

ORIGINAL RESEARCH

The effect of a mindfulness based stress reduction intervention on the perceived stress and burnout of RN students completing a doctor of nursing practice degree

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ABSTRACT

Background and objective: There is a vast amount of literature documenting the epidemic of stress and burnout within the nursing profession. It is well established that chronic stress contributes to burnout among nursing staff and students. Research suggests that organizational change, curriculum adjustment, and mindfulness interventions can contribute to decreased stress and better outcomes for nurses. The objective of this study was to investigate the effect of a Mindfulness Based Stress Reduction (MBSR) intervention on the perceived stress and burnout of students in a cohort of Registered Nurses (RNs) completing a Doctor of Nursing Practice (DNP) Degree.

Methods: This study utilized pre and post data collection to explore the effect of a MBSR intervention on self-reported perceived stress and burnout using the Perceived Stress Scale (PSS) and Copenhagen Burnout Inventory (CBI). Study participants (n = 24) received a general orientation to the study followed by a brief intervention using the body scan meditation, a component of the MBSR-model. Students registered with the Remind mobile app to supplement the live instruction and to encourage the students to engage in daily mindfulness practice.

Results: The repeated measures ANOVAs for all three CBI factors showed that personal, work, and client burnout means were statistically lower at four weeks post-intervention than they were at baseline. Perceived stress measures four weeks post-intervention were also statistically lower than baseline. There were no demographic interactions, and only one main effect for gender, in that males reported lower perceived stress.

Conclusions: The MBSR intervention was successful in reducing the self-reported perceived stress and burnout of RN students completing their DNP Degree.

Key Words: Mindfulness, MBSR, Stress, Nursing, Doctor of nursing practice, Burnout

1. INTRODUCTION

The benefits of mindfulness practice for a variety of populations has been increasingly recognized in both academic literature and popular media. Mindfulness based stress re-

duction (MBSR)^[1,2] is among the most commonly cited empirically supported intervention for the reduction of chronic pain, stress, anxiety, and depression.

In its standard form, MBSR training encompasses eight

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weekly sessions of 2.5 hours of mindfulness practice for groups of up to 30 participants. Sessions include the practice of three mindfulness based meditation exercises: the body scan, sitting meditation, and gentle yoga. These exercises encourage nonjudgment, observation, and acceptance of all bodily sensations as they arise, whether they be mental, emotional, or environmental stimuli.^[3]

Recent studies have focused on the efficacy of MBSR in non-clinical populations including health care professionals.^[4] The multitude of stressors in the current healthcare environment take a significant toll on the physical and emotional well-being of the nursing workforce. This leads to burnout and compassion fatigue, as well as physical and psychological illness. This study addresses the lack of stress management education provided to nursing students and specifically explores how a brief, abbreviated MBSR intervention affects the perceived stress and burnout of graduate nursing students. Current literature supports strong positive outcomes of many adapted MBSR interventions on the perceived stress level and burnout of both nurses and nursing students.^[5-7] This study adds to that body of literature.

1.1 Literature review

1.1.1 Stress in nursing

The nursing profession attracts highly motivated, caring, compassionate, and intelligent individuals who often find themselves burdened with the endless increases of workplace stress.^[8] Despite nurses' extensive education and high level of skill, they are not immune to stress in the workplace. Stress management is not routinely taught in nursing curricula.^[9] A gap exists between how nurse educators teach students to identify and manage the emotional challenges of practice^[10] and a growing body of literature that underscores the need to include stress management education.^[9]

1.1.2 Burnout and compassion fatigue

Compassion and caring are the foundation of nursing.^[11] The nursing profession's Code of Ethics emphasizes caring and compassion for patients, colleagues, and self.^[12] Nurses are notorious for often neglecting their own needs in the pursuit of caring for others.^[13] While restoring or improving a patient's quality of life is often the main focus of the care we provide, many nurses neglect their own quality of life and self-care.^[14]

The concept of burnout was first explained by Freudenberg,^[15] a psychologist who noted his clinical staff begin to suffer a gradual loss of energy, motivation, commitment, mental and physical exhaustion, and a wide range of other symptoms.^[16] Burnout is now defined as a "psychological state of physical and emotional exhaustion and is a result of

prolonged occupational stress".^[8] Burnout is a process, beginning with the "compulsion to prove oneself and followed by working harder, neglecting one's own needs, displacing conflicts, revision of values, denial, withdrawing, inner emptiness, depression, and finally into the actual burnout syndrome".^[17]

Compassion fatigue may lead to desensitization toward patients and the resulting loss of a nurse's ability to adequately care for patients.^[18] Nurses experiencing compassion fatigue may exhibit signs and symptoms of chronic anxiety, depression, moral distress, and stress-related illnesses.^[19,20]

1.1.3 Consequences of prolonged stress

Emotional distress resulting from stress in the workplace is implicated in at least 15 percent of occupational disability claims.^[21] Little time off between shifts has been correlated with insomnia, excessive sleepiness, excessive fatigue, and shift work disorder.^[22] This leads to increased absenteeism, lower productivity, decreased job satisfaction, increased turnover, and detrimental patient outcomes.^[23]

1.1.4 Stress relief education for nurses and nursing students

While much attention has been paid to burnout and stress among professional staff, little has been paid to the emotional health of nursing students. Nursing students report higher levels of stress than students of other majors.^[9,24-26] Interventions to decrease stress in students is essential to protect them and to "perhaps matriculate a resilient and emotionally fortified nursing workforce".^[27]

1.1.5 Mindfulness based stress reduction as an intervention

The benefits of MBSR training for a variety of populations has been increasingly recognized in both the academic literature and popular media. MBSR^[1,2] is among the most commonly cited empirically supported intervention for the reduction of chronic pain, stress, anxiety, and depression. MBSR training encourages nonjudgment, observation, and acceptance of all bodily sensations as they arise.^[3]

While eliminating work related stress for nurses is unrealistic, implementing interventions that focus on helping nurses learn to cope with stress is possible.^[6] A meta-analysis of MBSR found it to be moderately effective in pre-post studies, having large, clinically significant effects in treating anxiety and depression.^[28]

Studies have shown that mindfulness can reduce anxiety, psychological stress and burnout, improve provider-patient communication and relationships, and foster compassion and empathy, while helping nurses be more sensitive to their environment and open to new information and perspectives.^[29]

Mindfulness is a coping strategy found to be effective with managing mood, stress, and cognition, while positively affecting nursing students' academic abilities with the added insight of being present and making conscious choices instead of simply reacting in times of stress.^[5]

Mindfulness has been increasingly embraced as an important competency in education, business, and the military, and Ponte & Koppel^[29] correctly assert that nursing should follow suit, adding that nurse leaders in education and practice should "move to recognize and integrate mindfulness-based practice as a core competency that supports effective nursing practice and therapeutic relationships with patients and families".

Multiple studies have shown the efficacy of MBSR in non-clinical populations including health care professionals.^[4] This study introduces a mindfulness intervention to Registered Nurses (RNs) students completing a Doctor of Nursing Practice (DNP) degree. This population is ideal to survey regarding the perceived stress and burnout of being both a nurse and a student.

2. METHODS

2.1 Research design

This study was designed to investigate the effects of a MBSR intervention on the perceived stress and burnout of Registered Nurse students in a BSN to DNP degree program at Robert Morris University. A single-sample, pre-post design was utilized in this study. Participants completed two survey instruments, The Perceived Stress Scale and the Copenhagen Burnout Inventory at three points in time (baseline, two weeks post-intervention, and four weeks post intervention).

Baseline demographic information (age, gender, and years of nursing experience) was collected, as well as an assessment of the students' prior experience with formal stress management education as undergraduates (if any) or informal stress management techniques or strategies. Information was sought on how prepared students felt for the stress of nursing profession and if the stress of their nursing careers was a deciding factor in their decision to further their education by enrolling in a DNP program.

After giving consent, subjects completed the demographic survey followed by baseline tallies of their perceived stress and burnout as per the Perceived Stress Scale and the Copenhagen Burnout Inventory. The Perceived Stress Scale (PSS)^[30] is the most widely used psychological instrument for measuring the perception of stress, and the degree to which situations in one's life are appraised as stressful. It is a 10-item self-report instrument with a Likert method (0-4)

to measure the frequency and severity of stress.^[30]

Cohen, Kamarck & Mermelstein (1983) reported Cronbach's α between .84-.86 for the PSS, with a test-retest reliability of .85. Lee^[31] conducted a literature review which also assessed the test-retest reliability in four studies, and met the criterion of $> .70$ in all cases. Correlation of the PSS to other measures of similar symptoms ranges between .52-.76.^[30] Hypothesis testing revealed that the PSS was either moderately or strongly correlated with the hypothesized emotional variables, such as depression or anxiety, as measured using various other instruments.^[31]

The participants' levels of subjective burnout was evaluated by the Copenhagen Burnout Inventory (CBI). The CBI consists of three parts: a six-item personal burnout factor, a seven-item work burnout factor, and a six-item client burnout factor. All three factors use five-point items, scored from 0-100, where higher scores represent more burnout. If participants answer less than three questions, the respondent is classified as a non-responder.^[32] Winwood and Winefield^[33] compared the CBI with the Maslach Burnout Inventory and concluded that "the CBI possesses excellent psychometric properties and seems to be an appropriate measure of burnout in populations of health professionals". The CBI scales have high internal reliability and the non-response rates on the individual items are low.^[32] Both the PSS and CBI are available in the public domain.

Participants ($n = 24$) received a live 60-minute instructional session of mindfulness based stress reduction techniques and a general orientation to the study by the researchers/author. An abbreviated intervention was taught using two components of the MBSR-model: mindful breathing and the body scan. Mobile assistance and reminders were utilized via the Remind smart-phone app in order to enable participants and the researcher to contact one another. During the intervention, reminders were sent to participants via the app to encourage the students to engage in daily mindfulness practice and observation of the experience.

After a two-week and four-week interval, the PSS and CBI were re-administered. At the four week conclusion a compliance survey was administered to assess the level of compliance with the app and daily mindfulness practice. Participants were also asked how well they were able to fit MBSR practice into their daily routine, and if they felt they personally benefitted from this study.

2.2 Setting

Robert Morris University (RMU) has a traditional campus program and a distance learning program. All DNP students are Registered Nurses with varied professional experience.

In this program, classes are held once weekly for approximately 48 months. Students typically progress through the program with the same cohort from enrollment until completion, with some students choosing an accelerated format. There are three programs of study: DNP-Adult Gerontology Primary Care Nurse Practitioner, DNP-Family (Individual across Lifespan) Nurse Practitioner, and DNP-Psychiatric Mental Health Nurse Practitioner.

2.3 Sample

All students enrolled in the DNP programs take the Health Promotion class during the summer of their first year. After discussions with the faculty and program coordinator, permission was granted to recruit subjects for the purposes of this study during this Health Promotion class. Subjects were recruited at the beginning of the week three class session. A letter of consent was completed. Students were notified of their option to withdraw from the study at any time. All 24 students were present for the initial intervention and practice. All 24 students were present for each data collection periods. 12 out of 24 study participants enrolled in the daily Mindfulness offerings using the Remind app.

During the 30-day intervention period:

- Only one student practiced daily mindfulness.
- Three students practiced mindfulness for 21-28 days.
- One student practiced mindfulness for 15-21 days.
- Three students practiced mindfulness for 8-14 days.
- Fifteen students practiced mindfulness for 1-7 days.

2.4 Ethical considerations

IRB approval was obtained. Participation in this study was voluntary. All participants in the study group signed an informed consent and were given an opportunity to decline. No deception was involved in this study. Participants were not compensated for their participation, and this research was unfunded. The instrument scales used are freely available in the public domain for research purposes. Confidentiality was maintained using codes to ensure anonymity and there were no personal identifiers. The demographic files, consents, and completed surveys, were secured in a locked file cabinet. Computer files were password protected with biological fingerprint access.

2.5 Data analysis

Demographic information, compliance surveys, baseline data, two week post-intervention data, and four week post intervention data were analyzed separately. The repeated measures ANOVAs show that final burnout means are statistically lower at four weeks post-intervention than they are at baseline. This is true for all three CBI factors. Perceived

stress decreased significantly from period 1 to period 2, and dropped marginally from period 2 to period 3 ($p = .054$). The final perceived stress measure at four weeks post-intervention was statistically lower than at baseline, suggesting that the intervention was successful.

There were no demographic interactions, and only one main effect for gender; that males reported lower perceived stress. The lack of demographic influence suggests that the intervention was helpful to subjects across the board.

3. FINDINGS

Participants were between the ages of 20-50. Females represented 70.8% of the total ($n = 17$), 87.5% were Caucasian ($n = 21$), and the most common category of work experience (45.3%) was 2-5 years ($n = 11$). More than half (54.2%) indicated that the stress of a nursing career contributed to the decision to begin a DNP program. Half of these students ($n = 12$) signed up for the reminders via the Remind app. No subjects were dropped from the study.

Frequency distribution tables were examined for years of RN Experience, prior experience with stress management education, prior experience with informal stress management, and levels of preparedness for the stress of a nursing program. The data suggested that 20.8% of the sample cohort ($n = 5$) had previously tried informal stress management techniques. Of the participants who did have prior experience with formal stress management, none of them reported that stress management as being a part of their undergraduate nursing curriculum.

Half ($n = 12$) of the intervention subjects returned a compliance survey showing that they felt a personal benefit from the study. One participant stated that “it was easier as time went on [to fit mindfulness practice into their daily routine] and with continued practice it got easier”. Another participant was unsure of the benefit, stating, “Really did not get into it; did not feel like I needed it.” One participant stated they “somewhat benefitted” from the intervention.

3.1 Personal burnout

The personal burnout factor scores were tested with a one-way repeated-measures ANOVA using time as the variable. Violations of sphericity were run due to the smaller sample size, and were not evident ($\chi^2 = 0.363$, $df = 2$, $p = .834$). The F ratio was evaluated with the original degrees of freedom, and a significant effect for time emerged, $F(2, 46) = 27.72$, $p < .001$. The test of within-subjects effects indicated that the mean values for personal burnout changed significantly over the three time periods.

The mean value for personal burnout increased from 318.75

to 393.75 and subsequently decreased to 234.38. Post-hoc, contrasts reveal that the changes in personal burnout between consecutive periods are statistically significant, $p < .01$. A protected paired t-test shows that personal burnout was signif-

icantly lower in period 3 vs. period 1, $p = .001$ (see Table 1). Figure 1 depicts the relationship between personal burnout and time.

Table 1. Paired samples test

		Paired Differences			<i>t</i>	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Personal Burnout Total 1 Personal Burnout Total 3	84.375	107.54486	21.95250	3.844	23	.001

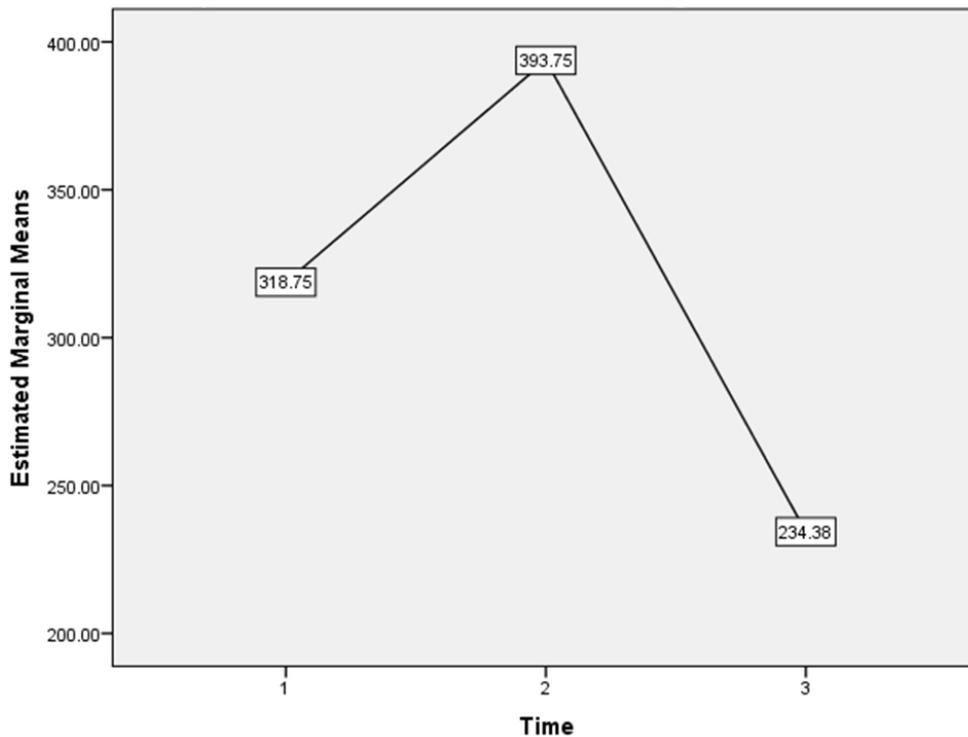


Figure 1. Personal burnout estimated marginal means

3.2 Work burnout

Work burnout factor scores were subjected to a one-way repeated-measures ANOVA using time as the within-subjects variable. Violations of sphericity were not evident ($\chi^2 = 1.49$, $df = 2$, $p = .474$), therefore the F ratio was evaluated with the original degrees of freedom. A significant effect for time emerged ($F(2, 46) = 25.52$, $p < .001$). The test of within-subjects effects indicates that the mean values for work burnout changed significantly over the three time peri-

ods.

The mean value for work burnout increased from 284.38 to 355.21, and subsequently decreased to 215.63. Post-hoc, contrasts reveal that the changes in work burnout between each consecutive period are statistically significant, $p < .05$. A paired *t*-test (see Table 2) showed that work burnout was significantly lower in period 3 vs. period 1, $p = .003$. Figure 2 depicts the relationship between work burnout and time.

Table 2. Paired samples test

		Paired Differences			<i>t</i>	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Work Burnout Total 1 Work Burnout Total 3	68.75000	100.06791	20.42628	3.366	23	.003

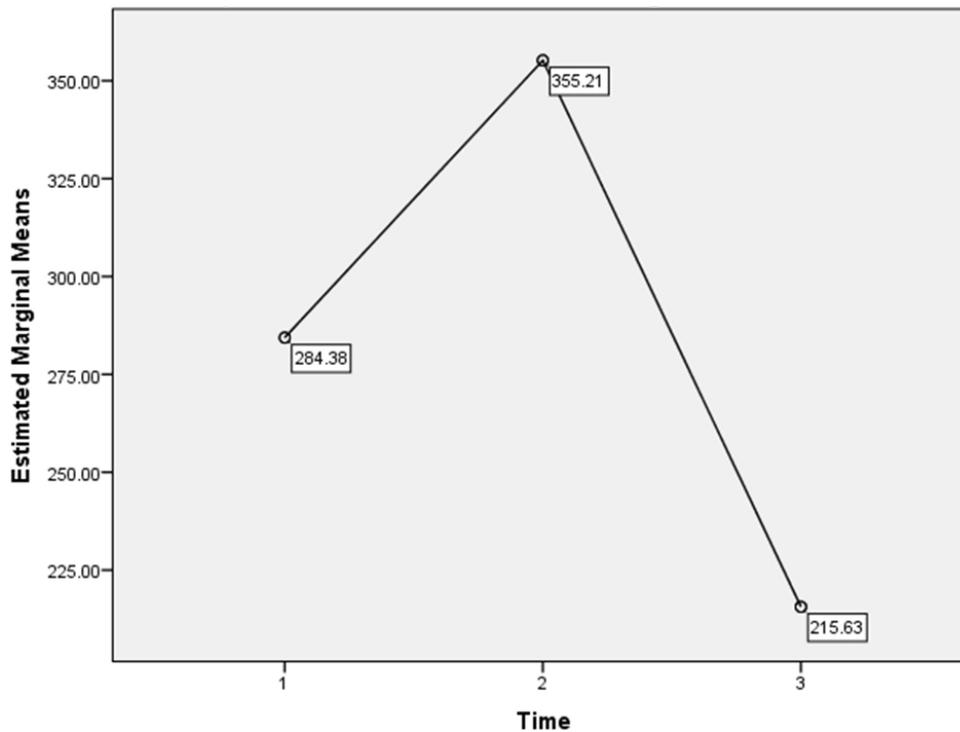


Figure 2. Work burnout estimated marginal means

3.3 Client burnout

Client burnout factor scores were subjected to a one-way repeated-measures ANOVA using time as the within-subjects variable. Violations of sphericity were not evident in the model, $\chi^2 = 1.10$, $df = 2$, $p = .579$. Thus, the F ratio was evaluated with the original degrees of freedom. A significant effect for time emerged ($F(2, 46) = 20.90$, $p < .001$). A test of within-subject effects indicates that the mean values for

personal burnout changed significantly over the three time periods.

The mean value for client burnout increased from 265.63 to 342.71, and subsequently decreased to 203.13. Post-hoc contrasts reveal that the changes in client burnout between each of the three periods are statistically significant, $p < .01$ (see Tables 3 and 4). Figure 3 depicts the relationship between client burnout and time.

Table 3. Tests of within-subjects contrasts

Source	Time	Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Level 2 vs. Level 1	142604.167	1	142604.167	10.499	.004
	Level 3 vs. Previous	245026.042	1	245026.042	36.810	.000
Error(Time)	Level 2 vs. Level 1	312395.833	23	13582.428		
	Level 3 vs. Previous	153098.958	23	6656.476		

Table 4. Paired samples test

		Paired Differences			t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean			
Pair 1	Client Burnout 1 Client Burnout 3	62.5000	96.96481	19.79286	3.158	23	.004

3.4 Perceived stress

The perceived stress scores were subjected to a one-way repeated-measures ANOVA using time as the within-subjects

variable. Violations of sphericity were evident in the model, $\chi^2 = 12.72$, $df = 2$, $p = .002$. Thus, the F ratio was evaluated with the Huynh-Feldt degrees of freedom. The Huynh-Feldt

epsilon is used over the Greenhouse-Geisser, as the later tends to be overly conservative, especially for small samples. Nevertheless, a significant effect for time emerged ($F(1.45, 33.37) = 4.50, p = .029$). The test of within-subjects effects indicates that the mean values for perceived stress changed significantly over the three time periods (see Table 5).

The mean value for perceived stress decreased from 19.67 to

17.17, and further decreased to 15.50 over the four week intervention period. Post-hoc contrasts reveal that the decrease in perceived stress between periods 1 and 2 is statistically significant, $F(1, 23) = 5.37, p = .03$. However, perceived stress decreased only marginally from period 2 to period 3, $F(1, 23) = 4.13, p = .054$. Finally, perceived stress was significantly lower in period 3 vs. period 1, $t = 2.32, df = 23, p = .03$ (see Table 6). Figure 4 depicts this relationship.

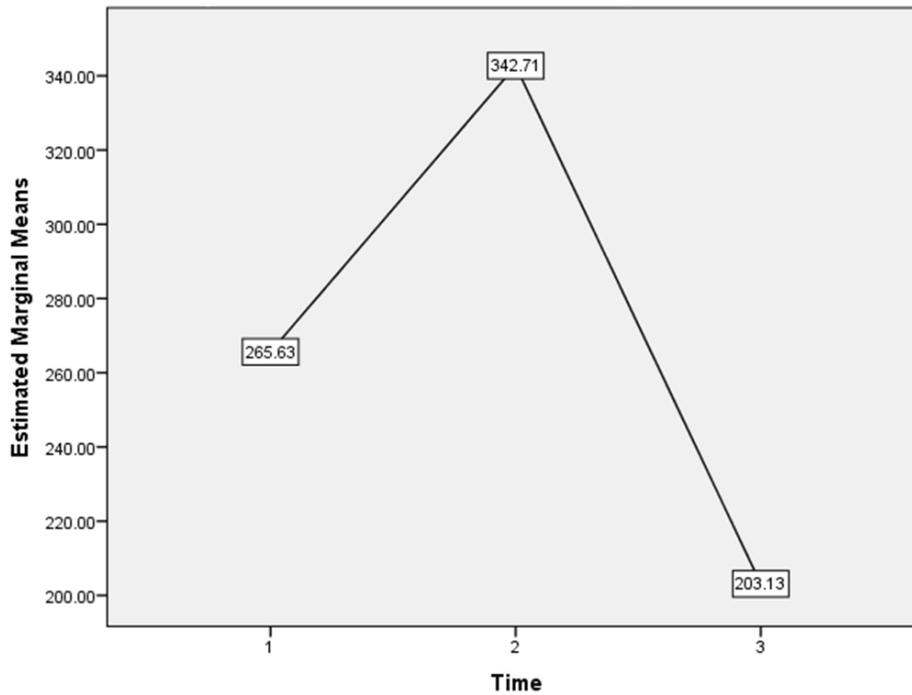


Figure 3. Client burnout estimated marginal means

Table 5. Tests of within-subjects effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Time	Sphericity Assumed	211.111	2	105.556	4.501	.016
	Greenhouse-Geisser	211.111	1.390	151.895	4.501	.030
	Huynh-Feldt	211.111	1.451	145.494	4.501	.029
	Lower-bound	211.111	1.000	211.111	4.501	.045
Error(Time)	Sphericity Assumed	1078.889	46	23.454		
	Greenhouse-Geisser	1078.889	31.966	33.751		
	Huynh-Feldt	1078.889	33.373	32.328		
	Lower-bound	1078.889	23.000	46.908		

3.5 Demographics

Mixed ANOVAs were conducted with the three CBI factors and perceived stress as the repeated measure outcomes over time. Several demographic variables were used as independent measures, including: gender, years of experience, and prior experience with stress management. No significant interactions emerged between the demographic variables and

the key outcomes (CBI and PSS). However, one significant main (between-subjects) effect emerged; overall, males reported significantly less perceived stress than did females, $F(1, 22) = 4.68, p = .042$. Figure 5 shows the pattern of perceived stress over time by gender. The parallel lines indicate a main effect for gender but no interaction with time.

Table 6. Descriptive statistics

	Gender	Mean	Std. Deviation	N
Total PSS 1	Male	17.7143	8.78852	7
	Female	20.4706	7.34947	17
	Total	19.6667	7.70469	24
Total PSS 2	Male	13.1429	4.37526	7
	Female	18.8235	6.45402	17
	Total	17.1667	6.39746	24
Total PSS 3	Male	10.4286	7.18464	7
	Female	17.5882	5.59083	17
	Total	15.5000	6.80153	24

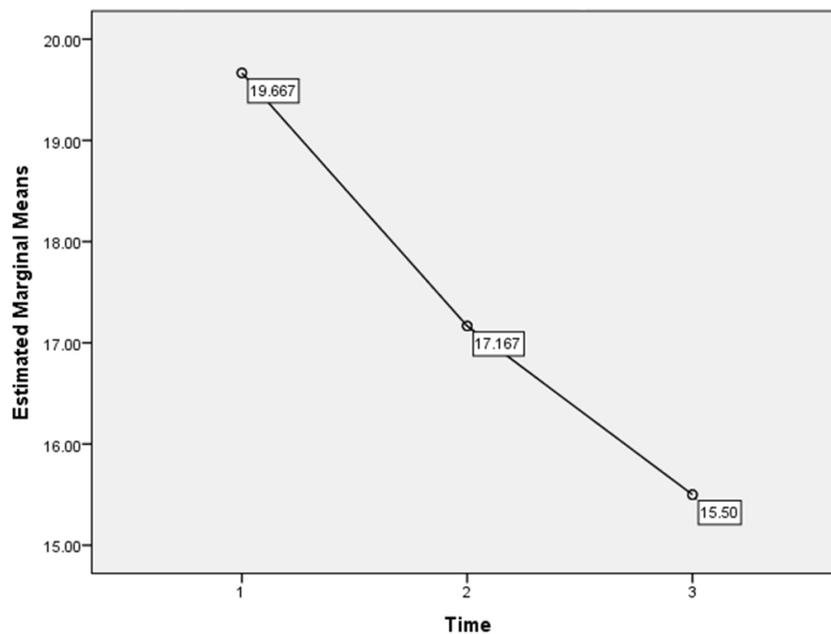


Figure 4. Perceived stress estimated marginal means

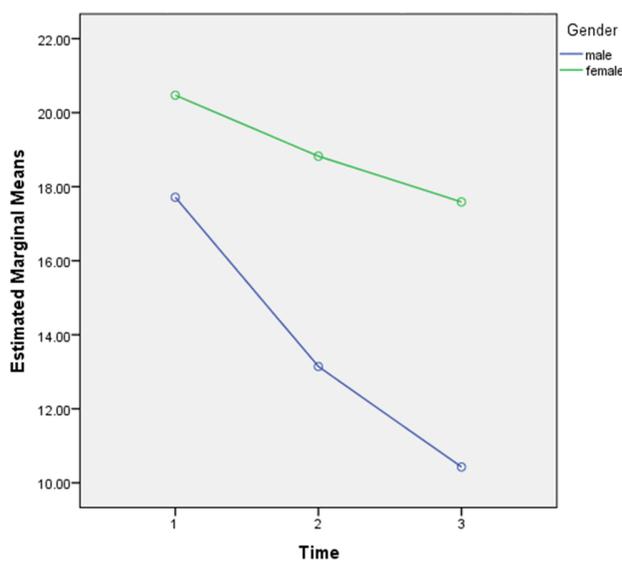


Figure 5. PSS estimated marginal means by gender

4. DISCUSSION AND CONCLUSION

While eliminating work related stress for nurses is unrealistic, implementing interventions that focus on helping nurses learn to cope with stress is possible.^[6] Multiple studies have shown the efficacy of MBSR in nonclinical populations including health care professionals.^[4]

Over half of the nurses in this study self-reported that stress and burnout were a deciding factor in their decision to enroll in a graduate education program. This trend is taking experienced professional nurses away from the bedside; away from their patients, and away from young nurses in need of their guidance and support. Persistent high stress has been linked to a host of negative outcomes besides personal and professional burnout and compassion fatigue within the health care industry. The majority of nurses find it difficult to care for and nurture themselves, usually perceiving themselves as the givers of care.^[34] Nurses often wait until they are in a

crisis to seek help for themselves.^[35] The management of burnout and compassion fatigue needs to include prevention and consequence minimization.^[36]

Nurses need to be well to promote wellness, and faculty can play a major role in integrating stress awareness and personal health and wellness into curricula.^[17] Mindfulness as a coping strategy was found to be effective to manage mood, stress, and cognition, while positively affecting nursing students' academic abilities.^[5] Ponte & Koppel (2015) correctly assert that nursing leaders in education and practice should "move to recognize and integrate mindfulness-based practice as a core competency that supports effective nursing practice and therapeutic relationships with patients and families".

Multiple studies have shown that mindfulness can reduce anxiety, stress, and burnout. This study adds to that body of literature. Knowing that nursing students experience higher rates of stress^[9,24-26] than other majors necessitates that faculty support students in the development of better coping mechanisms to employ during stressful situations.^[37] Interventions to decrease stress in students is essential to protect them and to "perhaps matriculate a resilient and emotionally fortified nursing workforce".^[27]

MBSR has proven efficacy and empirical evidence supporting its use in multiple populations, yet stress management is not often taught in nursing curricula.^[9] A gap exists between how nurse educators teach students to identify and manage the emotional challenges of practice^[10] and a growing body of literature that underscores the need to include stress management education.^[9] Integrating research-based information on professional stress management into the nursing curriculum could increase awareness of burnout and encourage students to not neglect their own wellbeing while caring for others.^[17]

The Carnegie Foundation, American Association of Colleges of Nursing (AACN), American Organization of Nurse Executives (AONE), and the National League for Nursing (NLN)

have asked nurse faculty to address the problems associated with new nurse retention and high turnover rates.^[17] Preparing the future workforce requires nurse educators to respond to emerging practice concerns.^[10]

Cohen-Katz^[38] recommend the implementation of stress-reduction programs at both individual and organizational levels to "reverse the problems of burnout". Nurse leaders are in a position to take initiative not to reverse burnout, but to prevent it, by enhancing our curriculum with the wellbeing of our learners being paramount. This unfunded study cost pennies to implement and had a successful outcome. Imagine the potential for organizational change and the potential impact of system wide mindfulness interventions.

Limitations

A larger sample size including nurses who weren't current students and undergraduate students may have ensured a more representative distribution. Self-reported data is limited by the fact that it rarely can be independently verified, and may contain several potential sources of bias. Threats to internal validity may have been avoided by using both experimental and control groups rather than a convenience sample. There is an underlying temporal nature to stress in general. Levels of appraised stress should be influenced by daily hassles, major events, and changes in coping resources.

Implications for future research

Findings from this study have implications for the emotional health and well-being of both current students and the nursing workforce. The success of this intervention may impact the future of nursing curriculum design. Future research should focus on the longitudinal effects and outcomes of mindfulness interventions incorporated into undergraduate nursing curriculum.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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