**Mindfulness-based interventions to reduce stress and burnout in nurses: an integrative review.**

ABSTRACT

**Background**

With work-related stress and current COVID-19 pandemic, nurses are at heightened risk of stress and burnout. Mindfulness-based interventions (MBI) have been seen to decrease stress and burnout, yet research into the effectiveness for nursing staff is limited. This review adds to the growing body of literature surrounding mindfulness and to explore the benefit it may have for clinical professionals.

**Aim**

To review and critically appraise the evidence around the effectiveness of MBIs to help reduce stress and/or burnout in nurses working in acute hospital settings.

**Method**

An integrative review.

**Findings**

Eleven research papers were identified, all of which found a reduction in stress and burnout for nurses working in acute hospital settings. MBIs can be adapted to suit nursing schedules whilst maintaining efficacy, but uncertainties remain around the optimisation of the length and delivery of these for integration into the NHS.

**Conclusions**

This updated review found that MBIs may be an effective intervention to reduce stress and burnout in nurses working in acute settings. However, further research to establish and test a standardised MBI is required before it could be implemented into the National Health Service (NHS) settings.

**BACKGROUND**

Even prior to the COVID-19 pandemic, 40% of NHS staff were reported to suffer work-related stress (NHS England 2020) and this is almost certain to have increased during the COVID-19 pandemic. For nurses, workplace stress can be worsened by workload, (Kinman et al. 2020; McGrath et al. 2003), understaffing (Buchan et al. 2019), workplace violence (Foster et al. 2020) and the conflict of managing organisational and patient demands (Hercelinskyj et al. 2014; McVicar 2003 Senek et al. 2020). Stress in nurses can lead to poor patient and carer rapport (Wu et al. 2010), increased medication errors (Virtanen 2009) and overall worsen patient outcomes (Hall et al. 2016). Similarly, prolonged stress can lead to burnout, defined as overwhelming exhaustion, cynicism, detachment from the job and lack of accomplishment (Maslach et al. 2001). Burnout in nurses can negatively impact patient outcomes (Hall et al. 2016), care and satisfaction (Van Bogaert et al. 2014) as well as act as an exacerbating factor for poor nurse retention in the UK (Theodosius et al. 2021). Therefore, it is important to examine the evidence for interventions that are proposed to improve self-care and reduce stress and burnout, such as mindfulness.

Mindfulness can be defined as, paying attention on purpose, becoming present and accepting the here and now, non-judgementally (Kabat-Zinn 2015). Techniques such as focusing on the inhale and exhale of breath and body scanning whilst meditating are the foundation to Mindfulness Based Interventions (MBIs) (Crane 2009). Research by Alem et al. (2018) found a reduction in stress in non-clinical participants after the delivery of an MBI. Whilst Research by Fjorback et al. (2011) suggest the benefits of a MBI can improve of symptoms of anxiety and depression. Lastly, Jazaieri and Shapiro, (2017) highlight the use of mindfulness as a skill to improve an individual's wellbeing. In the context of the global COVID-19 pandemic, it is never more important to research and better understanding the benefits of mindfulness.

**AIM**

The aim of this integrative review is to answer the question: *In nursing staff working in acute hospital settings, do mindfulness-based interventions help reduce stress and/or burnout?*

**SEARCH STRATEGY**

The CINAHL, Medline and PsychInfo databases were searched using the key words and Boolean operators of (AB Mindfulness OR AB "Mindfulness-based" OR AB MBSR), (AB Nurs*), (AB Stress OR AB Burnout) October 2019.

**Inclusion and exclusion criteria**

Inclusion criteria were that studies (full text, not abstracts or conference reports) were primary research published in the last 10 years, written in English, evaluated an MBI as the intervention, and related to registered nurses working in acute general or mental health hospital settings. Similarly, measurements of stress or burnout must have been recorded before and after the delivery of the MBI. Exclusion criteria were studies with mainly non-nursing participants as well as nursing students and those not available in English (Figure 1 PRISMA Diagram). Papers were critically appraised for quality using the Critical Appraisal Skills Programme checklist (appropriate for the study design) and an appraisal framework by Hawker et al. (2002). Papers were reviewed by one author JA, with any uncertainties discussed with LNT. Summary data was extracted into a template and is presented in Table 1. Studies were included up to October 2019.

**RESULTS**

Eleven research papers met the inclusion criteria and are included in this review (Table 1). Four were randomised controlled trials (RCTs) (Daigle et al. 2018; Lin et al. 2019; Pipe et al. 2009; Yang et al. 2018) with the remaining seven being pre and post-test studies (Bazarko et al. 2013; Duarte and Pinto-Gouveia 2016; Foureur et al. 2013; Gauthier et al. 2015; Horner et al. 2014; Mahon et al. 2017; Montanari et al. 2018). Two of the pre and post-test studies were mixed methods (Foureur et al. 2013; Montanari et al. 2018) and three were quasi-experimental (Duarte and Pinto-Gouveia 2016; Horner

et al. 2014; Mahon et al. 2017). Their results fell into three themes, this review will be presented under these themes.

- The effect of mindfulness on reducing stress
- The effect of mindfulness on reducing burnout
- Delivery of mindfulness-based interventions in acute hospital settings

**The effect of mindfulness in reducing stress in nurses**

All eleven studies found a reduction in stress measures after an MBI, with 9 of the 11 studies showing a statistically significant decrease in the levels of stress (Bazarko et al. 2013; Daigle et al. 2018; Duarte and Pinto-Gouveia 2016; Foureur et al. 2013; Gauthier et al. 2015; Lin et al. 2019; Mahon et al. 2017; Pipe et al. 2009; Yang et al. 2018).

A randomised controlled trial (RCT) by Pipe et al. (2009) randomised 33 nurse managers/leaders from multiple hospitals in the United States to a condensed 4-week MBI or control. They found a statistically significant fall in the stress subscale ($p$ = <0 .0096) within the Symptom Cheaklist-90. The control group in this trial received educational training on stress and leadership strategies. This was useful as it provides further insight to how mindfulness may compare to standard stress interventions. A limitation of this research, as with all others is selection bias, as nurses who choose to participate may be more motivated to reduce their stress.

Bazarko et al. (2013) conducted a pre and post-test study to determine the effectiveness of an 8-week telephone-delivered mindfulness-based stress reduction [MBSR] programme on the health and wellbeing of 36 nurses in an acute hospital setting. They found a statistically significant decrease ($p$ = <0 .001) in stress between pre to post intervention and then again 4 months later. Although showing the extended effectiveness of MBIs, the lack of a control group hinders their results.

Foureur et al. (2013) used a mixed methods quasi-experimental design in 28 registered nurses and midwives and found significant reductions ($p$ = <0 .004) in stress. Only 28 participants completed the post intervention measures, of which 10 engaged in follow up interviews and focus groups. The major

barrier reported related to finding time during their work schedule to engage in mindfulness practice. This study failed to not report how many of the participants were nurses. This may hinder its reliability when applying the results to the wider population of registered nurses. Yet, their qualitative data suggested the use of mindful practice helped to encourage an individual's awareness of emotion during stressful events.

A study by Gauthier et al. (2015) who modified the standard 6-week MBSR programme to 4-weeks (with 5-minute mindfulness training at the start of each shift) alongside weekly 30-minute sessions. They included 38 paediatric nurses and found that this shortened mindfulness intervention still reduced stress with significant results ($p$ = < 0.006). Although stress reduction remained significant after a one month, the level of self-directed practice needed to maintain positive effects of mindfulness remains unexplored.

Duarte and Pinto-Gouveia (2016) delivered a six-week MBI to 48 oncology nurses, comparing the intervention to a control in a quasi-experiential design. They found individuals who received an MBI had statistically significant decreases ($p$ = <0 .008) in stress measures within the Depression, Anxiety and stress scale compared to the control group.

Mahon et al. (2017) delivered a 6 and 8-week MBI to 64 registered nurses in three hospitals in Ireland. Two hospitals received an 8-week long MBI and participants from one hospital a 6-week long MBI. The quasi-experimental study found a significant ($p$ = <0 .001) decrease of stress within the perceived stress scale across all three hospitals. There were no significant differences between the results of the 6 or 8-week MBI.  This suggests a shorter course may be equally effective.

Similarly, Yang et al. (2018) randomised 95 mental health nurses from China in an RCT to an 8-week MBSR programme or standard support and examined work stress and mental health. They found a statistically significant reduction in stress ($p$ = <0 .001), depression ($p$ = <0 .001) and anxiety ($p$ = < 0.001). Although this suggests that the MBI delivered is more effective than existing psychological support, greater detail is needed around what the standard support entailed.

Daigle et al. (2018) used an RCT design on 52 nurses working in general hospitals in Canada. They found a significant decrease ($p$ = < 0.020) in distress within the tension anxiety subscale of The Profile of Mood States measure after an 8-week MBSR programme. They also found a non-significant decrease in medication errors. However, this result may have been influenced through self-report bias and must be taken with caution.

An RCT by Lin et al. (2019) included 90 nurses in two acute hospitals in China. They found a statistically significant decrease ($p$ = <0.01) in stress scores using the validated (Cohen et al. 1983) Perceived Stress Scale [PSS] from baseline and after the 8-week modified MBSR programme. This modified course utilised methods from both MBSR and mindfulness-based cognitive therapy [MBCT], mixing elements of mindfulness practice, education regarding self-care and recognition of an individual's own emotions. Similarly, self-directed study was implemented and monitored to 20 minutes daily, alongside day retreats being removed. This allowed a more intensive delivery to the nurses yet remained workable within the nursing schedule.


**The effect of mindfulness in reducing burnout**

Four of the 11 papers found some reductions in burnout measures after an MBI. However, only two studies found statistical significance in the reduction of burnout (Bazarko et al. 2013; Duarte and Pinto-Gouveia 2016). The other two studies showed only a trend towards significance (Horner et al. 2014; Montanari et al. 2018).

Bazarko et al. (2013) used the Copenhagen Burnout Inventory [CBI] and found a significant decrease in burnout from baseline to post-MBI. Significant reductions were all found within all three areas of: personal burnout ($p$ = < 0.001), work-related burnout ($p$ = <0 .001) and client-related burnout ($p$ = <0 .05). However, 4 months after the final MBI session, a reduction in burnout scores were only seen in the areas of work-related burnout ($p$ = <0 .05). They also found a significant decrease ($p$ = <0 .002) pre and post-MBI in the burnout subscale of the Professional Quality of Life Scale.

Horner et al. (2014) found no significant differences within the burnout subscale of the Professional Quality of Life measure after an MBI. However, only 60% of participants in the intervention group attended five or more classes. This lack of participant compliance with the intervention, will have influenced their results.

Montanari et al. (2018) used a mixed methods pre and post-test design on a final sample of 26 registered general hospital nurses in the USA. They aimed to assess the effectiveness of a 6-week mindfulness intervention on a unit experiencing a high staff turnover. Using the Perceived Stress Scale [PSS] and Maslach Burnout Inventory [MBI] they found no significant differences in stress and burnout after the intervention. This could be attributed to the intervention options, with multiple options on the 'mindful menu' delivered for 6 weekends. This may have detracted from the significance of consistent guided meditation as a standalone intervention for participants.


**Delivery of mindfulness-based interventions in acute hospital settings**

Although all 11 research papers utilise an MBI, the format, length and structure of these programs vary which makes it difficult to identify what components of a MBI make it most effective and whether one method works for all nurses. Despite this, there is evidence that mindfulness can be effective in decreasing stress or burnout in nurses when implemented in acute hospital settings. Interventions varied from 4 weeks (Gauthier et al. 2015; Pipe et al. 2009) to 10 weeks (Horner et al. 2014), and significant results were found with both durations, suggesting that the length of an MBI is not an indicator of efficacy. For the NHS this is important, to make an intervention realistic to implement.

The format of the intervention also varied. Bazarko et al. (2013) used a telephone delivery method. They provided 6 group telephone MBSR sessions with 2 classroom sessions. Emphasis was placed on participants complying with some homework. This introduces a potential limitation as it requires motivated individuals to complete independent work in order to achieve the benefits of mindfulness. Nevertheless, they still found reductions in both stress and burnout. Other research used face to face sessions. Lin et al. (2019) used 2-hour face to face sessions that were delivered once a week for 8

weeks, alongside 20 minutes of daily homework 6 days a week. They also showed a significant decrease in stress.

Nurses busy, irregular work schedules and workload could hinder them accessing MBIs. Both Horner et al. (2014) and Mahon et al. (2017) found that nursing workloads often led to participants being unable to attend some mindfulness sessions. For Mahon et al. (2017) it led to significant participant attrition and lowers the generalisability of their results. Gauthier et al. (2015) also recognised that drop out in participants may be due to the difficulties in adopting new habits and adjusting to changes in daily schedules. However, with significant results being achieved using both formats, the use of telephone delivery may offer more flexibility for nurses.

**DISCUSSION AND IMPLICATIONS FOR PRACTICE IN THE NHS**

This updated integrative review shows that MBIs can reduce stress and burnout in nurses in acute care settings and shows promise regarding integration and implementation into acute hospital settings. A key consideration, however, is the cost implications of introducing an MBI intervention into the NHS setting. This review found that telephone delivery of MBIs were equally effective (Bazarko et al. 2013) and may reduce the barrier around releasing clinical nurses for the intervention, a significant problem for managers. Although still costly to develop, an online intervention may prove to be cost-effective in the NHS over time (Appleby et al. 2009) and is a method of delivery that warrants further exploration. A meta-analysis by Spijkerman et al. (2016) suggests that online MBIs can reduce stress in non-clinical staff and therefore effectiveness of an e-learning package could be considered for future research. Yet this would require motivated individuals and non-adherence may impact their effectiveness.  Another barrier to the implementation of MBIs in nursing practice maybe the reluctance of nurses themselves to embrace a new practice (Carlström and Ekman 2012). MBIs require commitment, ongoing practice and cannot be viewed as a 'quick-fix' solution. Nurses with busy schedules may become frustrated if benefits are not immediately felt and therefore lead to poor

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treatment adherence. There may also be reluctance in uptake of MBI interventions by nurses, who despite reporting high amounts of stress and burnout, may perceive any psychological intervention as a failure to cope (Kinman et al. 2020). There may also be some scepticism around MBIs due, in part, to the disparity between these and other holistic treatments such as traditional Chinese medicine not conforming to the dominant bio-medical model of treatment (King and Gates 2006; Wade and Halligan 2017). Overcoming this barrier, requires regular dialogue with both end users (nurses and healthcare staff) and hospital managers to implement the MBI. Currently, with the global COVID-19 pandemic it is never more important to look for effective ways to reduce stress and support nurses, and MBIs do show effectiveness in reducing stress and burnout. However, MBI are not the only interventions proposed and studied to manage and reduce stress and burnout in healthcare staff. Other positive psychology interventions such practicing gratitude, self-compassion and positive interpersonal processes have also been used (Alexiou et al. 2021; Cheng et al. 2015; Luo et al. 2019).

MBIs delivered to nurses experiencing stress have the potential to reduce this stress (Ghawadra et al. 2019; Guillaumie et al. 2017; Van der Riet et al. 2018) and improve patient care and safety (Brady et al. 2011). There is also evidence that MBIs can impact on burnout (Bazarko et al. 2013; Duarte and Pinto-Gouveia 2016; Van der Riet et al. 2018). Feelings of burnout can adversely affect patient care which contributes to the breakdown of nurse-client and family rapport (Van Bogaert et al. 2014). Using mindfulness to reduce burnout can help to reduce feelings of emotional exhaustion and depersonalisation in nurses. As a result, nurses may be more open and engaging with patient and their families. One issue not included in this review, but that warrants mentioning is the relationship that stress and burnout have with compassion fatigue (CF). MBIs have been seen to show some evidence of reducing CF (Abernathy and Martin 2019; Duarte and Pinto-Gouveia 2016) and warrants further investigation in future research.

Despite the variation in these MBI interventions, they all demonstrate the potential that mindfulness has when integrating them into existing nurses' practice and even more so in an economically constrained NHS. Future research should focus on developing a refined and simplified programme to integrate easily into the NHS for staff and to examine both the medium- and longer-term effects of this. Similarly, research should continue to explore the impact of duration and intensity, as well as delivery format on key outcomes such as stress, burnout and compassion fatigue and whether specific formats of MBI delivery can be individualised to achieve better results.

This integrative review has some limitations that warrant mentioning. Its highly focussed question limited our paper inclusion to eleven papers. However, our exclusion of non-English papers did not eliminate any papers that met our inclusion criteria. Our aim was to focus this to nurses in acute care settings and provide an updated review of the effectiveness of MBI in reducing stress and burnout in nurses, which this review has done.

**CONCLUSION**

Stress and the development of burnout in nurses has been shown to negatively impact patient care and the health and well-being of staff. Alongside this, the impact of COVID-19 on healthcare staff has increased the risk of stress and burnout developing (Stuijfzand 2020). Mindfulness is a malleable and adaptive technique that has been proposed to reduce stress and potentially burnout. The use of MBIs are increasing, and this updated integrative review has found that MBIs can be effective in reducing stress and burnout in nurses in acute care settings. The challenge now is to consider how best to implement these into nursing practice and into the NHS in an effective manner and to continue to undertake research into their effectiveness.

**Keywords**

Mindfulness; Mindfulness-based intervention, Stress, Burnout, Nurses

**Key Points**

- Nurses and healthcare staff are facing increasing rates of work-related stress due to increased workload, understaffing, increased organisational and patient demands, all of which, exacerbated by the COVID-19 pandemic.

- Mindfulness-based interventions have been shown to produce statistically significant effects in reducing stress and burnout, but research in registered nurses is limited.

- This review has helped to identify that mindfulness-based interventions can be used to reduce stress and burnout in nurses working in clinical settings.

- Future research should investigate the optimal format and program length to deliver to nursing staff within the NHS.

**Reflective questions**

- Have you engaged in mindfulness practice before, if so, what kind of results have you seen?

- Are these MBIs offered through your organisation/employer?

- How would you feel about trying a mindfulness intervention?

- What things are stopping you from practicing mindfulness?

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