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Original Article

The impact of positive mindfulness training on academic well-being among medical students

Pegah Babadi, Fatemeh Sadat Marashian*, Sahar Safarzadeh

Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran

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Abstract

Background: Medical students experience significant stress, anxiety, and burnout from their challenging studies, which adversely affect their academic performance, motivation, and well-being. The present study aimed to investigate the effectiveness of positive mindfulness training on academic well-being among medical students.

Methods: This was a quasi-experimental study with a pre-test, post-test, follow-up design, and a control group. The population of this study consisted of all students at Jundishapur University of Medical Sciences, Ahvaz, who were enrolled in the 2022-2023 academic year. A convenience sample of 30 participants was selected and randomly assigned to the experimental (positive mindfulness training) and control groups. The experimental group received a 10-session, 90-minute positive mindfulness training program, while the control group received no training. The Academic Well-Being Questionnaire (AWBQ) was used as the research instrument. Data were analyzed using repeated measures ANOVA and the Bonferroni post hoc test.

Results: The results showed that positive mindfulness training significantly increased the scores on the academic value, academic satisfaction, and academic engagement subscales in the post-test compared to the control group ($P<0.01$). Additionally, the results indicated that positive mindfulness training significantly decreased academic burnout scores in the post-test among medical students ($P<0.01$).

Conclusion: These results suggest that mindfulness training can be a valuable tool for mitigating the negative psychological consequences of medical education and promoting a more positive and fulfilling academic experience. By cultivating mindfulness skills, medical students may be better equipped to manage stress, improve their focus and concentration, and develop a healthier relationship with their studies.

Introduction

Addressing challenges such as social maladjustment, and psychological, social, and academic problems among students has always been a concern for educational and training systems.[1] The first years of university are often the most stressful period during students' academic careers. During this time, students experience social challenges such as separation from family, and building a new social network, and academic challenges such as completing assignments.[2,3] These challenges may be accompanied by emotional disturbances, feelings of loneliness, homesickness, psychological problems, and an increased likelihood of substance use.[4]

The imperative to investigate the academic well-being of medical students stems from the multifaceted challenges they face.[5] Medical education is demanding, encompassing long hours, rigorous coursework, and high-stakes assessments.[6] These pressures can contribute to significant stress, anxiety, and burnout, which can negatively impact academic performance, mental health, and overall well-being.[7] By examining the academic well-being of medical students, researchers can gain valuable insights into the factors that influence their experiences, identify areas of need, and develop targeted interventions to support their academic and personal success.

Tuominen-Soini et al[8] argue that the domain of academic well-being, as a qualitative outcome of academic performance, has gained the attention of positive psychologists in recent decades. This is because the key to understanding the low academic performance of students may lie in their compromised academic well-being, or in other words, academic burnout.[9] Psychological well-being is a significant indicator of various educational achievements. Given the multiple ways in which well-being can be defined and the central role of school in adolescents' lives, the term well-being

***Corresponding author:** Fatemeh Sadat Marashian, Email: fsadatmarashian@gmail.com

can be defined in an educational context (academic well-being).[10] Although there is no consensus on the definition of students' academic well-being, it is often described as a multidimensional construct, encompassing several sub-dimensions.[11] Shengyao et al[12] stated that academic well-being can be defined as a comprehensive effort to create a state of sustained academic and emotional well-being, relying on perceptions of cognitive, emotional, and motor efficacy.

Various therapeutic approaches exist to improve the psychological problems of individuals, including students, one of which is positive mindfulness training.[13] Positive training emphasizes teaching how to focus on strengths to create, maintain, and enhance overall well-being along with positive emotions, and to positively change one's mental and behavioral goals.[14] By focusing purposefully and intelligently on human strengths and virtues such as wisdom, courage, justice, temperance, transcendence, and humanity, this training method seeks to overcome all threats related to human health.[15,16]

Positive mindfulness training, in terms of its theoretical and practical structure and content, simultaneously employs two approaches: releasing the mind from evaluating past and future events and focusing on present strengths and positives.[17] This simultaneous use and benefit from stopping the focus on and rumination of negative events, coupled with increased attention and focus on making the best use of human strengths such as wisdom, knowledge, courage, justice, humanity, and moving towards growth and self-improvement, leads to the release of cognitive, behavioral, emotional, and social energy and capacity, and increases individuals' adaptability and well-being.[18,19] In other words, when individuals stop negative evaluations of themselves and the world around them through mindfulness techniques, they are controlling and managing the most important primary element involved in depression: negative and ruminative cognitive elements focused on past and present events. When such a process is accompanied by the strengthening of positive, virtue-based human capacities such as courage, temperance, a desire for growth and self-realization, humanity, justice, and wisdom, it can lay the groundwork for individual transformation and growth.[20,21] Hansen et al[22] concluded that positive psychology and mindfulness interventions were able to increase optimism and self-compassion in nurses. Pourfereydoun et al[23] demonstrated in their research that positive mindfulness training intervention led to a decrease in psychological distress and an increase in emotional regulation, hope, and self-compassion in mastectomy patients with depression. Michel et al[24] demonstrated in their research that the combination of mindfulness therapy and positive activities led to increased work engagement, hope, and sleep quality, as well as decreased fatigue.

The pressing need to examine the academic well-being of medical students arises from the multifaceted challenges they encounter, including rigorous coursework, extensive study hours, and high-pressure assessments. These factors can contribute to significant levels of stress, anxiety, and burnout, which can negatively influence academic performance, mental health, and overall quality of life. While previous research has explored various interventions to address these challenges, such as stress management techniques and counseling services, there is a paucity of studies investigating the specific impact of mindfulness training on the academic well-being of medical students. This study aims to address this gap by examining the efficacy of a positive mindfulness training program in enhancing the academic well-being of medical students. By focusing on positive psychology principles, this intervention aims to cultivate positive emotions, such as gratitude and compassion, which have been shown to have a significant impact on mental health and well-being. This study differentiates itself from previous research by specifically targeting the unique stressors and challenges faced by medical students and by utilizing a positive psychology approach to promote resilience, motivation, and overall life satisfaction.

Methods

Design

This study employed a quasi-experimental pre-test-post-test design with a control group.

Participants

The population of this study consisted of all students at Jundishapur University of Medical Sciences, Ahvaz, who received academic counseling at the university counseling centers during the 2022-2023 academic year. A sample of 30 students was selected from this population using a convenience sampling method based on inclusion and exclusion criteria. A priori power analysis conducted with G*Power software determined this sample size to be sufficient for detecting a medium effect size (1.10) with a significance level of $\alpha = 0.05$ and a statistical power of 0.90. Participants were randomly assigned to experimental (positive mindfulness training) ($n = 15$) and control groups ($n = 15$). To ensure rigorous randomization and minimize potential bias, a computer-generated random number table was utilized. Each participant was assigned a unique number, and these numbers were then randomly sorted using the table. The first 15 participants in the sorted list were assigned to the experimental group, while the remaining 15 were assigned to the control group. This method ensured that participant assignment was unbiased and that both groups were comparable at baseline. Inclusion criteria included a diagnosis of academic problems after consulting with the university counseling center, the absence of severe mental disorders (such as psychosis), an age range of 20 to 35 years, and completion of at least four semesters of doctoral studies. Participants also had to provide written informed consent. Exclusion

criteria included receiving positive mindfulness training within the past two years, ongoing medication use, and non-cooperation or absence from two consecutive therapy sessions.

Instruments

The Academic Well-Being Questionnaire (AWBQ), a self-report measure developed by Tuominen-Soini et al,[8] assesses respondents' beliefs about academic well-being across four dimensions: value, burnout, satisfaction, and engagement. The scale consists of 31 items rated on a Likert scale, with eight reverse-scored items. Tuominen-Soini et al established the validity of the AWBQ through factor analysis, confirming its four-factor structure. Moradi et al[25] conducted a confirmatory factor analysis on the Persian version of the AWBQ, further supporting its four-factor structure. The questionnaire demonstrated strong internal consistency with a Cronbach's alpha of 0.94.

Procedure

After obtaining approval from the Research Unit of Azad University, Ahvaz Branch, and ethical approval for conducting the research, a total of 120 eligible students were identified by visiting the counseling center of Jundishapur University of Medical Sciences, Ahvaz, during the winter of 2022-2023. In a session arranged for these students, the objectives, benefits, and advantages of the research were explained. Subsequently, they were asked to sign a consent form if they agreed to participate in the study and were assured that they could withdraw at any time, even during the research process. They were also assured that all their information would be kept confidential. From among these students, a sample of 30 individuals who met the inclusion criteria was selected and randomly assigned to two groups: experimental (positive mindfulness training) and control (15 participants in each group). The experimental group received specialized positive mindfulness training, while no intervention was provided to the control group. It is worth noting that at the end of the study and after the follow-up phase, a suitable intervention was also provided to the control group. The intervention sessions were conducted over 10 weeks, with each session lasting 90 minutes. A summary of the positive mindfulness training sessions is presented in Table 1. After the interventions, post-tests were conducted, and a follow-up was conducted 45 days later for both the experimental and control groups.

Statistical analyses

For the analysis of data in this study, descriptive statistics such as mean and standard deviation, as well as inferential statistics including repeated measures analysis of variance (ANOVA) and the Bonferroni post hoc test, were used. It is worth noting that SPSS version 27 was used for data analysis. Additionally, the significance level in this study was set at $\alpha = 0.05$.

Results

Participants in this study consisted of 30 medical doctoral students with a mean age of 23.45 ± 6.62 years. Twelve participants were female and 18 were male. Table 2 presents the means and standard deviations of the academic well-being subscales for the positive mindfulness training and control groups at the pre-test, post-test, and follow-up stages. The results showed that in the experimental group, the mean scores of the academic value, academic satisfaction, academic engagement, and academic burnout subscales changed at the post-test and follow-up stages compared to the pre-test stage.

Table 1. Topics and content of positive mindfulness training sessions

Sessions	Topic	Content
First	Introduction and brief overview of the method	Establishing a positive rapport between the trainer and participants, introductions, outlining the rules and goals of the sessions, and providing a general overview of the structure of the positive mindfulness training method.
Second	Self-awareness	Explaining mastectomy, depression, and associated psychological problems, introducing mindfulness, self-awareness, positive psychology, and meditation, and familiarizing participants with focused meditation on breath, body, and emotions.
Third	Positive emotions	Discussing positive emotions and gratitude, and conducting a gratitude meditation focused on expressing gratitude towards someone or something.
Fourth	Self-compassion	Explaining self-compassion, reviewing relevant research, teaching methods to increase self-compassion, and providing and practicing a loving-kindness meditation focusing on self-compassion.
Fifth	Self-efficacy	Introducing character strengths, self-efficacy, and methods for improving them, and conducting a meditation focused on a time when participants best utilized their character strengths.
Sixth	Autonomy	Introducing autonomy and its relationship to eudaimonia (flourishing or well-being), and practicing mindfulness meditation based on the authentic self.
Seventh	Meaning	Discussing meaning and its relationship to eudaimonia, and conducting a writing exercise to describe one's best possible legacy or memories, aimed at practicing mindfulness of the past and meditating on the landscapes of one's best possible future life.
Eighth	Positive relationships with others	Discussing the benefits of positive relationships with others, teaching ways to improve positive relationships with others, and practicing loving-kindness meditation.
Ninth	Engagement and commitment	Explaining commitment and enjoyment discussing their relationship with positive emotions, and teaching a mindfulness of eating meditation.
Tenth	Summary and conclusion	Practicing strategies learned in previous sessions, summarizing and reviewing the sessions with participants, committing to applying the learned material in real life, and expressing gratitude to participants.

Table 2. Means and standard deviations (SD) of the academic well-being subscales

Variable	Phase	MBCT group	Control group
		Mean ± SD	Mean ± SD
Academic value	Pre-test	42.33 ± 4.38	40.40 ± 3.86
	Post-test	47.66 ± 4.35	40.66 ± 3.79
	Follow-up	48.00 ± 4.55	40.93 ± 3.95
Academic satisfaction	Pre-test	16.06 ± 1.94	16.17 ± 2.25
	Post-test	20.33 ± 1.95	16.20 ± 2.36
	Follow-up	20.53 ± 1.99	16.26 ± 2.43
Academic engagement	Pre-test	39.00 ± 3.56	38.80 ± 4.36
	Post-test	44.06 ± 3.82	39.06 ± 4.33
	Follow-up	44.40 ± 3.88	39.26 ± 4.36
Academic burnout	Pre-test	51.00 ± 3.42	50.06 ± 3.49
	Post-test	45.60 ± 3.77	49.86 ± 3.35
	Follow-up	45.40 ± 3.81	49.80 ± 3.46

Table 3. Bonferroni post-hoc test for paired comparison of the academic well-being subscales across time series

Scales	Phase A	Phase B	Mean difference (A-B)	SE	*P*
Academic value	Pre-test	Post-test	5.33	1.59	0.001
		Follow-up	5.66	1.38	0.001
	Post-test	Follow-up	0.33	1.40	0.261
Academic satisfaction	Pre-test	Post-test	4.26	1.32	0.001
		Follow-up	4.46	1.30	0.001
	Post-test	Follow-up	0.20	1.31	0.153
Academic engagement	Pre-test	Post-test	5.06	1.35	0.001
		Follow-up	5.40	1.32	0.001
	Post-test	Follow-up	0.34	1.39	0.244
Academic burnout	Pre-test	Post-test	-5.40	1.31	0.001
		Follow-up	-5.60	1.29	0.001
	Post-test	Follow-up	0.20	1.38	0.570

SE, Standard error

Before analyzing the data related to the hypotheses, the data of this study was examined for the assumptions of repeated measures ANOVA. The Kolmogorov-Smirnov test results indicated a normal distribution of variables. The Levene's test results indicated homogeneity of variances. Based on the results of Mauchly's test of sphericity, the variance-covariance matrix assumption was not met; therefore, the Greenhouse-Geisser correction was used. The results of repeated-measures ANOVA revealed a significant difference in academic well-being subscales across the pre-test, post-test, and follow-up stages ($P<0.001$). Additionally, there was a significant interaction between group and time for the dependent variables ($P<0.001$). Furthermore, the results indicated a significant difference in academic well-being subscales between the positive mindfulness training and control groups ($P<0.01$).

Table 3 presents the results of the Bonferroni post hoc test comparing the positive mindfulness training group and the control group on the academic well-being subscales at the post-test and follow-up stages relative to the pre-test. Based on the results, there was a significant difference in academic well-being subscales between the pre-test post-test, and follow-up stages in the positive mindfulness training group ($P<0.001$). However, there were no significant differences in academic well-being subscales between the post-test and follow-up stages in both the positive mindfulness training and control groups.

Discussion

This research aimed to investigate the effectiveness of positive mindfulness training on academic well-being among medical students. According to the results, positive mindfulness training was effective in improving the academic well-being of medical students. The findings of this study are consistent with the results of previous research by Michel et al,[24] and Sadeghi et al.[26] To explain these findings, Tuominen-Soini et al[8] argued that the field of academic well-being has been a focus of positive psychologists in recent decades as a qualitative outcome of academic performance. This is because the key to understanding the low academic performance of students may lie in their impaired academic well-being, or in other words, academic burnout.[10] Psychological well-being is an important indicator of various educational achievements. Given the multidimensional nature of well-being and the central role of schools in adolescents' lives, the term well-being can be defined in an educational context (academic well-being). Although there is no consensus on the definition of student well-being, it is often described as a multidimensional construct, consisting of several sub-dimensions.[12]

Tuominen-Soini et al[8] stated that academic well-being can be defined as a comprehensive effort to create a state of sustained academic and emotional well-being, relying on the perception of cognitive, emotional, and motor efficacy. Interventions based on positive psychology training have shown their effectiveness in improving various characteristics, especially positive psychological traits such as hope, optimism, and well-being.[14] The mindfulness-based approach, rooted in positive psychology, has emerged to dramatically increase the effectiveness of both educational methods. Results indicate its effectiveness on well-being and sexual pleasure, stress, depression, mindfulness, gratitude, self-compassion, autonomy, health, self-efficacy, meaning in life, and compassion for others.[13,15,18]

Mindfulness is different from attention redirection. While attention redirection aims to identify problematic or disturbing aspects of a thought and divert attention away from it by focusing on external matters, mindfulness involves the ability to identify problematic aspects of a

thought and establish a different relationship with these thoughts. The goal of any mindfulness-based therapy is to teach different ways of relating to one's mental content.[19] Furthermore, a functional approach to emotion regulation emphasizes the complexity and caution in judging the adaptive qualities and adaptive impact of emotion regulation strategies. Additionally, it increases the importance of contextual influences by focusing attention on the nature of individual goals. Finally, emotion regulation involves the review and evaluation of emotional experience. In other words, emotional self-reflection and cognitive appraisals of one's emotional experience are important for emotion regulation, as these appraisals guide individuals' emotional goals in that context and how and why they manage their emotions.[22]

The findings of this study provide compelling evidence for the efficacy of positive mindfulness training in enhancing the academic well-being of medical students. The significant improvements observed in the post-test compared to the control group across multiple dimensions of academic well-being, including value, satisfaction, engagement, and burnout, underscore the potential benefits of this intervention. Specifically, the results suggest that positive mindfulness training can effectively address the challenges faced by medical students, such as stress, anxiety, and burnout, which can negatively impact their academic performance and overall well-being. By cultivating mindfulness skills, medical students may be better equipped to cope with the demanding nature of their studies, manage stress effectively, and maintain a positive outlook. Moreover, the findings highlight the potential of mindfulness training to enhance students' academic engagement and satisfaction. By fostering a greater appreciation for the value of their studies and promoting a sense of purpose and fulfillment, mindfulness training can help medical students develop a more positive and meaningful academic experience.[27]

The study's generalizability is limited due to the specific population sampled. The use of convenience sampling may introduce biases, and the small sample size may limit the statistical power of the findings. These limitations should be considered when interpreting the results and drawing conclusions.

Conclusion

The findings of this study extend the existing literature by demonstrating the efficacy of a positive mindfulness training program in enhancing the academic well-being of medical students. While previous research has explored the benefits of mindfulness training for various populations, including college students, this study contributes to the field by specifically examining its impact on the unique challenges faced by medical students. By focusing on positive psychology principles, this intervention goes beyond traditional stress reduction techniques to promote a more holistic approach to well-being. The significant improvements observed in academic value, satisfaction, and engagement, as well as reductions in burnout, highlight the potential of mindfulness training to enhance both the academic and personal lives of medical students. This study differentiates itself from previous research by not only demonstrating the immediate benefits of the intervention but also suggesting that mindfulness training may have long-lasting effects on the academic and personal outcomes of medical students. Further research is needed to explore the long-term effects of mindfulness training on the academic and personal outcomes of medical students, as well as to identify potential moderators and mediators of these effects.

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Authors' Contribution

Conceptualization: Pegah Babadi.
Data curation: Pegah Babadi.
Investigation: Fatemeh Sadat Marashian.
Methodology: Pegah Babadi.
Project administration: Fatemeh Sadat Marashian.
Resources: Sahar Safarzadeh.
Software: Sahar Safarzadeh.
Supervision: Fatemeh Sadat Marashian.
Writing–original draft: Pegah Babadi.
Writing–review & editing: Fatemeh Sadat Marashian.

Competing Interests

The authors declare no conflict of interest.

Ethical Approval

The study was approved by the Ethical Committee of Islamic Azad University, Ahvaz branch (approval code: IR.IAU.AHVAZ.REC.1403.109).

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