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The Use of Mindfulness-Based Stress Reduction to Reduce Stress and Burnout in Nurses

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Contents

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Executive Summary

The Mindfulness-Based Stress Reduction Program (MBSR) has been used effectively in multiple clinical settings to reduce workplace stress and burnout in nurses. The MBSR's cost-effective approach to stress management can be implemented into any healthcare facility's policy. The topic of MBSR's effect on stress and burnout has been identified as essential due to nurses working in fast-paced, stressful work environments. These work environments lead to increased stress and burnout. The International Council of Nurses surveyed nurses before and after the pandemic. There were 40% of nurses that reported symptoms of burnout before the pandemic compared to 70% of nurses after the pandemic (Bartholomew, 2021). According to Sarazine et al. (2020), workplace stress is the highest safety risk for nurses. The continuing consequences of stress and burnout if the evidence-based change is not implemented include health issues in nurses like high blood pressure, heart disease, and sleep disorders. The Health Risk Appraisal by the American Nurses Association (2016) reported that 82% of nurses blamed workplace stress for their increased risk for illness.

Other continuing consequences of stress and burnout include increased errors, increased turnover rates, nursing shortages, and poor patient outcomes, costing healthcare facilities money (Green & Kinchen, 2021). The national turnover rate is 8.8% to 37% due to nursing burnout (Haddad et al., 2022). The Registered Nurse (RN) vacancy rate in Texas increased from 5.9% in 2019 to 17.6% in 2022 (Texas Center for Nursing Workforce Studies, 2022). The PICOT question that will be used for the Mindfulness-Based Stress Reduction change project will be as follows: In nurses suffering from workplace stress and burnout (P), how does a Mindfulness-Based Stress Reduction Program (I) compared with no Mindfulness-Based Stress Reduction Program (C) affect workplace stress and burnout (O) within eight weeks (T).

The Use of Mindfulness-Based Stress Reduction to Reduce Stress and Burnout in Nurses

Nurses have always suffered from workplace stress and burnout. Since the pandemic began, nurses have been more overworked, exhausted, and stressed than ever before. The purpose of this change project is to explore the effects of a Mindfulness-Based Stress Reduction Program (MBSR) to reduce workplace stress and burnout in nurses. Nurses were taught stress reduction techniques like mindfulness meditation and yoga to incorporate into daily routines. Mindfulness training relaxes the mind and body, decreasing stress and improving health while minimizing workplace stress, burnout and improving job satisfaction. There are numerous studies on MBSR Programs in non-clinical settings, but there have not been enough studies performed on nurses. This program can have a significant impact on nursing. Decreased stress will increase the nurse's focus, improve health, and improve patient care. The MBSR program could be implemented into any healthcare facility's policy as a cost-effective approach to stress management.

Rationale for the Project

Stress and burnout have always been an issue for nurses. Stress and burnout can lead to health issues in nurses, like high blood pressure, heart disease, and compromised immune systems. It can also lead to errors, increased turnover rates, nursing shortages, and poor patient outcomes, costing healthcare facilities money. There is a link between the increase in costly medical errors and nurses' workplace stress, depression, anxiety, and burnout syndrome. The impact of not implementing the change will include increased workplace stress and burnout, leading to poor patient outcomes, decreased patient satisfaction, and increased patient and family complaints, which are costly to healthcare facilities (Garcia et al., 2019). Approximately 400,000 patients encounter preventable medical errors, which cost healthcare facilities $4 billion annually

(Rodziewicz et al., 2022). Nursing turnover can cost about $11,000 to $90,000 per nurse, with the healthcare facility spending up to $8.5 million annually on unfilled vacancies, training, orientation, and patient deferment (Kelly et al., 2021).

Mindfulness techniques have been used in Western Countries since the '70s and 80's to improve psychological health (Lin et al., 2018). MBSR programs have decreased psychological distress in patients with chronic pain, patients with cancer, teachers, students, and veterans (Ghawadra et al., 2019). This program is a safe, cost-effective approach to stress management, and it could eliminate the need for medication which can be costly. Yoga and mindfulness meditation teach the nurse coping techniques that can be used in the workplace and their everyday life (Lin et al., 2018). MBSR can give the nurse techniques to stay calm and prioritize care. The nurse will be able to manage their stress more effectively, establish an inner calm, and improve their self-care. This will allow them to become more aware in emergency situations, prioritize, and focus on one task at a time. Remaining calm in the busy work environment will improve communication with colleagues and patients, improving patient care and patient outcomes (Knudsen et al., 2021).

The MBSR change project is an eight-week program. The participants practiced mindfulness for 30 minutes twice a week. The coping techniques are practiced at home and implemented in the workplace when needed. There are a variety of different ways this program can be implemented. Traditional face-to-face methods, smartphone applications, PowerPoints, and audio recordings can be used. This can be helpful if the nurse does not have time to attend a class because of their busy work schedule (Lin et al., 2018).

Literature Synthesis

Multiple databases were searched to find the highest level of evidence including the Cochrane database, the Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PubMed. The keywords used to conduct the search were nurses, nursing, stress, burnout, mindfulness, and Mindfulness-Based Stress Reduction (MBSR). The search was limited by using the Boolean operator "AND". Several studies with the strongest level of evidence were found and reviewed to assure relevancy to the PICOT question.

Twelve studies ranging from 2009 to 2022 were found to be relevant to the MBSR change project. The two studies completed over five years ago were critically appraised due to their strong supporting evidence and relevancy to the change project. Ramachandran et al. (2022), Suleiman-Martos et al. (2019), Lin et al. (2018), Ghawadra et al. (2020), Yang et al. (2018), Hilcove et al. (2021), Daigle et al. (2018), Burger & Lockhart (2017), Pipe et al. (2009), Aghamohannadi et al. (2022), Wu et al. (2021), and Knudsen et al. (2021) all concluded that a MBSR is effective in decreasing stress and burnout in nurses. Ramachandran et al. (2022), Yang et al. (2018), and Pipe et al. (2009) concluded that in addition to decreasing stress and burnout, MBSR decreased anxiety and depression in nurses. The commonality between Hilcove et al. (2021), Daigle et al. (2018), and Knudsen et al. (2021) is that there was an improvement in the nurses' sense of well-being in addition to decreased stress and burnout. Daigle et al. (2018), Lin et al. (2018), Aghamohannadi et al. (2022), Yang et al. (2018), and Knudsen et al. (2021) used an MBSR eight-week session, while Ghawadra et al. (2020), Burger & Lockhart (2017), Pipe et al. (2009), and Hilcove et al. (2021) utilized sessions that were modified to two to six weeks. Lin et al. (2018), Daigle et al. (2018), and Aghamohannadi et al. (2022) followed up with the participants after three months while Ghawadra et al. (2020) followed up with the participants

after eight weeks. Upon follow up in each of the studies, it was found that the participants still had a decrease in stress and burnout symptoms.

The evidence found in the twelve studies supports the MBSR change project. Implementing the MBSR program can decrease stress and anxiety in nurses, improving job satisfaction, decreasing call-ins due to stress-related illnesses, reducing turnover, errors, and improving patient outcomes. The evidence further concluded that it can be effectively performed on the participant's own time and practiced at work. MBSR can be performed in different formats including, face to face, smartphone applications, audio recordings, and other platforms like YouTube, making it more convenient for the participants and eliminating the barrier of lack of time. The commonality between the studies provides evidence that no matter which formats or time frame is used, MBSR is effective in reducing stress and burnout in nurses (Ramachandran et al., 2022; Suleiman-Martos et al., 2019; Lin et al., 2018; Ghawadra et al., 2020; Yang et al., 2018; Hilcove et al., 2021; Daigle et al., 2018; Burger & Lockhart, 2017; Pipe et al., 2009; Aghamohannadi et al., 2022; Wu et al., 2021; Knudsen et al., 2021). (see Appendix A)

Project Stakeholders

The stakeholders affected by this change include hospital administration, college executive leadership, human resources, employee health department, risk management, nurse managers, nurses, the nurses' colleagues, nursing faculty, students, patients, and the patient's family members. The college executive leadership had the power to approve or deny the MBSR Change Project. The change will have a positive impact on hospital administration, human resources, nurse managers, college executive leadership, employee health departments, the nurses' colleagues, patients, and patient's family members because there will be improvement in the nurse's health, a decrease in stress-related call-ins, and a decrease in turnover. Hospital

administration, risk management, patients, patient family members, and nurse managers will see a reduction in errors which will save the facility money, improve patient outcomes, and improve patient and family satisfaction.

The nurses and nursing faculty are participants in MBSR and are also in charge of passing their knowledge about the effects of MBSR to future nurses. Learning techniques to manage stress needs to begin in nursing school. If nurse educators can learn how to manage their stress and burnout, that knowledge can be passed down to their nursing students. Students who learn MBSR will learn to manage their stress and burnout earlier in their careers, which will prevent errors and improve their health. The nurse will learn how to remain calm in the busy work environment, which will improve communication and relationships with their colleagues (Knudsen et al., 2021). The nurse's ethical responsibility is to ensure that the patient receives the best care possible (Wu et al., 2021). The nurse will learn techniques to stay calm and prioritize care allowing them to manage their stress more effectively, establish an inner calm, and improve their self-care improving communication with patients, improving patient care and patient outcomes (Knudsen et al., 2021).

Implementation Plan

The problem of increasing stress and burnout in nurses was identified. A systematic search of the literature for the effects of MBSR on stress and burnout was performed. The search of literature ended with twelve keeper studies. The body of evidence was reviewed. An informational PowerPoint was created to present to the stakeholders. The PowerPoint included information regarding MBSR, the benefits of MBSR, turnover rates, and the cost of medical errors. The PowerPoint was presented to the college’s executive leadership to provide evidence

that supported the benefits of MBSR on stress and burnout to increase buy-in. The change project that included the nursing faculty was approved.

After the approval from the college's executive leadership, there was a face-to-face meeting with eight faculty members. The informational PowerPoint was shown to the nursing faculty members to increase buy-in. A follow-up email was sent to the potential participants, including the informational PowerPoint and the pre-intervention surveys. Before the eight-week MBSR intervention, eight nursing faculty were emailed a copy of the Perceived Stress Scale (PSS) and the Maslach Burnout Inventory (MBI) to assess pre-intervention stress and burnout. The participants were given ten days to complete the PSS and MBI. Six nursing faculty responded to the email and provided their pre-intervention surveys.

The PSS is a 14-item, 5-point Likert scale that measures the perception of stress. The participant will rate each item from "0" (never) to "4" (very often). A PSS score of 0-13 indicates low stress, 14-26 indicates moderate stress, and 27-40 indicates high stress (Cohen et al., 1983). The MBI is a 22-question, 7-point Likert scale that covers three areas, emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA). The participant rated each question from "0" (never) to "6" (daily). A score on the group of questions for EE of less than 17 indicates low EE, 18-29 is moderate EE, and greater than 30 indicates high EE. A score on the group of questions for DP of less than 5 indicates low DP, 6-11 indicates moderate DP, and greater than 12 indicates high DP. A score on the group of questions for PA less than 33 indicates low PA, 34-39 indicates moderate PA, and greater than 40 indicates high PA. It is optimal to have lower scores for EE and DP and higher scores for PA (Maslach & Jackson, 1981). (see Appendix B)

Six faculty members from a State College volunteered to participate in the MBSR Change Project. Three participants are faculty in the Transition Registered Nursing (RN) Program, and three are faculty in the Vocational Nursing Program. Two participants have a Master of Science (MSN) in Nursing. Three participants have a Bachelor of Science (BSN) in Nursing and 30 hours towards their MSN. One participant has an Associate of Science Degree in Nursing (ADN). There are five females and one male. One participant is in the 30-39 age group, two are in the 40-49 age group, two are in the 50-59 age group, and one is in the 60-69 age group.

A training PowerPoint was created to provide education about the effect of MBSR on stress and burnout, the eight-week MBSR change project, and the mindfulness resources needed to complete the program. There was another face-to-face meeting with the six participants to identify potential barriers and present the training PowerPoint about the MBSR change project. The identified barrier that was found was the potential lack of time. To prevent the barrier of lack of time, the participants chose to do the MBSR activity on their own time, and they utilized the mindfulness application that best satisfied their needs. The participants performed 30 minutes of a mindfulness activity twice a week for eight weeks. Mindfulness.com meditation app, Headspace app, and YouTube are examples of resources that can be used for mindfulness activities. There were weekly check-ins every Monday to answer questions, assess for potential barriers, assess progress, and provide support, motivation, and guidance to the participants.

After the eight-week MBSR intervention, a face-to-face meeting was held, and the six participants were asked questions about their experience and administered a paper copy of the post intervention PSS and MBI. The pre and post-survey data were compared to evaluate if the eight-week MBSR intervention was successful and if the participants had decreased stress and

burnout. After the data analysis was complete, the results were disseminated to the college's executive leadership and nursing faculty.

Timetable/Flowchart

The problem of increased stress and burnout was identified in Fall 2021. A systematic search of literature was performed in Fall 2021, Spring 2022, Summer 2022, and Summer 2023. Twelve keeper studies were found. The body of evidence was reviewed in Fall 2021, Spring 2022, Summer 2022, and Summer 2023. An informational PowerPoint was created to increase stakeholder buy-in on April 24, 2023. The informational PowerPoint was presented to the college's executive leadership, and approval was gained on April 26, 2023. There was a face-to-face meeting with eight nursing faculty members on May 14, 2023. The informational PowerPoint presented to the college's executive leadership was then shown to the potential participants to provide details regarding the MBSR change project and increase buy-in. A follow up email that detailed the information presented in the meeting on May 14, 2023, was sent to the potential participants.

On May 18, 2023, an email that included the PSS and MBI pre-intervention surveys, along with the explanation of the scales, was sent to potential participants. The participants were given from May 18, 2023, to May 28, 2023, to complete and return the pre-intervention surveys via email. Six of the eight VN and Transition RN faculty sent their pre-intervention surveys in via email by the due date of May 28, 2023. A training PowerPoint with education on the benefits of the MBSR, the MBSR change project, and mindfulness resources needed to complete the program were created on May 27, 2023, and May 28, 2023. There was a face-to-face meeting with the participants on May 29, 2023, to identify potential barriers and present the training PowerPoint.

On May 29, 2023, the eight-week MBSR intervention began. The participants performed 30 minutes of mindfulness activities twice a week from May 29, 2023, to July 23, 2023. Weekly check-ins were performed every Monday from May 29, 2023, to July 23, 2023, to answer questions, assess for barriers, assess progress, and provide support, motivation, and guidance to the participants. The eight-week intervention ended on July 23, 2023. The participants were asked questions about their experience and completed the post-intervention PSS and MBI in a face-to-face meeting on July 24, 2023. On July 25, 2023, the pre- and post-intervention PSS and MBI data were compared for a decrease in stress and burnout. Met with the college's executive leadership and participants on July 31, 2023, to disseminate the results of the MBSR change project. (see Appendix C)

Data Collection Methods

Data collection began pre MBSR intervention, and then concluded post-eight-week MBSR intervention. Pre-intervention PSS and MBI surveys were administered prior to the beginning of the MBSR intervention. The PSS is a 14-item, 5-point Likert scale that measures the perception of stress (Cohen et al., 1983). The MBI is a 22-question, 7-point Likert scale that covers three areas, emotional exhaustion (EE), depersonalization (DP), and personal accomplishment (PA) (Maslach & Jackson, 1981). At the conclusion of the MBSR intervention, the six participants were administered a paper copy of the PSS and MBI that were completed in the post-intervention face-to-face meeting. The participants were also asked which format they used, and if they were able to complete the mindfulness activity for 30 minutes two days a week for the entire eight-weeks. The pre- and post-intervention PSS and MBI data were compared, and the mean, median, and standard deviation were calculated using Microsoft Excel to evaluate if the eight-week MBSR intervention was successful, and if the participants had decreased stress

and burnout post MBSR intervention. A decreased PSS score indicates the participant has decreased perceived stress and the MBSR intervention was successful. A decreased EE and DP score and higher PA score indicate the MBSR successfully reduced burnout in the participants post intervention. A t-test is the inferential statistics that could be performed to assess if the findings could apply to a larger population, but because there were only six participants, the t-test was not be performed.

Cost/Benefit Discussion

According to the Texas Center for Nursing Workforce Studies (2022), action must be taken to increase nurse resilience, well-being and decrease burnout. NSI Nursing Solutions, Inc (2023) reported that the average cost for registered nurse (RN) turnover is $52, 350 per nurse. This has led to healthcare facilities losing about $6.27 to $10.53 million dollars annually. Healthcare facilities are turning to travel nurses to fill vacancies. It costs, on average, $127.12 per hour for each travel nurse. This can cost the facility $264, 410 annually per travel nurse. The cost difference between a staff nurse and a travel nurse is $75.46 per hour, which is $156, 965 per year (NSI Nursing Solution, Inc., 2023).

The ongoing cost to sustain the change in the organization would be utilizing mindfulness smartphone applications, televised mindfulness activities, or the MBSR online programs. Two mindfulness smartphone application examples include the Mindfulness.com meditation app and Headspace. Mindfulness.com is free, with an option to purchase the premium version for $9.99 per month or $59.99 per year. Headspace is free to download with two subscriptions offered. It can be purchased for $12.99 per month or $69.99 per year. Mindfulness activities can also be found on YouTube. YouTube is free, but YouTube Premium, which offers no commercials, can be purchased for $11.99 per month. Using of MBSR can decrease stress and burnout in nurses

which will reduce turnover, the need for travel nurses, and medical errors. It can also improve the nurse's health reducing the number of stress-related call-ins. The benefit of the MBSR change project is that it is more cost-effective than the risk of spending $4 billion annually on medical errors, 6.27 to 10.53 million dollars per year for nurse turnover, and $264, 410 annually per travel nurse (NSI Nursing Solutions, Inc., 2023; Rodziewicz et al., 2022).

Discussion of Results

The six participants submitted their pre-intervention PSS and MBI prior to the MBSR intervention, and the post-intervention PSS and MBI were submitted by the participants at the conclusion of the MBSR intervention. All six participants completed the mindfulness activity for 30 minutes two times a week. A smartphone application was used by four of the participants, and two participants utilized YouTube. The pre- and post-intervention surveys were compared. The pre-intervention PSS mean was 22, the median was 21.5, and the standard deviation (SD) was 1.79. These scores were then compared to the post-intervention PSS scores. The post-intervention mean was 16.2, the median was 17, and SD was 3.13. There was an increase in the post intervention SD when comparing the pre- and post-intervention SD values. There was a significant decrease in the post-intervention PSS findings when compared to the pre-intervention PSS findings indicating that the MBSR intervention successfully reduced perceived stress in the participants.

The pre- and post-intervention MBI results were then analyzed. The pre-intervention EE mean was 19.5, the median was 19.5, and SD was 9.4 compared to the post-intervention EE mean of 14.8, the median of 14.5, and SD 7.9. The pre-intervention DP mean was 8.3, the median was 8.5, and SD was 4.13, and the post intervention DP mean was 5.3, the median was 5, and SD was 2.8. The pre-intervention PA mean was 29.2, the median was 28.5, and SD was

7.33. The post-intervention PA was 32.8, the median was 32, and SD was 5.8. There was a decrease in the MBI SD post-intervention in comparison to the pre-intervention SD. When comparing the pre and post EE and DP findings, there was a significant decrease in the EE and DP MBI scores post intervention. When comparing the pre-intervention and post-intervention PA scores there was an increase in the PA scores post intervention. The ideal MBI score is a decreased EE and DP score but an increased PA score. Collectively the results indicate that the MBSR intervention was successful in decreasing burnout in the participants. Based on the data analysis, it was concluded that the MBSR intervention reduced stress and burnout in the participants.

Conclusions/Recommendations

The findings from the MBSR change project indicated that the MBSR intervention effectively decreased stress and burnout. The recommendation is that MBSR will help the nurse manage their stress positively, which could cause a gradual increase in job satisfaction, leading to less burnout and improved patient care. When the nurse has a decrease in stress and burnout, this will lead to fewer errors, a decrease in call-ins due to stress-related illness, and a decrease in nursing turnover. Errors lead to increased length of patient stay, which costs the health care facility money. Call-ins and turnover lead to a shortage of nurses which causes the healthcare facility to hire new nurses or use travel nurses, which are both costly. The nurse will also have improved health, decreasing the need for extra healthcare provider visits and medications. Any healthcare facility or nursing school could implement an MBSR program. Teaching current and future nurses how to handle stress and burnout positively will improve self-care, resilience, and patient care (Lin et al., 2018).

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Appendix A

Clinical Question (PICOT):

Intervention: In nurses suffering from workplace stress and burnout (P), how does a Mindfulness-Based Stress Reduction Program (I) compared with no Mindfulness-Based Stress Reduction Program (C) affect workplace stress and burnout (O) within 10-weeks (T)?

Meaning: How do nurses (P) with workplace stress and burnout (I) perceive a Mindful Stress Reduction Program (O) during a 10-week period (T)?

Citation: Author, Date of Publ. & Title	Purpose of Study	Conceptual Framework	Design/ Method	Sample/Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Worth to Practice: LOE Strengths/Weaknesses Feasibility Conclusion RECOMMENDATION
KS#1 Ramachandran, H. J. (2022, February	Effect of MBI on PWB, burnout, and PTSD	NONE	SR and MA 6 Databases searched:	EndNote X8 Software used Cochrane risk of bias	IV: MBI DB: PWB, burnout, and PTSD	Scales: PANAS GHQ PSDI PSS	Cohen'd Chi-squared test I2 statistic	**PD** PC=SMD -0.86 CI=95%; p=0.01 I2=84%	LOE 1 Strengths: Included all RCTs, RNs from different CS participated. Included LPNs and NAs.

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20). Effectiveness of mindfulness-based interventions on psychological well-being, burnout and post traumatic stress disorder among nurses: A systematic review and meta-analysis.			PubMed, Scopus, Embase, CINAHL, PsycInfo, Web of Science from 2005-2021 PRISMA and RevMan 5.4 was used RCTs	assessment tool RCTs-14 2-8 weeks Characteristics: RNs, LPNs, and NAs		NSS POMS-TA HADS-Anxiety GADS SAS HADS-Depression PHQ-9 SDS MBI PCL-C	REM	P=0.002 AC=SMD -0.96 CI=96%; p=0.01 I2 missing data **Stress** PC=SMD -1.14 CI=95%; p=0.03 I2=91% P=0.0008 AC=SMD -0.82 CI=95%; p=0.36 I2= No CF **Anxiety** PC=SMD -0.81 CI=95%; p=0.07 I2=86% p=0.007	Weaknesses: Small number of studies, studies included had small sample sizes, meta-analysis missing from some of the studies, included only English studies. Recommendation: MBI was effective in decreasing stress, anxiety, depression, and burnout in nurses. More studies need to be done in the future.

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								AC=SMD -0.93 CI=95%; p=0.34 I2=98%. p<0.001 **Depression** PC=SMD -0.68 CI=95%. p=0.001 I2=No data AC=SMD -0.52 CI=95%; p=0.34 I2=95%. p<0.001 **Burnout** PC=pooled MD -1.81 CI=95%; p=0.12 I2=No data	

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								AC=pooled MD -0.00 CI=95%; p=1.00 I2=86%. p=0.007 **PTSD** p=.0002	
KS#2 Suleiman-Martos, N. (2019, August 18). The effects of mindfulness training on burnout syndrome in nurses:	Effects of MT on burnout in nurses	N O N E	SR and MA 7 Databases searched: CINAHL, LILACS, Medline, ProQuest, PsycINFO, Scielo, & Scopus	CK and ICC used 17 articles 632 nurses 8 RCTs 9 QE Studies 3-12 wks. Characteristics:	IV: MT DV: burnout	MBI ProQOL CBI	I2 index Rev Man 5.3	**EE** I2=71% 1.32(95%CI: -9.41-6.78 **DP** I2=26% 1.91(95%CI: -4.50-0.68) **PA** I2=95% 2.21(95%CI: -9.91-14.14)	LOE 1 Strengths: Included 8 RCTs and 9 QE and nurses and CS from med surg units in hospitals. Weaknesses: Small number of studies, mainly female, short studies, and limited f/u. Recommendation: MT was shown to be effective for burnout in nurses. More

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A systematic review and meta-analysis.			PRISMA was used RCTs & QE	Age 29-52 Nurses MS units in hospital NS					studies need to be done in the future.
KS#3 Lin, L. He. (2018, October 28). The effects of a modified mindfulness-based stress reduction program for nurses: A randomized control trial.	Effects of MBSR on stress, affect, resilience & JS in nurses	N O N E	RCT Randomized Modified 8-week MBSR F/F, SP/App, PP, AR 3mo. F/U	110 FT nurses 11 dropped out d/t lack of time	IV: Modified MBSR DV: Dec. stress, negative affect, Inc. positive affect, JS & resilience	Scales: PSS PANASC D-RISC MMSS	SPSS 22.0 ANOVA T-Test Chi Squared Test	ANOVA= (p>.05) GE PSS .802 PANAS .834 CD-RISC .895 MMSS .934 TO & T1 & T2 (p<.05) T0 & T2 (p<.05)	LOE 2 Strengths: Randomized 1:1 Modified MBSR for hectic schedules Scales tested for reliability and validity Nurses in multiple CS and non-CS can participate Weaknesses: Some nurses lacked time, not a blind study Recommendation: MBSR should be used to reduce stress and burnout in nurses which can decrease

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									errors and improve patient outcomes. Modified program can be beneficial for nurses with hectic schedules
KS#4 Ghawadra, S.F. (2020). The effect of mindfulness-based training on stress, anxiety, depression, and job satisfaction among	Effect of MBSR on SAD and JS	N O N E	RCT Randomized 4-week guided SP MBT F/F Web 8-week F/U	224 participants 48.3 % DOR Mod-Mild SAD Used G*Power 3.1 F test ANCOVA	IV: MBSR DV: Dec. SAD Inc. JS	Scales: SAQ PC DASS JSS MAAS	SSPS 25.0 ITT GEE Cohen d Chi square t test	EOT= Stress (p<.001) Anxiety (p=.001) Depression (p<.001) Mindfulness (p<.001) DBG Anxiety (p=.037) JS(p<.001) IBTG= Anxiety (p=.008)	LOE 2 Strengths: Randomized, decreased selection bias, confounding minimized, minimized contamination bias Weakness: No blinding, used self-reported questionnaires, high drop rate for unknown reasons Recommendations: MBSR decreases stress, improves job satisfaction, can improve patient care, can be used in CS and Non-CS,

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ward nurses: A randomized control trial.								JS(p=.040) ES= Anxiety (0.465) JS (0.221) RR= Stress (0.50) Anxiety (0.82) JS (0.107)	cost effective, can reduce medical leave due to illness
KS#5 Yang, J. (2018). Effect of mindfulness-based stress reduction therapy on work stress and mental health of	To assess the effect of MBSR on WS and MH on nurses	N O N E	RCT Randomized 8-week F/F No F/U	100 participants 50-intervention 50-control Characteristics: Nurses DOR-2 intervention, 3 control No reason given	IV: MBSR DV: WS, MH	Scales: SCL-90 SDS SAS NSS	SPSS 15.0 t test Chi-square WRST	Intervention: SCL90= P<0.001 SDS/SAS= P<0.001 NSS=P<0.001 Control: SCL-90= P>0.05 SDS/SAS= P>0.05 NSS= P>0.05	LOE 2 Strengths: Randomized, the intervention and control groups were statistically comparable, intervention group had lowered depression, anxiety, and WS, consistent with timing of intervention. Weakness: No reason given for DOR, small sample, need to expand sample to include other

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psychiatric nurses.									departments, No F/U, no tool validity mentioned. Recommendation: MBSR useful in improving the MH and WS of nurses which leads to an increase in job satisfaction and patient outcomes.
KS#6 Hilcove, K. (2021). Holistic nursing in practice: Mindfulness-based yoga as an intervention to manage stress and burnout.	To assess the effect of MBYP on stress, burnout, and WB among nurses	Theory of environmental adaption	RCT Single blinded Randomized 6 weeks No F/U	80 participants 41-intervention 39-control Characteristics: Nurses, NA, therapist, doctors, SW	IV: MBYP DV: stress, burnout, WB	Scales: PSS MBI MOSSF-36 GSQ MAS BSS DSC B/P	G*Power 3 SPSS 18 PASW-20 ANOVA t test WRST	Stress/ Burnout= p<.01 vitality, SQ, serenity, mindfulness=p <.01 Cortisol= t test-p=.21 WRST-p=.27 B/P=	LOE 2 Strengths: Randomized, single blinded, tools validated, decreases stress, burnout, and improves well-being in comparison to control group. Weakness: Small sample, No F/U, cortisol and B/P did not show significant change in 6 weeks. Recommendation: MB interventions are beneficial

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								128.78/89.29 to 122.56/78.44	in reducing stress, burnout, and improve well-being in nurses which can increase job satisfaction and improve patient outcomes.
KS#7 Daigle, S. (2018, March 22). Mindfulness-based stress reduction training yielding improvements in well-being and rates of perceived nursing	To assess MBSR effect on WB and errors among hospital nurses.	N O N E	RCT Matched pair design Randomized 8 weeks 3-month F/U	75 participants 38-intervention 37-waitlist group 1-withdrew 2-excluded for health reasons 2-statistically outlying data Characteristics: RNs and LPNs	IV: MBSR DV: WB and errors	Scales: POMS-TA NERS	ANCOVA Chi-square t-test	POMS-TA=pretest: mean=11.32, SD=6.66; posttest: mean=8.92, SD=6.89 F(1,67)=5.669 p=.020 partial eta squared=0.08 37.5% had decreased errors at 3-month F/U	LOE2 Strengths: Matched pair design, 3-month F/U, 74% completed post treatment assessment, improved well-being in 71% and decreased errors in 37.5%, cost effective. Weaknesses: Relies on self-reports, small sample, no tool validity mentioned. Recommendation: MBSR program shows promise in decreasing distress and errors among nurses which improves

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errors among hospital nurses.									nurses' well-being and improves patient outcomes.
KS#8 Burger, K.G. (2017). Meditation effects on attentional efficiency, stress, and mindfulness characteristics of nursing students.	Effect of mediation on stress, mindfulness, attention regulation, and safe nursing practice	Neurocognitive Model of Attention	RCT Randomized 4-week program F/U unknown	60-participants 32-intervention 28-control Characteristics: ADN students Caucasian, women, 18-40 DOR: 1 WD, 5 did not complete eval, 8 did not complete course.	IV: Meditation DV: stress, mindfulness, attention regulation, and safe nursing practice	ANT PSS-10 FFMQ	ANCOVA MANCOVA ttest	ANCOVA F (1,49) =4.26, p=0.44 17.4(SE=8.42) np=0.80 MANCOVA F (2, 47) =7.16 p=.002 np=2.34 Mindfulness= p=0.13 PS=p=.000	LOE2 Strengths: Randomized, improved mindfulness, attention regulation, and symptoms of stress in nursing students which can help them provide safe care. Weakness: Inc. DOR, need a more diverse group, f/u unknown. Recommendations: Meditation shows promise on the effect of stress, mindfulness, attention

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									regulation, and safe nursing practice. **Study included due to the findings strongly indicating the positive outcomes of the MBSR.
KS#9 Pipe, T.B. (2009). Nurse leader mindfulness meditation program for stress management: A randomize	Effects of MMP on SAD and CE	Jean Watson's Theory of Human Caring	RCT Randomized 4-week program F/F No F/U	33 participants 15-intervention 17-control DOR-1 d/t personal time management	IV: MMP DV: Dec. SAD, Inc. CE	Scales: SCL-90-R PSDI GSI PST	t test UA HB	PSDI- P= 0.010 (CI= -0.0483 to -0.073) GSI- P=0.019 (CI= -0.475 to -0.046) PST- P=0.066 (CI= -16.66 to 0.581)	LOE 2 Strengths: Randomized, controlled, Baseline stress higher than thought with significant improvement post intervention, findings suggest 4-week as beneficial as 8-week, cost effective, low DOR Weakness: Dec. ability to monitor frequency and duration of intervention, selection bias d/t recruiting motivated nursed, small

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d controlled trial.									sample, no long-term comparison, no F/U, researchers felt unethical to withhold MMP from control group Recommendations: MMP Dec. SAD and Inc. CE, cost effective, Dec. nurse leader stress will improve leadership which can affect nursing staff, could increase job satisfaction and productivity which will improve patient care and patient satisfaction. ** Study included due to the findings strongly indicating the positive outcomes of the MBSR.

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KS#10 Aghamohannadi, F. (2022). The effectiveness of adapted group mindfulness-based stress management program on perceived stress and emotion regulation in midwives:	Effect of adapted group MBSR program to reduce midwives' stress and improve their ER strategies.	N O N E	RCT Randomized 8-week program F/U 3 months	42-participants 21-intervention 21-control Characteristics: Midwives, BS or higher, PSS score greater than 28, 1yr exp.	IV: MBSR DV: PS and ER strategies	PSS DERS	Chi squared t test SPSS-16 ANCOVA ANOVA KS Levne's	PS=p=0.001 ER=p=0.001 3month f/u PS=p=0.003 ER=p=0.125	LOE2 Strengths: Randomized, DOR 0, improved PS and ER, 3-month f/u. Weakness: Small group, 3-month f/u ER not improved. Recommendation: MBSR improves PS and ER which can increase performance, decrease errors, and improve patient outcomes. More studies need to be done.

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A randomized clinical trial.									
KS#11 Wu, X. (2021). Nurses' experiences of the effects of mindfulness training: A narrative review and qualitative meta-synthesis.	To assess effect of MMP on nurses	NONE	Qualitative Meta-Synthesis 7 Data bases searched: PubMed, Cochrane, Science Direct, EBSCO, Web of Science, Scopus, and PsychINFO from 2014-2019.	Sample size small 9-29 participants Characteristics: Nurses, doctors, midwives, AHP, other HCW	IV: questions and reflections DV: SCM, VA of MMP strategies, SCA and strategies, challenges of MMP	Interviews	CASP MMAT Thematic Analysis	5 studies QR strong 2 studies QR strong-moderate 1 study QR adequate	LOE 5 Strengths: 6 of the 7 studies were rated high quality, the nurses had positive outcomes, participants improved self-care and decreased perception of stress. Limitations: Some participants noted lack of time, need good facilitator to encourage participation, some feel guilty leaving unit to participate, small sample of volunteers could lead to intrinsic bias, interventions

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			Prisma used Qualitative and Mixed Method Studies						varied, only subjective not objective. Recommendations: Can be used in CS and Non-CS to decrease stress and improve self-care and improve patient care and satisfaction, would also be beneficial in nursing schools, modified programs are available if lack time.
KS#12 Knudsen, R. K. (2021). Healthcare professionals' experiences of using mindfulnes	Effect of MBSR on CP and interactions with patients and colleagues	NONE	Qualitative Study Participants volunteered Mostly women 8-week MBSR	15 participants 6 Interviewed 3-doctors 3-nurses	IV: Questions & reflections DV: perceived Inc. calmness and focus,	Recorded Interviews	Smith's IPA	No Data Given Expressed improved focus, acceptance, responsiveness of colleagues, awareness, compassion,	LOE 6 Strengths: Detailed participant experience Nurses in multiple CS and non-CS can participate Improved patient care Used IPA guidelines Weakness: Mostly Women, no F/U

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s training in a cardiology department -a qualitative study.			F/F No F/U		Acceptance/understanding of colleagues, awareness compassion			accepted limitations, calmness in busy work environment	Recommendation: MBSR can be used in CS and Non-CS to improve well-being, quality of life, and mental health

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Appendix B

Instruments

Perceived Stress Scale

A more precise measure of personal stress can be determined by using a variety of instruments that have been designed to help measure individual stress levels. The first of these is called the Perceived Stress Scale.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument. The tool, while originally developed in 1983, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

_____ l. In the last month, how often have you been upset because of something that happened unexpectedly?

_____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?

_____ 3. In the last month, how often have you felt nervous and stressed?

_____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?

_____ 5. In the last month, how often have you felt that things were going your way?

_____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?

_____ 7. In the last month, how often have you been able to control irritations in your life?

_____ 8. In the last month, how often have you felt that you were on top of things?

_____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?

_____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Figuring Your PSS Score

You can determine your PSS score by following these directions:

- First, reverse your scores for questions 4, 5, 7, and 8. On these 4 questions, change the scores like this:

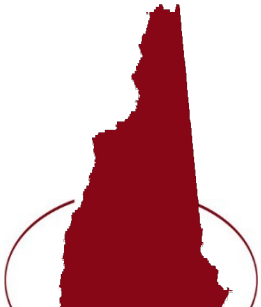
0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0.

- Now add up your scores for each item to get a total. **My total score is _____.**

- Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress.
  - Scores ranging from 0-13 would be considered low stress.
  - Scores ranging from 14-26 would be considered moderate stress.
  - Scores ranging from 27-40 would be considered high perceived stress.

The Perceived Stress Scale is interesting and important because your perception of what is happening in your life is most important. Consider the idea that two individuals could have the exact same events and experiences in their lives for the past month. Depending on their perception, total score could put one of those individuals in the low stress category and the total score could put the second person in the high stress category.

***Disclaimer**: The scores on the following self-assessment do not reflect any particular diagnosis or course of treatment. They are meant as a tool to help assess your level of stress. If you have any further concerns about your current well being, you may contact EAP and talk confidentially to one of our specialists.*



The Maslach Burnout Inventory

How do you perceive your work? Are you exhausted? How capable are you Of shaping your relationship to others? To what degree are you personally fulfilled?

Indicate how frequently the following statements apply to you and add the points indicated on top of the respective box:

0 = Never
1 = At least a few times a year
2 = At least once a month
3 = Several times a month
4 = Once a week
5 = Several times a week
6 = Every day

01 – I feel emotionally exhausted because of my work	0	1	2	3	4	5	6
02 – I feel worn out at the end of a working day							
03 – I feel tired as soon as I get up in the morning and see a new working day stretched out in front of me							
04 – I can easily understand the actions of my colleagues/supervisors							
05 – I get the feeling that I treat some clients/colleagues impersonally, as if they were objects							
06 – Working with people the whole day is stressful for me							
07 – I deal with other people's problems successfully							
08 – I feel burned out because of my work							
09 – I feel that I influence other people positively through my work							
10 –I have become more callous to people since I have started doing this job							
11 – I'm afraid that my work makes me emotionally harder							
12 – I feel full of energy							
13 – I feel frustrated by my work							
14 – I get the feeling that I work too hard							
15 – I'm not really interested in what is going on with many of my colleagues							

16 – Being in direct contact with people at work is too stressful							
17 – I find it easy to build a relaxed atmosphere in my working environment							
18 – I feel stimulated when I been working closely with my colleagues							
19 – I have achieved many rewarding objectives in my work							
20 – I feel as if I'm at my wits' end							
21 – In my work I am very relaxed when dealing with emotional problems							
22 – I have the feeling that my colleagues blame me for some of their problems							

Overall score for occupational exhaustion (EE)

Add together the answers to questions 01. 02. 03. 06. 08. 13. 14. 16. 20

Occupational exhaustion	EE < 17	EE 18 - 29	EE > 30
	Low degree	Moderate degree	High degree

Overall score for depersonalization / loss of empathy (DP)

Add together the answers to questions 05. 10. 11. 15. 22

Depersonalisation	DP < 5	DP 6 - 11	DP > 12
	Low degree	Moderate degree	High degree

Overall score personal accomplishment assessment (PA)

Add together the answers to questions 04. 07. 09. 12. 17. 18. 19. 21.

Personal accomplishment assessment	PA < 33	PA 34 - 39	PA > 40
	Low degree	Moderate degree	High degree

Degree of burnout

Beware if the totals of your EE and DP answers are both in the red area, and above all if your personal accomplishment assessment is also in the red!!!

EE	Occupational exhaustion (burnout) is typically connected to a relationship with work that is perceived as difficult, tiring, stressful… Maslach sees this as different from depression, as it is likely that the symptoms of burnout would be reduced during holidays.
DP	Depersonalisation or loss of empathy is characterised by a loss of regard for others (clients, colleagues…), and by keeping a greater emotional distance, which is expressed through cynical, derogatory remarks, and even callousness.
PA	The personal accomplishment assessment is a feeling that acts as a "safety valve" and contributes to bringing about a balance if occupational exhaustion and depersonalisation occur. It ensures fulfilment in the workplace and a positive view of professional achievements.

Appendix C

Flowchart