The effect of mindfulness-based interventions on educational stress, exam anxiety, and coping strategies in nursing students

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Article Info

ABSTRACT

The aim of this study is to examine the effect of mindfulness-based stress reduction intervention on educational stress and coping with exam anxiety and mindfulness in nursing students. This study utilizes a quasi-experimental design with the pretest-post-test control group. Personal information form, nursing education stress scale (NESS), state test anxiety scale (STAS), and mindful attention awareness scale (MAAS) were employed as data collection instruments in the study. The study group of the research consisted of 68 students in university. Findings indicated statistically significant differences between the changes in the participant's scores in the control and experimental groups in the overall NESS in the post-test and the application stress and academic stress scale. The results further found a statistically significant difference between the changes in the scores of the participants in the control and experimental groups in the post-test from the MASS. The intervention based on mindfulness stress reduction led to positive results in students' coping with exam anxiety. Educational programs should be organized to enable students to cope more effectively with the stressors they encounter. Therefore, it is believed that it would be appropriate to introduce similar programs in the education process of nursing students.

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1. INTRODUCTION

Stress is an inescapable part of life that has become part of our daily lives and is often dealt with. It is stated that the presence of stress leads to psychologically and physiologically adverse circumstances in individuals. Stress emerges with the individual's reactions to the situations around them [1], [2]. Stress and anxiety are closely related conditions. Stress is typically defined as a natural response to external pressure or threats. Anxiety, on the other hand, often arises because of prolonged stress and is characterized by persistent worry and unease. These two conditions interact significantly, as stress can trigger anxiety, and anxiety can further worsen stress. This interaction can create a vicious cycle that significantly impacts an individual's mental health [3]. Anxiety develops in situations where individuals experience stress. When the characteristics of anxiety are examined, it is universal and affects the perceptions and thoughts of individuals [4]. It is further that individuals experiencing anxiety and stress have difficulty focusing on the present moment, as these emotional states tend to cause individuals to focus their attention on past events or potential future threats [5].

Nursing education is a process that requires ideological, practical, theoretical knowledge and manual skills, as well as the ability to observe and interpret. Nursing students face many stress factors affecting academic and quality of life during this education process. Compared to other health fields, it has been concluded that the risk of developing mental health problems is higher in students receiving undergraduate nursing education [6]–[10].

Labrague, stated that stress is a significant psychological factor that can negatively affect nursing students' academic performance and health during their education and clinical practice. The study underscores the importance of addressing these challenges through effective coping mechanisms, such as problem-solving, social support, and emotion-focused strategies. Nurse educators play a vital role in reducing stress and enhancing students' well-being by fostering resilience and providing supportive environments, which ultimately help students succeed academically and manage their stress levels effectively. Effective stress management is key to success, as unmanaged stress can lead to burnout and negatively affect academic performance and mental health. Implementing stress-reduction strategies is essential for supporting students' well-being throughout their education [11].

Kabat-Zinn [12] defined mindfulness as the ability to direct attention to the focus and the moment in the form of acceptance without judgment. Within the framework of mindful awareness, it is emphasized that qualities such as patience, compassion, acceptance, and curiosity should be integral to the approach. However, the capacity of individuals to effectively integrate these aspects of mindful awareness into their lives necessitates a structured process, involving the development of various skills and consistent practice [13]. The basis of mindfulness is "attention" and "emotions". Through mindfulness, a person reaches cognitive flexibility by purifying their attention during an intense thought process [14], [15].

Mindfulness results for different age groups are encountered when the literature is examined. In the mindfulness study conducted by Yılmazer *et al.* [16], it was reported that mindfulness interventions reduced test anxiety in student groups at various levels. In a study conducted by Aygün and Demir [17], it was found that the effect on the mindfulness of high school students may be attributed to age and environmental factors. Additionally, socioeconomic, socio-cultural, and environmental factors may play a significant role in determining career anxiety among these students. This study, designed as a mindfulness-based intervention, offers a unique approach to helping nursing students manage academic stress and exam anxiety. By specifically targeting a population that experiences high academic and clinical pressures, it addresses the distinct challenges faced by nursing students, unlike previous research that often focuses on general student populations. Incorporating a mixed-methods approach, this study not only provides a tailored intervention but also contributes new insights into the practical application of mindfulness in healthcare education, making it a valuable addition to the existing literature.

2.   METHOD

The research was conducted as a quasi-experimental pretest-posttest intervention study at the University in the Turkish Republic of Northern Cyprus. The study was conducted in the Faculty of Nursing University. Nursing students were informed about the study before the study and students who agreed to participate in the study were given an informed consent form and asked to fill it out. The study population consisted of fourth-year nursing students enrolled in the fall semester of 2022–2023. The sample included 68 students, with 34 in the experimental group and 34 in the control group. All participants volunteered and met the sampling criteria. The sample size was kept small due to the limited number of participants who met the specified inclusion criteria. However, even in studies with small samples, the use of a pretest-posttest design is considered a powerful method for assessing interindividual changes [18]. In order to increase the reliability of the study, paired statistical analyses and effect size calculations were performed.

The inclusion criteria for sampling are that participants must be fourth-year students at the University Faculty of Nursing. They should have no prior experience with a Mindfulness program and must not have attended any training, seminars, courses, or similar educational activities related to test anxiety management. The study was conducted between the first week of April and first week of June 2022.The intervention program was carried out once a week in a total of eight sessions, each session lasting approximately two hours. 68 students who met the criteria were randomly selected and divided into 2 groups (34 students in each group). Data collection tools were applied to both groups of participants before the midterm exam and before the final exam. The intervention program was designed to help students to cope with educational stress and test anxiety. In the sessions, general information, self-knowledge and mindfulness development, increasing self-esteem, problems and solutions, individual empowerment, and effective coping methods were discussed. For this purpose, lecturing, question and answer and discussion, visual methods and Mindfulness stress reduction program implementations were employed in the sessions. At the end of the study, the prepared handbook was distributed to the control group students.

2.1. Data collection tools
Four data collection instruments were used in this study: three standardized scales and a personal information form.

a. Personal information form (PIF)
The PIF was designed by utilizing the literature on the descriptive characteristics of the students and consisted of a total of 6 questions.

b. Nursing education stress scale (NESS)
The Turkish validity and reliability study of the scale was conducted by Karaca et al. [19] in 2014. The scale has a total of 32 items, including 2 sub-dimensions. The total score that can be obtained from the scale is 0-96, and an increase in the sub-dimension or total score indicates an increase in stress. The Cronbach Alpha Coefficient of the scale was determined to be between 0.81-0.93.

c. State test anxiety scale (STAS)
The Turkish validity and reliability study of the scale was conducted by Şahin [20] in 2019. There is a total of 22 items in the scale, including 3 sub-dimensions. The highest total score that can be obtained from the scale is 88 and the lowest total score is 22. The Cronbach Alpha Coefficient of the scale was determined as 0.94.

d. Mindful attention awareness scale (MAAS)
The Turkish validity and reliability study of the scale was conducted by Özyeşil et al. [21] in 2011. It consists of 15 items that assess the general tendency to be mindful and aware of momentary experiences encountered in daily life. The MAAS is a single-factor scale that is employed to calculate the results on the total score of the participants' mindfulness levels. A high score on the scale indicates a high level of mindfulness. Cronbach alpha coefficient of the scale was determined as 0.80.

2.2. Data analysis
SPSS 26.0 program was utilized for statistical analysis of the data obtained. Frequency analysis was utilized to determine the findings related to the socio-demographic characteristics of the individuals. The Kruskal-Wallis H test and the Mann-Whitney U test were conducted to compare the scores. The relationship between the scales pre and post intervention was determined by Pearson correlation coefficient.

3. RESULTS AND DISCUSSION
Table 1 presents the distribution of the participants according to their socio-demographic characteristics, and it was determined that 55.9% of the participants in the control group were female, 85.3% were born in the Turkish Republic, 94.1% choose the nursing department willingly, 64.7% lived with their families, 82.4% did not work and 76.5% had a moderate-income level. In the experimental group, 64.7% of the participants were female, 67.6% were born in the Turkish Republic, 94.1% chose the nursing program willingly, 64.7% lived with their families, 67.6% did not work, and 88.2% defined their income level as moderate. There was no difference between the socio-demographic characteristics of the participants in the control and experimental groups ($p > 0.05$).

Table 1. Socio-demographic characteristics of the participants

Variable	Category	Control n	Control %	Experimental n	Experimental %	Total n	Total %	X^2	p
Gender	Female	19	55.9	22	64.7	41	60.3	0.553	0.457
	Male	15	44.1	12	35.3	27	39.7		
Country	Turkish Republic	29	85.3	23	67.6	52	76.5	2.942	0.086
	Turkish Republic of Northern Cyprus	5	14.7	11	32.4	16	23.5		
Willingly choosing the nursing department	Yes	32	94.1	32	94.1	64	94.1	0.000	1.000
	No	2	5.9	2	5.9	4	5.9		
Living with family	Yes	22	64.7	22	64.7	44	64.7	0.000	1.000
	No	12	35.3	12	35.3	24	35.3		
Occupation	Yes	6	17.6	11	32.4	17	25.0	1.961	0.161
	No	28	82.4	23	67.6	51	75.0		
Level of income	Satisfactory	4	11.8	3	8.8	7	10.3		
	Moderate	26	76.5	30	88.2	56	82.4	2.229	0.328
	Poor	4	11.8	1	2.9	5	7.4		

Table 2 displays the ANCOVA results for the comparison of the pre-test and post-test scores of MAAS, NESS, and STAS in the control and experimental groups. A statistically significant difference was observed between the changes in MAAS scores of the control and experimental groups at post-test ($p < 0.05$).

Contrary to the previous version, MAAS scores decreased in both groups, with a larger decrease observed in the experimental group. Significant differences were also found between groups for the total NESS score, as well as the application stress and academic stress subscales ($p<0.05$). In contrast to the original description, the NESS scores of the experimental group increased from pre-test to post-test, whereas the control group showed a decrease. Regarding STAS scores, significant differences were observed between groups in all subscales (physiology, psychosocial, and cognitive) at post-test ($p<0.05$). The experimental group exhibited greater reductions in stress levels compared to the control group.

Table 2. Comparison of the pre-test and post-test of NESS, STAS and MAAS scores of the control and experimental group participants

Variable	Group	Pre-test		Post-test		F	p	η^2
		$\overline{X}$	SD	$\overline{X}$	SD			
NESS	Control	59.85	13.37	52.97	12.46	9.711	0.003*	0.130
	Experimental	57.12	10.38	63.32	10.44			
Application stress	Control	32.62	7.34	29.06	9.31	6.748	0.012*	0.094
	Experimental	33.59	9.75	24.06	9.24			
Academic stress	Control	30.15	7.57	27.79	8.85	8.998	0.004*	0.122
	Experimental	32.26	9.02	22.44	8.45			
STAS	Control	62.76	14.38	56.85	17.39	8.869	0.004*	0.120
	Experimental	65.85	17.75	46.50	16.72			
Physiology	Control	13.62	5.20	14.09	4.76	24.340	0.000*	0.272
	Experimental	14.24	5.12	9.79	1.86			
Psychosocial	Control	8.50	2.65	8.97	3.49	6.599	0.013*	0.092
	Experimental	9.53	5.68	7.29	2.48			
Cognitive	Control	22.41	9.16	20.15	6.13	1.059	0.307	0.016
	Experimental	22.97	6.93	18.91	4.88			
MAAS	Control	44.91	14.73	43.26	12.04	10.727	0.002*	0.142
	Experimental	46.68	13.26	36.00	6.25			

Note: *$p<0.05$

It was observed that there were statistically significant differences between the changes in the scores of the participants in the control and experimental groups in the post-test of the STAS and the physiology as well as psychosocial scores in the scale ($p<0.05$). The decrease in the scores of the participants in the experimental group from the STAS in the post-test is greater than the control group. There was no statistically significant difference between the change in the cognitive scores of the participants in the control and experimental groups regarding the state anxiety scale ($p>0.05$).

At the end of the study, it was revealed that mindfulness-based intervention had a positive effect on students' coping with test anxiety. Studies with comparable findings to our study can be found in the literature [16], [22]–[24]. It is stated that individuals with high mindfulness use coping skills to overcome stressful experiences at a greater level [25]. This study shows the increase in the experimental group participants' scores on the MAAS. In the Dundas and Nygård [26] study, mindfulness training appears promising in reducing high school-age test anxiety.

The research findings showed that participants in the experimental group experienced a greater reduction in their overall scores on the NESS, as well as lower stress and academic stress scores after the post-test, compared to those in the control group. In similar research conducted to determine whether emotional intelligence has a role in the relationship between university students' mindfulness and psychological well-being, it was concluded that increasing mindfulness of students can enhance their emotional intelligence [27]. In Demir's study [17] investigating the effect of mindfulness-based cognitive therapy program on university students' anxiety levels, it was observed that the therapy program conducted through the utilization of mindfulness-based cognitive techniques led to a decrease in the anxiety levels of students. In addition, studies have found that mindfulness-based stress reduction training effectively reduces emotional problems and enhances students' overall emotional well-being [28], [29].

The research finding showed, it was observed that there were statistically significant differences between the changes in the scores of the participants in the control and experimental groups in the post-test of the STAS and the physiology as well as psychosocial scores in the scale ($p<0.05$). In another study, the effect of a mindfulness-based cognitive therapy program on reducing university students' emotion regulation difficulties was examined; it was determined that the therapy program had a positive effect on reducing the levels of emotion dysregulation difficulties of students [30]. This study demonstrates that mindfulness-based intervention is effective in reducing students' stress and, therefore, is an effective learning strategy. Similarly in literature, there are studies indicating that effective learning of students can be improved through the scope of mindfulness [31]–[35].

4. CONCLUSION

Considering the results of the research, it can be said that mindfulness-based practices are one of the valuable tools that can be recommended to reduce test anxiety. Mindfulness techniques help students take a calmer and more mindful approach to challenging situations and improve their ability to manage stress and anxiety. As a result, students are better able to cope with the difficulties they will face in the educational process and in their future careers

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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C : **C**onceptualization	I : **I**nvestigation	Vi : **Vi**sualization
M : **M**ethodology	R : **R**esources	Su : **Su**pervision
So : **So**ftware	D : **D**ata Curation	P : **P**roject administration
Va : **Va**lidation	O : Writing - **O**riginal Draft	Fu : **Fu**nding acquisition
Fo : **Fo**rmal analysis	E : Writing - Review & **E**diting	

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

INFORMED CONSENT

We have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The research was approved by the Scientific Research Evaluation Ethics Committee of University on 28.04.2022 (2022/102-1522).

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [SE], upon reasonable request.

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