sup>[8]</sup> In this model, chronic pain and disability are seen as resulting from dynamic interactions among biological, psychological, and social factors perpetuating and worsening each other, and reducing quality of life.<sup>[1]</sup> A key Yoga teacher of the modern world, Iyengar,

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described Yoga “as more than physical. It is cellular, mental, intellectual, and spiritual it involves man in his entire body.”<sup>[4]</sup> Yoga aligns with holistic principles of the biopsychosocial perspective; thus, it can be instrumental in treating chronic pain.

## Eight Limbs of Yoga

Patanjali, an Indian sage, compiled generations of oral Yoga teachings into written scripture in a time between 500 BCE and 400 CE.<sup>[9,10]</sup> According to Patanjali, the practice of Raja (King), also known as Ashtanga (Eight Limbs) Yoga, deals with mind management, and consists of eight practices, all equally important and connected as parts of the whole.<sup>[9,10]</sup> These practices are Yama (moral disciplines), Niyama (positive duties), Asana (Yoga postures), Pranayama (breath and prana expansion), Pratyahara (sensory transcendence), Dharana (concentration), Dhyana (meditation), and Samadhi (achieving peace).<sup>[9,10]</sup> With these practices, one can achieve mastery of mental states, so that life and creativity can continuously evolve.<sup>[11]</sup> The first four practices quiet the externalizing tendency of the mind, whereas the last four provide direction to the mind.<sup>[12,13]</sup> Thus, Raja Yoga consists of practices that allow one to become the ruler or king of ones’ life.<sup>[11]</sup>

## Sivananda Yoga

In 1957, Swami Vishnudevananda, propelled by his guru, Swami Sivananda, travelled to the West to share the Sivananda Yoga teachings.<sup>[14,15]</sup> He increased accessibility and popularized Yoga by breaking down the practice into five practical components – the five points of Yoga.<sup>[12]</sup> These are Asana (proper exercise), Pranayama (proper breathing), Savasana (proper relaxation), Vegetarian (proper diet), Vedanta (positive thinking), and Dhyana (meditation).<sup>[12]</sup> There are similarities between the five points of Yoga and the Eight Limbs of Yoga (i.e. Asana, Pranayama, and Dhyana), reflecting the core connections between Yoga practices. Of note, the five points of Yoga focus on diet, relaxation, and positive thinking, which are explored to a lesser extent in the eight limbs of Yoga.

## Mindfulness Meditation and Relaxation Response

### Mindfulness meditation

Jon Kabat-Zinn pioneered the practice of mindfulness-based stress reduction through his stress reduction clinic in 1979.<sup>[13]</sup> An operational working definition of MM is “the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment.”<sup>[16]</sup> Meditation manifests itself through the Fifth-Seventh Limbs of Yoga, respectively, Pratyahara, Dharana, and Dhyana.<sup>[9,10]</sup>

Pratyahara, an internal practice, is the fifth step of *Raja* Yoga, that is, withdrawal of the senses from objects or

retreat. It allows for the objective observation of cravings and habits that are potentially interfering with inner growth.<sup>[9,10]</sup> Yoga Nidra<sup>[17]</sup> is the first stage of Pratyahara. Yoga Nidra, has two phases: (1) Relax, recharge, and rejuvenate; and (2) deep meditation.<sup>[17]</sup> Yoga Nidra is performed in the supine position, thus, one can quickly and easily access this posture.<sup>[17]</sup> Yoga Nidra occurs when one remains conscious during deep sleep.<sup>[17]</sup> *Antar Mouna* (that is, inner silence or thought observation) is another practice of Pratyahara (second stage of Pratyahara) through which one can achieve mastery over the mind.<sup>[18]</sup> Thoughts coming into the mind are simply observed, not stopped.<sup>[18]</sup> The principle is to remain an observer and witness mental processes without getting involved in them.<sup>[18]</sup>

The practices of Pratyahara create the setting for Dharana, where one learns how to slow down their thought processes by concentrating on a single mental object.<sup>[9,10]</sup> The skill of concentration was developed in the previous three limbs of Yoga, through Asana (posture), Pranayama (breath control), and Pratyahara (withdrawal of senses).<sup>[9,10]</sup> By focusing solely on the practice of concentration, and through extended periods of it, one is naturally led to Dhyana (meditation).<sup>[9,10]</sup> Similar to MM, during Dhyana, one is in a state of keen awareness, without focus on any particular object.<sup>[9,10]</sup> In Dhyana, the mind is quiet and still and few if any thoughts are being produced.<sup>[9,10]</sup> It takes a great amount of strength, stamina, and practice to reach this stage.<sup>[9]</sup>

MM practices are not confined to specific methods, rather, these initial practices are launching platforms to further one’s ability to sustain attention.<sup>[16]</sup> For example, in regards to chronic pain, the instructor could suggest to be aware of the sensations and pain experiences in the body.<sup>[15]</sup> With time and practice, one can sense the changing nature of sensations and their transience, then work to disassociate from the pain sensations as well as any negative emotions.<sup>[15]</sup> Similarly, in *Antar Mouna*, one learns how to not only be mindful of the thinking process but how to replace unpleasant thoughts with thoughts of one’s choice.<sup>[18]</sup> This can be particularly useful for individuals with constant awareness of pain.

### Relaxation response

The RR is characterized by physiological changes opposite to the stress response, such as decreased metabolism, heart rate, blood pressure, rate of breathing, and a decrease in brain activity.<sup>[19]</sup> Two steps are required for the RR: (1) Repetition of a word, sound, or prayer, and (2), when other thoughts intrude, a passive return to the initial repetition.<sup>[19]</sup> The Third Point of Sivananda Yoga, Savasana, emphasizes the importance of proper relaxation.<sup>[20,21]</sup> The RR focuses on the physical aspect of relaxation, whereas Savasana focuses on relaxation of the whole self.<sup>[19-21]</sup> In Sivananda Yoga, the belief is that full relaxation of the mind, body, and spirit is a natural way of re-energizing the body.<sup>[20]</sup>

Western techniques such as autogenic training and progressive muscle relaxation (PMR) can elicit a RR.<sup>[22]</sup> Autogenic training refers to a self-induced state of relaxation involving the following sequential exercise: Generating a heaviness feeling and sense of warmth in the limbs, cardiac regulation, passive concentration on breathing, warmth of abdomen, and feeling of coolness on the forehead.<sup>[22]</sup> PMR focuses on achieving increased discriminative control over skeletal muscles until one is able to recognize slight muscle contractions and then avoid them; this will lead to the achievement of the deepest degree of relaxation.<sup>[22]</sup> Similar to the RR, Savasana uses PMR to release stressful energy from the physical body.<sup>[21]</sup> Methodically, the whole body is tensed, one limb at a time, and then each limb is relaxed.<sup>[21]</sup> Total relaxation is best achieved through practice, and PMR is encouraged to be repeated three to four times a day.<sup>[21]</sup>

The RR may have clinical usefulness as those who practice it will be able to alter a stress sequence by preventing the elicitation of the stress response.<sup>[22]</sup> One can attempt to change the perception of a stressful event, leading to alterations in the sequence of adreno-cortical and medullary stress hormone release.<sup>[22]</sup> Moreover, these different training techniques can be seen as the Western versions of the many techniques of ancient Yoga Nidra.<sup>[17]</sup>

### Research on mindfulness mediation and relaxation response

The effects of MM and relaxation training can be compared through levels of distress, positive states of mind, rumination, and distraction.<sup>[23]</sup> In a 1-month randomized control study comparing MM to somatic relaxation training, 81 students reporting distress were allocated to three groups: MM ( $N = 27$ ), relaxation ( $N = 24$ ), and waitlisted control ( $N = 30$ ).<sup>[23]</sup> The MM approach was based on the MBSR program from the University of Massachusetts Medical Centre including a body scan, Hatha Yoga, and walking meditation for 4 weekly sessions of one and a ½ h each.<sup>[15,23]</sup> Somatic relaxation training included the practice of autogenic relaxation, PMR, simple breathing techniques, and guided imagery for 4 weekly one and a ½ h sessions.<sup>[23]</sup> Results were measured via questionnaires completed 10 days before the intervention and within 2 weeks after the intervention.<sup>[23]</sup> Weekly data were analyzed via hierarchical linear modeling, evaluating potential changes over time as a function of condition (i.e. control, relaxation, meditation) based on distress and positive states of mind.<sup>[23]</sup> *Post hoc* Tukey tests were conducted for all comparisons of postintervention group measures.<sup>[23]</sup> Results showed that the MM group's effect size for positive states of mind was larger than that of the relaxation group, with the finding of lower psychological distress for MM to have clinical as well as statistical significance.<sup>[23]</sup> MM is also different from RR in its ability to reduce rumination and distraction when compared with the control group.<sup>[23]</sup>

### Summary of mindfulness meditation and relaxation response

An evidence-based approach of the similarities and differences of MM and RR was explored by Luberto *et al.*,<sup>[24]</sup> The overarching goal of mindfulness training is to develop an open, nonreactive relationship with internal and external experiences through engaging in regular practice.<sup>[16]</sup> In comparison, the RR refers to a physiological state of parasympathetic dominance, characterized by reductions in heart rate, blood pressure, and respiration rate.<sup>[16,19]</sup> Both types of practices can elicit the RR; individuals report decreased stress and tension following MM and relaxation training.<sup>[24-26]</sup> In addition, both practices share common elements and could be used together for better results.<sup>[24]</sup> Mindfulness can promote the efficacy of relaxation practices by helping people become aware of the actuality of relaxation experienced in their practices.<sup>[24]</sup> For instance, individuals may browse social media with the intention to relax, but when one is more mindful during this practice, they may realize that certain muscles are actually tense.<sup>[24]</sup> Differences between MM and relaxation practices lie in the intention of their practice.<sup>[24]</sup> MM focuses on noticing the present moment and accepting all that crosses one's conscious mind, while relaxation practices emphasize *changing* the present self's internal events to reflect parasympathetic dominance.<sup>[24]</sup>

### Cognitive behavioral therapy

Aaron Beck was one of the founding fathers of CBT, initially influenced by the works of George Kelly and Albert Ellis.<sup>[3]</sup> Beck developed cognitive therapy by drawing from his experience in conducting psychoanalytic therapy.<sup>[27]</sup> He extrapolated meaning from an individual's experiences and identified consistent themes across their behaviors, while advising patients to focus on their present problems and patterns of thought.<sup>[27]</sup> He posited that those with psychopathologies process external and internal stimuli with a biased approach, unknowingly and systematically distorting their own construction of events.<sup>[27]</sup> This can lead to a variety of cognitive errors such as overgeneralization and personalization.<sup>[27]</sup> These pathways of maladaptive thinking are activated by external cues, and with regards to chronic pain, external cues can include the pain or events associated with pain.<sup>[27]</sup>

The modern wave of CBT is characterized by a broad platform for theoretical and practical diversity.<sup>[3]</sup> Notably, in regards to chronic pain management, acceptance and commitment therapy (ACT) has been highlighted in research.<sup>[28]</sup> ACT encourages patients to focus on the whole of the experience, while establishing clear and specific goals for treatment.<sup>[28]</sup> Patients are helped to abandon the need to know the literal "truth," rather they are encouraged to embrace the meaning of all events, even if negative or irrational.<sup>[28]</sup> After accepting the (occasionally negative) events, the important step is

what comes next, in which patients are advised to find ways to grow and do better.<sup>[28]</sup>

### Research on cognitive behavioral therapy

In a prospective study at an interdisciplinary chronic pain management program, higher scores of pain acceptance in participants at admission influenced changes in both subscales of acceptance, Activities engagement and pain willingness, at discharge and were also correlated with a greater positive change at discharge.<sup>[29]</sup> It was postulated that patients who accept their pain are more likely to make decisive behavioral changes and adopt a self-management approach that will allow for goal accomplishment.<sup>[29]</sup> The results of this study corroborated previous studies by McCracken and Eccleston, and Viane *et al.*, which report that acceptance is associated with lower depression and anxiety, and an increased sense of well-being.<sup>[30,31]</sup> Although this study had a large sample size ( $n = 184$ ), it does have drawbacks as there was no true control group.

### Cognitive behavioral therapy, acceptance and commitment therapy, MM and yoga

CBT encourages patients to identify and replace maladaptive thoughts, emotions, and actions with adaptive ones.<sup>[27]</sup> Similarly, the practice of *Antar Mouna* expels negative thoughts.<sup>[18]</sup> CBT ideology is also similar to the Fifth point of Sivananda Yoga (Vedanta and Dhyana), relating to positive thinking and meditation.<sup>[12]</sup> Vedantic philosophy teaches one to maintain a positive calm mindset, via focusing on the unity of creation or cohesion of consciousness, whereas Dhyana (meditation) is key to achieving inner peace and eliminating negativity in one's life.<sup>[12]</sup> In Sivananda Yoga, it is believed that when one harbors negative thoughts, the mind becomes agitated, resulting in disturbed and unbalanced actions,<sup>[12]</sup> while practising yoga reveals to the self that one's own thoughts are the true root of success and happiness. Once the art of positive thinking is mastered, one can become truly harmonious.<sup>[12]</sup> While CBT is less spiritual in comparison, the same adaptive and positive mindset rings through in CBT, Sivananda Yoga, and Satyananda Yoga.<sup>[32]</sup>

In ACT, patients are helped to accept all events of their lives, whether it be sensations of pain or negative external circumstances.<sup>[28]</sup> The important step is to advise patients to find growth, which could occur via establishing clear and specific goals for treatment.<sup>[28]</sup> ACT has similarities with MM; cognitive defusion of ACT is a technique that hones one's ability to let thoughts come and go without attachment to them.<sup>[33]</sup> For example, a negative thought can be regarded dispassionately, repeated out loud until only the sound remains, and the emotional attachment is gone.<sup>[33]</sup> Cognitive Defusion can help patients terminate their emotional connection with pain and move on to a life of acceptance.<sup>[33]</sup> MM also emphasizes "paying attention on purpose...nonjudgmentally to the unfolding of experience

moment by moment."<sup>[16]</sup> The practice of the Fifth limb of Yoga, Pratyahara, is also similar to ACT. Pratyahara focuses on withdrawal or sensory transcendence.<sup>[9]</sup> Similarly, to Cognitive Defusion, one terminates connections while tuning into the internal self.<sup>[9]</sup> The goal setting of ACT is reminiscent of the "sankalpas" in Raja Yoga that are meant to provide a clear direction and purpose for the mind to develop.<sup>[17]</sup> Sankalpa means resolve or intention that is specifically made during the practice of Yoga Nidra. Sankalpa is a short phrase clearly and concisely expressed, using the same wording each time, to bring about a positive change in one's life.<sup>[17]</sup> Overall, there exist key connections in the practices of MM, Raja Yoga, and Cognitive Defusion of ACT.

The mechanisms encompassed by the Eastern and Western practices involve the cardiovascular, pulmonary, and musculoskeletal systems in treating chronic pain.<sup>[34-36]</sup> Through Yoga, MM, and RR, patients are practicing breath and heart rate control; this occurs through meditation and relaxation strategies, as well as Pranayama of Yoga.<sup>[12,16,22]</sup> Yoga poses, Asanas, paired with Pranayama are known as Hatha Yoga.<sup>[37]</sup> Hatha Yoga works by safely and gently engaging the musculoskeletal system.<sup>[37]</sup> Stretching results in the release of lactic acid buildup in the muscle that can cause stiffness, discomfort, and pain.<sup>[37]</sup> Yoga also increases the range of motion in the joints and their lubrication.<sup>[37]</sup>

### Research on yoga

Hatha Yoga styles popular in the West include Iyengar, restorative, ashtanga, and vinyasa Yoga.<sup>[37]</sup> In Alberta, Tul *et al.*, observed seven chronic pain patients in an 8-week Hatha Yoga program consisting of group classes and at-home practice.<sup>[38]</sup> A main characteristic of the Yoga program was to teach participants to be aware of their bodies and minds during the sessions, without concern for any desired outcomes.<sup>[38]</sup> By the end of the Yoga program, the researchers identified three themes in the participants' comments: (1) Renewed awareness of their body, (2) transformed their relationship with their body in pain, and (3) gained a sense of acceptance of their situation.<sup>[38]</sup> Increased awareness of their bodies lead to participants noticing pain patterns, uncovering certain tensions, and feelings that incite painful responses.<sup>[38]</sup> By remedying the initial trigger to pain, for example, conducting Yoga stretches when triggering tensions are noticed, the final pain sensation is cancelled.<sup>[38]</sup> Limitations of the study include the method of recording the experimental accounts, as the results were extrapolated from interviews with participants. Researchers may be inclined to ask participants about the topics they are interested in studying, increasing the influence of confirmation bias.

Tul *et al.* concluded that the practice of acceptance relies on the letting go of expectations and goals, and coming to accept that even with chronic pain, one is "still okay."<sup>[38]</sup> Acceptance is a core principle of Yoga and mindfulness

practices within Yoga, as set by the Fifth Limb of Yoga, Pratyahara, which is when one consciously draws awareness to the internal self.<sup>[9,10]</sup> This mindset is analogous to the *letting go* mindset of MM, which echoes the same ideology of relinquishing one's expectations for the treatment, while placing focus on the present.<sup>[16]</sup>

Lazaridou *et al.* studied the impact of a 6-week Satyananda Yoga program on fibromyalgia, a condition of widespread, continuous pain, negative affect, and poor sleep.<sup>[32]</sup> The Satyananda Yoga program consisted of weekly in-person one and a half hour sessions and included asanas, meditation, and mindfulness-based practices.<sup>[32]</sup> Participants were also encouraged to follow a daily 30-min Yoga video as homework in between the in-person classes.<sup>[32]</sup> Thirty-six female participants completed the study to a meaningful extent (attended four to six classes and reported home practice).<sup>[32]</sup> Results revealed that pain intensity, as measured by the brief pain index, significantly decreased from baseline to posttreatment.<sup>[32]</sup> The greatest benefit was observed in participants who practiced 25 min/day or more compared to those who did <25 min/day.<sup>[32]</sup> This study was limited by the lack of a control group and all female participants, thus limiting the generalizability of the findings.<sup>[32]</sup>

## Conclusion

In this paper, ancient Eastern and modern Western practices such as Yoga, Mindfulness Meditation, RR, and cognitive behavioral therapy, specifically acceptance and commitment therapy, were compared for commonalities in the context of chronic pain management. Of note, the Eight Limbs of Yoga and Five Points of Yoga highlight the Asana poses that are often associated with mainstream Yoga, but also establish detailed guidelines that direct Yoga practitioners onto a new standard of living. There exists an overarching ideology of acceptance in Yoga that is mirrored in ACT and MM. As well, both Yoga and MM place focus on heightening internal and external awareness. The RR and Savasana of the five points of Yoga highlight the importance of total relaxation for the mind and body while CBT and Vedanta and Dhyana of the five points of Yoga, focus on the benefits of positive thinking and meditation for the self.

The impacts of Yoga on chronic pain were explored through research studies. Results highlight the improvement of pain intensity outcomes in patients with fibromyalgia. In a qualitative study, participants commented that Yoga transformed their relationship with their bodies in regard to pain and uncovered the possibility of remedying painful sensations using self-awareness and Yoga. Future Yoga research studies should focus on employing larger sample sizes to allow for increased statistical power and external validity, as well as further in-depth quantitative analysis of the effect of Yoga on various populations. MM, CBT, RR, and Yoga address chronic pain through increased awareness,

altering one's own perspective to be more mindful and positive, as well as utilizing postures and stretches to alleviate pain – all nonpharmaceutical therapies. In this paper, connections were drawn between ancient Eastern practices such as Yoga and Western therapeutic approaches in the management of chronic pain, focusing on their core practices.

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## Conflicts of interest

There are no conflicts of interest.

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