

OBSERVING THE EFFECTS OF MINDFULNESS-BASED MEDITATION ON ANXIETY AND DEPRESSION IN CHRONIC PAIN PATIENTS

Kim Rod

McMaster University, Hamilton, Ontario, Canada

SUMMARY

Background: People whose chronic pain limits their independence are especially likely to become anxious and depressed. Mindfulness training has shown promise for stress-related disorders.

Methods: Chronic pain patients who complained of anxiety and depression and who scored higher than moderate in Hamilton Depression Rating Scale (HDRS) and Hospital Anxiety and Depression Scale (HADS) as well as moderate in Quality of Life Scale (QOLS) were observed for eight weeks, three days a week for an hour of Mindfulness Meditation training with an hour daily home Mindfulness Meditation practice. Pain was evaluated on study entry and completion, and patients were given the Patients' Global Impression of Change (PGIC) to score at the end of the training program.

Results: Forty-seven patients (47) completed the Mindfulness Meditation Training program. Over the year-long observation, patients demonstrated noticeable improvement in depression, anxiety, pain, and global impression of change.

Conclusion: Chronic pain patients who suffer with anxiety and depression may benefit from incorporating Mindfulness Meditation into their treatment plans.

Key words: chronic pain - anxiety – depression - mindfulness

* * * * *

INTRODUCTION

Chronic pain is pain that continues more than three months, or a pain that continues a month or more beyond the usual recovery period for an injury or illness, or a pain that continues for months or years due to a chronic condition. The International Association for the Study of Pain (IASP) defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described by the patient in terms of such damage” (Merskey 1979). The most common sources of chronic pain are low back problems, arthritis, cancer, repetitive stress injuries, shingles, headaches, and fibromyalgia. Other causes include diabetic neuropathy, phantom limb sensation, and other neurological conditions. Chronic pain can also exist with no apparent cause (NINDS). In the United States (US) alone, more than 100 million people suffer with chronic pain, costing the nation as much as \$635 billion a year in medical treatment and lost productivity (Institute of Medicine Report 2011).

A 2006 survey conducted for the American Pain Foundation evaluated the impact that chronic pain had on 303 chronic pain sufferers who sought care from their physicians and were currently using an opioid to treat their pain. The Voices of Chronic Pain survey found that as a result of pain, more than three quarters of patients (77%) reported feeling depressed, 70% said they have trouble concentrating, and more than half (52%) said their chronic pain has put a strain on relationships with family and friends. Importantly, more than half of respondents (51%) felt they had little or no control over their pain (Pain Survey 2006). In fact, there

is significant evidence of comorbidity for anxiety and depression related to chronic pain (Tsang 2008).

Depression often magnifies the pain and reduces patients' coping skills. Mindfulness training - the practice of maintaining a nonjudgmental state of heightened or complete awareness of one's thoughts, emotions, or experiences on a moment-to-moment basis - has been shown to benefit both depression and substance use disorders (Brewer 2008, Brewer 2009; Brewer 2010, Libby 2012, Brewer 2013, Schuman-Oliver 2014, Garrison 2015).

Although still unclear, this approach may target common behavioral and neurobiological processes. (Brewer 2011, Brewer 2013, Mindfulness; Brewer 2013, *Frontiers in Human Neuroscience*; Garrison 2014). In addition to medications for chronic pain, non-medicinal therapies may help teach patients new self-management skills. Mindfulness meditation training has been adapted as a central component of psychotherapy and has shown some efficacy in the treating psychiatric disorders related or involving pain, anxiety, and depression (Marchand 2013, Goyal 2014).

Dr. Jon Kabat-Zinn developed Mindfulness-Based Stress Reduction (MBSR), based on ancient healing practices, it is a well-defined and systematic patient-centered educational approach that is a relatively intensive training in mindfulness meditation. This core program teaches people how to take better care of themselves and live healthier and more adaptive lives (Mindful Living Programs). Dr. Kabat-Zinn's stress reduction program at the University of Massachusetts Medical School was used as a model for the following observation.

MATERIALS AND METHODS

To be included in the study, patients with chronic pain who complained of anxiety and depression had to score 15 or higher (0-7=normal, 8-13=mild depression, 14-18=moderate depression, 19-20=severe depression) on the Hamilton Depression Rating Scale (HDRS) (Hamilton 1960); 11 or higher (0-7=normal levels of anxiety and depression (8-10=borderline anxiety, 11-21=abnormal anxiety and depression) on the Hospital Anxiety and Depression scale (HADS) (Zigmond 1983); and less than 5 (0=non functioning –10=normal) on the Quality of Life scale (QOLS) (Flanagan 1978). On the Numeric Pain Rating Scale (NPRS), (McCaffery 1999) 25% of study patients rated their pain as mild, 55% as moderate, and 20% as severe (0=none; 1-3=mild; 4-6=moderate; 7-10=severe). At the end of the study, patients were to complete the Patient's Global Impression of Change Scale (PGIC) (0-4=much better, 5=no change, 6-10=much worse) (Hurst 2004). The baseline entering scores of the above mentioned scales as well as NPRS numbers were recorded as baseline patient state.

Patients were observed for eight weeks (3 days a week, one hour per visit). Mindfulness techniques included breathing, body scan, mindful inquiry, mindful walking, and mindful eating.

RESULTS

During the year 2014, a total of 50 patients were enrolled in 10 programs; 47 patients completed the study. Three patients did not complete the study for personal reasons unrelated to the study. Their numbers were based on their answers at their exit points. Noticeable improvement was observed in patients' depression, anxiety, quality of life with this program. Patients also scored favorably on the PGIC. Results are demonstrated bellow (Table 1).

Table 1. Percentage of Change in Depression, Anxiety, Quality of Life, and Patients' Global Impression of Change Scores

Scale	Before Treatment	After Treatment
HDRS	100% scored 15 or higher	60% scored <7
HADS	100% 11 or higher	59% scored <7
QOLS	100% less than 5	12% <5
PGIC	N/A	80% >5

HDRS: 0-7=normal, 8-13=mild, 14-18=moderate, 19-20=severe;
HADS: 0-7=normal, 8-10=borderline, 11-21=abnormal;
QOLS: 0-5=non functioning, 6-10=normal quality of life;
PGIC: 0-5=no change, 6-10=much improved

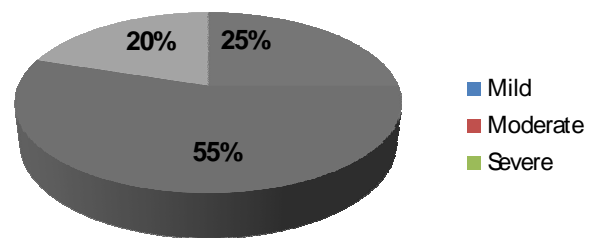
Patients also showed improvement in pain levels with this treatment (Figure 1 and 2)

DISCUSSION

Chronic pain and depression can affect a person's entire life. Millions of patients suffer with their pain,

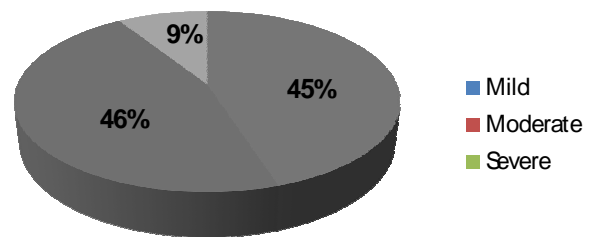
resulting in significant loss of productivity and income as well as negative impacts on their personal and family lives. Depression is one of the most common psychological issues facing people who suffer from chronic pain, and it often complicates the patient's conditions and treatment. Because of the connection between chronic pain and depression and anxiety, it makes sense that treatments for these conditions overlap. An ideal treatment approach addresses all the areas of patients' lives that are affected by chronic pain as well as depression and anxiety. Mindfulness Meditation training focuses on the present moment and has shown promise as a component of addiction treatment, possibly offering promise for those dealing with chronic pain associated with various disorders as well.

This study sought to evaluate the impact of Mindfulness Meditation on patients experiencing depression and anxiety associated with chronic pain. The results are promising, suggesting that Mindfulness training, including Mindfulness of breathing, Body scan, Mindful inquiry, Mindful walking, and Mindful eating may improve levels of anxiety and depression as well as pain intensity.



0=none; 1-3=mild; 4-6=moderate; 7-10=severe

Figure 1. Numeric Pain Rating Scores before Treatment



0=none; 1-3=mild; 4-6=moderate; 7-10=severe

Figure 2. Numeric Pain Rating Scores after Treatment

CONCLUSIONS

Our findings suggest that Mindful Meditation training is a positive approach for patients with chronic pain who are suffering with depression and anxiety, overall improving their QOL and pain intensity.

Acknowledgements:

We would first like to thank the participants in this study.

Conflict of interest: None to declare.

References

1. Brewer JA, Grant JE & Potenza MN: *The Treatment of Pathologic Gambling. Addictive Disorders and Their Treatment* 2008; 7:1-13.
2. Brewer JA, Sinha R, Justin A, Chen JA, Michalsen RN, Babuscio TA, Nich C, Grier A, Keri L, Bergquist KL, Reis DL, Potenza MN, Kathleen M, Carroll KM and Rounsaville BJ: *Mindfulness Training and Stress Reactivity in Substance Abuse: Results from A Randomized, Controlled Stage I Pilot Study. Subst Abus* 2009; 30:306–317.
3. Brewer JA, Bowen S, Smith JT, Marlatt GA, and Potenza MN: *Mindfulness-Based Treatments for Co-Occurring Depression and Substance Use Disorders: What Can We Learn from the Brain? Addiction* 2010; 105:1698–1706.
4. Brewer JA, Elwafi HM, Davis JH *Craving to quit: psychological models and neurobiological mechanisms of mindfulness training as treatment for addictions. Psychology of Addictive Behaviors* 2013; 27:366-79.
5. Brewer JA, Worhunsky PD, Gray JR, Tang YY, Weber J, and Kober H: *Meditation experience is associated with differences in default mode network activity and connectivity. PNAS* 2011; 108:20254-20259.
6. Brewer JA, Davis JH and Goldstein J: *Why is it so hard to pay attention, or is it? Mindfulness, the factors awakening and reward-based training. Mindfulness* 2013; 4: doi:10.1007/s12671-012-0164-8.
7. Brewer JA, Garrison KA and Whitefield-Gabrieli S: *What about the “self” is processed in the posterior cingulate cortex? Frontiers in Human Neuroscience* 2013; 7:647.
8. Flanagan JC: *A research approach to improving our quality of life. Am Psychologist* 1978; 33:138-147.
9. Garrison KA, Prasanta P, Rojiani R, Dallery J, O'Malley S and Brewer JA: *A randomized controlled trial of smartphone-based mindfulness training for smoking cessation: a study protocol. BMC Psychiatry* 2015; 15:83.
10. Garrison KA, Scheinost D, Constable RT and Brewer JA: *Bold signal and functional connectivity associated with loving kindness meditation. Brain and Behavior* 2014; 4:337-347.
11. Goyal M, Singh S, Sibinga EM, Gould NF, Rowland-Seymour A, Sharma R, Berger Z, Sleicher D, Maron DD, Shihab HM, Ranasinghe PD, Linn S, Saha S, Bass EB and Haythornthwaite JA: *Meditation programs for psychological stress and well-being: a systematic review and meta-analysis. JAMA Internal Medicine* 2014; 174:357–68.
12. Hamilton M: *A rating scale for depression. J Neurol Neurosurg PS* 1960; 23:56-62.
13. Hurst H, Bolton J: *Assessing the clinical significance of change scores recorded on subjective outcome measures. J Manipulative Physiol Ther* 2004; 27:26-35.
14. Institute of Medicine: *Report from the Committee on Advancing Pain Research, Care, and Education: Relieving Pain in America, A Blueprint for Transforming Prevention, Care, Education and Research. The National Academies Press*, 2011.
15. Libby DJ, Worhunsky PD, Pilver CE, Brewer JA: *Meditation-induced changes in high-frequency heart rate variability predict smoking outcomes. Frontiers in Human Neuroscience* 2012; 6:54.
16. Marchand WR: *Mindfulness meditation practices as adjunctive treatments for psychiatric disorders. Psychiatr Clin North Am* 2013; 36:141–52.
17. McCaffery M, Pasero C: *Teaching patients to use a numerical pain-rating scale. Am J Nurs* 1999; 99:22.
18. Merskey H: *Pain terms: a list with definitions and notes on usage recommended by the IASP subcommittee on taxonomy. Pain* 1979; 6:249–252.
19. *Mindful Living Programs. Available at: <http://www.mindfullivingprograms.com/whatMBSR.php>. Accessed June 1, 2015.*
20. *Mindful Living Programs: What is Mindfulness-Based Stress Reduction? Available at: <http://www.mindfullivingprograms.com/whatMBSR.php>. Accessed June 1, 2015.*
21. *National Institute for Neurological Disorders and Stroke: NINDS Chronic Pain Information Page. Available at: http://www.ninds.nih.gov/disorders/chronic_Pain/chronic_Pain.htm. Accessed June 1, 2015.*
22. Schuman-Olivier ZD, Hoepfner BB, Evins AD and Brewer J: *Finding the right match: Mindfulness training may potentiate the therapeutic effect of non-judgment of inner experience on smoking cessation. Subst Use Misues* 2014; 49:586-594.
23. Tsang A, Von Korff M, Lee S, Alonso J, Karam E, Angermeyer MC, Borges GL, Bromet EJ, Demyttenaere K, de Girolamo G, de Graaf R, Gureje O, Lepine JP, Haro JM, Levinson D, Oakley Browne MA, Posada-Villa J, Seedat S, Watanabe M: *Common chronic pain conditions in developed and developing countries: gender and aged if ferences and comorbidity with depression-anxiety disorders. J Pain* 2008; 9:883-91.
24. *Voices of Chronic Pain: National Survey 2006. Available at: <http://www.davidmichaelsoncompany.com/Documents/Voices%20of%20Chronic%20Pain%20Report.pdf>. Accessed June 1, 2015.*
25. Zigmond AS, Snaith RP: *The hospital anxiety and depression scale. Acta Psychiatr Scand* 1983; 67:361-70.

Correspondence:

Kim Rod, B.Sc. Hons Life Science and Psychology
McMaster University
1280 Main Street West, Hamilton, Ontario L8S 4L8, Canada
E-mail: Kimyarod@gmail.com