Section A-Research paper

Interventional Effects of Heartfulness Meditation among Adults and Older Adults: A Systematic Review

K.Vijay Ananth[1], D. Anandhi[2], Rajathi Sakthivel[3], Ponnulakshmi Rajagopal[4], N.Arunagirinathan[1*]

[1*]Central Research Laboratory, Meenakshi Academy of Higher Education and Research, (MAHER), Deemed to be University, Chennai-600078

[2]College of Nursing, Madras Medical College, Chennai, Tamil Nadu, India

[3]Head and Vice Principal, Department of Pediatrics, Hindu Mission College of Nursing, Chennai, Tamil Nadu.

[4]Central Research Laboratory, Meenakshi Ammal Dental College & Hospital, Meenakshi Academy of Higher Education and Research (MAHER), Deemed to be University, Maduravoyal, Chennai-600095, India

Corresponding Author*

Dr. N. Arunagirinathan

Central Research Laboratory

Meenakshi Academy of Higher Education and Research

Chennai-600078, Tamil Nadu.

Email:n_arunagiri@yahoo.co.in.

Abstract

Background: Meditation helps to replace negative thoughts and may relieve stress and depression and promote positive energy. Meditation with deep breathing enables individuals to stay with presence of mind actively (consciousness) and provide more control to regain balance in mind and body.

Objective: The purpose of the present systematic review is to identify the effectiveness of Heartfulness based meditation and further examine whether Heartfulness based meditation helps to reduce depression, stress, and improve the quality of life among older adults.

Methods: The literatures are systematically searched for studies focusing on Heartfulness meditation intervention targeting adults and older adults related issues using relevant search terms in major databases such as Google scholar, Web of Science core collection,

and PubMed, based on the selection criteria. The relevant existing studies published between 1990 and February 28, 2023, were included in the present review.

Results: Heartfulness meditation used in the older adults for reducing and improving various outcomes are discussed in detail. Based on selection criteria, 20 (Twenty) articles were identified and included in the final review. The sample size, intervention duration, and outcome measures, have varied based on its study objectives. Overall, the Heartfulness meditation can provide an effective alternative and promising non-pharmaceutical approach to the management of late-life psychosocial issues, especially stress, depression, anxiety, quality of late life, cognitive functions, burnout condition, life satisfaction, and emotional wellness.

Conclusion: Evidence suggests that interventions like Heartfulness based meditation in adults or older adults with psychosocial issues like stress, depression, anxiety, quality of life, may be effective in improving their conditions. However, there is a need for good quality experimental studies with randomized controlled trials examining the efficacy of Heartfulness meditation.

Keywords: *Heartfulness Meditation, Stress, Depression, Quality of Life, Cognitive Function*

Introduction

Heartfulness Meditation is utilized to regulate, relax the mind, and expand consciousness, ultimately leading to a permanent state of wakefulness, not only during meditation time but also at all other times (Thimmapuram et al., 2020; Westeinde & Patel, 2022). Two prominent features of this heart-based meditation practice are the passive attitude of the therapist or trainer and the use of yogic transmission. The setting of this simple yoga practice is used only at the starting point, to assume the presence of light in the heart, also known as the “inner self.” It is not intended to visualize light, but rather the subtlest suggestion of lightness and purity, closely associated with the quality of nothingness that is described by the Heartfulness philosophy (Westeinde & Patel, 2022).

Heartfulness meditation is a messenger that takes us on an endless journey, it takes us to move from selfishness to altruistic, from a reactive mind to a responsive heart, from restlessness to peace, from imbalance to balance and from darkness to light (Amatya, 2019). This form of meditation has been evaluated in numerous settings, specifically healthcare, schools, counselling centres, and corporate wellness centres and has been shown to improve physical health, psychological, and psychosocial issues such as burnout, sleep quality, stress, anxiety, depression, quality of life, and loneliness (Agrawal et al., 2023; Desai et al., 2021; Gupta et al., 2022; Thimmapuram et al., 2017, 2020; Thimmapuram, Pargament, Bell, et al., 2021). Further, Heartfulness meditation is also helpful to improve cognitive function, cognitive skill development, and cognition (Agrawal et al., 2023; Kamaraj et al., 2020; Krishna et al., 2022).

Older adults are facing numerous psychosocial problems and in the late-life period they need physical, emotional, and psychological support from the family members and even society (Karim & Venkatachalam, 2021; Dubey et al., 2020; Rej et al., 2015). Early proper diagnosis of psychosocial symptoms and effective managements are required to improve the quality of life of older adults suffering from various issues related to psychosocial comorbidities (Ferreira et al., 2021; Lee et al., 2014; Thimmapuram et al., 2022). The most prominent psychosocial issues, depression is the most prevalent mental health problem among older adults and it contributes to increase comorbidities, social deprivation (Amarnath et al., 2017), loneliness, cognitive decline, suicidal ideation (Rotenstein et al., 2016), and mortality, reduces quality of life and elevates normal daily life activities (ADL limitations). Several research studies in previous literature have shown

that Heartfulness meditation helps in reducing negative dimensions of psychological stress, especially with distress mood.

Previous studies also stated that Heartfulness meditation reduce perceived stress, decrease burnout as well as improve emotional wellbeing and sleep quality of the older adults (Thimmapuram et al., 2017; Venkatesan et al., 2021; Yadav et al., 2021; Yommer et al., 2018). Very rare studies only found in the literature to implement Heartfulness meditation with the older adults to come out of psychosocial issues. Hence, a systematic review is needed to identify the interventional effectiveness of Heartfulness meditation with older adults who suffering from psychosocial and related problems in their late-life.

Material and methods

Design

The researcher followed guidelines on methodology of reviews (Roe, 2007), as well as Cochrane Handbook guidelines (Higgins et al., 2019).

Search strategy and selection criteria

Electronic databases such as Google scholar, Web of Science core collection, and PubMed, are searched with time limit between 1990 and February 28th 2023 as well as limits with English language only. The search terms in databases were “Heartfulness”, “Heartfulness meditation”, “depression”, “stress”, “loneliness”, “distress”, “quality of life”, “anxiety”, and “psychosocial issues”. One and the combination of 9 keywords was used as searching strategy in this review article. Further, all the articles which were come under the inclusion criteria were examined and reviewed. The PRISMA flow chart (Figure 1) explore more detail about the methodological process of this study.

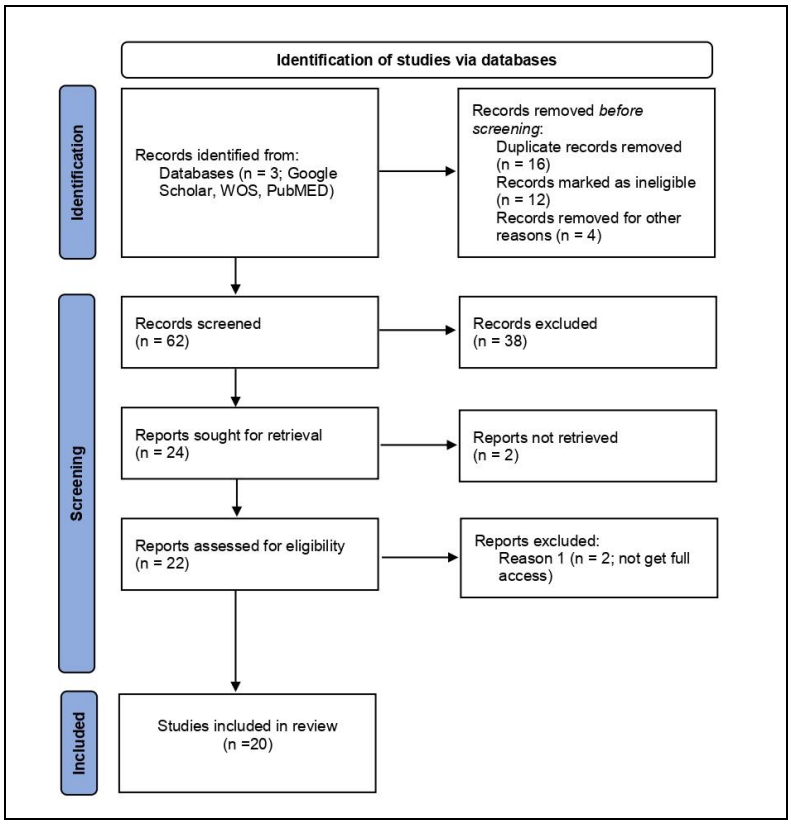

Figure 1: *PRISMA Flow chart of the present study*

Inclusion and exclusion criteria

In the present study has been followed carefully about the following inclusion criteria: (1) have published between 1990 and February 28th 2023, (2) has been published in English, (3) participants must be adults or older adults, (4) studies must have implemented Heartfulness meditation intervention for adults or older adults, (5) experimental or quasi- experimental, randomized controlled trials, prospective observational studies, previous systematic reviews with adults or older adults related to Heartfulness meditation, are considered eligible.

The following exclusion criteria have been adopted in this study: (1) cross-sectional studies, (2) psychometric or validation studies on older adult, related scales or tests, (3) studies lacking full text accessibility, (4) descriptive, case-control study, were excluded from the present review study.

Results

After entering the keywords into databases, sixty two (62) studies have been finally retrieved after removing duplication and at the end, based on the selection criteria, twenty two studies were reviewed for the present study. The researcher read the full-texts of selected articles and those articles that did not meet the inclusion criteria (not access full-text) were excluded again. Hence, finally, 20 articles only met the required criteria which include 3 systematic reviews, and the rest of them were randomized controlled trials. Such articles have been selected for further research process. All the selected articles have been published in English language that was listed in Table 1.

Table 1:

	Purpose	Sample size / Studies included	Data collection methods	Research Design	Instruments used	Outcomes
	To examine well being and carried out high-density Electroencephalogra phy (EEG) recordings to examine indices of Heartfulness meditation and cognition	39	Random selection	Randomized Pilot study	Positive and Negative Affect Schedule (PANAS) Satisfaction with Life Scale (SWLS) Mindful Attention and Awareness Scale (MAAS) General Well Being Scale (GWBS)	It was observed that d meditation, occipital was enhanced in profi meditators as compare controls. Also, Heartf meditation deliberates being enhancements t practitioners as observ proficient meditators that new meditators e well-being benefits or acquire some level o proficiency.

	To investigate the effects of Heartfulness Meditation on Heart Rate Variability (HRV) in a group of 26 healthy subjects. Also, to assess the HRV and residual HRV (rHRV) at rest and during meditation.	26	Random selection based on certain inclusion and exclusion criteria	Experimental study	Freiburg Mindfulness Inventory (FMI) Mindfulness Attention Awareness Scale (MAAS) Meditation Depth Questionnaire (MEDEQ) Monitoring of Heart rate, Respiration,	This study found a re some HRV and rHRV during Heartfulness M Also, found that Hear meditation induce a s global vagal modulati increase the sympathe modulation and baror
	To assess the factors affecting work-life balance and also measure the impact of Heartfulness Meditation on burnout.	139	Survey method	Survey based quasi experimental method	The Abbreviated Maslach Burnout Inventory (aMBI)	Heartfulness Meditat associated with a sign decrease in EE and su participants to be a us skill to combat stress/
	To determine the effectiveness of 12 weeks of Heartfulness Meditation on depression, anxiety, stress, and cognitive functions in Type 2 diabetic patients.	40	Purposive sampling	Quasi experimental method	DASS 42 was used to assess depression, anxiety, and stress	The Heartfulness me positive impact on the of psychological diso (depression, anxiety, and improving cogn functions.
	To evaluate the effects of an 8-week Heartfulness Meditation on burnout and satisfaction with life among chartered accountants.	206	Survey method	Prospective cohort analysis with Intervention and control group	The Maslach Burnout Inventory (MBI), Satisfaction with Life Scale (SWLS)	Heartfulness meditati intervention helps to r burnout and improve with life among accou professionals. Also, su online Heartfulness meditati could serve as a pote reducing burnout and improvi satisfaction.
	To study the effects of Heartfulness Meditation on heart rate variability (HRV), Blood pressure (BP), and heart rate (HR).	30	Purposive sampling	Experimental method	Cantril's Ladder Scale, Scale of Positive and Negative Experience (SPANE), Flourishing Scale (FS)	Heartfulness Meditati positive effect on sym balance and significant decrease i LF/HF and increase i values.

	To assess the effects of a 12-week 'Heartfulness Meditation' program on burnout, emotional wellness, and telomere length in residents, faculty members, and nurses at a large community hospital	155	Prospective sampling	Prospective cohort trial	Emotional wellness assessment form (EWA), Maslach Burnout Inventory (MBI)	The study results reve Heartfulness Meditati associated with signif improvement in all pa burnout and emotiona
	To analyse and compare the effect of a 30-minute Heartfulness meditation session on vital parameters of experienced and new meditators	151	Survey method	Quasi experimental method	Body mass Index (BMI), Heart rate, respiratory rate, and systolic blood pressure.	Heartfulness meditati significant relaxation autonomic nervous system and fa moderates basic vital across all groups.
	To investigate the effect of a virtual heart-based meditation is associated with improving stress levels and quality of sleep among participants from the general population during the COVID 19 pandemic.	63	Purposive sampling	Mixed Method Study	Perceived Stress Scale (PSS), Pittsburgh Sleep Quality Index (PSQI)	A significant reducti perceived stress score improvement in sleep quality index was not end of a virtual Heartfulness program. Moreover, Heartfulness meditati the quality of empath acceptance, and indiv peace.
	To study the effects of 4 weeks of Heartfulness meditation on certain parameters in COVID-19 patients following treatment completion.	25	Random selection	Experimenta l group	Perceived stress score, Pittsburgh Sleep Quality Index questionnaire, cardiovascular parameters, complete blood count, serum cortisol, inflammatory parameters, oxidative stress parameters, and antioxidant parameters	App-based Heartfulness m ation can be used as a nonpharmacolo gica hasten the recovery pr in patients who have the COVID-19 treatm protocol

	To review and examine using a qualitative analysis of the impact of Heartfulness meditation on people with chronic insomnia	10 Articles	Review	Literature review used PubMed, MEDLINE, Web of Science, Research Gate	Emotional wellness, Satisfaction of Life, analysing sleep pattern, reduction of stress	The review study reve regular practice of Heartfulness meditati improves the cognitiv ability, neurophysiolo functions, and suppre the risks of Alzheime disease.
	To understand the lived experiences of Heartfulness practitioners	25	Purposive sampling (Thematic analysis strategy)	Qualitative study	Thematic Analysis: Physical, Psychological, Social, Cognitive, Spiritual	The findings of this s provide an insight on the lived experiences Heartfulness meditati found that practitione developed their phys psychological, social cognitive, as well as t spiritual life. This fin shed further light on
	To study and assess the effectiveness of Heartfulness Meditation in reducing stress levels of nursing students in a learning environment.	120	Survey method	Cross sectional research design	Stress Scale, Work Burden scale	Heartfulness meditati helps nursing students become more intuitive sensitive to their surroundings
	To assess frontal electrical activities of the brain and self-reported anxiety and heartfulness practice.	61	Survey study	Cross sectional based experimental design	The Mindfulness Attention Awareness Scale (MAAS), State and Trait Anxiety Inventory (STAI), EEG	Heartfulness Meditati practice can influence frontal brain activities associated with highe order brain functionin practitioners.
	This review paper examined various practices like Mindfulness, Full Attention, Open Meditation, Mind Body Intervention and Heartfulness	14 studies	Review	Existing literature	Ten-Sticker Sharing Tasks, MAAS, SCS and EF	It is commonly obser the meditation practi improved the function connectivity and neur plasticity. Heartfulnes meditation is popular communication betw and brain is effective
	To assess the effects of remote Heartfulness meditation in improving loneliness and sleep quality.	155	Prospective survey	Randomized controlled study	UCLA loneliness scale, Pittsburgh sleep quality index	Heartfulness meditati appears to provide an improvement in the p loneliness and sleep quality.

	To assess the effects of remote Heartfulness meditation in improving loneliness and sleep quality.	155	Prospective survey	Randomized controlled study	UCLA loneliness scale, Pittsburgh sleep quality index	Heartfulness meditati appears to provide an improvement in the p loneliness and sleep quality.
	Thimmapur a m et al. (2020)	To investigate the effectiveness of Heartfulness meditation coupled with sleep hygiene to treat chronic insomnia.	32	Survey	Prospective pre-post design cohort study	Insomnia Se Index (ISI)
	Gurram et al. (2021)	To investigate the effect of Heartfulness meditation during impacted third molar surgery (ITMS)	60	Purposive sampling	Prospective intervention al study	State - Trait Inventory (S Modified De Anxiety Scal Numerical R Scale
	Venkatesan et al. (2021)	To examine the Holistic, patient centered care integrating meditation and addressing psychosocial needs through a care coordinator will improve healthcare outcomes in Cyclic Vomiting Syndrome (CVS).	49	Survey based sampling	Prospective randomized controlled trial	Brief Sympto Inventory (B Hospital Anx Depression S (HADS), Pai Anxiety Sym Scale, Percei Stress Scale, efficacy Scal Perceived So Support, PA Emotion Regulation Questionnair COPE, PSQI Health Short (Version 1)

Discussion

The results of this review study have demonstrated that Heartfulness meditation program improves several outcomes including stress, depression, emotional wellness, quality of life, and sleep hygiene. Also, studies with noticeable pre and post-test differences in heart rate, breathing rate, and Heart rate variability were observed (HRV; Arya et al., 2018; Léonard et al., 2019). The strength of this study is that it is reviewed in a real-world condition. In an outpatient-based outcomes while implementing Heartfulness

meditation, the completion of the meditation program by most of the participants may indicate the applicability of the study to those who choose Heartfulness practice for improving insomnia. The results of this study added to the existing literature to support the practices of meditation to improve stress, depression, burnout, emotional wellness, and sleep in various populations including adult patients as well as older adults.

A previous study was conducted using Heartfulness meditation with in-house staff, faculty physicians, and nurses, showed an improvement in emotional wellness (Thimmapuram et al., 2017). Another study done to demonstrate the benefit of Heartfulness meditation among accounting professionals and the findings stated that burnout and satisfaction with life improved. (Gupta et al., 2022). Another study evaluated the effects of heartfulness training in perceived stress and sleep quality (Desai et al., 2021). They found that virtual heartfulness meditation was equivalent to in-person heartfulness training to reduce stress during and before the pandemic condition. It was also found that mixed findings about the improvement of sleep quality (Amarnath et al., 2017; Subramanian et al., 2022; Thimmapuram, Pargament, Tredici, et al., 2021; Yadav et al., 2021). In another study, an 8- week heartfulness-oriented meditation conducted virtually showed an improvement in the psychological wellbeing of female teachers during the COVID-19 pandemic. Thus, studies confirmed that both brief, virtual, and in-person Heartfulness meditation program improved perceived stress, depression, emotional wellness, sleep quality, and loneliness among various participants. Cognitively, improvement in electroencephalogram (EEG) and functional MRI (fMRI) signal frequencies from the heart to the brain had been observed in regular practioners of Heartfulness meditation.

In addition, participants have mentioned in some studies that they can easily manage to overcome their feeling of insecurity, introverted behaviour, anxiety, depression, psychological distress, and PTSD, with the Heartfulness practice and felt more beneficial after the meditation (Gupta et al., 2022; Kaniamuthan & Cheang, 2021). Also, implementing yoga and meditation can reduce the trait anxiety in older adults.

Conclusion

This systematic review evidenced that the Heartfulness meditation significantly improved various psychosocial issues, including perceived stress, insomnia, depression, sleep quality, emotional wellness, burnout, and anxiety. It appears to be easily incorporated with the participants' daily life, and also is cost effective, and requires no special guidance. The results of the studies seem to have promising effect with Heartfulness meditation. It is one of a beneficial non-pharmacological intervention for several psychosocial issues with chronic as well as acute problem. However, it is found that there is a gap in implementing heartfulness meditation in older adults in improving symptoms of stress and depression, life satisfaction, and emotional wellbeing. Such studies may be warranted further in future. The researchers also recommend a larger randomized study to measure the efficacy of Heartfulness meditation for older adults in future to overcome late-life issues.

Conflict of Interest

There are no conflict of interest.

References

Agrawal, N., Kote, N., Parapurath, S., A, R., Goothy, S., Choudhary, A., Chouhan, R., & Awasthi, P. (2023). Effectiveness of 12 weeks of practice of heartfulness meditation on depression, anxiety, stress, and cognitive functions in Type 2 diabetic patients. *National*

Journal of Physiology, Pharmacy and Pharmacology, *13*(0), 1. https://doi.org/10.5455/njppp.20223.13.08384202216082022

Amarnath, G. R., Prasanthi, J., Sharma, N., Jenitha, S., & Rajan, C. (2017). Efficacy of Heartfulness Meditation in Moderating Vital Parameters - A Comparison Study of Experienced and New meditators Professor , Department of Pulmonary Medicine , Director - Critical Care Services , Sree Balaji. *International Journal of Medical Research & Health Sciences,June*, 70–79.

Amarnath, R. G., Karumuri S, S., Prasanthi, J., Jenitha, S., Elizabeth, A., MK, A., Nair, M., Purohit, M., Bharathwajan, N. R. S., S, P., CR, R., B, K., Mani, K., Sandhya, Ramanathan, H. M., Saralapriy, & Malarvizhi. (2017). Impact of Heartfulness Meditation Masterclass on Reducing Stress in College Students- a Prospective Observational Study. *International Journal of Recent Scientific Research*, *8*(1), 19493–19498.

Amarnath, R., Verma, G., Jenitha, S., Rajan, C., Prasanthi, J., & Elizabeth, A. (2017). Improving sleep quality through heartfulness meditation: Technical aspects and benefits.*International Journal of Health Sciences and Research*, *7*(May), 368–381. www.ijhsr.org

Amatya, D. (2019). *A Heartfulness Meditation Intervention in University Students Using Mixed Methodology* [University of Texas at Tyler]. http://hdl.handle.net/10950/1336

Arunachalam, K., & Chandran, K. S. (2021). Effects of heartfulness meditation practices on control of alz-heimer's disease: A comprehensive review. *Iranian Journal of Public Health*, *50*(12), 2427–2438. https://doi.org/10.18502/ijph.v50i12.7925

Arya, N. K., Singh, K., Malik, A., & Mehrotra, R. (2018). Effect of Heartfulness cleaning and meditation on heart rate variability. *Indian Heart Journal*, *70*, S50–S55. https://doi.org/10.1016/j.ihj.2018.05.004

Desai, K., Gupta, P., Parikh, P., & Desai, A. (2021). Impact of virtual heartfulness meditation program on stress, quality of sleep, and psychological wellbeing during the covid-19 pandemic: A mixed-method study. *International Journal of Environmental Research and Public Health*, *18*(21). https://doi.org/10.3390/ijerph182111114

Dubey, S., Biswas, P., Ghosh, R., Chatterjee, S., Dubey, M. J., Chatterjee, S., Lahiri, D., & Lavie, C. J. (2020). Psychosocial impact of COVID-19. *Diabetes and Metabolic Syndrome: Clinical* Research *and Reviews*, *14*(5), 779–788. https://doi.org/10.1016/j.dsx.2020.05.035

Ferreira, L. N., Pereira, L. N., da Fé Brás, M., & Ilchuk, K. (2021). Quality of life under the COVID-19 quarantine. *Quality of Life Research*, *30*(5), 1389–1405. https://doi.org/10.1007/s11136-020-02724-x

Gupta, P. K., Thimmapuram, J., Krishna, P., Karmarkar, Y., & Madhusudhan, D. K. (2022). The Effect of Heartfulness Meditation Program on Burnout and Satisfaction With Life Among Accounting Professionals. *Global Advances In Health and Medicine*, *11*, 1–9. https://doi.org/10.1177/2164957X221123559

Gurram, P., Narayanan, V., Chandran, S., Ramakrishnan, K., Subramanian, A., & Kalakumari, A. P. (2021). Effect of Heartfulness Meditation on Anxiety and Perceived Pain

in Patients Undergoing Impacted Third Molar Surgery. *Journal of Oral and Maxillofacial Surgery*, *79*(10), 2060.e1-2060.e7.https://doi.org/10.1016/j.joms.2021.04.027

Kamaraj, A., Kumar, J. S., & Sundaram, C. K. (2020). Review of Statistical Analysis and Effects of Meditation on Mental Health and Cognitive Skill Development. *Indian Journal of Public Health Research & Development*, *11*(6), 22–29. https://doi.org/10.37506/ijphrd.v11i6.9738

Kaniamuthan, A. A., & Cheang, A. W. O. (2021). An in-depth understanding of heartfulness meditation. *IeJSME*, *15*(July), 19–28.

Karim, M. A., & Venkatachalam, J. (2021). Cognitive functions, Depression, Anxiety, and Stress: A comparative study among COVID-19 older adults and the elderly survivors. *International Journal of Advance and Innovative Research*, *8*(3), 138–144. http://iaraedu.com/about-journal/ijair-volume-6-issue-1-xxxv-january-march-2019-part-2.php

Krishna, D., Prasanna, K., Angadi, B., Singh, B., Anurag, S., & Deepeshwar, S. (2022). Heartfulness meditation alters electroencephalogram oscillations: An electroencephalogram study. *International Journal of* Yoga, *15*(3), 205. https://doi.org/10.4103/ijoy.ijoy_138_22

Lee, J.-W., Lim, G.-H., Kim, H.-R., Bang, Y.-K., Lee, J.-Y., Cho, M.-L., Kim, D.-J., & Yang, Y.-A. (2014). The Correlation between Cognition, Depression and Leisure Activity of Elderly People. *The Korean Journal of Health Service Management*, *8*(1), 65–73. https://doi.org/10.12811/kshsm.2014.8.1.065

Léonard, A., Clément, S., Kuo, C. D., & Manto, M. (2019). Changes in Heart Rate Variability During Heartfulness Meditation: A Power Spectral Analysis Including the Residual Spectrum. *Frontiers in Cardiovascular Medicine*, *6*(May), 1–8. https://doi.org/10.3389/fcvm.2019.00062Rej, S., Begley, A., Gildengers, A., Dew, M. A., Iii, C. F. R., & Butters, M. A. (2015).

Psychosocial risk factors for cognitive decline in late-life depression: Findings from the MTLD-III study. *Canadian Geriatrics Journal*, *18*(2), 43–50.

Rotenstein, L. S., Ramos, M. A., Torre, M., Bradley Segal, J., Peluso, M. J., Guille, C., Sen, S., & Mata, D. A. (2016). Prevalence of depression, depressive symptoms, and suicidal ideation among medical students a systematic review and meta-analysis. *JAMA - Journal of the American Medical Association*, *316*(21), *2214*–2236. https://doi.org/10.1001/jama.2016.17324

Subramanian, S., Sripad, V., Dharmalingam, A., Guhan, Vn., Kalidoss, V., Gautam, N., Shankaralingappa, A., Rajendran, R., & Mohiuddin, S. (2022). Effect of 4-week heartfulness meditation on stress scores, sleep quality, and oxidative and inflammatory biochemical parameters in COVID-19 patients after completion of standard treatment – A randomized

controlled trial. *International Journal of Yoga*, *15*(3), 195. https://doi.org/10.4103/ijoy.ijoy_95_22

Sylapan, B. S., Nair, A. K., Jayanna, K., Mallipeddi, S., Sathyanarayana, S., & Kutty, B. M. (2020). Meditation, well-being and cognition in heartfulness meditators – A pilot study. *Consciousness and Cognition*, *86*(October), 103032. https://doi.org/10.1016/j.concog.2020.103032

Thimmapuram, J., Pargament, R., Bell, T., Schurk, H., & Madhusudhan, D. K. (2021). Heartfulness meditation improves loneliness and sleep in physicians and advance practice providers during COVID-19 pandemic. *Hospital Practice (1995)*, *49*(3), 194–202. https://doi.org/10.1080/21548331.2021.1896858

J., Pargament, R., Sibliss, K., Grim, R., Risques, R., & Toorens, E. (2017).Effect of heartfulness meditation on burnout, emotional wellness, and telomere length inhealth care professionals. *Journal of Community Hospital Internal Medicine Perspectives*, *7*(1), 21–27. https://doi.org/10.1080/20009666.2016.1270806

Thimmapuram, J., Pargament, R., Tredici, S. Del, Bell, T., Yommer, D., Daoud, D., Powell, F., & Madhusudhan, D. K. (2021). Sleep Patterns of Resident Physicians and the Effect of Heartfulness Meditation. *Annals of Neurosciences*, *28*(1–2), 47–54. https://doi.org/10.1177/09727531211039070

Thimmapuram, J., Patel, K., Madhusudhan, D. K., Deshpande, S., Bouderlique, E., Nicolai, V., & Rao, R. (2022). Health-Related Quality of Life Outcomes with Regular Yoga and Heartfulness Meditation Practice: Results from a Multinational, Cross-sectional Study. *JMIR Formative Research*, *6*(5), 1–11. https://doi.org/10.2196/37876

Thimmapuram, J. R., Grim, R., Bell, T., Benenson, R., Lavallee, M., Modi, M., Noll, D., & Salter, R. (2019). Factors Influencing Work–Life Balance in Physicians and Advance Practice Clinicians and the Effect of Heartfulness Meditation Conference on Burnout. *Global Advances In Health and Medicine*, *8*. https://doi.org/10.1177/2164956118821056

Thimmapuram, J., Yommer, D., Tudor, L., Bell, T., Dumitrescu, C., & Davis, R. (2020). Heartfulness meditation improves sleep in chronic insomnia. *Journal of Community Hospital Internal Medicine Perspectives*, *10*(1), 10–15. https://doi.org/10.1080/20009666.2019.1710948

Venkatesan, T., Porcelli, A., Matapurkar, A., Suresh Kumar, V. C., Szabo, A., Yin, Z., & Wieloch, L. (2021). An integrative healthcare model with heartfulness meditation and care coordination improves outcomes in cyclic vomiting syndrome. *Neurogastroenterology and Motility*, *33*(11), 1–11. https://doi.org/10.1111/nmo.14132

Westeinde, A. van't, & Patel, K. D. (2022). Heartfulness Meditation: A Yogic and Neuroscientific Perspective. *Frontiers in Psychology*, *13*(May), 1–13.https://doi.org/10.3389/fpsyg.2022.806131

Yadav, G. S., Cidral-Filho, F. J., & Iyer, R. B. (2021). Using Heartfulness Meditation and Brainwave Entrainment to Improve Teenage Mental Wellbeing. *Frontiers in Psychology*, *12*(October), 1–9. https://doi.org/10.3389/fpsyg.2021.742892

Yommer, D., Thimmapuran, J., & Tudor, L. (2018). Heartfulness Meditation: An effective treatment option for chronic insomnia. *Sleep*, *41*, A147.