Section: Mental Health Nursing

Evaluating the effectiveness of mindfulness-based interventions on academic burnout and perceived stress among nursing students: an interventional study in Indonesia

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Abstract

Academic burnout and perceived stress are prevalent issues among nursing students worldwide including in Indonesia. To deal with these health concerns, various approaches has been well conducted including Mindfulness-Based Interventions (MBIs). MBIs are recognized as effective strategies to alleviate academic burnout in particular population. The study used quasi-experimental design with pre- and post-test control group design. All the criteria (inclusion and exclusion) were set before study initiate. Eighty participants were divided into control and intervention groups (40 each) via sequential sampling. Tools used included the Maslach Burnout Inventory-Student Survey (MBI-SS) and Perceived Stress Scale (PSS). All the instruments were evaluated of its validity and reliability profile. Statistical analyses (paired and independent sample t-tests) revealed significant reductions in burnout and stress in the intervention group compared to minimal change in the control group (p < 0.00). Differences in academic burnout and stress scores were also significant between groups. These findings suggest MBIs effectively reduce academic burnout and perceived stress in nursing students. This approach offers a valuable insight for educational and mental health support in this population. The implications for nurses include the need to recognize and address academic burnout and perceived stress in themselves and their peers to maintain mental well-being and professional effectiveness. Implementing MBIs as part of self-care practices can enhance resilience, reduce stress, and prevent burnout. Additionally, nurses who experience the benefits of MBIs may advocate for integrating such programs into nursing education and clinical training.

Keywords: Burnout, community nursing, Mindfulness-Based Interventions, nursing care, nursing students

Introduction

Academic burnout and perceived stress are prevalent issues among nursing students worldwide. Burnout syndrome has been recognized in the World Health Organization (WHO) International Classification of Diseases since 2019 (Gjods et al., 2022). Globally, the prevalence of burnout among nursing students is approximately 23%, with estimates ranging from 2.7% to 46.4% (Kang et al., 2023). In Indonesia, the incidence of burnout among nursing students is reported to be 19%. School burnout arises from prolonged exposure to chronic stressors in the educational environment (Urquiza et al., 2023). Common stressors include the pressure to excel academically and meet expectations, often leading to feelings of guilt and mental exhaustion (Gómez-Urquiza et al., 2023). Nursing students experience heightened levels of burnout and perceived stress compared to students in other disciplines. They face multiple stressors, such as rigorous academic demands, challenges in adapting to clinical settings, lack of self-confidence, feelings of incompetence, and fear of errors in nursing practice. The intensity of these demands can result in physical, mental, and emotional fatigue, contributing to burnout (Suha et al., 2022). The consequences of academic burnout and perceived stress manifest in behavioral, psychosomatic, and emotional forms. Behaviorally, students may engage in substance abuse, poor dietary habits, frequent absenteeism, or difficulty relaxing. Psychosomatically, burnout can lead to health problems, including cardiovascular issues, digestive disorders, insomnia, or chronic fatigue. Emotionally, it can result in depression, low self-esteem, loss of motivation, and even thoughts of dropping out (Gómez-Urquiza et al., 2023). Academic burnout and perceived stress are linked to physical and mental health issues, making early identification and intervention crucial (Mariano et al., 2024). Burnout can also increase dropout rates, decrease academic performance, and negatively affect the quality of nursing care (Tomaschewski-Barlem et al., 2014).

Given these impacts, it is essential to implement interventions to prevent burnout and perceived stress among nursing students. Addressing these issues is vital for the students' well-being to safeguard the quality of healthcare services provided by future nurses. One promising intervention is mindfulness, a practice aimed at cultivating present-

moment awareness without judgment (McVeigh et al., 2021). Rooted in Vipassana meditation in Buddhism, mindfulness involves focusing on the present moment, maintaining a non-judgmental perspective, and detaching from negative thoughts and emotions (Lia et al., 2020). This approach reduces stress and anxiety by minimizing negative thoughts related to the past or future, thereby improving mental resilience. Mindfulness interventions include meditation, yoga, and cognitive training. These practices help individuals focus on the present, fostering positive responses to stress and illness (Squyres, 2023). Evidence suggests that mindfulness-based interventions positively affect stress, anxiety, and overall well-being, particularly among healthcare students. They improve attention, resilience, and emotional regulation, making them effective in reducing the stress and burnout experienced by nursing students (Veigh et al., 2021).

The gaps addressed by this study stem from the limited research on MBIs targeting academic burnout and perceived stress in nursing students within the Indonesian context. While MBIs are increasingly recognized as effective strategies to alleviate stress and burnout in healthcare students, existing studies often focus on Western populations, where cultural, educational, and institutional differences may affect their applicability. Nursing students face unique challenges, such as clinical workload, academic pressures, and emotional strain, yet little is known about how MBIs can be tailored to address these issues in Indonesia's cultural and educational framework. This creates a critical need for research that investigates the effectiveness of MBIs in such a setting. Moreover, most prior studies on MBIs lack a comprehensive analysis of their impact on both psychological outcomes, such as stress and burnout, and their potential influence on students' academic performance and professional readiness. While Indonesia has a growing population of nursing students facing significant academic and clinical demands, few interventions have been rigorously tested for their ability to support mental health and reduce dropout rates in this demographic. This study aims to fill these gaps by providing evidence on the cultural relevance and practical benefits of MBIs in reducing burnout and stress among Indonesian nursing students. The study will contribute valuable insights for educators, policymakers, and mental health professionals in the region.

Method

This research employs a quasi-experimental design featuring a pre-test and post-test control group approach. This design is particularly effective for evaluating the impact of interventions in real-world settings where randomization may not be feasible (Kim & Steiner, 2016). The study focuses on active undergraduate nursing students at Sekolah Tinggi Ilmu Kesehatan Sukabumi, who were selected based on specific inclusion criteria. These criteria included being registered in the Pangkalan Data Pendidikan Tinggi (PDDIKTI) system, demonstrating a willingness to participate as respondents, and being enrolled in the nursing program. The study aims to gather relevant data that reflects the unique challenges faced by nursing students in relation to academic burnout and perceived stress. The sampling technique utilized in this study is consecutive sampling, which is a non-random method that involves selecting participants sequentially until the desired sample size is achieved. In this case, a total sample of 80 students was recruited, with 40 participants assigned to the intervention group and 40 to the control group. This balanced division allows for a comparative analysis of the effects of the mindfulness-based intervention on academic burnout and perceived stress levels. With including a control group, the study can effectively isolate the impact of the intervention from other variables that may influence the outcomes. Data collection was conducted using standardized instruments to ensure the reliability and validity of the measurements. The Maslach Burnout Inventory-Student Survey (MBI-SS) was employed to assess academic burnout, while the Perceived Stress Scale (PSS-10) was used to evaluate perceived stress levels among participants. Both instruments were rigorously tested for validity, achieving a p-value of less than 0.05, and demonstrated strong internal consistency with a Cronbach alpha value greater than 0.70. These statistical indicators affirm the appropriateness of the instruments for the study population, ensuring that the data collected accurately reflects the participants' experiences regarding burnout and stress. The intervention group received mindfulness-based interventions (MBIs) for 8 weeks, with a duration of 50 minutes for each session. The intervention was conducted by the researcher and the team. Meanwhile, the control group did not receive any intervention. The researcher only conducted pre- and post-evaluations. However, that group was taught mindfulness-based interventions (MBIs) after the study was completed.

Statistical analysis of the collected data was performed using the Statistical Package for Social Sciences (SPSS) software, version 26. The analysis involved paired sample t-tests to evaluate pre- and post-intervention differences within groups and independent sample t-tests to compare outcomes between the control and intervention groups. These statistical methods are suitable for assessing the effectiveness of the mindfulness-based intervention on reducing academic burnout and perceived stress, providing robust insights into the intervention's impact. The combination of these analytical techniques allows for a comprehensive understanding of the data, facilitating informed conclusions about the effectiveness of the intervention. Ethical considerations were paramount throughout the study. Ethical approval was obtained from the Sukabumi College of Health Sciences, with the ethical number No: 000150/KEP STIKES SUKABUMI/2024. Informed consent was secured from all participants, ensuring they were fully aware of the study's purpose, procedures, and their rights. Confidentiality and anonymity were strictly maintained to protect the participants' identities and personal information throughout the research process. Importantly, the study posed no known risks to participants, and all procedures adhered to established ethical guidelines. This commitment

to ethical research practices underscores the integrity of the study and its findings, contributing to the overall validity and reliability of the research outcomes.

Results

The table illustrates the demographics of respondents in both the intervention and control groups. In the intervention group, the majority of participants were aged 18-20 years, with 28 individuals (70.0%). The group was predominantly female, comprising 32 participants (80.0%). Most respondents were currently in level 1 of their studies, totalling 14 individuals (35.0%). Additionally, 23 participants (57.5%) reported living with their families, and 27 individuals (67.5%) were involved in organizational activities. Conversely, the control group consisted mostly of respondents aged 18-21 years, with 30 individuals (75.0%). This group also had a significant female representation, with 29 participants (72.5%). Among them, 13 individuals (32.5%) were in level 1, 20 participants (50.0%) lived with their families, and 24 individuals (60.0%) were engaged in organizational activities **(Table 1)**.

Table 1. Overview of respondent characteristics

Respondent Characteristics	Intervention Group	Control Group
	n = 40 (%)	n = 40 (%)
Age (Years)		
18-20	28 (70.0)	30 (75.0)
21-23	12 (30.0)	10 (25.0)
Gender		
Male	8 (20.0)	11 (27.5)
Female	32 (80.0)	29 (72.5)
Level		
1	14 (35.0)	13 (32.5)
2	11 (27.5)	12 (30.0)
3	9 (22.5)	7 (17.5)
4	6 (15.0)	8 (20.0)
Living Together		
Other family members	6 (15.0)	5 (12.5)
Parents	23 (57.5)	20 (50.0)
Alone	11 (27.5)	15 (37.5)
Participate in Organizational Activities		
Participate	27 (67.5)	24 (60.0)
Not participating	13 (32.5)	16 (40.0)

The table presents the pre-test and post-test results for academic burnout and perceived stress in both groups. In the intervention group, the pre-test academic burnout average was 50.92, with a standard deviation of 7.94, a minimum value of 37, and a maximum value of 59. Following the intervention, the post-test academic burnout average dropped to 40.22, with a standard deviation of 6.74, a minimum value of 29, and a maximum value of 52. In the control group, the pre-test academic burnout average was 50.15, with a standard deviation of 7.74, a minimum value of 37, and a maximum value of 59. The post-test results showed a slight reduction, with an average of 48.30, a standard deviation of 8.16, a minimum value of 34, and a maximum value of 59. Regarding perceived stress, the intervention group had a pre-test average of 22.02, a standard deviation of 6.22, a minimum value of 12, and a maximum value of 31. The post-test average decreased significantly to 16.76, with a standard deviation of 2.91, a minimum value of 10, and a maximum value of 22. In contrast, the control group's pre-test perceived stress average was 22.44, with a standard deviation of 6.61, a minimum value of 11, and a maximum value of 33. The post-test results showed minimal change, with an average of 22.36, a standard deviation of 6.55, a minimum value of 12, and a maximum value of 33 **(Table 2)**.

The table indicates a significant effect of mindfulness-based interventions on academic burnout in the intervention group, with a p-value of 0.000. The results further demonstrate a difference in pre-test and post-test academic burnout scores within the control group, also yielding a p-value of 0.000. Notably, the intervention group experienced a more substantial decrease in average academic burnout compared to the control group, with a mean difference of 10.70 in the intervention group versus 1.85 in the control group. Additionally, the mindfulness-based interventions had a significant effect on perceived stress in the intervention group, again with a p-value of 0.000. The differences in pre-test and post-test perceived stress scores in the control group also yielded a p-value of 0.000. The intervention group exhibited a more pronounced decrease in average perceived stress compared to the control group, with a mean difference of 5.26 in the intervention group compared to just 0.08 in the control group **(Table 3)**. In summary, the data presented in tables clearly demonstrate the effectiveness of mindfulness-based interventions in reducing both academic burnout and perceived stress among nursing students. The significant changes observed in

the intervention group highlight the potential benefits of incorporating mindfulness practices into educational settings, particularly for students facing high levels of stress and burnout. The findings underscore the importance of addressing mental health and well-being in academic environments to enhance student outcomes.

Table 2. Univariate analysis.

		Mean	SD	Min	Max
Academic Burnout	Intervention Group				
	Pre-test	50.92	7,94	37	59
	Post-test	40.22	6,74	29	52
	Control Group				
	Pre-test	50.15	7,74	37	59
	Post-test	48.30	8.16	34	59
Perceived Stress	Intervention Group				
	Pre-test	22.02	6.22	12	31
	Post-test	16.76	2.91	10	22
	Control Group				
	Pre-test	22.44	6.61	11	33
	Post-test	22.36	6.55	12	33

Table 3. Bivariate analysis.

		Mean	Mean Difference	SD	t	p
Academic Burnout	Intervention Group					
	Pre-test	50.92	10.70	6.76	10.010	0.000
	Post-test	40.22				
	Control Group					
	Pre-test	50.15	1.85	1.59	7.340	0.000
	Post-test	48.30				
Perceived Stress	Intervention Group					
	Pre-test	22.02	5.26	3.48	13.916	0.000
	Post-test	16.76				
	Control Group					
	Pre-test	22.44	0.08	0.52	1.284	0.203
	Post-test	22.36				
		Mean	Mean Difference		t	p
Academic Burnout	Intervention Group	10.70	8.85		8.058	0.000
	Control Group	1.85				
Perceived Stress	Intervention Group	5.26	5.19		13.497	0.000
	Control Group	0.08				

Discussion

Academic burnout is characterized by physical and emotional exhaustion, leading to boredom, reduced motivation, apathy towards tasks, and decreased academic performance (Putra et al., 2020). Nursing students face substantial practical instruction is crucial for building self-confidence related to their future professional aspirations. Programs designed to equip participants with essential skills for managing patients in various clinical settings are vital (Rodríguez-García et al., 2021). However, this rigorous training can contribute to academic burnout among nursing students (Alghtany et al., 2024; Andargeery et al., 2024). Academic burnout is a form of fatigue that arises when students are overwhelmed by their workload during university enrollment. Moreover, nursing students regularly encounter challenging situations that can create a difficult environment. The transition from enrolling in a university can significantly heighten stress levels and lead to academic burnout (March-Amengual et al., 2022).

In the study, post-test measurements revealed that the average academic burnout score in the intervention group decreased. This indicates that the mindfulness-based intervention effectively impacted the academic burnout levels in the intervention group. Long-term exposure to academic-related pressures can lead to emotional exhaustion, depersonalization, and a lack of personal fulfilment. The condition potentially results in severe consequences such as suicidal thoughts, substance misuse, and negative emotions. Mindfulness therapy as rooted in ancient contemplative traditions, has emerged as a promising method to combat burnout (Wang et al., 2023). Mindfulness practices involve paying attention without judgment while maintaining an accepting and curious mindset. Numerous studies have demonstrated the efficacy of mindfulness-based therapies in treating various mental health conditions, including

burnout (Aldbyani & Al-Abyadh, 2023). Mindfulness is an effective strategy for reducing burnout, and its benefits include decreased emotional exhaustion and improved personal achievement. Research consistently shows that implementing mindfulness interventions helps individuals maintain a state of well-being free from burnout. Regular mindfulness exercises targeting emotional fatigue may alleviate burnout and enhance academic performance among nursing students (Wang et al., 2023). Among the many advantages of mindfulness-based interventions are improved awareness of current feelings and heightened attention to ongoing tasks, both of which can foster inner contentment and tranquillity. Prior studies have demonstrated mindfulness's effectiveness in enhancing mental health outcomes, specifically in alleviating symptoms of common psychological issues such as stress, anxiety, depression, and burnout (Kang et al., 2022). Integrating self-awareness and acceptance can significantly reduce negative emotions and thought patterns. This approach enhances academic motivation and efficiency by effectively mitigating stress and academic burnout stemming from low self-efficacy, self-doubt, or fear of failure. Therefore, there exists a moderating relationship between academic burnout and mindfulness-based therapies (Zhu et al., 2024). In the control group, the post-test measurement of academic burnout yielded an average score of 48.30 which indicating a minimal decrease from the pre-test average of 50.15, with a difference of only 1.85. However, statistical analysis revealed a significant influence, with a p-value of less than 0.05. Although the control group did not receive any intervention, they benefited from good social support within the university environment, which helped mitigate academic burnout. Many students reported feeling comfortable and motivated during their studies. Social support is defined as the perception of being cared for, loved, appreciated, and valued by those around them (Ye et al., 2021). It plays a crucial role for students during college, as they face high expectations from society, family, and themselves. This support can ease the burdens associated with academic responsibilities and lead to more adaptive problem-solving strategies (Velando-Soriano et al., 2020). Social support fosters positive interactions, balances emotional conditions, and reduces the likelihood of academic burnout. It also contributes to life satisfaction, motivation, academic achievement, and overall psychological health (Firdausi et al., 2023).

The study results revealed a difference in academic burnout between the control and intervention groups, with both experiencing a decrease in average values. However, the intervention group demonstrated a significantly greater reduction of 10.7 compared to the control group's 1.85. This difference may be attributed to the fact that many students in the control group were in their third and fourth years, where higher-level students often develop better coping mechanisms for academic burnout. Research indicates that class level is related to emotional regulation and influences academic burnout overall (Iuga & David, 2024). Higher-level students tend to employ positive learning strategies, time management skills, and seek support (Hong & Hanafi, 2024). Final-year students' experiences foster positive psychology, emphasizing present-focused attention and increased awareness, where mindfulness indirectly aids in managing academic stress and burnout (Arlinkasari & Akmal, 2017). The notable decrease in academic burnout in the intervention group is likely due to the mindfulness treatment received. This aligns with a study which states that mindfulness has a small to moderate but significant effect on reducing overall fatigue, including emotional exhaustion and academic efficacy (Wang et al., 2024). Mindfulness practices enhance self-awareness and emotional regulation, ultimately decreasing emotional exhaustion (Hidajat et al., 2023). Mindfulness training affects cognitive and information processing systems, reduces rumination, and lessens unproductive attitudes (Zhu et al., 2024). Mindfulness involves observing fleeting sensations with curiosity and without judgment, leading to reduced cognitive evaluations of stressful situations and decreased stress reactivity (Wen et al., 2023). Engaging in mindfulness practices improves focus by diminishing negative perceptions of academic pressure, enhancing awareness of emotional reactions, and better controlling distracting thoughts. Consequently, mindfulness can elevate motivation and efficiency in academic endeavors, establishing a mediating role between mindfulness and academic burnout levels (Zhu et al., 2024).

In nursing students, prolonged stress can affect psychological health, causing anxiety, depression, concentration difficulties, and diminished coping abilities (Alghamdi et al., 2019; Chawla & Kumari, 2024). A supportive academic atmosphere is essential for helping students manage stress and optimize their professional identity formation (Zhao et al., 2024). In our population, post-test measurements of perceived stress in the intervention group averaged 16.76, indicating a significant decrease of 5.26 from the pre-test score of 22.02. The findings demonstrate that the mindfulness-based intervention positively impacted perceived stress levels in the intervention group, supported by statistical analysis revealing a p-value of less than 0.05. This aligns with studies indicated that mindfulness-based interventions significantly affect perceived stress, with a relatively large influence and high effect size (Karo et al., 2023; Lu et al., 2023). Mindfulness has gained popularity in healthcare for its ability to foster present-moment awareness, non-judgmental acceptance, and emotional regulation (Batool et al., 2023). Practicing mindfulness helps reduce stress, anxiety, hostility, depression, and physical symptoms (Lu et al., 2023). MBIs improve emotional regulation, attention, and cognitive flexibility, contributing to their positive effects on stress (Aldbyani & Al-Abyadh, 2023). The findings suggest that mindfulness training may effectively address these challenges and reduce perceived stress among nursing students.

The control group's post-test perceived stress measurement averaged 22.36, showing a minimal decrease from the pre-test average of 22.44, with a difference of only 0.08. This decrease was not statistically significant, with a p-value greater than 0.05, indicating that the control group, which did not receive mindfulness-based interventions, did

not exhibit a meaningful reduction in perceived stress levels. The slight decrease observed may be attributed to respondents' resilience. Resilience refers to an individual's internal resources that aid in effectively managing stress. It can be developed through exposure to stress. Resilience is linked to the ability to recover from stress and is associated with various important factors and characteristics (Abai & Madihie, 2021). Resilience enables individuals to face challenges effectively, with successful stress management closely tied to one's level of resilience. In stressful situations, resilient individuals are better equipped to overcome difficulties to achieve their goals. Resilience plays a crucial role in selecting and applying effective coping strategies, with highly resilient individuals tending to employ better methods to manage stress. For instance, students with strong resilience are more likely to use problem-focused strategies, such as time management and seeking additional resources (Pratama & Tondok, 2023).

Overall, the study indicates that mindfulness-based interventions effectively alleviate perceived stress. MBIs offer a flexible therapeutic method and provide a wide range of benefits that enhance both physical health and mental well-being. When practiced correctly and consistently, MBIs demonstrate positive effects on mental health. However, individuals with lower mindfulness levels may be more susceptible to intrusive and unwanted thoughts and behaviours. Mindfulness training can influence brain activity related to emotions and improve mental health. A meta-analysis identified key brain areas involved in cognitive and emotional processes associated with mindfulness interventions, including the anterior cingulate cortex, basal ganglia, entorhinal cortex, and medial prefrontal cortex, all crucial for meditation experiences (Duartea et al., 2022; Marqués, 2024). In the control group, the minimal reduction in perceived stress was not attributable to mindfulness-based intervention therapy but rather to factors such as the respondents' support systems, resilience in managing various situations, and other influences. These conditions enabled respondents to develop effective coping mechanisms, resulting in some observed reductions in perceived stress. The implementation of mindfulness-based interventions has proven effective in helping respondents reduce perceived stress. These interventions provide significant benefits by enhancing awareness of thoughts and emotions and fostering more adaptive stress responses. With a structured, evidence-based approach, these interventions can be applied in daily life, effectively addressing daily stress, educational pressures, improving emotional regulation, and creating better psychological balance.

Conclusion
This study concludes that MBIs are effective in reducing academic burnout and perceived stress among nursing students in Indonesia. The findings demonstrate significant improvements in emotional resilience and stress management skills which emphasizing the value of integrating MBIs into nursing education. Addressing the psychological well-being of nursing students is crucial for their personal development and professional competence. Given the encouraging results, it is recommended that nursing institutions consider implementing structured mindfulness programs as part of their curriculum. These programs can include mindfulness meditation, mindful movement, and cognitive mindfulness training tailored to the unique stressors nursing students face. Institutions should also evaluate the long-term impact of these interventions on academic performance, clinical adaptability, and career satisfaction to further understand their benefits. Additionally, it would be beneficial to assess how cultural factors influence the reception and effectiveness of MBIs in diverse student populations. Future research should explore the scalability of MBIs for larger cohorts of nursing students and investigate their comparative efficacy against other stress-reduction techniques. Studies could also examine the integration of technology, such as mobile applications, to deliver MBIs in more accessible and flexible formats. Further, qualitative studies that capture the lived experiences of students participating in these interventions would provide deeper insights into their psychological and behavioral transformations. These efforts will contribute to the development of holistic strategies that promote mental well-being and enhance the quality of nursing education globally.

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Conflict of Interest
The authors have no conflict of interest to declare.

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