

Spiritual Knowledge and Practices to Conquer Chronic Pain: A Systematic Review

Sweta Viraj Salgaonkar, Yashashri Shetty¹, Vishal Singh¹

Departments of Anesthesiology and ¹Pharmacology and Therapeutics, Seth GSMC and KEMH, Mumbai, Maharashtra, India

Abstract

Understanding of pain as multidimensional experience has improved quality of life of many sufferings from chronic pain. Addressing spiritual dimension in chronic pain patients can improve outcome. The purpose of the present study was to systematically review literature from 1994 to 2018 using PubMed search engine to correlate between spirituality and pain management. The review included 25 randomized controlled trials (RCT). Positive correlation with spiritual healing was proved in 7 RCTs that included patients of idiopathic chronic pain syndromes. Patients with cancer pain, showed improvement in quality of life, visual analog scores with various spiritual techniques in 4 out of 6 RCTs. Pray meditation was recommended as one of management techniques for reducing pain after cesarean surgery in 1 RCT. Migraine medication usage decreased in spiritual meditation group improving the pain tolerance with significant improvements in anxiety, depression, and reduction in muscle tension in 3 RCTs. A study of cognitive behavioral therapy of 8 weeks, done in fibromyalgia patients recommended second generation mindfulness as a therapy to control their symptomatology in 1 RCT. In 2 RCTs involving students, the cold pressor task and the length of cold immersion seemed to be longer in those receiving spiritual intervention. One RCT, involving hospitalized patients concluded that spiritual healing was effective in promoting a state of muscle relaxation, reducing anxiety and depression, and raising the perceptions of wellness in patients. In a RCT involving chronically ill patients, encouraging spiritual coping was associated with better psychosocial and health outcome. Three RCTs involving patients of rheumatoid arthritis, neurofibromatosis, and chronic pain states not responding to conventional therapy did not show any significant correlation with spiritual intervention. Pain physicians can use better understanding of spiritual knowledge with non-pharmacotherapy techniques.

Keywords: Cognitive behavioral therapy, coping strategies, meditation, mindfulness, neuroplasticity, spirituality

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INTRODUCTION

Chronic pain, whether considered a pathological entity or a disease, has emerged as a major health issue affecting millions, creating enormous global burden, resulting in poor quality of life and the leading cause of disability in both the developed and developing countries.^[1-3] The overall burden of disease of chronic pain along with its associated comorbidities is unparalleled, higher than the combined burden of cancer, diabetes, and heart disease. Recurrent nature of chronic pain and its inadequate control pose a huge load on the health care and economy of the nation.

Understanding of pain as bio-psychosocial model in place of the biomedical model has widened the possibilities of new cost-effective target therapies for interdisciplinary pain

management. Acceptance of pain as a complex, multidimensional experience with unique neuro-matrix signature has led to the incorporation of various non-pharmacotherapy techniques such as mindfulness, yoga, meditation, and cognitive behavioral therapy (CBT) as part of multimodal pain management. Though medications and interventions provide immediate relief to patients with chronic pain, they are not without side effects. Non-pharmacotherapy techniques can be incorporated as life-style changes without significant side effects.^[4] Many of these therapies are based on the principles of psychosocial behaviors and spirituality. Research in the field of neurobiology

Address for correspondence: Dr. Sweta Viraj Salgaonkar, 1003, Jasmine, Neelkanth Gardens, Govandi (East), Mumbai - 400 088, Maharashtra, India. E-mail: swetavs@gmail.com

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of pain has given us a relationship between spirituality and pain.^[5,6] The biopsychosocial-spiritual model (BPSSM) suggests that illness disrupts the biological, interpersonal, and spiritual relationships unique to the individual. The BPSSM recognizes the potential impact of spiritual and religious factors that may modify the experience of illness and pain response.^[7] Addressing the spiritual dimension in patients of chronic pain can modify pain perception. The purpose of the present study was to systematically review the correlation between spirituality and pain perception and management.

METHODOLOGY

PubMed search engine was used, and the search terms were spiritual* AND pain AND (assistance OR intervention OR treatment OR therapy OR assessment OR group) AND (clinical trial OR meta-analysis OR randomized controlled trial OR controlled clinical trial). The collected data included the study design, patients' characteristics (age, gender, and pain subgroup), sample size, objectives, follow-up time, results, clinical outcomes, and conclusion. The period of publication considered was from 1994 to 2018 and the last date searched was January 2019. The quality of the included randomized controlled trials (RCTs) was assessed in accordance with the Cochrane Review criteria.

Articles whose abstract was not found, articles published in languages other than English and articles not related to Spirituality and Pain but displayed in results were excluded [Figure 1].

RESULTS

Using these search terms in the PubMed search engine, we found 145 articles. Phase I segregation was done by two authors reading the title of the study and 45 relevant studies were found. Then, Phase II Segregation was done by reading the article and relevance to the systematic review, which resulted in 25 relevant articles. Summary of 25 randomized controlled trials is tabulated. [Table 1]

DISCUSSION

The science of Pain Medicine, though steadily progressing, has not been able to manage chronic pain states satisfactorily. Persistent pain remains difficult to treat and affects the quality of human life. Seven RCTs, that included patients of idiopathic chronic pain syndromes, noncardiac chest pain, and neck pain, confirmed positive correlation with spiritual healing.^[8-13,17] It is well understood that pain is multidimensional. Taking care of physical pain alone does not provide substantial pain relief especially in chronic pain scenarios. Unless, biopsychological, socioeconomic, and spiritual dimensions are considered and addressed, pain management remains unsatisfactory. In the initial phase, it is, primarily the physical component, but chronicity of pain leads to the development of other dimensions. These nonphysical dimensions then develop a bidirectional relationship with the physical dimension, producing central sensitization, and propagation of the pain [Figure 2].

Nevertheless, complete pain relief becomes an unrealistic goal if all components are not taken into consideration.^[33]

A study conducted by Abbot *et al.*, did not show any specific effect of face to face or distant healing.^[24] Whereas a study by Zale *et al.* in patients with neurofibromatosis did show improved resiliency but without much improvement in spiritual well-being.^[25] All three RCTs, in headache patients, concluded that there was a significant decrease in frequency, duration of headache attacks.^[18-20] Six RCTs included cancer and end-of-life disease patients, of which 4 studies showed a positive correlation with improved outcome,^[26,28,29,31] while 2 studies could not show any improvement in spiritual well-being in these group of patients.^[30,32] One RCT involving patients of rheumatoid arthritis, also did not show any clinical or biochemical improvements in outcome measures, though the severity of the disease was not taken into consideration at the time of inclusion.^[23] One RCT in patients with temporomandibular joint dysfunction, proved significant improvements in outcome measures.^[21]

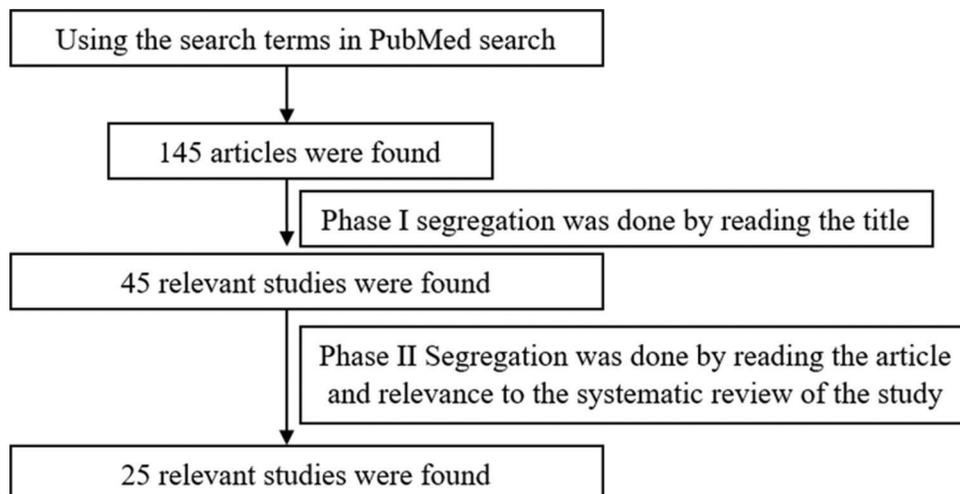


Figure 1: Search method and results

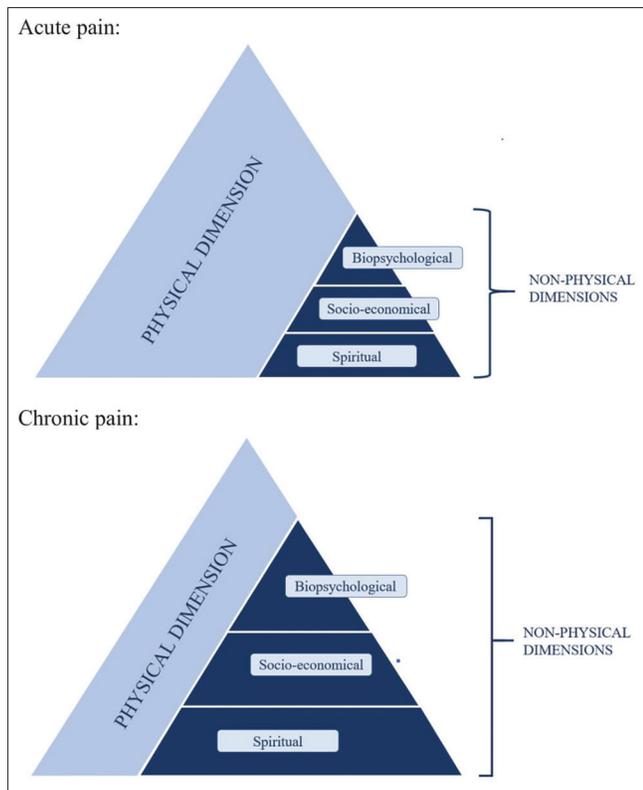


Figure 2: Pain perception

A study of CBT of 8 weeks, done in fibromyalgia patients recommended second-generation mindfulness, which involved spiritual aspect, as a therapy to control their symptomatology.^[14] Refocusing the mind on the present and increasing awareness of one's external surroundings and inner sensations, allowed the individual to step back and reframe experiences. Overall, spiritual healing and spiritual-based meditation decreased anxiety, depression, muscle tension in patients.^[14] It also improved sleep pattern, visual analog scale (VAS), physical functions, especially in patients where myofascial contribution was significant, though not much effect was seen on physiological variables such as heart rate, blood pressure and respiratory rate. Spiritual well-being was found to be directly related to the reduction of anxiety and depression.^[14] Pray meditation was used for post-cesarean section pain management with benefits of a decrease in VAS and postoperative nausea and vomiting at 3 and 6 h, as shown by a study conducted in a small cohort of women. Nonpharmacological therapy enhanced patient perception of self-control over pain. It helped by decreasing pain and anxiety. It also decreased analgesic requirements and the side effects that accompany them.^[34]

In the modern era, when chronic pain is a major health problem and the opioid crisis is real, pain physicians must embrace non-pharmacotherapy techniques as part of interdisciplinary management of chronic pain. In the fall of 2015, the White House convened a national summit to address the national epidemic of opioid use and proposed complementary and

integrative health approaches as a way to reduce over-use of opioids in chronic pain management.^[35] Various studies suggest that the positive spiritual cognition and interventions as part of non-pharmacotherapy techniques may improve coping strategies and quality of life in patients with chronic pain.

Although there is no single, widely agreed upon definition of spirituality, the Cambridge dictionary meaning says "it is the quality that involves deep feelings and beliefs of a religious nature, rather than the physical parts of life."^[36] As per the Oxford dictionary, "it is the quality, of being concerned with the human spirit or soul as opposed to material or physical things."^[37] In modern times, it is considered as 'the deepest values and meanings by which people live' and often in a context separate from organized religious institutions.

Understanding brain structures and their role in nonphysical dimensions of chronic pain

So far, science interpreted that the experience of pain was conveyed directly to the brain from the skin, without any psychosocial interplay. Only in late 20th century, it was recognized that pain is not always linearly related to nociceptive input, especially in chronic pain states. Behavioral response to pain can be modified by injury, memories, emotions, attention,^[38] expectations,^[39] pathological, genetic and cognitive factors, cultural practices, beliefs, and faith.^[40] All these factors and their dynamic interactions produce a signature pain matrix unique to that individual.^[41] Though it is understood that brain areas involved in pain matrix also perform non pain functions. Unlike vision, and hearing, there is no pain center or one specific cortical area dedicated to pain. There is presence of multiple potential target nuclei, as well as several efferent pathways, that exert modulatory control on pain transmission and in the ultimate experience of pain.

There has been extensive research of the spinal and medullary mechanisms of inhibitory control of nociceptive transmission, but we have an incomplete understanding of how higher cortical functions contribute to endogenous pain control.^[42] The primary and secondary somato-sensory cortex, insula and anterior cingulate cortex (ACC) are involved essentially in cortical processing of painful stimuli and contribute to different dimensions of pain experience. The primary somato-sensory cortex appears to be mainly involved in sensory-discriminative aspects of pain. The secondary somato-sensory cortex seems to have an important role in recognition, learning, and memory of painful events. The posterior insular cortex participates in the sensory-discriminative aspects of pain, while anterior insular cortex mediates affective-motivational aspects of pain.^[43] Taken together, both the bottom-up (touch-pain interaction) and top-down (anticipation-pain interaction) modulation of pain perception involve the insula.^[44] ACC appears to be involved in pain integration; the unpleasantness of pain is encoded in the ACC.^[45]

Noninvasive neuroimaging techniques like positron emission tomography and functional magnetic resonance imaging have

helped to examine the involvement of the frontal lobe in human pain perception. Prefrontal cortex plays a role in “keeping pain out of mind.”^[42] It is a site of major neurodegeneration and potential cell death in chronic pain patients. This, in-turn, could have negative effects on descending inhibitory system and contribute to chronic pain states.^[41]

It is only in the past few decades that pain physicians, psychologists and neurobiologists have understood the importance of midbrain structures like thalamus, hypothalamus, pituitary, pineal gland, hippocampus, amygdala, basal ganglia not only for feelings and emotions but also in pain perception and modulation. The latero-capsular division of the central nucleus of the amygdala is now known as the “nociceptive amygdala.” The amygdala appears to play a dual facilitatory-inhibitory role in the modulation of pain behavior. It is also involved in nociceptive processing that is dependent on environmental conditions and affective states.^[46] Several findings support the amygdala as a target site for noradrenaline involved in pain modulation during heightened emotional states. Thus, there is evidence that intrathecal injection of α_2 adrenergic receptor agonists like clonidine has analgesic functions.^[47] Ploghaus *et al.* found that areas in the hippocampal complex were activated during mismatches between expected and actual pain. They also reported activation of the entorhinal cortex during anxiety-driven hyperalgesia.^[48]

Researchers have investigated that alteration in people’s attention influences brainstem activity and therefore nociceptive processing via cortico-brainstem influences. Attention is effective in modulating sensory and affective aspects of pain experience. A clinical feature of many chronic pain patients is hypervigilance to pain and pain-related information directly affecting the quality of life.^[41] Attention to pain may be partly governed by threat value which depends on nature, novelty, uncertainty, anticipation, controllability, and information about pain.^[49] As described in Quantum physics, energy responds to mindful attention and is observer dependent. Environment in which pain occurs also affects its experience, whether it fulfills the potential benefit from pain including attentional demands. Memories of pain, catastrophizing can influence pain perception through altering attention, anticipation, and heightening emotional responses to pain.^[41]

Advances in pain studies have rendered obsolete the concept of a hard-wired classic pain pathway.^[50] Professor Michael Merzenich, the leading researcher on brain plasticity, has also observed that attention to a stimulus or lack of it, is the key component in forming or loosening brain’s neural connections, respectively. This concept forms basis of non-pharmacotherapies such as mindfulness, yoga, and CBT to modulate pain perception and break the chronic pain cycle.

Context can also influence pain perception that can be proved by placebo manipulation. Descending influences from hypothalamus, amygdala, diencephalon, insula, ACC, prefrontal cortex that elicit inhibition or facilitation of nociceptive transmission are thought to occur via placebo

analgesia.^[41] Role of microglial activation and genetics in chronic pain is under investigation.

Current non-pharmacotherapy techniques for pain management

Pharmacotherapy, as per revised WHO ladder for chronic pain, is directed towards mainly physical and partly psychological aspects of pain. With better understanding of the aberrant mind-body responses, non-pharmacotherapy has gained importance in recent years to address the social, emotional, and spiritual aspects of pain. Yoga and exercise, meditation and mindfulness, cognitive behavioral therapy are the some of the therapies recommended for chronic pain management.^[51]

Yoga and exercise

Yoga in Sanskrit means union of the self with the Supreme Being in a state of complete awareness and tranquility through certain physical and mental exercises. Yoga has gained global popularity as a form of mind-body exercise, with general lifestyle benefits. Yoga initiates relaxation response in neuro-endocrinal system and thereby reduces pain perception.^[52] Yoga promotes both strength and flexibility in muscles. In contrast to exercises, yoga asanas are isometric. Asanas stabilize the autonomic nervous system. Poor sleep can worsen pain and is thought to be a major contributor to pain in conditions as chronic fatigue syndrome and fibromyalgia.^[52] Regular practice of asanas can also improve sleep. Pranayama with abdominal breathing initiates relaxation. Gradually, the person becomes aware of his own control over the symptom progression.^[53] In Cochrane database 2017 review, authors concluded that there is low-to moderate-certainty evidence that yoga results in small to moderate improvements in back-related function over short term in patients with nonspecific low back pain. It is uncertain whether there is any difference between yoga and other exercise for back-related function or pain, or whether yoga added to exercise is more effective than exercise alone.^[51]

One of the nonpharmacological modalities for chronic musculoskeletal orofacial pain and fibromyalgia is aerobic exercise. Exercise induced hypoalgesia may be related to increased levels of neurotransmitters such as serotonin, dopamine, acetylcholine, and norepinephrine.^[54] Exercise reduces fatigue and depression, improves peak oxygen uptake and physical fitness, and reduces pain.^[55] The combination of amitriptyline and aerobic exercise can reduce frequency, duration, and intensity of headache in patients with chronic migraine.^[56] The magnitude, type, and amount of exercise to manage pain differ according to patient’s pain and tolerance. In the study conducted by Sullivan *et al.*, the participants exposed to even brief protocol of 10 min of physical exercise program produced significant, immediate antidepressant and anxiolytic effects, along with decreases in perceived exertion.^[57] Aerobic exercise combats the deconditioning cycle affecting sensory (endogenous endorphin release) as well as affective component (mood improvement and relaxation), and is therefore a key component in treating chronic pain. It can

also improve core muscle strengthening, reduce load on spine and joints, and help in weight reduction.

Yoga and exercise cut down the negative emotional input that propagates the chronic pain cycle. Furthermore, reorganization of muscular architecture and spindles may help in repair of neural network, thereby reducing the pain intensity.

Meditation

Meditation means “to become familiar with.” In Sanskrit, it is called “dhyai” or “dhyana” and it means “to cultivate self.” Meditation is spiritually training the mind. It is widely followed by various religions. It helps develop powerful skills of observation and focus, so that one can learn to pay attention to the solutions and coping strategies rather than pain. Brain stays in the creative mode rather than survival. The electroencephalogram of Buddhist meditators showed lower anticipatory activity in right inferior parietal cortex and cingulate gyrus in response to laser stimuli on their forearm. It was suggested that acceptance of pain promotes cognitive control by reducing engagement with an emotional judgment of perceived events.^[58] MRI scans of Zen meditators showed thicker cortex in affective, pain-related brain regions including ACC, bilateral para-hippocampal gyri, and anterior insula. The brain morphometry alters due to long term meditation practice and significantly lowers pain sensitivity.^[59]

Mindfulness

Mindfulness is a concept developed from the ancient yoga philosophy and meditation traditions of India. It is practiced by paying attention to the present moment with openness, curiosity, and acceptance. Mindfulness helps in detached observation and self-regulation for chronic pain patients. Neurological mechanisms involve posterior cingulate cortex.^[60] There is uncoupling of sensory dimension of pain experience from affective and cognitive component. Furthermore, it can improve coping strategies. Mindfulness meditation alleviates pain and depression symptoms and improves the quality of life by psychological and neurophysiological modifications.^[60] Prayer meditation is

one of the universal spiritual practices followed to cope with pain and improve the quality of life.^[61]

Cognitive behavioral therapy

CBT is psychotherapeutic approach that uses combination of cognitive and behavioral therapies, addresses dysfunctional emotions and maladaptive behaviors through goal directed systemic procedures. Psychological and behavioral factors, cognitive, and emotional processes influence pain perception. Depression and anxiety are frequently found in patients suffering from chronic pain. Thoughts and feelings broadcast electromagnetic signals in the quantum field producing emotions, leading to actions, which in turn produce desires, creating more thoughts and feelings [Figure 3].

Negative, inappropriate, and catastrophic thoughts are often present in patients with pain disorders, which are highly correlated to the intensity of pain complaints. Thoughts may represent cognitive distortions that have little to do with reality. Catastrophizing manifests as rumination, magnification, or helplessness and is incredibly robust predictor of pain, disability, and maladaptation to chronic painful conditions. There is strong, if not overwhelming evidence for the efficacy of CBT in restoring function and mood and in reducing pain and disability-related behavior.^[62]

Pain-related fear and avoidance appear to be an essential feature of the development of a chronic problem for a substantial number of patients with musculoskeletal pain.^[63] Many patients with chronic pain develop a fear of movement, called kinesiophobia. There is obvious reduction in their routine activity levels, social withdrawal. In a review article, Vlaeyen and Linton wrote that fear of pain was more of a problem than the actual pain experience. The resultant fear avoidance behavior reinforces chronic pain and disability.^[64]

CBT is a form of talk therapy that helps people identify and develop skills to change negative thoughts and behaviors [Figure 4].

Even if the actual level of pain stays the same, people can change their awareness of pain and develop better-coping skills

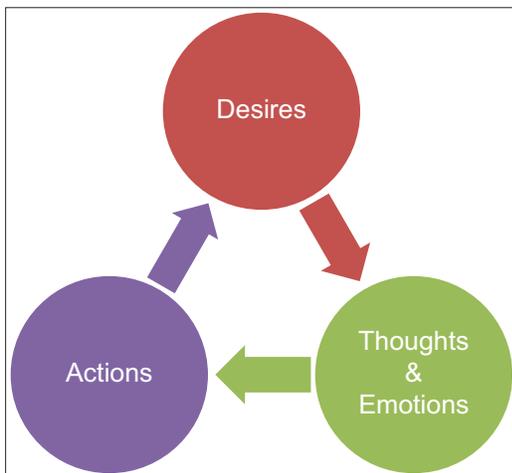


Figure 3: Understanding generation of emotions

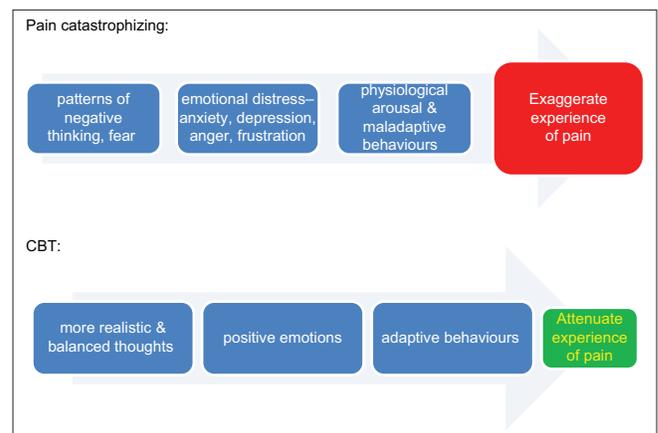


Figure 4: Cognitive re-structuring

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such that pain interferes less with their quality of life. CBT can also change the physical response in the brain, which in turn, causes the release of norepinephrine and serotonin. Cognitive restructuring encourages a problem-solving attitude, feeling of more control over pain and situation. This may involve keeping track of the thoughts and feelings associated with the pain throughout the day. CBT involves homework; assignments are reviewed in each session and are used for planning new homework for the following week. It fosters life skills and empowers patients with coping mechanisms that they can use in everyday life.^[65] Coping strategies can be assessed using the coping strategy questionnaire, of Rosenstiel and Keefe 1983. It comprises the patient self-rated six subscales for cognitive strategies (ignoring pain, the reinterpretation of pain, diverting attention, coping self-statements, catastrophizing, praying/hoping) and two subscales for behavioral strategies (increasing activity levels and increasing pain behaviors).^[66]

SPIRITUAL KNOWLEDGE-THE INVISIBLE ESSENTIAL

As we understand the involvement of supraspinal pathways in pain perception, it is natural to look at these targets for pain management. Neurohormonal, chemical, genetic influences responsible for the affective component of pain perception can be well modified by the generation of appropriate emotions and their correct handling. Non-pharmacotherapy management discussed so far can alter the affective component, which in turn, can modify the sensory component and pain perception. Effects of these therapies can be individual dependent and may require continuous reinforcement by the physician. The probable reason for this could be lack of background spiritual knowledge and insufficient empowerment of patients.

The science of psychology had labeled spirituality as nonscientific for many years. Psychology is the scientific study of the mind and behavior. While spirituality is the quality reflecting deepest values for the purpose of life. Toward the end of the 20th century, psychologists investigated the influence of religious and spiritual behaviors and beliefs on both mental and physical health outcomes. Swami Vivekananda described how the highest principles of Vedanta can be applied to conquer problems and pains of life, physical, emotional, or otherwise. Vedanta is one of the earliest Indian philosophical system of beliefs. Vedanta texts of Upanishads and Bhagavad Gita were likely written down for the first time around 500 BCE. The Gita describes that suffering remains an aspect of all living beings till one achieves the highest spiritual knowledge. And once the spiritual knowledge is internalized and practiced, there is no suffering due to pain.

The spiritual knowledge essentially imparts the principles of objectivity, detachment, gratitude, understanding the difference between temporary and permanent aspects of life, living in the moment, dissolving one's ego and being one with the universe.^[67] The principle of objectivity helps patients in better understanding and acceptance of the condition without a prejudice. Rather than focusing on "suffering" and "why

me?," patient can be taught to focus on "how can I best handle it?." Acceptance leads to calm mind, which in turn, gives the right value to a problem (attention/distraction) in context with chronic pain and build up realistic expectations. Now, the patient can also think about better coping strategies and possible lifestyle changes. This principle is used in acceptance – commitment therapy for chronic pain.^[33] This also reduces the possibility of catastrophizing.

Spiritual knowledge provides the power of improving intellect that helps one to choose better thoughts, feelings, and actions. The Buddha says, "you are what you think." Thoughts control internal milieu of body. Idea is to allow purer thoughts in mind so as to make favorable neural connections and chemical changes that provide positive feedback. The principle of imparting the right value for any worldly emotion, action, behavior, or situation can come from the understanding that one has the power to change oneself, but does not have control over the external world. So, getting affected by surrounding people and things can only produce disappointment, anger, frustrations, and many more negative emotions which in turn can worsen pain perception. To have emotions is a virtue. Spiritual scriptures only caution against the onslaught of emotions. Spiritual practice is bound to lead to peace and bliss by modifying emotional and affective components in chronic pain patients. Action is insignia of life. Scriptures mention that activity is needed to maintain your body. The positive effects of physical therapy in chronic pain are well documented in the literature. For many years, the treatment of choice for chronic pain has included recommendations of inactivity and rest. Recently, however, the opposite has shown to be effective. Regular exercise programs can prove beneficial to those with chronic pain.

Chronic pain is a central nervous system condition that is maintained by maladaptive neuroplastic changes in structure and function. Spiritual knowledge can bring about positivity that can rewire the brain and neural connections. Positive and more balanced thoughts about conquering pain conditions can reduce social withdrawal, catastrophizing and anxiety related to pain. Repetitive negative thoughts can cause fear and progressive inaction. Though the experience of pain is real, one's thoughts, emotions, expectations, and memories create secondary sources of chronic pain. So, here, neuroplasticity can be harnessed for healing as encouraging evidence suggests that alterations in the brain associated with chronic pain are modifiable and reversible with effective clinical interventions.^[68]

A popular Hindu and Buddhist belief is that suffering is the cost of attachment. The knowledge of detachment helps one to see oneself as "sakshi" or witness to the happenings in one's own life without getting emotionally affected. As the circle of identification (self, family, society, nation, world) progressively increases, the selfless attitude and service comes naturally. This selfless attitude provides the patient with the joy of giving and fulfillment, which in turn, increases the power of healing. And as one sets a higher goal in life, one's own

Table 1: 25 randomized controlled trials

Characteristics	Authors				
	Sundblom <i>et al.</i> , 1994 ^[8]	Gerard <i>et al.</i> , 2003 ^[9]	Gasiorowska <i>et al.</i> , 2009 ^[10]	Tsubono <i>et al.</i> , 2009 ^[11]	Carneiro <i>et al.</i> , 2017 ^[12]
Patient population	24, idiopathic pain syndromes	68, neck pain patients	39, noncardiac chest pain	16, chronic pain patients	41, cardiovascular inpatients
Intervention	SH	SH	Johrei versus non-Johrei	20 min meditation every day	Spiritist "passé"
Duration	1½ years	3 weeks, 30 min/week	18 Johrei sessions for 6 weeks	2 months	10 min session on 3 days
Outcome measures	Analgesic intake, sleep pattern, clinical variables, attitudes, hopelessness, acceptance of psychological factors	ROM neck in 3 directions, VAS, SF-36, health survey general health questionnaire, HADS, chronic pain grade	VAS	VAS, McGill pain questionnaire	VAS, anxiety, depression, perceptions of muscle tension and well-being, physiological parameters
Conclusion	↓Analgesics intake, improved sleep pattern SH helpful to patients suffering from idiopathic chronic pain syndrome	Improved ROM neck, scores for physical function and energy and vitality, low VAS	Johrei may have a role in improving noncardiac chest pain symptoms	Improvement in VAS and present pain intensity scale	Effective, ↓anxiety, and perception of muscle tension, improved peripheral oxyhemoglobin saturation and sensation of well-being
Co relation	Significant	Significant	Significant	Significant	Significant
Characteristics	Authors				
	de Souza Cavalcante <i>et al.</i> , 2016 ^[13]	Van Gordon <i>et al.</i> , 2017 ^[14]	Wachholtz and Pargament 2005 ^[15]	Feuille and Pargament 2015 ^[16]	Carneiro <i>et al.</i> , 2016 ^[17]
Patient population	50, chronic pain	148, FMS	84, college students, cold water hand immersion	107, students	72, hospitalized patients
Intervention	Weekly spiritist "passe" sessions	2 nd generation mindfulness based intervention versus CBT	SH (meditation) versus secular healing (relaxation)	Standardized versus spiritualized mindfulness versus simple relaxation	Spiritual practice session
Duration	8 weeks	8 weeks	2 weeks, 20 min/day	2 weeks	10 min session for 3 days
Outcome measures	STAI-trait	Symptoms, pain perception, sleep quality, distress, nonattachment and civic engagement at 6 months	Length of hand immersion, pain, anxiety, mood, spiritual health	Cold-pressor task	HAD scale, perceptions of muscle tension and wellness, VAS, HR, SpO ₂
Conclusion	↓anxiety in Spiritist "passe" than in controls	Ameliorate FMS symptomatology and pain perception by ↓ing attachment to self, recognize spiritual aspect of mindfulness and may have a role in the treatment of FMS	Spiritual therapeutic techniques may be more effective, greater positive affect, less anxiety	Pain-related outcomes better in standardized, spiritualized mindfulness condition though spirituality did appear to enhance mindful awareness	Promotes a state of muscle relaxation, ↓anxiety, depression, muscle tension, ↑perception of wellness, No difference in HR, SpO ₂ , VAS
Co relation	Significant	Significant	Significant	Significant	Significant
Characteristics	Authors				
	Kiran <i>et al.</i> , 2014 ^[18]	Wachholtz <i>et al.</i> , 2017 ^[19]	Wachholtz and Pargament 2008 ^[20]	Vuckovic <i>et al.</i> , 2012 ^[21]	McCauley <i>et al.</i> , 2011 ^[22]
Patient population	50, CCTH patients	92 meditation-naïve migraine patients	83, frequent migraineurs	23 women suffering from TMD	100, chronically ill patients, average of three illnesses
Intervention	Brahmakumaris spiritual based meditation known as Rajyoga	Spiritual versus internally versus externally focused secular meditation versus progressive muscle relaxation	Spiritual versus internally focused versus externally focused meditation	Shamanic healing	A video and workbook encouraging use of patient spiritual coping
Duration	8 weeks	30 days	1 month, 20 min/day	9 months	4 weeks

Contd...

Table 1: Contd....

Characteristics	Authors				
	Kiran <i>et al.</i> , 2014 ^[18]	Wachholtz <i>et al.</i> , 2017 ^[19]	Wachholtz and Pargament 2008 ^[20]	Vuckovic <i>et al.</i> , 2012 ^[21]	McCauley <i>et al.</i> , 2011 ^[22]
Outcome measures	Severity, frequency and duration of CCTH, and their headache index	Headache frequency, severity, and medication use	Frequency of migraine, mental and spiritual health variables	TMD research diagnostic criteria axis II	Psychosocial and health outcome measures
Conclusion	Rajyoga meditation highly effective in causing earlier relief in chronic tension headache	No effect pain severity, but ↓ frequency and improved pain tolerance with ↓ ed headache related analgesic medication usage	↓ frequency headaches, anxiety, negative affect, and ↑ in pain tolerance, headache-related self-efficacy, daily spiritual experiences, and existential wellbeing	Shamanic healing had lasting effects on TMDs in the small cohort of women	Encouraging spiritual coping was associated with ↑ ed energy, and required no additional clinician time
Co relation	Significant	Significant	Significant	Significant	Significant
Characteristics	Authors				
	le Gallez <i>et al.</i> , 2000 ^[23]	Abbot <i>et al.</i> , 2001 ^[24]	Zale <i>et al.</i> , 2018 ^[25]	Meghani <i>et al.</i> , 2018 ^[26]	Beiranvand <i>et al.</i> , 2014 ^[27]
Patient population	29, RA	120, chronic pain resistant to CT	63, neurofibromatosis	18, cancer patients	160, Iranian muslim women
Intervention	SH	Face to face SH (part 1) Distant SH (part 2)	Mind-body program versus attention placebo control via group video conferencing	Mindfulness-based art therapy	Pray meditation for women undergoing c-section
Duration	6 months	16 weeks, weekly session	6–8 sessions	8 weeks	Single session
Outcome measures	Clinical, biochemical assessments	McGill pain questionnaire, VAS, SF36, HAD scale, MYMOP and patient subjective experiences	Self-report measures of resiliency i.e., perceived coping abilities, social support, gratitude, optimism, spiritual well-being, mindfulness at 6 months	Walkabout, sleep quality, QOL, SOC, and spirituality	VAS, BP, HR, RR
Conclusion	No change in pain outcome in RA patients	No specific effect of face-to-face or distant healing	Sustained ↑ es in multiple dimensions of resiliency, but no differences in spiritual well-being, optimism, or gratitude	Significant improvements in depression, peace, meaning, faith. no changes in physical functioning, pain, sleep, tiredness, drowsiness, nausea, appetite	↓ VAS at 3 and 6 h after pray meditation. less PONV and more relaxation
Co relation	Not significant	Not significant	Not significant	Significant	Significant
Characteristics	Authors				
	Steinhauser <i>et al.</i> , 2008 ^[28]	Jafari <i>et al.</i> , 2013 ^[29]	Vermandere <i>et al.</i> , 2016 ^[30]	Ando <i>et al.</i> , 2009 ^[31]	Mosher <i>et al.</i> , 2018 ^[32]
Patient population	82, end-of-life disease patients cancer, heart and lung disease	65, Iranian women with breast cancer	Incurable, life-threatening disease	28, Japanese cancer patients undergoing anti cancer therapy	50, advanced GI cancer patients and caregivers
Intervention	Discussions of end-of-life preparation versus listening and watching CD versus no intervention	spirituality based intervention	Structured spiritual history taking by health care workers on the spiritual well-being	MBMT, including breathing, yoga movement and meditation	Telephone-based or a peer helping + coping skills intervention
Duration	3 sessions	6 weeks	Single session	2 weeks	5 sessions

Contd...

Table 1: Contd....

Characteristics	Authors				
	Steinhauser <i>et al.</i> , 2008 ^[28]	Jafari <i>et al.</i> , 2013 ^[29]	Vermandere <i>et al.</i> , 2016 ^[30]	Ando <i>et al.</i> , 2009 ^[31]	Mosher <i>et al.</i> , 2018 ^[32]
Outcome measures	VAS, spiritual well-being, QOL by MSAS, QUAL-E, ADL scale, anxiety sub-scale, CESD, daily spiritual experience scale	FACIT-sp, QLQ-C30	Spiritual well-being, quality of life, pain, or patient-provider trust	HADS, FACIT-Sp VAS	Meaning in life/peace, fatigue, psychological symptoms, coping self-efficacy, emotional support, patient pain and caregiver burden
Conclusion	Active discussion offers resolution of emotional and spiritual concerns with improved outcomes	Improvements in spiritual well-being and QOL	No significant differences at any point in time in the scores	MBMT effective for anxiety, depression and spiritual well-being is related to anxiety, depression, pain	Slight ↓ in burden for patients and care givers but no effect on spiritual well being
Co relation	Significant	Significant	Not significant	Significant	Not significant

↓ - decrease, ↑ - increase, SH: Spiritual healing, CT: Conventional therapy, VAS: Visual analog scale, MSAS: Memorial symptom assessment scale, SF-36: Short form 36, HAD scale: Hospital anxiety and depression scale, FACIT-sp: Functional assessment of chronic illness therapy-spiritual, MBMT: Mindfulness-based meditation therapy, BP: Blood pressure, HR: Heart rate, RR: Respiratory rate, QOL: Quality of life, TMD: Temporomandibular disorder, C-section: Cesarean section, CCTH: Chronic tension headache, PONV: Postoperative nausea and vomiting, GI: Gastrointestinal, FMS: Fibromyalgia syndrome, STAI-trait: Trait anxiety inventory, CBT: Cognitive behavioral therapy, SpO₂: Oxygen saturation, SOC: Sense of coherence, MYMOP scale: Measure Yourself Medical Outcome Profile scale, ROM: Range of Motion, RA: Rheumatoid Arthritis, CD: compact disc, QUAL-E: Measuring the Quality of Life of Seriously Ill Patients, QLQ-C30: Quality of Life Questionnaire in cancer patients, ADL: Activities of Daily Living, CESD: Center for the Epidemiological Studies of Depression

pain becomes a meager issue. Management therapies, which enhance subjective well-being and decrease negative affect, and reduce pain catastrophizing may have the highest potential for benefiting individuals with disability-associated chronic pain.^[69] The lack of agreement on the conceptualization of spirituality in both research and clinical practice often results in a non-systematic and indifferent approach to patients' spiritual needs.^[70]

The basic principles of spiritual knowledge discussed in this article sharpen one's intellect. Spiritual awareness and its application in day to day life, can help in better pain management.

Spiritual wellbeing significantly correlates with greater levels of physical, emotional and functional wellbeing and a better quality of life.^[70]

Non-pharmacotherapy techniques discussed here, have been found useful in the end of life scenarios, in cancer palliation. If extended to conditions like chronic pain states, as being researched in recent years, they will help in addressing the complexity of pain perception. The mental state of renunciation is an essential prerequisite for practicing concentration and meditation. The mind requires to be prepared for the practice of yoga to get free from the bulk of desires. Just practicing yoga as a form of physical exercise may not give long term benefits and may be counterproductive. Long term happiness can prevail only if the person has internalized the spiritual knowledge and is practicing it in all aspects of life.

Addressing spiritual dimension in clinical practice for pain management – Way forward for pain physicians:

Spirituality as a subject can be introduced but cannot be

learnt from medical school textbooks. It requires knowledge mentioned in scriptures rather than scientific books. Saints, sages, and enlightened souls have spent their life in understanding the purpose of life. It is faith in them that attracts us to follow their advice and investigate reality. Spiritual information can indeed be retrieved from abundant literature that is available in India, that insists on the holistic rather than reductionist approach. However acquiring that knowledge and internalizing it, are the most difficult aspects. Once a person is spiritually evolved, spirituality becomes one's nature and is followed in all aspects of life, professional as well as personal. Such a person has the ability to transfer that spiritual knowledge to others, including patients. However, it might be difficult for many physicians to themselves get convinced regarding spiritual principles, as spirituality is subtle and abstract. Nevertheless, there is a resurgence of interest both among patients and professionals in holistic and integrative approaches to healthcare and pain management.

The need to address the spiritual component in patients with chronic pain comes from the understanding that pharmacotherapy and interventions do not completely relieve patients of their pain. This is probably the missing link that is required to be prescribed and practiced in chronic pain management for better patient outcomes. Vedantic scriptures have definitely given the solution for suffering. However, scriptures do not have scientific evidence in the form of RCTs or case series for scientists. However our search, of bringing an end to suffering in chronic pain patients, would fail, without being inclusive of spiritual knowledge. Pain physicians and psychologists have partly accepted these principles

and devised therapies. Background of spiritual knowledge can enhance the efficacy and duration of these therapies. Clinical interventions that increase meaningfulness and purpose in life allow patients with chronic pain to overcome the maladaptive cognitions associated with pain, thereby reducing symptoms.^[71] A multidimensional pain assessment that includes biopsychosocial as well as spiritual domains must be used.^[72] As pain physicians and scientists, we must take up the challenge to prove or disprove the effectiveness and relevance of spirituality for pain management outcomes using technologies to design appropriate clinical trials and derive scientific conclusions.

Limitations

Sample sizes were highly variable. The study groups and spiritual interventional techniques followed were heterogeneous. The frequency of techniques and follow-up durations were variable. As acquiring spiritual knowledge is a long process, integrating spirituality in therapies for chronic pain management can be challenging and will require pain physicians to be more individualistic and creative in their approach.

CONCLUSION

Inadequate control of chronic pain can exaggerate nonphysical aspects of pain, thereby exacerbating pain perception and deteriorating quality of life. This adds to the anxiety, depression, fear further leading to physical deconditioning and social withdrawal. Pharmacotherapy and interventional therapy have not yet found a definitive solution for chronic pain issues. Pain researchers are exploring the role of nonpharmacotherapies like yoga, exercise, meditation, mindfulness, and CBT. The principles on which they are based, come from ancient spiritual scriptures of Indian philosophy which states that strengthening of intellect, control of mind over the body with the purity of thoughts and living with objectivity can bring about neuroplasticity in favor of pain control. Most recommended nonpharmacologic therapies are not widely available in health care settings, are often excluded from insurance coverage, and provided only after opioids and interventional procedures fail. Though they generate meaningful clinical improvement in only a subset of patients, nearly all nonpharmacological therapies are safer than medications and invasive procedures. Thus, these therapies along with the background of nonreligious based spiritual knowledge, should be administered as part of holistic pain management approach. Addressing the spiritual dimension of pain should be an essential component of the multimodal integrated approach in the management of chronic pain. With advancing technology, conducting well-designed research studies in this area can produce scientific evidence to embrace the spiritual component in the clinical management of chronic pain states. The search for eliminating suffering due to pain would be incomplete without addressing the spiritual dimension of pain.

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