



## Addressing Stress Among Healthcare Workers Using Mindfulness-Based Interventions

Pallav Dave \*

Regulatory Compliance Analyst, Louisville, KY,40223, USA

### Article Info:

#### Article History:

Received 11 April 2024  
Reviewed 29 May 2024  
Accepted 19 June 2024  
Published 15 July 2024

#### Cite this article as:

Dave P, Addressing Stress Among Healthcare Workers Using Mindfulness-Based Interventions, Asian Journal of Dental and Health Sciences. 2024; 4(2):56-60

DOI: <http://dx.doi.org/10.22270/ajdhs.v4i2.89>

#### \*Address for Correspondence:

Pallav Dave, Regulatory Compliance Analyst,  
Louisville, KY,40223, USA

### Abstract

Stress is rampant among healthcare workers in different patient care settings. Healthcare workers are one of the groups that report high workplace stress levels with some studies reporting these levels to be as high as 70 to 90%. Stress was particularly rampant among healthcare workers during the COVID-19 pandemic because most workers were overwhelmed and could not provide the best care for their patients. Stress among healthcare workers is likely to continue because the work conditions that contribute to this high level of stress are becoming more rampant. For instance, demanding work, long and unpredictable work hours, and high administrative burdens continue to be rampant. Other factors such as an increase in the number of people affected by multiple chronic conditions and the aging workers are also putting a lot of strain on healthcare and among healthcare workers. Considering the staff shortages, taking care of people with numerous needs can increase stress levels which explains why healthcare workers report high levels of stress. Considering the negative effects of stress on healthcare workers' health and well-being, it is important to have effective interventions in place to deal with this stress such as mindfulness training. Research has shown that mindfulness-based interventions have a lot of potential when it comes to addressing work-related stress. It also helps to deal with depression and anxiety. To increase effectiveness, mindfulness training can also be incorporated as part of wellness programs in the workplace.

**keywords:** mindfulness training, mindfulness-based interventions, stress, burnout, healthcare workers

### Introduction

Stress is rampant in healthcare with statistics indicating that healthcare workers in different patient care settings are significantly affected. According to a study by Prasad et al. high levels of stress were reported by healthcare workers during the COVID-19 pandemic.<sup>1</sup> In a 2022 survey involving 11,964 nurses, 70% reported experiencing high levels of stress at the height of the COVID-19 pandemic.<sup>2</sup> Similarly, high levels of stress were reported by physicians during the same time period.<sup>3</sup> Although high levels of stress were reported among healthcare professionals during the COVID-19 pandemic, stress is not new to healthcare. High levels of stress were reported among healthcare workers prior to the COVID-19 pandemic with some studies reporting stress levels of up to 90%.<sup>4,5</sup> Research indicates that stress among healthcare workers is likely to continue increasing as working conditions that contribute to this stress become more rampant.<sup>6</sup>

Different factors explain why high levels of stress are reported among healthcare workers. Healthcare workers report higher levels of stress because they are constantly exposed to stressful and emotional situations that involve a lot of emotional labor. Emotional labor in this case means the ability to manage emotions while working with patients and ensuring that one's emotions do not affect the performance of their duties.<sup>7</sup> Emotional labor has been shown to have an effect on the physical and mental health of healthcare professionals.<sup>8</sup> Healthcare workers who perform emotional labor for extended periods of time are more likely to report emotional exhaustion and an increased likelihood of burnout. Exposure to human

suffering and working under pressure are also factors that contribute to higher levels of stress among healthcare workers. Emotional workers are also more prone to pressure because of the increased risk of exposure. This was particularly witnessed during the COVID-19 pandemic where fear of exposure to disease was one of the factors that led to high stress levels that were reported at the time.<sup>1</sup> Healthcare workers also report high-stress levels because of demanding work, long and unpredictable work hours, financial strain, and high administrative burdens.

Stress has a profound effect on healthcare workers affecting both their physical and mental health. The toll that comes with workplace stress has been reported to lead to burnout when it extends for long periods.<sup>1</sup> Physically, stress increases the risk of migraines, irritable bowel syndrome, and rashes.<sup>9</sup> Workplace stress also increases the likelihood of emotional exhaustion, lower professional efficacy, depersonalization, reduced timely-decision making, inadequacy, lower work efficiency, and reduced quality of care.<sup>10</sup> Mentally, workplace stress has been attributed to higher levels of anxiety and depression.<sup>10</sup> All these are likely to affect the ability of healthcare workers to deliver care. For instance, healthcare workers' stress has been attributed to increased risk of medical errors, decreased patient satisfaction, increased risk of hospital-acquired infections, and increased length of hospital stay.<sup>11</sup> Overall, workplace stress affects care provision. It increases the risk of safety incidents and lowers overall quality of care.

The profound effects of workplace stress on healthcare workers necessitate the need for interventions that can rectify the situation and improve their overall health and well-being. Several interventions have been suggested to address workplace stress over the years. For instance, rest and relaxation is highly encouraged as a measure of addressing workplace stress. Other interventions that are encouraged to deal with stress are breathing exercises, meditation, healthy eating, adopting healthy sleeping habits, and physical exercise. Although these measures have been shown to alleviate the effect of stress, they may not be able to adequately address long-term stress. This necessitates evidence-based approaches such as mindfulness training to deal with workplace stress. The effectiveness of mindfulness training in reducing workplace stress among healthcare workers has been established through research.<sup>12</sup> Mindfulness training can be tailored to different healthcare settings which makes it suitable to address stress in different groups of healthcare workers.

This review seeks to establish whether mindfulness training is an effective measure of addressing stress among healthcare workers. It explores different types of mindfulness training and their effectiveness when it comes to dealing with workplace stress.

## Types of Mindfulness-Based Interventions

Mindfulness is a concept that originates from the Buddhist tradition and which is cultivated through a number of different meditation practices.<sup>13</sup> Mindfulness refers to a form of attention training that seeks to direct an individual's attention to focus on everyday, present-moment experiences.<sup>14</sup> This is done with an attitude of curiosity, acceptance, and non-judgmental. Mindfulness is done with different aims with one of the objectives being to train people to respond to situations in a manner that is reflective instead of responding to them automatically.<sup>13</sup> As noted in the definition, mindfulness seeks to direct an individual's attention to focus on present-moment experiences. With this definition in mind, mindfulness can be defined as a psychological state that aims to promote an individual's awareness.<sup>15</sup> It puts one in a state of being aware which significantly improves their well-being. Mindfulness is also associated with psychological well-being because elements of mindfulness such as awareness and non-judgmental acceptance of one's present-moment experiences are regarded as effective against factors that cause psychological distress such as fear, anxiety worry among others.<sup>16</sup> Mindfulness can be acquired through training and different forms of Mindfulness-Based Interventions (MBI). These interventions aim to enhance a person's proximal skills such as non-judgmental attention control which play a crucial role in reducing symptoms that may affect one's psychological well-being.<sup>17</sup> In addition to improving one's psychological well-being, mindfulness training enables an individual to be able to recognize their thoughts, emotions, and physical sensations better. The ability to recognize one's thoughts and emotions better is what enables an individual to respond to stressful situations in a better manner. Mindfulness also increases resilience towards stressful situations. This is why mindfulness training is recommended as an effective strategy for dealing with stress among healthcare workers.

Different types of mindfulness-based interventions exist. Some of the most popular are mindfulness-based stress reduction (MBSR), mindfulness-based cognitive therapy (MBCT), mindfulness-based art therapy (MBAT), mindfulness-based pain management (MBPM), acceptance and commitment therapy (ACT), and dialectical behavior therapy. Mindfulness-based stress reduction (MBSR) is attributed to Jon Kabat-Zinn. He developed the therapy in 1979. MBSR is a structured group program whose main focus is to ensure an individual acquires mindfulness progressively.<sup>18</sup> The program takes approximately 8 to 10 weeks and can comprise 10 to 40 participants. The

groups that are involved in the program can be homogenous or heterogenous when it comes to the disorders or problems of participants. The average session of MBSR takes approximately 2.5 hours for every single session.<sup>18</sup> These sessions are done weekly. Additionally, the program involves additional single all-day sessions per course that are done on a weekend. Exercises and topics relating to mindfulness are covered in each session. The instructor guides the group in these exercises during each session. Some of these exercises are yoga, meditation, breathing techniques, group dialogue, and gratitude journaling.<sup>19</sup> Mindfulness during stressful situations and social interactions are also done during these sessions. MBSR also involves homework assignments which are done on a daily basis. These assignments take an average of 45 minutes and are in the form of mindful yoga, meditation practice, and applying mindfulness in different situations in life.

Research has documented that MBSR is an effective form of mindfulness training when it comes to reducing stress, dealing with depression, and addressing anxiety. MBSR is effective when it comes to dealing with stress because it reduces emotional reactivity and enhances an individual's cognitive appraisal.<sup>19</sup> In addition to addressing stress and other psychological disorders, MBSR can be used to alleviate symptoms of chronic pain in patients dealing with different conditions.<sup>19,20</sup> Therefore, MBSR can be used to increase the ability of individuals to cope with distress and disability more so for people going through devastating conditions such as chronic pain and psychological disorders.

Another form of mindfulness training that is widespread in healthcare is mindfulness-based cognitive therapy (MBCT). MBCT integrates principles of cognitive therapy into the mindfulness-based stress reduction (MBSR) program to address recurring episodes of depression.<sup>21</sup> MBCT was designed to prevent relapse in people with recurrent depression and was found to reduce the risk of relapse significantly. MBCT reduces depression relapse by making people more aware of their thoughts, feelings, and bodily sensations and relating to them differently.<sup>22</sup> It teaches important skills that allow individuals to dissociate from habitual cognitive routines more so thoughts that trigger depression which reduces the risk of relapse and recurrence. Different techniques are employed when using MBCT. They include mindfulness meditation, yoga, mindfulness stretching, and mindfulness practices. Similar to MBSR, techniques such as mindfulness meditation seek to teach individuals how to consciously pay attention to their thoughts and feelings without being judgmental.

Just like MBSR, MBCT is also an 8-week program with weekly sessions lasting 2 hours each. MBCT also encompasses different forms of meditation practices which can be classified as both formal and informal. Some of these practices are sitting and walking meditations, guided body scans, breathing exercises, mindful movement, and focused awareness of daily routine activities.<sup>23</sup> Each session aims to bring attention to breathing or bodily sensations. As such, the meditations are guided with similar intent. Although the sessions are done in groups, emphasis is also placed on developing an independent practice and expanding mindfulness to mental events including thoughts and emotions. Similar to MBSR, MBCT also encompasses homework assignments which are 45-minute sessions done on a daily basis with a focus on mindfulness activities.<sup>23</sup> These are done using guided meditation recordings. Although MBCT is similar to MBSR, there are some sessions that differ. For instance, MBCT encompasses cognitive therapy and psychoeducation about depression.<sup>23</sup> With regard to cognitive therapy, MBCT teaches people that attempting to resist or avoid unwanted thoughts and feelings does not make these feelings go away. Instead, it intensifies them which increases the risk of

depression. However, unlike cognitive behavioral therapy, MBCT does not place a lot of emphasis on changing or altering thought content. Instead, emphasis is placed on individual awareness of the relationship they have with their thoughts and feelings.<sup>24</sup> As a result, the aim is to enhance a person's metacognitive awareness. In addition to cognitive therapy and psychoeducation, MBCT also provides individuals with the necessary support that can lead to better well-being. The support can entail listening to music, taking walks, or even taking a bath.

The ability of MBCT to enhance a person's metacognitive awareness can explain why it is an effective technique for dealing with depression, anxiety, stress, and other psychological problems.<sup>25,26</sup> The fact that MBCT makes a person more aware of their thoughts and feelings means that they are able to identify early warning signs of depression and other psychological problems before the symptoms worsen. Besides, research has established that MBCT is effective in dealing with recurring depression with patients who have used the method showing significant improvement.<sup>26</sup>

In addition to MBSR and MBCT, there are other interventions of mindfulness training such as mindfulness-based pain management, mindfulness-based art therapy, acceptance and commitment therapy, and dialectical behavior therapy all of which have been shown to have varying forms of success when it comes to dealing with different issues. For instance, mindfulness-based pain management is an intervention that is used to help people manage chronic pain.<sup>27</sup> The intervention has also been shown to improve depression symptoms and overall quality of life.<sup>27</sup> Mindfulness-based art therapy is a mindfulness intervention that integrates mindfulness practices and art.<sup>28</sup> It allows an individual to engage in creative art as a way of self-exploration. This is done in a mindful manner in that the art is performed in a curious, kind, non-judgmental manner, and when an individual is aware of the present moment.<sup>28</sup> Research shows that mindfulness-based art therapy can be used to reduce emotional distress, anxiety, pain, and depression. Acceptance and commitment therapy (ACT) is an additional form of mindfulness intervention that encourages people to address negative thoughts, feelings, and sensations while providing guidance to commit to value-based actions.<sup>29</sup> Dialectical behavior therapy encourages people to develop healthy ways of coping with stress and other negative emotions. Combining different forms of mindfulness interventions can have a positive impact on stress and negative emotions among healthcare workers. Different mindfulness interventions can help healthcare workers address stress, depression, negative emotions, and other psychological issues that result from their work.

### **Mindfulness as a Measure to Address Stress among Healthcare Workers**

Healthcare workers continue to face profound workplace stress despite the numerous measures that have been put in place to address it. Organizational measures such as reducing workload, and improving workplace relationships have not been entirely effective in dealing with stress among healthcare workers because of the nature of work.<sup>30</sup> For instance, during COVID-19, healthcare workers experienced significant loss which impacted their ability to provide care and increased stress levels. The feeling of not being able to adequately provide care because of limited resources and an overwhelming number of patients contributed to higher stress levels during this period. Besides, the fear of getting infected and seeing their colleagues lose their lives because of the virus also led to higher stress levels. Newer problems also continue to emerge in healthcare and there are inadequate measures to address them. These factors explain why workplace stress is

prevalent among healthcare workers and why more measures are needed to address it. Addressing workplace stress is important because it has been shown to influence patient health and safety.<sup>31</sup> Workplace stress also increases the cost of care and affects the health and well-being of healthcare workers. Therefore, using measures that are shown to work in addressing stress is vital for overall good outcomes and well-being.

Research has shown that mindfulness training has a lot of potential when it comes to addressing stress and other psychological problems such as depression and anxiety among healthcare workers.<sup>32,33</sup> Combining different mindfulness-based interventions reduces overall stress, depression, and anxiety in both clinical and non-clinical populations. According to a meta-analysis done by Ruiz-Fernandez et al. mindfulness therapies were shown to be beneficial to healthcare professionals in helping them to manage and reduce stress.<sup>13</sup> Mindfulness was also found effective in increasing self-compassion among healthcare personnel. Mindfulness programs were also found to be effective in helping workers to respond effectively to stressors in the workplace.<sup>34</sup> The study which included different workers in healthcare such as dietitians, physicians, social workers, nurses, clinical trainees, and health researchers utilized MBST to provide mindfulness training. Some of the skills that were offered are mindfulness, relaxation response, positive affect-generating meditation, and guided imagery or hypnosis.<sup>34</sup> The training resulted in significant changes in stress levels, empathy, mindfulness, and resilience despite the fact that it was offered online. A similar study done by Shapiro et al. on medical and premedical students had similar findings.<sup>35</sup> The study showed that mindfulness was an effective intervention in reducing psychological distress including depression and anxiety. Mindfulness training also increased overall empathy levels and overall well-being.

Mindfulness training helps to reduce stress through a number of mechanisms. Mindfulness influences two stress pathways in the brain which leads to changes in brain structures and activity in regions that deal with attention and emotion regulation.<sup>36,37</sup> These changes influence how a person copes with stressful situations or regulate their emotions. Mindfulness-based interventions such as MBCT and MBSR also help to reduce stress by changing how people react to negative thoughts and emotions.<sup>38</sup> People who engage in mindfulness training tend to focus on the present and are less likely to put much thought into negative thoughts and emotions. Reducing focus on negative thoughts enables individuals to find positive ways to cope. In healthcare, there are different situations that increase negative thoughts and emotions. Stressful workplace conditions can increase negative thoughts and emotions among healthcare workers elevating stress levels. Using mindfulness training to address these negative emotions can lead to positive outcomes. Besides, mindfulness training emphasises the need to focus on the awareness of the present moment. As such, it can increase attention and concentration on the present moment reducing worry about past situations or future situations. Doing so is likely to increase focus which can lead to better decision-making.

Mindfulness training can also be used to improve the health and well-being of healthcare workers. Healthcare workers often encounter situations that are likely to impact their health and well-being.<sup>39</sup> (Sue, 2019). Mindfulness helps to foster empathy and self-compassion. Empathy and self-compassion are important when dealing with events that are likely to trigger stress.

The importance of mindfulness-based interventions in addressing stress is established in research. However, it is important to take note of the existing limitations and how these

limitations could impact their overall efficiency. First, mindfulness does not take into account that people react differently to different interventions and techniques and what may be effective for one person may not be effective for another.<sup>40</sup> Because people may react differently to these techniques, their effectiveness may be different. Secondly, the use of mindfulness interventions by people with a limited understanding of mental health may have negative effects. Limited understanding of mental health may limit positive outcomes associated with mindfulness-based interventions. Mindfulness can also increase stress response, negative emotions, and dissociation in some individuals leading to an opposite effect than what was expected.<sup>41</sup> Besides, the cost-effectiveness of mindfulness-based interventions in large organizational settings is yet to be established. Although the interventions are generally considered to be effective because they are administered in groups, the cost can be higher if administered to individuals.<sup>33</sup> Therefore, there is a need to consider the potential limitations of mindfulness interventions and put measures in place that can minimize negative effects.

## Conclusion

Stress is rampant among healthcare workers in different patient care settings. Even before the COVID-19 pandemic, stress was still prevalent with high levels reported among healthcare workers. During Covid-19, the number of healthcare workers affected by stress almost tripled raising concern about the effective measures that could be used to address the problem. Stress among healthcare workers is likely to continue because the work conditions that contribute to this high level of stress are becoming more rampant. For instance, demanding work, long and unpredictable work hours, and high administrative burdens continue to be rampant. Besides, the aging population and the number of people affected by chronic conditions are continuing to rise. Such factors put a lot of demands on healthcare workers which explains the high level of stress in this population. Considering the negative effects of stress on healthcare workers' health and well-being, it is important to have effective interventions in place to deal with this stress. Mindfulness training has been shown to have potential when it comes to addressing stress among healthcare workers. In addition to reducing stress, it has been shown to improve empathy, self-compassion, and reduce depression and anxiety. Different mindfulness-based interventions can be used but MBSR and MBCT are the most commonly used when dealing with stress. Mindfulness training can also be incorporated as part of wellness programs in the workplace to increase accessibility to more healthcare professionals.

## References

1. Prasad K, McLoughlin C, Stillman M, et al. Prevalence and correlates of stress and burnout among US healthcare workers during the COVID-19 pandemic: a national cross-sectional survey study. *EClinicalMedicine*. 2021;35. PMID:34041456 PMCID:PMC8141518 <https://doi.org/10.1016/j.eclinm.2021.100879>
2. American Nurses Foundation. Pulse on the Nation's Nurses Survey Series: COVID-19 Two-Year Impact Assessment Survey. 2022. Available from: <https://www.nursingworld.org/~4a2260/contentassets/872ebb13c63f44f6b11a1bd0c74907c9/covid-19-two-year-impact-assessment-written-report-final.pdf>
3. Linzer M, Stillman M, Brown R, et al. Preliminary report: US physician stress during the early days of the COVID-19 pandemic. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes*. 2021;5(1):127-36. <https://doi.org/10.1016/j.mayocpiqo.2021.01.005> PMID:33718790 PMCID:PMC7930845
4. Lebares CC, Guvva EV, Ascher NL, O'Sullivan PS, Harris HW, Epel ES. Burnout and stress among US surgery residents: psychological distress and resilience. *Journal of the American College of*

5. Surgeons. 2018;226(1):80-90. <https://doi.org/10.1016/j.jamcollsurg.2017.10.010> PMID:29107117
6. Jordan TR, Khubchandani J, Wiblehauser M. The impact of perceived stress and coping adequacy on the health of nurses: A pilot investigation. *Nursing Research and Practice*. 2016;2016(1):584-3256. <https://doi.org/10.1155/2016/5843256> PMID:27882246 PMCID:PMC5108847
7. Dyrbye LN, Shanafelt TD, Sinsky CA, et al. Burnout among health care professionals: a call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspectives*. 2017. Available from: [https://iuhcpe.org/file\\_manager/1501524077-Burnout-Among-Health-Care-Professionals-A-Call-to-Explore-and-Address-This-Underrecognized-Threat.pdf](https://iuhcpe.org/file_manager/1501524077-Burnout-Among-Health-Care-Professionals-A-Call-to-Explore-and-Address-This-Underrecognized-Threat.pdf) <https://doi.org/10.31478/201707b>
8. Grandey AA. Emotional regulation in the workplace: A new way to conceptualize emotional labor. *Journal of Occupational Health Psychology*. 2000;5(1):95. <https://doi.org/10.1037/1076-8998.5.1.95> PMID:10658889
9. Chen CC, Lan YL, Chiou SL, Lin YC. The effect of emotional labor on the physical and mental health of health professionals: Emotional exhaustion has a mediating effect. *InHealthcare*. 2022; 11 (1): 104. MDPI. <https://doi.org/10.3390/healthcare11010104> PMID:36611564 PMCID:PMC9819436
10. Koinis A, Giannou V, Drantaki V, Angelaina S, Stratou E, Saridi M. The impact of healthcare workers job environment on their mental-emotional health. Coping strategies: the case of a local general hospital. *Health Psychology Research*. 2015;3(1). <https://doi.org/10.4081/hpr.2015.1984> PMID:26973958 PMCID:PMC4768542
11. Babapour AR, Gahassab-Mozaffari N, Fathnezhad-Kazemi A. Nurses' job stress and its impact on quality of life and caring behaviors: a cross-sectional study. *BMC Nursing*. 2022;21(1):75. <https://doi.org/10.1186/s12912-022-00852-y> PMID:35361204 PMCID:PMC8968092
12. Rink LC, Oyesanya TO, Adair KC, Humphreys JC, Silva SG, Sexton JB. Stressors among healthcare workers: a summative content analysis. *Global qualitative nursing research*. 2023;10:23333936231161127. <https://doi.org/10.1177/23333936231161127> PMID:37020708 PMCID:PMC10068501
13. Burton A, Burgess C, Dean S, Koutsopoulou GZ, Hugh-Jones S. How effective are mindfulness-based interventions for reducing stress among healthcare professionals? A systematic review and meta-analysis. *Stress and Health*. 2017;33(1):3-13. <https://doi.org/10.1002/smi.2673> PMID:26916333
14. Ruiz-Fernández MD, Ortíz-Amo R, Ortega-Galán ÁM, Ibáñez-Masero O, Rodríguez-Salvador MD, Ramos-Pichardo JD. Mindfulness therapies on health professionals. *International Journal of Mental Health Nursing*. 2020;29(2):127-40. <https://doi.org/10.1111/inm.12652> PMID:31498549
15. Kabat-Zinn J. Mindfulness-based interventions in context: past, present, and future. 2003. American Psychological Association. <https://doi.org/10.1093/clipsy/bpg016>
16. Davis DM, Hayes JA. What are the benefits of mindfulness? A practice review of psychotherapy-related research. *Psychotherapy*. 2011;48(2):198. <https://doi.org/10.1037/a0022062> PMID:21639664
17. Keng SL, Smoski MJ, Robins CJ. Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*. 2011;31(6):1041-56. <https://doi.org/10.1016/j.cpr.2011.04.006> PMID:21802619 PMCID:PMC3679190
18. Dunning DL, Griffiths K, Kuyken W, et al. Research Review: The effects of mindfulness-based interventions on cognition and mental health in children and adolescents-a meta-analysis of randomized controlled trials. *Journal of Child Psychology and Psychiatry*. 2019;60(3):244-58. <https://doi.org/10.1111/jcpp.12980> PMID:30345511 PMCID:PMC6546608

18. Grossman P, Niemann L, Schmidt S, Walach H. Mindfulness-based stress reduction and health benefits: A meta-analysis. *Journal of Psychosomatic Research*. 2004;57(1):35-43. [https://doi.org/10.1016/S0022-3999\(03\)00573-7](https://doi.org/10.1016/S0022-3999(03)00573-7) PMID:15256293
19. Khoury B, Sharma M, Rush SE, Fournier C. Mindfulness-based stress reduction for healthy individuals: A meta-analysis. *Journal of Psychosomatic Research*. 2015;78(6):519-28. <https://doi.org/10.1016/j.jpsychores.2015.03.009> PMID:25818837
20. Niazi AK, Niazi SK. Mindfulness-based stress reduction: a non-pharmacological approach for chronic illnesses. *North American Journal of Medical Sciences*. 2011;3(1):20. <https://doi.org/10.4297/najms.2011.320> PMID:22540058 PMCID:PMC3336928
21. Frostadottir AD, Dorjee D. Effects of mindfulness based cognitive therapy (MBCT) and compassion focused therapy (CFT) on symptom change, mindfulness, self-compassion, and rumination in clients with depression, anxiety, and stress. *Frontiers in Psychology*. 2019;10:1099. <https://doi.org/10.3389/fpsyg.2019.01099> PMID:31164849 PMCID:PMC6534108
22. Tickell A, Ball S, Bernard P, et al. The effectiveness of mindfulness-based cognitive therapy (MBCT) in real-world healthcare services. *Mindfulness*. 2020;11:279-90. <https://doi.org/10.1007/s12671-018-1087-9> PMID:32064009 PMCID:PMC6995449
23. Sipe WE, Eisendrath SJ. Mindfulness-based cognitive therapy: theory and practice. *The Canadian Journal of Psychiatry*. 2012;57(2):63-9. <https://doi.org/10.1177/070674371205700202> PMID:22340145
24. Williams JM, Russell I, Russell D. Mindfulness-based cognitive therapy: further issues in current evidence and future research. *J Consult Clin Psychology*. 2008;76 (3): 524-529. <https://doi.org/10.1037/0022-006X.76.3.524> PMID:18540746 PMCID:PMC2834575
25. MacKenzie MB, Abbott KA, Kocovski NL. Mindfulness-based cognitive therapy in patients with depression: current perspectives. *Neuropsychiatric Disease and Treatment*. 2018;1599-605. <https://doi.org/10.2147/NDT.S160761> PMID:29950842 PMCID:PMC6018485
26. Kuyken W, Warren FC, Taylor RS, et al. Efficacy of mindfulness-based cognitive therapy in prevention of depressive relapse: an individual patient data meta-analysis from randomized trials. *JAMA Psychiatry*. 2016;73(6):565-74. <https://doi.org/10.1001/jamapsychiatry.2016.0076> PMID:27119968 PMCID:PMC6640038
27. Hilton L, Hempel S, Ewing BA, et al. Mindfulness meditation for chronic pain: systematic review and meta-analysis. *Annals of Behavioral Medicine*. 2017;51(2):199-213. <https://doi.org/10.1007/s12160-016-9844-2> PMID:27658913 PMCID:PMC5368208
28. Joshi AM, Mehta SA, Pande N, Mehta AO, Randhe KS. Effect of Mindfulness-Based Art Therapy (MBAT) on psychological distress and spiritual wellbeing in breast cancer patients undergoing chemotherapy. *Indian Journal of Palliative Care*. 2021;27(4):552. [https://doi.org/10.25259/IJPC\\_133\\_21](https://doi.org/10.25259/IJPC_133_21) PMID:34898951 PMCID:PMC8655656
29. Fuchs C, Lee JK, Roemer L, Orsillo SM. Using mindfulness-and acceptance-based treatments with clients from nondominant cultural and/or marginalized backgrounds: Clinical considerations, meta-analysis findings, and introduction to the special series: Clinical considerations in using acceptance-and mindfulness-based treatments with diverse populations. *Cognitive and Behavioral Practice*. 2013;20(1):1-2. <https://doi.org/10.1016/j.cbpra.2011.12.004> PMID:26294894 PMCID:PMC4539954
30. Fiabane E, Giorgi I, Sguazzin C, Argentero P. Work engagement and occupational stress in nurses and other healthcare workers: the role of organisational and personal factors. *Journal of Clinical Nursing*. 2013;22(17-18):2614-24. <https://doi.org/10.1111/jocn.12084> PMID:23551268
31. Keykaleh MS, Safarpour H, Yousefian S, Faghisolouk F, Mohammadi E, Ghomian Z. The relationship between nurse's job stress and patient safety. *Open Access Macedonian Journal of Medical Sciences*. 2018;6(11):2228. <https://doi.org/10.3889/oamjms.2018.351> PMID:30559893 PMCID:PMC6290432
32. Zeller JM, Levin PF. Mindfulness interventions to reduce stress among nursing personnel: An occupational health perspective. *Workplace Health & Safety*. 2013;61(2):85-9. <https://doi.org/10.1177/216507991306100207> PMID:23336129
33. Zhang D, Lee EK, Mak EC, Ho CY, Wong SY. Mindfulness-based interventions: an overall review. *British Medical Bulletin*. 2021;138(1):41-57. <https://doi.org/10.1093/bmb/ldab005> PMID:33884400 PMCID:PMC8083197
34. Kemper KJ, Khirallah M. Acute effects of online mind-body skills training on resilience, mindfulness, and empathy. *Journal of Evidence-Based Complementary & Alternative Medicine*. 2015;20(4):247-53. <https://doi.org/10.1177/2156587215575816> PMID:25783980
35. Shapiro SL, Schwartz GE, Bonner G. Effects of mindfulness-based stress reduction on medical and premedical students. *Journal of Behavioral Medicine*. 1998;21:581-99. <https://doi.org/10.1023/A:1018700829825> PMID:9891256
36. Creswell JD, Lindsay EK, Villalba DK, Chin B. Mindfulness training and physical health: mechanisms and outcomes. *Psychosomatic Medicine*. 2019;81(3):224-32. <https://doi.org/10.1097/PSY.0000000000000675> PMID:30806634 PMCID:PMC6613793
37. Dave P, How Digital Health is Revolutionizing Healthcare and Contributing to Positive Health Outcomes, *Journal of Drug Delivery and Therapeutics*. 2024; 14(6):287-293 <https://doi.org/10.22270/jddt.v14i6.6640>
38. Gu J, Strauss C, Bond R, Cavanagh K. How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*. 2015;37:1-2. <https://doi.org/10.1016/j.cpr.2015.01.006> PMID:25689576
39. Penque S. Mindfulness to promote nurses' well-being. *Nursing Management*. 2019;50(5):38-44. <https://doi.org/10.1097/01.NUMA.0000557621.42684.c4> PMID:30985526 PMCID:PMC6716566
40. Farias M, Wikholm C. Has the science of mindfulness lost its mind?. *BJPsych Bulletin*. 2016;40(6):329-32. <https://doi.org/10.1192/pb.bp.116.053686> PMID:28377813 PMCID:PMC5353526
41. Britton WB. Can mindfulness be too much of a good thing? The value of a middle way. *Current Opinion in Psychology*. 2019;28:159-65. <https://doi.org/10.1016/j.copsyc.2018.12.011> PMID:30708288 PMCID:PMC6612475