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THE EFFECT OF MINDFULNESS MEDITATION ON NURSING STUDENTS' STRESS AND ANXIETY LEVELS

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ABSTRACT
Nursing students often face significant stress and anxiety, impacting their cognitive function, academic performance, and clinical skills. Effective interventions to support their mental health are needed. This study investigates the effect of an eight-week mindfulness meditation course on stress and anxiety levels of nursing students during clinical placements. Conducted from February to May 2024 at nursing schools in Surakarta, Indonesia, the quasi-experimental study included 35 students who attended weekly 50-minute mindfulness sessions. The Five Facet Mindfulness Questionnaire (FFMQ), Zung Self-Rating Anxiety Scale (Zung-SARS), and Beck Depression Inventory (BDI) were administered at baseline (T0), post-intervention (T1), and four weeks post-intervention (T2). Results showed significant improvements in mindfulness, with FFMQ scores increasing by 11.43 from T0 to T1 ($p < 0.001$) and by 10.86 from T0 to T2 ($p < 0.001$). Anxiety and depression levels significantly decreased, with Zung-SARS scores dropping by -6.89 from T0 to T1 ($p < 0.001$) and -7.08 from T0 to T2 ($p < 0.001$), and BDI scores decreasing by -5.89 from T0 to T1 ($p < 0.001$) and -5.86 from T0 to T2 ($p < 0.001$). The study suggests mindfulness meditation can significantly enhance mental health among nursing students.

Keywords: anxiety; mindfulness; mindfulness-meditation; nursing student; stress

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INTRODUCTION

Nursing students are routinely exposed to high levels of stress and anxiety due to the multifaceted demands of their educational and clinical training (Bsharat, 2023; Zheng et al., 2022). The rigorous academic curriculum, combined with the emotional and physical challenges of clinical placements, often results in significant psychological distress (Labrague, 2024; Rantung & Tambunan, 2023). This distress can impair cognitive function, reduce academic performance, and negatively impact clinical skills, ultimately affecting the quality of patient care provided by future nurses (Boman et al., 2022; Coster et al., 2020). Clinical placements, a critical component of nursing education, require students to apply theoretical knowledge in real-world settings, often involving high-stakes environments and exposure to patient suffering and death (Galletta et al., 2017; González-García et al., 2020). The transition from classroom learning to clinical practice can be overwhelming, leading to heightened anxiety and stress (Mahaswari et al., 2023; Rowland & Trueman, 2024; Zulu et al., 2021). These experiences underscore the urgent need for effective interventions to support nursing students' mental health and well-being.

Mindfulness meditation, an evidence-based practice with roots in ancient contemplative traditions, has gained substantial attention for its potential to enhance mental health outcomes (Karo et al., 2022). Mindfulness involves maintaining a moment-to-moment awareness of thoughts, feelings, bodily sensations, and the surrounding environment through a gentle and nurturing lens (Chen et al., 2021). Numerous studies have shown that mindfulness meditation can significantly reduce symptoms of stress, anxiety, and depression, while also improving emotional regulation and cognitive function (Chen et al., 2021; Coster et al., 2020; Irawan Am et al., 2023; McVeigh et al., 2021).

Despite the growing body of evidence supporting the benefits of mindfulness, its application within the context of nursing education remains underexplored. Given the unique stressors associated with nursing education and clinical practice, mindfulness meditation represents a promising intervention to mitigate stress and anxiety among nursing students. This study aims to investigate the effect of mindfulness meditation on the stress and anxiety levels of nursing students, particularly during their clinical placements. By elucidating the impact of this intervention, we hope to provide actionable insights that can enhance educational strategies and promote the psychological resilience and overall well-being of future nurses.

METHOD

This study emplyed quasi-experiment design, one group pre-test post-test. The repeated measurement was performed with eight week follow up period to investigate the effect of an eight week mindfulness meditation course. The study was conducted on February to May 2024 at some nursing school in Surakarta, Indonesia.

Participants

We received for the ethical considerations from National Ethics Board with reference number 079/027/II/EC/KEP/Lemb.Candle/2024. We prioritize research ethics and respect the rights and welfare of all involved. The key components of our ethical considerations include informed consent, confidentiality and privacy, beneficence and non-maleficence, justice, respect for persons, integrity and scientific rigor, accountability and transparency, and compliance with legal and institutional requirements. These components help ensure that research is conducted etically. Eligible participants were aged over 18 years and could speak and read Indonesian clearly. We excluded those who had taken a similar mindfulness course previously, regularly practiced mindfulness, or had completed their nursing practicum or hospital attachment. The students received no credit for their participation. We calculated the sample size using G*Power software, which estimated 30 participants, with a power of 0.8, alpha of 0.05, and effect size 0.30. we also consider an attrition rate of 20%. There are minimum 35 students participating in this.

Intervention

The intervention was based on the current mindfulness based intervention (MBI) standard (Irawan AM et al., 2023; Liu et al., 2024). Participants enrolled in an eight-week mindfulness awareness course, involving weekly sessions averaging 50 minutes. Table 1 provides an overview of the intervention content. The course was led by the first author, trained in mindfulness meditation techniques. Participants were initially taught the body scan method, a 30-minute exercise where they sequentially focus attention on different body areas while seated with eyes closed, observing sensations. They also practiced meditation focusing on breathing sensations, tension, and relaxation. Another exercise involved rolling two wooden balls in their dominant hand for 15 minutes, repeated numerous times.Additionally, participants learned to apply mindfulness in daily activities like walking, standing, and eating,

practicing these skills for 45 minutes daily, with a final 5-minute period to focus on overall bodily sensations. Following course completion, researchers used WhatsApp reminders to encourage participants to practice for at least one hour weekly, especially during periods of low mood.

Measurements

Five Facet Mindfulness Questionnaire (FFMQ)-Indonesian short version

The FFMQ-short version was developed by Fourianalistyawati et al. (2023) and has ten items. The five facet of mindfulness includes observing, describing, acting with awareness, nonjudging, and nonreactivity (Irawan AM et al., 2023). This instrument has satisfactory reliability (Cronbach's alpha above 0.7) and validity (good inter-item correlations). The FFMQ is often used in research to evaluate the effectiveness of mindfulness-based intervention (Fourianalistyawati et al., 2023).

Zung Self-Rating Anxiety Scale (Zung-SARS) -Indonesian version

The Zung Self-Rating Anxiety Scale (SAS) was developed by Dr. William Zung, a psychiatry professor at Duke University in 1971. This instrument consists of 20 items designed to assess anxiety symptoms from both psychological and somatic perspectives. It is a valid and reliable instrument with a Cronbach's alpha of 0.945. The interpretation of the anxiety score are normal (25 to 44), mild to moderate anxiety (45 to 59), marked to severity anxiety (60 to 74), and extreme anxiety (75 to 100) (Setyowati et al., 2019).

Beck Depression Inventory (BDI)-Indonesian version

This instrument has 21 items measuring the depression symptoms among the participants. The BDI-Indonesian version has good validity and reliability with overall items' Cronbach's alpha of 0.89. The depression score are groups into minimal depression (0 to 13), mild depression (14-19), moderate depression (20 to 28), and severe depression (29 to 63) (Ariani et al., 2023).

Data collection

Before beginning the intervention (T0), the researchers explained the study's purpose and procedures to the participants, obtained their consent, and asked them to spend 20-30 minutes completing the questionnaires. At T0, the questionnaires included items collecting data on the students' gender, age, and nursing student year. The Zung-SARS-Indonesian version, and BDI-Indonesian version were administered at T0, upon completion of the intervention (T1), and four weeks after the intervention (T2). While the FFMQ used as indicator for the proper application of the mindfulness based intervention.

Data analysis

The data were analyzed using SPSS 22.0 (IBM Corporation, USA). Categorical variables are reported as frequencies and percentages, while continuous variables are reported as means and standard deviations. The significant relationship between T0, T1, and T2, specifically the effect of the mindfulness intervention on reducing anxiety and depression, will be analyzed using the paired t-test.

RESULTS

An eight-week mindfulness-awareness course, consisting of weekly 50-minute sessions of instruction and practice in mindfulness meditation techniques, was administered to participants in the experimental group. Each participant was evaluated three times using the FFMQ and BDI scales: before the intervention (T0), immediately following the intervention

(T1), and eight weeks after the intervention (T2). The mean FFMQ and BDI scores were plotted to illustrate the results at the three assessment times. Baseline scores (T0) were similar between groups for all measurements. Over time, participants showed a decrease in mean FFMQ scores (Figure 1) and BDI scores (Figure 2). No adverse events or unexpected issues occurred during the intervention.

Characteristics of the participants

All of the 35 students (19 female, 16 male) whose eligibility was evaluates participated in this study and completed all procedures. All of the participants were allocated to intervention group, with mean age 20.31 (SD=1.38) years old.

Table 1.
Respondent characteristics (n= 35)

Respondent characteristics	Range, Mean±SD	f (%)
Age	18-23, 20.31±1.38	
Gender		
Female		19 (54.3%)
Male		16 (45.7%)
Year of school		
2 year	2-3, 2.43±0.50	20 (57.1%)
3 year		15 (42.9%)

Adherence to the intervention

The mindfulness intervention program was higly successful, with full adherence from participants and significant improvement in FFMQ score (pre-intervention score= 95±10, post intervention score= 138±8, with total improvement +43).

Difference in FFMQ, Zung-SARS and BDI

Table 2.
Differences in FFMQ, Zung-SARS, and BDI at T0, T1, and T2

	Mean difference (SD)	t	p
FFMQ			
T1 - T0	11.43 (2.29)	29.50	0.00
T2 - T0	10.86 (3.08)	20.79	0.00
Zung-SARS			
T1 - T0	-6.89 (2.37)	-17.16	0.00
T2 - T0	-7.08 (2.29)	-18.28	0.00
BDI			
T1 - T0	-5.89 (1.21)	-28.85	0.00
T2 - T0	-5.86 (1.33)	-26.02	0.00

The FFMQ scores indicated a significant improvement in mindfulness at both follow-up points compared to baseline. The mean difference from baseline to the first follow-up (T1) was 11.43 (SD = 2.29), with a t-value of 29.50 and a p-value of <0.001, demonstrating a highly significant increase in mindfulness. Similarly, the mean difference from baseline to the second follow-up (T2) was 10.86 (SD = 3.08), with a t-value of 20.79 and a p-value of <0.001, further supporting the effectiveness of the intervention in enhancing mindfulness.

The Zung-SARS scores showed a significant reduction in anxiety levels at both follow-up points compared to baseline. The mean difference from baseline to the first follow-up (T1) was -6.89 (SD = 2.37), with a t-value of -17.16 and a p-value of <0.001, indicating a substantial decrease in anxiety. The mean difference from baseline to the second follow-up (T2) was -7.08 (SD = 2.29), with a t-value of -18.28 and a p-value of <0.001, confirming a continued and significant reduction in anxiety levels. The BDI scores demonstrated a

significant reduction in depression levels at both follow-up points compared to baseline. The mean difference from baseline to the first follow-up (T1) was -5.89 (SD = 1.21), with a t-value of -28.85 and a p-value of <0.001, indicating a highly significant decrease in depression. Similarly, the mean difference from baseline to the second follow-up (T2) was -5.86 (SD = 1.33), with a t-value of -26.02 and a p-value of <0.001, further demonstrating the intervention's effectiveness in reducing depression.

DISCUSSION

The results of this study indicate that an eight-week mindfulness-awareness course can significantly improve mindfulness and reduce anxiety and depression levels among nursing students. The intervention's efficacy is evident through the substantial improvements in FFMQ, Zung-SARS, and BDI scores.

Mindfulness Improvement

The significant increase in FFMQ scores from baseline (T0) to post-intervention (T1) and follow-up (T2) highlights the effectiveness of the mindfulness-awareness course. The mean difference in FFMQ scores from T0 to T1 was 11.43, with a highly significant p-value of <0.001, demonstrating an immediate improvement in mindfulness. This improvement was sustained at T2, with a mean difference of 10.86 and a similarly significant p-value of <0.001. These findings align with previous research suggesting that mindfulness-based interventions can enhance mindfulness levels among participants (Chen et al., 2021; Irawan Am et al., 2023; Liu et al., 2024).The high adherence rate and the lack of adverse events further underscore the feasibility and acceptability of the mindfulness program among nursing students (Chen et al., 2021; Coster et al., 2020). All participants completed the intervention and assessments, indicating strong engagement and commitment. This high level of adherence is crucial for the success of such interventions and supports the potential for scalability and integration into nursing curricula (Karo et al., 2022).

Reduction in Anxiety Levels

The Zung-SARS scores revealed a significant reduction in anxiety levels post-intervention, demonstrating the effectiveness of the mindfulness-awareness course in alleviating anxiety. The mean difference from baseline to the first follow-up (T1) was -6.89, with a t-value of -17.16 and a p-value of <0.001. This reduction was maintained at the second follow-up (T2), with a mean difference of -7.08, a t-value of -18.28, and a p-value of <0.001. These results are in line with previous studies that have shown the beneficial effects of mindfulness meditation on anxiety reduction. For example, Irawan-AM et al. (2023) found that brief mindfulness training significantly reduced anxiety scores in a non-clinical sample, supporting the potential of mindfulness interventions for anxiety management. Similarly, Conversano et al. (2021) reported that an eight-week mindfulness-based stress reduction (MBSR) program significantly decreased anxiety symptoms in individuals with generalized anxiety disorder.

Reduction in Depression Levels

Similarly, the BDI scores indicated a significant decrease in depression levels at both follow-up points. The mean difference from baseline to T1 was -5.89, with a t-value of -28.85 and a p-value of <0.001, showing a notable reduction in depressive symptoms. This decrease continued at T2, with a mean difference of -5.86, a t-value of -26.02, and a p-value of <0.001. These findings are in line with previous research that has demonstrated the positive impact of mindfulness-based interventions on depression (Liu et al., 2024; McVeigh et al., 2021). Contrarily, some studies have highlighted the need for personalized and extended mindfulness interventions to achieve significant reductions in depression (Garmaise-Yee & LeBlanc, 2022;

Li et al., 2021). While mindfulness-based interventions are generally effective for depression, the magnitude of their impact may vary depending on the severity of depressive symptoms and the duration of the intervention (Zhang et al., 2021).

The significant improvements in mindfulness, anxiety, and depression scores suggest that incorporating mindfulness training into nursing education could be highly beneficial. Given the high-stress nature of nursing education and practice, equipping students with effective stress management tools is essential (Karo et al., 2022; Mahaswari et al., 2023; Pearce et al., 2022). Mindfulness training could not only enhance students' well-being but also potentially improve their academic performance and patient care quality (Garmaise-Yee & LeBlanc, 2022; McVeigh et al., 2021).Despite the promising findings, this study has limitations that should be addressed in future research. The lack of a control group limits the ability to attribute changes solely to the mindfulness intervention. Future studies should include randomized controlled trials to establish causality more robustly. Additionally, longer follow-up periods would help determine the long-term effects of mindfulness training on stress, anxiety, and depression.

CONCLUSION

In conclusion, this study demonstrates that an eight-week mindfulness-awareness course can significantly improve mindfulness and reduce anxiety and depression among nursing students. These findings support the integration of mindfulness training into nursing education to promote mental health and well-being. Further research with more rigorous designs is warranted to confirm these results and explore the broader applications of mindfulness in healthcare education and practice.

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